APPENDIX A

COASTAL ZONE MANAGEMENT ACT OF 1972,

as amended through Pub. L. No. 109-58,
the Energy Policy Act of 2005

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16 U.S.C. § 1451. Congressional findings (Section 302)

The Congress finds that--

(a) There is a national interest in the effective management, beneficial use, protection, and development of the coastal zone.
(b) The coastal zone is rich in a variety of natural, commercial, recreational, ecological, industrial, and esthetic resources of immediate and potential value to the present and future well-being of the Nation.
(c) The increasing and competing demands upon the lands and waters of our coastal zone occasioned by population growth and economic development, including requirements for industry, commerce, residential development, recreation, extraction of mineral resources and fossil fuels, transportation and navigation, waste disposal, and harvesting of fish, shellfish, and other living marine resources, have resulted in the loss of living marine resources, wildlife, nutrient-rich areas, permanent and adverse changes to ecological systems, decreasing open space for public use, and shoreline erosion.

(d) The habitat areas of the coastal zone, and the fish, shellfish, other living marine resources, and wildlife therein, are ecologically fragile and consequently extremely vulnerable to destruction by man's alterations.
(e) Important ecological, cultural, historic, and esthetic values in the coastal zone which are essential to the well-being of all citizens are being irretrievably damaged or lost.
(f) New and expanding demands for food, energy, minerals, defense needs, recreation, waste disposal, transportation, and industrial activities in the Great Lakes, territorial sea, exclusive economic zone, and Outer Continental Shelf are placing stress on these areas and are creating the need for resolution of serious conflicts among important and competing uses and values in coastal and ocean waters;
(g) Special natural and scenic characteristics are being damaged by ill-planned development that threatens these values.
(h) In light of competing demands and the urgent need to protect and to give high priority to natural systems in the coastal zone, present state and local institutional arrangements for planning and regulating land and water uses in such areas are inadequate.
(i) The key to more effective protection and use of the land and water resources of the coastal zone is to encourage the states to exercise their full authority over the lands and waters in the coastal zone by assisting the states, in cooperation with Federal and local governments and other vitally affected interests, in developing land and water use programs for the coastal zone, including unified policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance.
(j) The national objective of attaining a greater degree of energy self-sufficiency would be advanced by providing Federal financial assistance to meet state and local needs resulting from new or expanded energy activity in or affecting the coastal zone.
(k) Land uses in the coastal zone, and the uses of adjacent lands which drain into the coastal zone, may significantly affect the quality of coastal waters and habitats, and efforts to control coastal water pollution from land use activities must be improved.
(l) Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence.
(m) Because of their proximity to and reliance upon the ocean and its resources, the coastal states have substantial and significant interests in the protection, management, and development of the resources of the exclusive economic zone that can only be served by the active participation of coastal states in all Federal programs affecting such resources and, wherever appropriate, by the development of state ocean resource plans as part of their federally approved coastal zone management programs.

16 U.S.C. § 1452. Congressional declaration of policy (Section 303)

The Congress finds and declares that it is the national policy--

(1) to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations;
(2) to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development, which programs should at least provide for--

(A) the protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone,
(B) the management of coastal development to minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard, and erosion-prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands,
(C) the management of coastal development to improve, safeguard, and restore the quality of coastal waters, and to protect natural resources and existing uses of those waters,
(D) priority consideration being given to coastal-dependent uses and orderly processes for siting major facilities related to national defense, energy, fisheries development, recreation, ports and transportation, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists,
(E) public access to the coasts for recreation purposes,
(F) assistance in the redevelopment of deteriorating urban waterfronts and ports, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features,
(G) the coordination and simplification of procedures in order to ensure expedited governmental decisionmaking for the management of coastal resources,
(H) continued consultation and coordination with, and the giving of adequate consideration to the views of, affected Federal agencies,
(I) the giving of timely and effective notification of, and opportunities for public and local government participation in, coastal management decisionmaking,
(J) assistance to support comprehensive planning, conservation, and management for living marine resources, including planning for the siting of pollution control and aquaculture facilities within the coastal zone, and improved coordination between State and Federal coastal zone management agencies and State and wildlife agencies, and

(K) the study and development, in any case in which the Secretary considers it to be appropriate, of plans for addressing the adverse effects upon the coastal zone of land subsidence and of sea level rise; and

(3) to encourage the preparation of special area management plans which provide for increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, including those areas likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decisionmaking;

(4) to encourage the participation and cooperation of the public, state and local governments, and interstate and other regional agencies, as well as of the Federal agencies having programs affecting the coastal zone, in carrying out the purposes of this chapter;

(5) to encourage coordination and cooperation with and among the appropriate Federal, State, and local agencies, and international organizations where appropriate, in collection, analysis, synthesis, and dissemination of coastal management information, research results, and technical assistance, to support State and Federal regulation of land use practices affecting the coastal and ocean resources of the United States; and

(6) to respond to changing circumstances affecting the coastal environment and coastal resource management by encouraging States to consider such issues as ocean uses potentially affecting the coastal zone.

16 U.S.C. § 1453. Definitions (Section 304)

For purposes of this chapter--

(1) The term "coastal zone" means the coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several coastal states, and includes islands, transitional and intertidal areas, salt marshes, wetlands, and beaches. The zone extends, in Great Lakes waters, to the international boundary between the United States and Canada and, in other areas, seaward to the outer limit of State title and ownership under the Submerged Lands Act (43 U.S.C. 1301 et seq.), the Act of March 2, 1917, (48 U.S.C. 749), the Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America, as approved by the Act of March 24, 1976 (48 U.S.C. 1801 et seq.), or section 1 of the Act of November 20, 1963 (48 U.S.C. 1705), as applicable. The zone extends inland from the shorelines only to the extent necessary to control shorelands, the uses of which have a direct and significant impact on the coastal waters, and to control those geographical areas which are likely to be affected by or vulnerable to sea level rise. Excluded from the coastal zone are lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents.

(2) The term "coastal resource of national significance" means any coastal wetland, beach, dune, barrier island, reef, estuary, or fish and wildlife habitat, if

any such area is determined by a coastal state to be of substantial biological or natural storm protective value.
(3) The term "coastal waters" means (A) in the Great Lakes area, the waters within the territorial jurisdiction of the United States consisting of the Great Lakes, their connecting waters, harbors, roadsteads, and estuary-type areas such as bays, shallows, and marshes and (B) in other areas, those waters, adjacent to the shorelines, which contain a measurable quantity or percentage of sea water, including, but not limited to, sounds, bays, lagoons, bayous, ponds, and estuaries.
(4) The term "coastal state" means a state of the United States in, or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of this chapter, the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Mariana Islands, and the Trust Territories of the Pacific Islands, and American Samoa.
(5) The term "coastal energy activity" means any of the following activities if, and to the extent that (A) the conduct, support, or facilitation of such activity requires and involves the siting, construction, expansion, or operation of any equipment or facility; and (B) any technical requirement exists which, in the determination of the Secretary, necessitates that the siting, construction, expansion, or operation of such equipment or facility be carried out in, or in close proximity to, the coastal zone of any coastal state;

> **(i)** Any outer Continental Shelf energy activity.
> **(ii)** Any transportation, conversion, treatment, transfer, or storage of liquefied natural gas.
> **(iii)** Any transportation, transfer, or storage of oil, natural gas, or coal (including, but not limited to, by means of any deepwater port, as defined in section 1502(10) of Title 33).
>
> For purposes of this paragraph, the siting, construction, expansion, or operation of any equipment or facility shall be "in close proximity to" the coastal zone of any coastal state if such siting, construction, expansion, or operation has, or is likely to have, a significant effect on such coastal zone.

(6) The term "energy facilities" means any equipment or facility which is or will be used primarily--

> **(A)** in the exploration for, or the development, production, conversion, storage, transfer, processing, or transportation of, any energy resource; or
> **(B)** for the manufacture, production, or assembly of equipment, machinery, products, or devices which are involved in any activity described in subparagraph (A).
>
> The term includes, but is not limited to (i) electric generating plants; (ii) petroleum refineries and associated facilities; (iii) gasification plants; (iv) facilities used for the transportation, conversion, treatment, transfer, or storage of liquefied natural gas; (v) uranium enrichment or nuclear fuel

processing facilities; (vi) oil and gas facilities, including platforms, assembly plants, storage depots, tank farms, crew and supply bases, and refining complexes; (vii) facilities including deepwater ports, for the transfer of petroleum; (viii) pipelines and transmission facilities; and (ix) terminals which are associated with any of the foregoing.

(6a) The term "enforceable policy" means State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources in the coastal zone.
(7) The term "estuary" means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term includes estuary-type areas of the Great Lakes.
(8) The term "estuarine sanctuary" means a research area which may include any part or all of an estuary and any island, transitional area, and upland in, adjoining, or adjacent to such estuary, and which constitutes to the extent feasible a natural unit, set aside to provide scientists and students the opportunity to examine over a period of time the ecological relationships within the area.
(9) The term "Fund" means the Coastal Zone Management Fund established under section 1456a(b) of this title.
(10) The term "land use" means activities which are conducted in, or on the shorelands within, the coastal zone, subject to the requirements outlined in section 1456(g) of this title.
(11) The term "local government" means any political subdivision of, or any special entity created by, any coastal state which (in whole or part) is located in, or has authority over, such state's coastal zone and which (A) has authority to levy taxes, or to establish and collect user fees, or (B) provides any public facility or public service which is financed in whole or part by taxes or user fees. The term includes, but is not limited to, any school district, fire district, transportation authority, and any other special purpose district or authority.
(12) The term "management program" includes, but is not limited to, a comprehensive statement in words, maps, illustrations, or other media of communication, prepared and adopted by the state in accordance with the provisions of this chapter, setting forth objectives, policies, and standards to guide public and private uses of lands and waters in the coastal zone.
(13) The term "outer Continental Shelf energy activity" means any exploration for, or any development or production of, oil or natural gas from the outer Continental Shelf (as defined in section 1331(a) of Title 43) or the siting, construction, expansion, or operation of any new or expanded energy facilities directly required by such exploration, development, or production.
(14) The term "person" means any individual; any corporation, partnership, association, or other entity organized or existing under the laws of any state; the Federal Government; any state, regional, or local government; or any entity of any such Federal, state, regional, or local government.

(15) The term "public facilities and public services" means facilities or services which are financed, in whole or in part, by any state or political subdivision thereof, including, but not limited to, highways and secondary roads, parking, mass transit, docks, navigation aids, fire and police protection, water supply, waste collection and treatment (including drainage), schools and education, and hospitals and health care. Such term may also include any other facility or service so financed which the Secretary finds will support increased population.
(16) The term "Secretary" means the Secretary of Commerce.
(17) The term "special area management plan" means a comprehensive plan providing for natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone.
(18) The term "water use" means a use, activity, or project conducted in or on waters within the coastal zone.

16 U.S.C. § 1454. **Submittal of State program for approval (Section 305)**

Any coastal state which has completed the development of its management program shall submit such program to the Secretary for review and approval pursuant to section 1455 of this title.

16 U.S.C. § 1455. Administrative grants (Section 306)

(a) Authorization; matching funds

The Secretary may make grants to any coastal state for the purpose of administering that state's management program, if the state matches any such grant according to the following ratios of Federal-to-State contributions for the applicable fiscal year:

(1) For those States for which programs were approved prior to November 5, 1990, 1 to 1 for any fiscal year.
(2) For programs approved after November 5, 1990, 4 to 1 for the first fiscal year, 2.3 to 1 for the second fiscal year, 1.5 to 1 for the third fiscal year, and 1 to 1 for each fiscal year thereafter.

(b) Grants to coastal states; requirements

The Secretary may make a grant to a coastal state under subsection (a) of this section only if the Secretary finds that the management program of the coastal state meets all applicable requirements of this chapter and has been approved in accordance with subsection (d) of this section.

(c) Allocation of grants to coastal states

Grants under this section shall be allocated to coastal states with approved programs based on rules and regulations promulgated by the Secretary which shall take into account the extent and nature of the shoreline and area covered by the program, population of the area, and other relevant factors. The Secretary shall establish, after consulting with the coastal states, maximum and minimum grants for any fiscal year to promote equity between coastal states and effective coastal management.

(d) Mandatory adoption of State management program for coastal zone

Before approving a management program submitted by a coastal state, the Secretary shall find the following:

(1) The State has developed and adopted a management program for its coastal zone in accordance with rules and regulations promulgated by the Secretary, after notice, and with the opportunity of full participation by relevant Federal agencies, State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private, which is adequate to carry out the purposes of this chapter and is consistent with the policy declared in section 1452 of this title.

(2) The management program includes each of the following required program elements:

(A) An identification of the boundaries of the coastal zone subject to the management program.

(B) A definition of what shall constitute permissible land uses and water uses within the coastal zone which have a direct and significant impact on the coastal waters.

(C) An inventory and designation of areas of particular concern within the coastal zone.

(D) An identification of the means by which the State proposes to exert control over the land uses and water uses referred to in subparagraph (B), including a list of relevant State constitutional provisions, laws, regulations, and judicial decisions.

(E) Broad guidelines on priorities of uses in particular areas, including specifically those uses of lowest priority.

(F) A description of the organizational structure proposed to implement such management program, including the responsibilities and interrelationships of local, areawide, State, regional, and interstate agencies in the management process.

(G) A definition of the term "beach" and a planning process for the protection of, and access to, public beaches and other public coastal areas of environmental, recreational, historical, esthetic, ecological, or cultural value.

(H) A planning process for energy facilities likely to be located in, or which may significantly affect, the coastal zone, including a

process for anticipating the management of the impacts resulting from such facilities.

(I) A planning process for assessing the effects of, and studying and evaluating ways to control, or lessen the impact of, shoreline erosion, and to restore areas adversely affected by such erosion.

(3) The State has--

(A) coordinated its program with local, areawide, and interstate plans applicable to areas within the coastal zone--

(i) existing on January 1 of the year in which the State's management program is submitted to the Secretary; and

(ii) which have been developed by a local government, an areawide agency, a regional agency, or an interstate agency; and

(B) established an effective mechanism for continuing consultation and coordination between the management agency designated pursuant to paragraph (6) and with local governments, interstate agencies, regional agencies, and areawide agencies within the coastal zone to assure the full participation of those local governments and agencies in carrying out the purposes of this chapter; except that the Secretary shall not find any mechanism to be effective for purposes of this subparagraph unless it requires that--

(i) the management agency, before implementing any management program decision which would conflict with any local zoning ordinance, decision, or other action, shall send a notice of the management program decision to any local government whose zoning authority is affected;

(ii) within the 30-day period commencing on the date of receipt of that notice, the local government may submit to the management agency written comments on the management program decision, and any recommendation for alternatives; and

(iii) the management agency, if any comments are submitted to it within the 30- day period by any local government--

(I) shall consider the comments;

(II) may, in its discretion, hold a public hearing on the comments; and

(III) may not take any action within the 30-day period to implement the management program decision.

(4) The State has held public hearings in the development of the management program.

(5) The management program and any changes thereto have been reviewed and approved by the Governor of the State.

(6) The Governor of the State has designated a single State agency to receive and administer grants for implementing the management program.
(7) The State is organized to implement the management program.
(8) The management program provides for adequate consideration of the national interest involved in planning for, and managing the coastal zone, including the siting of facilities such as energy facilities which are of greater than local significance. In the case of energy facilities, the Secretary shall find that the State has given consideration to any applicable national or interstate energy plan or program.
(9) The management program includes procedures whereby specific areas may be designated for the purpose of preserving or restoring them for their conservation, recreational, ecological, historical, or esthetic values.
(10) The State, acting through its chosen agency or agencies (including local governments, areawide agencies, regional agencies, or interstate agencies) has authority for the management of the coastal zone in accordance with the management program. Such authority shall include power--

> **(A)** to administer land use and water use regulations to control development to ensure compliance with the management program, and to resolve conflicts among competing uses; and
> **(B)** to acquire fee simple and less than fee simple interests in land, waters, and other property through condemnation or other means when necessary to achieve conformance with the management program.

(11) The management program provides for any one or a combination of the following general techniques for control of land uses and water uses within the coastal zone:

> **(A)** State establishment of criteria and standards for local implementation, subject to administrative review and enforcement.
> **(B)** Direct State land and water use planning and regulation.
> **(C)** State administrative review for consistency with the management program of all development plans, projects, or land and water use regulations, including exceptions and variances thereto, proposed by any State or local authority or private developer, with power to approve or disapprove after public notice and an opportunity for hearings.

(12) The management program contains a method of assuring that local land use and water use regulations within the coastal zone do not unreasonably restrict or exclude land uses and water uses of regional benefit.
(13) The management program provides for--

> **(A)** the inventory and designation of areas that contain one or more coastal resources of national significance; and
> **(B)** specific and enforceable standards to protect such resources.

(14) The management program provides for public participation in permitting processes, consistency determinations, and other similar decisions.
(15) The management program provides a mechanism to ensure that all State agencies will adhere to the program.
(16) The management program contains enforceable policies and mechanisms to implement the applicable requirements of the Coastal Nonpoint Pollution Control Program of the State required by section 1455b of this title.

(e) Amendment or modification of State management program for coastal zone

A coastal state may amend or modify a management program which it has submitted and which has been approved by the Secretary under this section, subject to the following conditions:

(1) The State shall promptly notify the Secretary of any proposed amendment, modification, or other program change and submit it for the Secretary's approval. The Secretary may suspend all or part of any grant made under this section pending State submission of the proposed amendments, modification, or other program change.
(2) Within 30 days after the date the Secretary receives any proposed amendment, the Secretary shall notify the State whether the Secretary approves or disapproves the amendment, or whether the Secretary finds it is necessary to extend the review of the proposed amendment for a period not to exceed 120 days after the date the Secretary received the proposed amendment. The Secretary may extend this period only as necessary to meet the requirements of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). If the Secretary does not notify the coastal state that the Secretary approves or disapproves the amendment within that period, then the amendment shall be conclusively presumed as approved.
(3) **(A)** Except as provided in subparagraph (B), a coastal state may not implement any amendment, modification, or other change as part of its approved management program unless the amendment, modification, or other change is approved by the Secretary under this subsection.
(B) The Secretary, after determining on a preliminary basis, that an amendment, modification, or other change which has been submitted for approval under this subsection is likely to meet the program approval standards in this section, may permit the State to expend funds awarded under this section to begin implementing the proposed amendment, modification, or change. This preliminary approval shall not extend for more than 6 months and may not be renewed. A proposed amendment, modification, or change which has been given preliminary approval and is not finally approved under this paragraph shall not be considered an enforceable policy for purposes of section 1456 of this title.

16 U.S.C. § 1455a. Coastal resource improvement program (Section 306A)

(a) Definitions

For purposes of this section--

(1) The term "eligible coastal state" means a coastal state that for any fiscal year for which a grant is applied for under this section--

(A) has a management program approved under section 1455 of this title; and

(B) in the judgment of the Secretary, is making satisfactory progress in activities designed to result in significant improvement in achieving the coastal management objectives specified in section 1452(2)(A) through (K) of this title.

(2) The term "urban waterfront and port" means any developed area that is densely populated and is being used for, or has been used for, urban residential recreational, commercial, shipping or industrial purposes.

(b) Resource management improvement grants

The Secretary may make grants to any eligible coastal state to assist that state in meeting one or more of the following objectives:

(1) The preservation or restoration of specific areas of the state that (A) are designated under the management program procedures required by section 1455(d)(9) of this title because of their conservation recreational, ecological, or esthetic values, or (B) contain one or more coastal resources of national significance, or for the purpose of restoring and enhancing shellfish production by the purchase and distribution of clutch material on publicly owned reef tracts.

(2) The redevelopment of deteriorating and underutilized urban waterfronts and ports that are designated in the state's management program pursuant to section 1455(d)(2)(C) of this title as areas of particular concern.

(3) The provision of access to public beaches and other public coastal areas and to coastal waters in accordance with the planning process required under section 1455(d)(2)(G) of this title.

(4) The development of a coordinated process among State agencies to regulate and issue permits for aquaculture facilities in the coastal zone.

(c) Uses, terms and conditions of grants

(1) Each grant made by the Secretary under this section shall be subject to such terms and conditions as may be appropriate to ensure that the grant is used for purposes consistent with this section.

(2) Grants made under this section may be used for--

(A) the acquisition of fee simple and other interests in land;
(B) low-cost construction projects determined by the Secretary to be consistent with the purposes of this section, including but not limited to, paths, walkways, fences, parks, and the rehabilitation of historic buildings and structures; except that not more than 50 per centum of any grant made under this section may be used for such construction projects;
(C) in the case of grants made for objectives described in subsection (b) (2) of this section--

(i) the rehabilitation or acquisition of piers to provide increased public use, including compatible commercial activity,
(ii) the establishment of shoreline stabilization measures including the installation or rehabilitation of bulkheads for the purpose of public safety or increasing public access and use, and
(iii) the removal or replacement of pilings where such action will provide increased recreational use of urban waterfront areas, but activities provided for under this paragraph shall not be treated as construction projects subject to the limitations in paragraph (B);

(D) engineering designs, specifications, and other appropriate reports; and
(E) educational, interpretive, and management costs and such other related costs as the Secretary determines to be consistent with the purposes of this section.

(d) State matching contributions; ratio; maximum amount of grants

(1) The Secretary may make grants to any coastal state for the purpose of carrying out the project or purpose for which such grants are awarded, if the state matches any such grant according to the following ratios of Federal to state contributions for the applicable fiscal year: 4 to 1 for fiscal year 1986; 2.3 to 1 for fiscal year 1987; 1.5 to 1 for fiscal year 1988; and 1 to 1 for each fiscal year after fiscal year 1988.

(2) Grants provided under this section may be used to pay a coastal state's share of costs required under any other Federal program that is consistent with the purposes of this section.

(3) The total amount of grants made under this section to any eligible coastal state for any fiscal year may not exceed an amount equal to 10 per centum of the total amount appropriated to carry out this section for such fiscal year.

(e) Allocation of grants to local governments and other agencies

With the approval of the Secretary, an eligible coastal state may allocate to a local government, an areawide agency designated under section 3334 of Title 42, a regional agency, or an interstate agency, a portion of any grant made under this section for the purpose of carrying out this section; except that such an allocation shall not relieve that state of the responsibility for ensuring that any funds so allocated are applied in furtherance of the state's approved management program.

(f) Other technical and financial assistance

In addition to providing grants under this section, the Secretary shall assist eligible coastal states and their local governments in identifying and obtaining other sources of available Federal technical and financial assistance regarding the objectives of this section.

16 U.S.C. § 1455b. Protecting coastal waters

(a) In general

(1) Program development

Not later than 30 months after the date of the publication of final guidance under subsection (g) of this section, each State for which a management program has been approved pursuant to section 306 of the Coastal Zone Management Act of 1972 shall prepare and submit to the Secretary and the Administrator a Coastal Nonpoint Pollution Control Program for approval pursuant to this section. The purpose of the program shall be to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other State and local authorities.

(2) Program coordination

A State program under this section shall be coordinated closely with State and local water quality plans and programs developed pursuant to sections 1288, 1313, 1329, and 1330 of Title 33 and with State plans developed pursuant to the Coastal Zone Management Act of 1972 , as amended by this Act. The program shall serve as an update and expansion of the State nonpoint source management program developed under section 1329 of Title 33, as the program under that section relates to land and water uses affecting coastal waters.

(b) Program contents

Each State program under this section shall provide for the implementation, at a minimum, of management measures in conformity

with the guidance published under subsection (g) of this section, to protect coastal waters generally, and shall also contain the following:

(1) Identifying land uses

The identification of, and a continuing process for identifying, land uses which, individually or cumulatively, may cause or contribute significantly to a degradation of--

> **(A)** those coastal waters where there is a failure to attain or maintain applicable water quality standards or protect designated uses, as determined by the State pursuant to its water quality planning processes; or
> **(B)** those coastal waters that are threatened by reasonably foreseeable increases in pollution loadings from new or expanding sources.

(2) Identifying critical coastal areas

The identification of, and a continuing process for identifying, critical coastal areas adjacent to coastal waters referred to in paragraph (1)(A) and (B), within which any new land uses or substantial expansion of existing land uses shall be subject to management measures in addition to those provided for in subsection (g) of this section.

(3) Management measures

The implementation and continuing revision from time to time of additional management measures applicable to the land uses and areas identified pursuant to paragraphs (1) and (2) that are necessary to achieve and maintain applicable water quality standards under section 1313 of Title 33 and protect designated uses.

(4) Technical assistance

The provision of technical and other assistance to local governments and the public for implementing the measures referred to in paragraph (3), which may include assistance in developing ordinances and regulations, technical guidance, and modeling to predict and assess the effectiveness of such measures, training, financial incentives, demonstration projects, and other innovations to protect coastal water quality and designated uses.

(5) Public participation

Opportunities for public participation in all aspects of the program, including the use of public notices and opportunities for comment, nomination procedures, public hearings, technical and financial assistance, public education, and other means.

(6) Administrative coordination

The establishment of mechanisms to improve coordination among State agencies and between State and local officials responsible for land use programs and permitting, water quality permitting and enforcement, habitat protection, and public health and safety, through the use of joint project review, memoranda of agreement, or other mechanisms.

(7) State coastal zone boundary modification

A proposal to modify the boundaries of the State coastal zone as the coastal management agency of the State determines is necessary to implement the recommendations made pursuant to subsection (e) of this section. If the coastal management agency does not have the authority to modify such boundaries, the program shall include recommendations for such modifications to the appropriate State authority.

(c) Program submission, approval, and implementation

(1) Review and approval

Within 6 months after the date of submission by a State of a program pursuant to this section, the Secretary and the Administrator shall jointly review the program. The program shall be approved if--

(A) the Secretary determines that the portions of the program under the authority of the Secretary meet the requirements of this section and the Administrator concurs with that determination; and

(B) the Administrator determines that the portions of the program under the authority of the Administrator meet the requirements of this section and the Secretary concurs with that determination.

(2) Implementation of approved program

If the program of a State is approved in accordance with paragraph (1), the State shall implement the program, including the management measures included in the program pursuant to subsection (b) of this section, through-

(A) changes to the State plan for control of nonpoint source pollution approved under section 1329 of Title 33; and

(B) changes to the State coastal zone management program developed under section 306 of the Coastal Zone Management Act of 1972, as amended by this Act.

(3) Withholding coastal management assistance

If the Secretary finds that a coastal State has failed to submit an approvable program as required by this section, the Secretary shall

withhold for each fiscal year until such a program is submitted a portion of grants otherwise available to the State for the fiscal year under section 306 of the Coastal Zone Management Act of 1972, as follows:

(A) 10 percent for fiscal year 1996.
(B) 15 percent for fiscal year 1997.
(C) 20 percent for fiscal year 1998.
(D) 30 percent for fiscal year 1999 and each fiscal year thereafter.

The Secretary shall make amounts withheld under this paragraph available to coastal States having programs approved under this section.

(4) Withholding water pollution control assistance

If the Administrator finds that a coastal State has failed to submit an approvable program as required by this section, the Administrator shall withhold from grants available to the State under section 1329 of Title 33, for each fiscal year until such a program is submitted, an amount equal to a percentage of the grants awarded to the State for the preceding fiscal year under that section, as follows:

(A) For fiscal year 1996, 10 percent of the amount awarded for fiscal year 1995.
(B) For fiscal year 1997, 15 percent of the amount awarded for fiscal year 1996.
(C) For fiscal year 1998, 20 percent of the amount awarded for fiscal year 1997.
(D) For fiscal year 1999 and each fiscal year thereafter, 30 percent of the amount awarded for fiscal year 1998 or other preceding fiscal year.

The Administrator shall make amounts withheld under this paragraph available to States having programs approved pursuant to this subsection.

(d) Technical assistance

The Secretary and the Administrator shall provide technical assistance to coastal States and local governments in developing and implementing programs under this section. Such assistance shall include--

(1) methods for assessing water quality impacts associated with coastal land uses;
(2) methods for assessing the cumulative water quality effects of coastal development;
(3) maintaining and from time to time revising an inventory of model ordinances, and providing other assistance to coastal States and local governments in identifying, developing, and implementing pollution control measures; and

(4) methods to predict and assess the effects of coastal land use management measures on coastal water quality and designated uses.

(e) Inland coastal zone boundaries

(1) Review

The Secretary, in consultation with the Administrator of the Environmental Protection Agency, shall, within 18 months after November 5, 1990, review the inland coastal zone boundary of each coastal State program which has been approved or is proposed for approval under section 306 of the Coastal Zone Management Act of 1972, and evaluate whether the State's coastal zone boundary extends inland to the extent necessary to control the land and water uses that have a significant impact on coastal waters of the State.

(2) Recommendation

If the Secretary, in consultation with the Administrator, finds that modifications to the inland boundaries of a State's coastal zone are necessary for that State to more effectively manage land and water uses to protect coastal waters, the Secretary, in consultation with the Administrator, shall recommend appropriate modifications in writing to the affected State.

(f) Financial assistance

(1) In general

Upon request of a State having a program approved under section 306 of the Coastal Zone Management Act of 1972, the Secretary, in consultation with the Administrator, may provide grants to the State for use for developing a State program under this section.

(2) Amount

The total amount of grants to a State under this subsection shall not exceed 50 percent of the total cost to the State of developing a program under this section.

(3) State share

The State share of the cost of an activity carried out with a grant under this subsection shall be paid from amounts from non-Federal sources.

(4) Allocation

Amounts available for grants under this subsection shall be allocated among States in accordance with regulations issued pursuant to section 306(c) of the Coastal Zone Management Act of 1972, except that the Secretary may use not more than 25 percent of amounts available for such grants to assist States which the Secretary, in consultation with the Administrator, determines are making exemplary progress in preparing a State program under this section or have extreme needs with respect to coastal water quality.

(g) Guidance for coastal nonpoint source pollution control

(1) In general

The Administrator, in consultation with the Secretary and the Director of the United States Fish and Wildlife Service and other Federal agencies, shall publish (and periodically revise thereafter) guidance for specifying management measures for sources of nonpoint pollution in coastal waters.

(2) Content

Guidance under this subsection shall include, at a minimum--

(A) a description of a range of methods, measures, or practices, including structural and nonstructural controls and operation and maintenance procedures, that constitute each measure;
(B) a description of the categories and subcategories of activities and locations for which each measure may be suitable;
(C) an identification of the individual pollutants or categories or classes of pollutants that may be controlled by the measures and the water quality effects of the measures;
(D) quantitative estimates of the pollution reduction effects and costs of the measures;
(E) a description of the factors which should be taken into account in adapting the measures to specific sites or locations; and
(F) any necessary monitoring techniques to accompany the measures to assess over time the success of the measures in reducing pollution loads and improving water quality.

(3) Publication

The Administrator, in consultation with the Secretary, shall publish--

(A) proposed guidance pursuant to this subsection not later than 6 months after November 5, 1990; and
(B) final guidance pursuant to this subsection not later than 18 months after November 5, 1990.

(4) Notice and comment

The Administrator shall provide to coastal States and other interested persons an opportunity to provide written comments on proposed guidance under this subsection.

(5) Management measures

For purposes of this subsection, the term "management measures" means economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives.

(h) Authorization of appropriations

(1) Administrator

There is authorized to be appropriated to the Administrator for use for carrying out this section not more than $1,000,000 for each of fiscal years 1992, 1993, and 1994.

(2) Secretary

(A) Of amounts appropriated to the Secretary for a fiscal year under section 318(a)(4) of the Coastal Zone Management Act of 1972, as amended by this Act, not more than $1,000,000 shall be available for use by the Secretary for carrying out this section for that fiscal year, other than for providing in the form of grants under subsection (f) of this section.
(B) There is authorized to be appropriated to the Secretary for use for providing in the form of grants under subsection (f) of this section not more than--
(i) $6,000,000 for fiscal year 1992;
(ii) $12,000,000 for fiscal year 1993;
(iii) $12,000,000 for fiscal year 1994; and
(iv) $12,000,000 for fiscal year 1995.

(i) Definitions

In this section--
(1) the term "Administrator" means the Administrator of the Environmental Protection Agency;
(2) the term "coastal state" has the meaning given the term "coastal State" under section 304 of the Coastal Zone Management Act of 1972 (16 U.S.C. 1453);
(3) each of the terms "coastal waters" and "coastal zone" has the meaning that term has in the Coastal Zone Management Act of 1972;

(4) the term "coastal management agency" means a State agency designated pursuant to section 306(d)(6) of the Coastal Zone Management Act of 1972;
(5) the term "land use" includes a use of waters adjacent to coastal waters; and
(6) the term "Secretary" means the Secretary of Commerce.

16 U.S.C. § 1456. Coordination and cooperation (Section 307)

(a) Federal agencies

In carrying out his functions and responsibilities under this chapter, the Secretary shall consult with, cooperate with, and, to the maximum extent practicable, coordinate his activities with other interested Federal agencies.

(b) Adequate consideration of views of Federal agencies

The Secretary shall not approve the management program submitted by a state pursuant to section 1455 of this title unless the views of Federal agencies principally affected by such program have been adequately considered.

(c) Consistency of Federal activities with State management programs; Presidential exemption; certification

(1) **(A)** Each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. A Federal agency activity shall be subject to this paragraph unless it is subject to paragraph (2) or (3).

(B) After any final judgment, decree, or order of any Federal court that is appealable under section 1291 or 1292 of Title 28, or under any other applicable provision of Federal law, that a specific Federal agency activity is not in compliance with subparagraph (A), and certification by the Secretary that mediation under subsection (h) of this section is not likely to result in such compliance, the President may, upon written request from the Secretary, exempt from compliance those elements of the Federal agency activity that are found by the Federal court to be inconsistent with an approved State program, if the President determines that the activity is in the paramount interest of the United States. No such exemption shall be granted on the basis of a lack of appropriations unless the President has specifically requested such appropriations as part of the budgetary process, and

the Congress has failed to make available the requested appropriations.

(C) Each Federal agency carrying out an activity subject to paragraph (1) shall provide a consistency determination to the relevant State agency designated under section 1455(d)(6) of this title at the earliest practicable time, but in no case later than 90 days before final approval of the Federal activity unless both the Federal agency and the State agency agree to a different schedule.

(2) Any Federal agency which shall undertake any development project in the coastal zone of a state shall insure that the project is, to the maximum extent practicable, consistent with the enforceable policies of approved State management programs.

(3) **(A)** After final approval by the Secretary of a state's management program, any applicant for a required Federal license or permit to conduct an activity, in or outside of the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide in the application to the licensing or permitting agency a certification that the proposed activity complies with the enforceable policies of the state's approved program and that such activity will be conducted in a manner consistent with the program. At the same time, the applicant shall furnish to the state or its designated agency a copy of the certification, with all necessary information and data. Each coastal state shall establish procedures for public notice in the case of all such certifications and, to the extent it deems appropriate, procedures for public hearings in connection therewith. At the earliest practicable time, the state or its designated agency shall notify the Federal agency concerned that the state concurs with or objects to the applicant's certification. If the state or its designated agency fails to furnish the required notification within six months after receipt of its copy of the applicant's certification, the state's concurrence with the certification shall be conclusively presumed. No license or permit shall be granted by the Federal agency until the state or its designated agency has concurred with the applicant's certification or until, by the state's failure to act, the concurrence is conclusively presumed, unless the Secretary, on his own initiative or upon appeal by the applicant, finds, after providing a reasonable opportunity for detailed comments from the Federal agency involved and from the state, that the activity is consistent with the objectives of this chapter or is otherwise necessary in the interest of national security.

(B) After the management program of any coastal state has been approved by the Secretary under section 1455 of this title, any

person who submits to the Secretary of the Interior any plan for the exploration or development of, or production from, any area which has been leased under the Outer Continental Shelf Lands Act (43 U.S.C. 1331 et seq.) and regulations under such Act shall, with respect to any exploration, development, or production described in such plan and affecting any land or water use or natural resource of the coastal zone of such state, attach to such plan a certification that each activity which is described in detail in such plan complies with the enforceable policies of such state's approved management program and will be carried out in a manner consistent with such program. No Federal official or agency shall grant such person any license or permit for any activity described in detail in such plan until such state or its designated agency receives a copy of such certification and plan, together with any other necessary data and information, and until--

(i) such state or its designated agency, in accordance with the procedures required to be established by such state pursuant to subparagraph (A), concurs with such person's certification and notifies the Secretary and the Secretary of the Interior of such concurrence;

(ii) concurrence by such state with such certification is conclusively presumed as provided for in subparagraph (A), except if such state fails to concur with or object to such certification within three months after receipt of its copy of such certification and supporting information, such state shall provide the Secretary, the appropriate federal agency, and such person with a written statement describing the status of review and the basis for further delay in issuing a final decision, and if such statement is not so provided, concurrence by such state with such certification shall be conclusively presumed; or

(iii) the Secretary finds, pursuant to subparagraph (A), that each activity which is described in detail in such plan is consistent with the objectives of this chapter or is otherwise necessary in the interest of national security.

If a state concurs or is conclusively presumed to concur, or if the Secretary makes such a finding, the provisions of subparagraph (A) are not applicable with respect to such person, such state, and any Federal license or permit which is required to conduct any activity affecting land uses or water uses in the coastal zone of such state which is described in detail in the plan to which such concurrence or finding applies. If such state objects to such certification and if the Secretary fails to make a finding under clause (iii) with respect to such certification, or if such person fails

substantially to comply with such plan as submitted, such person shall submit an amendment to such plan, or a new plan, to the Secretary of the Interior. With respect to any amendment or new plan submitted to the Secretary of the Interior pursuant to the preceding sentence, the applicable time period for purposes of concurrence by conclusive presumption under subparagraph (A) is 3 months.

(d) Application of local governments for Federal assistance; relationship of activities with approved management programs

State and local governments submitting applications for Federal assistance under other Federal programs, in or outside of the coastal zone, affecting any land or water use of natural resource of the coastal zone shall indicate the views of the appropriate state or local agency as to the relationship of such activities to the approved management program for the coastal zone. Such applications shall be submitted and coordinated in accordance with the provisions of section 6506 of Title 31. Federal agencies shall not approve proposed projects that are inconsistent with the enforceable policies of a coastal state's management program, except upon a finding by the Secretary that such project is consistent with the purposes of this chapter or necessary in the interest of national security.

(e) Construction with other laws

Nothing in this chapter shall be construed--

(1) to diminish either Federal or state jurisdiction, responsibility, or rights in the field of planning, development, or control of water resources, submerged lands, or navigable waters; nor to displace, supersede, limit, or modify any interstate compact or the jurisdiction or responsibility of any legally established joint or common agency of two or more states or of two or more states and the Federal Government; nor to limit the authority of Congress to authorize and fund projects;
(2) as superseding, modifying, or repealing existing laws applicable to the various Federal agencies; nor to affect the jurisdiction, powers, or prerogatives of the International Joint Commission, United States and Canada, the Permanent Engineering Board, and the United States operating entity or entities established pursuant to the Columbia River Basin Treaty, signed at Washington, January 17, 1961, or the International Boundary and Water Commission, United States and Mexico.

(f) Construction with existing requirements of water and air pollution programs

Notwithstanding any other provision of this chapter, nothing in this chapter shall in any way affect any requirement (1) established by the Federal Water Pollution Control Act, as amended, or the Clean Air Act, as amended, or (2) established by the Federal Government or by any state or

local government pursuant to such Acts. Such requirements shall be incorporated in any program developed pursuant to this chapter and shall be the water pollution control and air pollution control requirements applicable to such program.

(g) Concurrence with programs which affect inland areas

When any state's coastal zone management program, submitted for approval or proposed for modification pursuant to section 1455 of this title, includes requirements as to shorelands which also would be subject to any Federally supported national land use program which may be hereafter enacted, the Secretary, prior to approving such program, shall obtain the concurrence of the Secretary of the Interior, or such other Federal official as may be designated to administer the national land use program, with respect to that portion of the coastal zone management program affecting such inland areas.

(h) Mediation of disagreements

In case of serious disagreement between any Federal agency and a coastal state--

(1) in the development or the initial implementation of a management program under section 1454 of this title; or
(2) in the administration of a management program approved under section 1455 of this title; the Secretary, with the cooperation of the Executive Office of the President, shall seek to mediate the differences involved in such disagreement. The process of such mediation shall, with respect to any disagreement described in paragraph (2), include public hearings which shall be conducted in the local area concerned.

(i) Application fee for appeals

(1) With respect to appeals under subsections (c)(3) and (d) of this section which are submitted after November 5, 1990, the Secretary shall collect an application fee of not less than $200 for minor appeals and not less than $500 for major appeals, unless the Secretary, upon consideration of an applicant's request for a fee waiver, determines that the applicant is unable to pay the fee.

(2) **(A)** The Secretary shall collect such other fees as are necessary to recover the full costs of administering and processing such appeals under subsection (c) of this section.

(B) If the Secretary waives the application fee under paragraph (1) for an applicant, the Secretary shall waive all other fees under this subsection for the applicant.

(3) Fees collected under this subsection shall be deposited into the Coastal Zone Management Fund established under section 1456a of this title.

16 U.S.C. § 1456a. Coastal Zone Management Fund (Section 308)

(a) **(1)** The obligations of any coastal state or unit of general purpose local government to repay loans made pursuant to this section as in effect before November 5, 1990, and any repayment schedule established pursuant to this chapter as in effect before November 5, 1990, are not altered by any provision of this chapter. Such loans shall be repaid under authority of this subsection and the Secretary may issue regulations governing such repayment. If the Secretary finds that any coastal state or unit of local government is unable to meet its obligations pursuant to this subsection because the actual increases in employment and related population resulting from coastal energy activity and the facilities associated with such activity do not provide adequate revenues to enable such State or unit to meet such obligations in accordance with the appropriate repayment schedule, the Secretary shall, after review of the information submitted by such State or unit, take any of the following actions:

(A) Modify the terms and conditions of such loan.
(B) Refinance the loan.
(C) Recommend to the Congress that legislation be enacted to forgive the loan.

(2) Loan repayments made pursuant to this subsection shall be retained by the Secretary as offsetting collections, and shall be deposited into the Coastal Zone Management Fund established under subsection (b) of this section.

(b) **(1)** The Secretary shall establish and maintain a fund, to be known as the "Coastal Zone Management Fund", which shall consist of amounts retained and deposited into the Fund under subsection (a) of this section and fees deposited into the Fund under section 1456(i)(3) of this title.

(2) Subject to amounts provided in appropriation Acts, amounts in the Fund shall be available to the Secretary for use for the following:

(A) Expenses incident to the administration of this chapter, in an amount not to exceed for each of fiscal years 1997, 1998, and 1999 the higher of--
(i) $4,000,000; or
(ii) 8 percent of the total amount appropriated under this chapter for the fiscal year.
(B) After use under subparagraph (A)--
(i) projects to address management issues which are regional in scope, including interstate projects;

(ii) demonstration projects which have high potential for improving coastal zone management, especially at the local level;
(iii) emergency grants to State coastal zone management agencies to address unforeseen or disaster-related circumstances;
(iv) appropriate awards recognizing excellence in coastal zone management as provided in section 1460 of this title; and
(v) to provide financial support to coastal states for use for investigating and applying the public trust doctrine to implement State management programs approved under section 1455 of this title.
(vi) Redesignated (v)

(3) Omitted

16 U.S.C. § 1456b. Coastal Zone Enhancement Grants (Section 309)

(a) "Coastal zone enhancement objective" defined

For purposes of this section, the term "coastal zone enhancement objective" means any of the following objectives:

(1) Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands.
(2) Preventing or significantly reducing threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level rise.
(3) Attaining increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.
(4) Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.
(5) Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.
(6) Preparing and implementing special area management plans for important coastal areas.
(7) Planning for the use of ocean resources.
(8) Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related

activities and Government activities which may be of greater than local significance.

(9) Adoption of procedures and policies to evaluate and facilitate the siting of public and private aquaculture facilities in the coastal zone, which will enable States to formulate, administer, and implement strategic plans for marine aquaculture.

(b) Limits on grants

(1) Subject to the limitations and goals established in this section, the Secretary may make grants to coastal states to provide funding for development and submission for Federal approval of program changes that support attainment of one or more coastal zone enhancement objectives.

(2) **(A)** In addition to any amounts provided under section 1455 of this title, and subject to the availability of appropriations, the Secretary may make grants under this subsection to States for implementing program changes approved by the Secretary in accordance with section 1455(e) of this title.

(B) Grants under this paragraph to implement a program change may not be made in any fiscal year after the second fiscal year that begins after the approval of that change by the Secretary.

(c) Evaluation of State proposals by Secretary

The Secretary shall evaluate and rank State proposals for funding under this section, and make funding awards based on those proposals, taking into account the criteria established by the Secretary under subsection (d) of this section. The Secretary shall ensure that funding decisions under this section take into consideration the fiscal and technical needs of proposing States and the overall merit of each proposal in terms of benefits to the public.

(d) Promulgation of regulations by Secretary

Within 12 months following November 5, 1990, and consistent with the notice and participation requirements established in section 1463 of this title, the Secretary shall promulgate regulations concerning coastal zone enhancement grants that establish--

(1) specific and detailed criteria that must be addressed by a coastal state (including the State's priority needs for improvement as identified by the Secretary after careful consultation with the State) as part of the State's development and implementation of coastal zone enhancement objectives;

(2) administrative or procedural rules or requirements as necessary to facilitate the development and implementation of such objectives by coastal states; and

(3) other funding award criteria as are necessary or appropriate to ensure that evaluations of proposals, and decisions to award funding, under this

section are based on objective standards applied fairly and equitably to those proposals.

(e) No State contribution required

A State shall not be required to contribute any portion of the cost of any proposal for which funding is awarded under this section.

(f) Funding

Beginning in fiscal year 1991, not less than 10 percent and not more than 20 percent of the amounts appropriated to implement sections 1455 and 1455a of this title shall be retained by the Secretary for use in implementing this section, up to a maximum of $10,000,000 annually.

(g) Eligibility; suspension of State for noncompliance

If the Secretary finds that the State is not undertaking the actions committed to under the terms of the grant, the Secretary shall suspend the State's eligibility for further funding under this section for at least one year.

16 U.S.C. § 1456c. Technical assistance (Section 310)

(a) The Secretary shall conduct a program of technical assistance and management-oriented research necessary to support the development and implementation of State coastal management program amendments under section 1456b of this title, and appropriate to the furtherance of international cooperative efforts and technical assistance in coastal zone management. Each department, agency, and instrumentality of the executive branch of the Federal Government may assist the Secretary, on a reimbursable basis or otherwise, in carrying out the purposes of this section, including the furnishing of information to the extent permitted by law, the transfer of personnel with their consent and without prejudice to their position and rating, and the performance of any research, study, and technical assistance which does not interfere with the performance of the primary duties of such department, agency, or instrumentality. The Secretary may enter into contracts or other arrangements with any qualified person for the purposes of carrying out this subsection.

(b) **(1)** The Secretary shall provide for the coordination of technical assistance, studies, and research activities under this section with any other such activities that are conducted by or subject to the authority of the Secretary.

(2) The Secretary shall make the results of research and studies conducted pursuant to this section available to coastal states in the form of technical assistance publications, workshops, or other means appropriate.

(3) The Secretary shall consult with coastal states on a regular basis regarding the development and implementation of the program established by this section.

16 U.S.C. § 1457. Public hearings (Section 311)

All public hearings required under this chapter must be announced at least thirty days prior to the hearing date. At the time of the announcement, all agency materials pertinent to the hearings, including documents, studies, and other data, must be made available to the public for review and study. As similar materials are subsequently developed, they shall be made available to the public as they become available to the agency.

16 U.S.C. § 1458. Review of performance (Section 312)

(a) Evaluation of adherence with terms of grants

The Secretary shall conduct a continuing review of the performance of coastal states with respect to coastal management. Each review shall include a written evaluation with an assessment and detailed findings concerning the extent to which the state has implemented and enforced the program approved by the Secretary, addressed the coastal management needs identified in section 1452(2)(A) through (K) of this title, and adhered to the terms of any grant, loan, or cooperative agreement funded under this chapter.

(b) Public participation; notice of meetings; reports

In evaluating a coastal state's performance, the Secretary shall conduct the evaluation in an open and public manner, and provide full opportunity for public participation, including holding public meetings in the State being evaluated and providing opportunities for the submission of written and oral comments by the public. The Secretary shall provide the public with at least 45 days' notice of such public meetings by placing a notice in the Federal Register, by publication of timely notices in newspapers of general circulation within the State being evaluated, and by communications with persons and organizations known to be interested in the evaluation. Each evaluation shall be prepared in report form and shall include written responses to the written comments received during the evaluation process. The final report of the evaluation shall be completed within 120 days after the last public meeting held in the State being evaluated. Copies of the evaluation shall be immediately provided to all persons and organizations participating in the evaluation process.

(c) Suspension of financial assistance for noncompliance; notification of Governor; length of suspension

(1) The Secretary may suspend payment of any portion of financial assistance extended to any coastal state under this chapter, and may withdraw any unexpended portion of such assistance, if the Secretary determines that the coastal state is failing to adhere to (A) the management program or a State plan developed to manage a national estuarine reserve established under section 1461 of this title, or a portion of the program or plan approved by the Secretary, or (B) the terms of any grant or cooperative agreement funded under this chapter.

(2) Financial assistance may not be suspended under paragraph (1) unless the Secretary provides the Governor of the coastal state with--

(A) written specifications and a schedule for the actions that should be taken by the State in order that such suspension of financial assistance may be withdrawn; and
(B) written specifications stating how those funds from the suspended financial assistance shall be expended by the coastal state to take the actions referred to in subparagraph (A).

(3) The suspension of financial assistance may not last for less than 6 months or more than 36 months after the date of suspension.

(d) Withdrawal of approval of program

The Secretary shall withdraw approval of the management program of any coastal state and shall withdraw financial assistance available to that State under this chapter as well as any unexpended portion of such assistance, if the Secretary determines that the coastal state has failed to take the actions referred to in subsection (c)(2)(A) of this section.

(e) Notice and hearing

Management program approval and financial assistance may not be withdrawn under subsection (d) of this section, unless the Secretary gives the coastal state notice of the proposed withdrawal and an opportunity for a public hearing on the proposed action. Upon the withdrawal of management program approval under this subsection (d) of this section, the Secretary shall provide the coastal state with written specifications of the actions that should be taken, or not engaged in, by the state in order that such withdrawal may be canceled by the Secretary.

16 U.S.C. § 1459. Records and audit (Section 313)

(a) Maintenance of records by recipients of grants or financial assistance

Each recipient of a grant under this chapter or of financial assistance under section 1456a of this title, as in effect before November 5, 1990, shall keep such records as the Secretary shall prescribe, including records which fully disclose the amount and disposition of the funds received under the grant and of the proceeds of such assistance, the total cost of the project or undertaking supplied by other sources, and such other records as will facilitate an effective audit.

(b) Access by Secretary and Comptroller General to records, books, etc., of recipients of grants or financial assistance for audit and examination

The Secretary and the Comptroller General of the United States, or any of their duly authorized representatives, shall--

(1) after any grant is made under this chapter or any financial assistance is provided under section 1456a of this title, as in effect before November 5, 1990; and
(2) until the expiration of 3 years after--
(A) completion of the project, program, or other undertaking for which such grant was made or used, or
(B) repayment of the loan or guaranteed indebtedness for which such financial assistance was provided, have access for purposes of audit and examination to any record, book, document, and paper which belongs to or is used or controlled by, any recipient of the grant funds or any person who entered into any transaction relating to such financial assistance and which is pertinent for purposes of determining if the grant funds or the proceeds of such financial assistance are being, or were, used in accordance with the provisions of this chapter.

16 U.S.C. § 1460. Walter B. Jones Excellence in Coastal Zone Management Awards (Section 314)

(a) Establishment

The Secretary shall, using sums in the Coastal Zone Management Fund established under section 1456a of this title and other amounts available to carry out this chapter (other than amounts appropriated to carry out sections 1454, 1455, 1455a, 1456b, 1456c, and 1461 of this title), implement a program to promote excellence in coastal zone management by identifying and acknowledging outstanding accomplishments in the field.

(b) Annual selection of recipients

The Secretary shall select annually--

(1) one individual, other than an employee or officer of the Federal Government, whose contribution to the field of coastal zone management has been the most significant;
(2) 5 local governments which have made the most progress in developing and implementing the coastal zone management principles embodied in this chapter; and
(3) up to 10 graduate students whose academic study promises to contribute materially to development of new or improved approaches to coastal zone management.

(c) Solicitation of nominations for local government recipients

In making selections under subsection (b)(2) of this section the Secretary shall solicit nominations from the coastal states, and shall consult with experts in local government planning and land use.

(d) Solicitation of nominations for graduate student recipients

In making selections under subsection (b)(3) of this section the Secretary shall solicit nominations from coastal states and the National Sea Grant College Program.

(e) Funding; types of awards

Using sums in the Coastal Zone Management Fund established under section 1456a of this title and other amounts available to carry out this chapter (other than amounts appropriated to carry out sections 1454, 1455, 1455a, 1456b, 1456c, and 1461 of this title), the Secretary shall establish and execute appropriate awards, to be known as the "Walter B. Jones Awards," including--

(1) cash awards in an amount not to exceed $5,000 each;
(2) research grants; and
(3) public ceremonies to acknowledge such awards.

16 U.S.C. § 1461. National Estuarine Research Reserve System (Section 315)

(a) Establishment of System

There is established the National Estuarine Research Reserve System (hereinafter referred to in this section as the "System") that consists of--

(1) each estuarine sanctuary designated under this section as in effect before April 7, 1986; and
(2) each estuarine area designated as a national estuarine reserve under subsection (b) of this section.

Each estuarine sanctuary referred to in paragraph (1) is hereby designated as a national estuarine reserve.

(b) Designation of national estuarine reserves

After April 7, 1986, the Secretary may designate an estuarine area as a national estuarine reserve if--

(1) the Governor of the coastal state in which the area is located nominates the area for that designation; and
(2) the Secretary finds that--
(A) the area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;
(B) the law of the coastal state provides long-term protection for reserve resources to ensure a stable environment for research;
(C) designation of the area as a reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation; and
(D) the coastal state in which the area is located has complied with the requirements of any regulations issued by the Secretary to implement this section.

(c) Estuarine research guidelines

The Secretary shall develop guidelines for the conduct of research within the System that shall include--

(1) a mechanism for identifying, and establishing priorities among, the coastal management issues that should be addressed through coordinated research within the System;
(2) the establishment of common research principles and objectives to guide the development of research programs within the System;
(3) the identification of uniform research methodologies which will ensure comparability of data, the broadest application of research results, and the maximum use of the System for research purposes;
(4) the establishment of performance standards upon which the effectiveness of the research efforts and the value of reserves within the System in addressing the coastal management issues identified in paragraph (1) may be measured; and
(5) the consideration of additional sources of funds for estuarine research than the funds authorized under this chapter, and strategies for encouraging the use of such funds within the System, with particular emphasis on mechanisms established under subsection (d) of this section.

In developing the guidelines under this section, the Secretary shall consult with

prominent members of the estuarine research community.

(d) Promotion and coordination of estuarine research

The Secretary shall take such action as is necessary to promote and coordinate the use of the System for research purposes including--

(1) requiring that the National Oceanic and Atmospheric Administration, in conducting or supporting estuarine research, give priority consideration to research that uses the System; and
(2) consulting with other Federal and State agencies to promote use of one or more reserves within the System by such agencies when conducting estuarine research.

(e) Financial assistance

(1) The Secretary may, in accordance with such rules and regulations as the Secretary shall promulgate, make grants--

(A) to a coastal state--
(i) for purposes of acquiring such lands and waters, and any property interests therein, as are necessary to ensure the appropriate long-term management of an area as a national estuarine reserve,
(ii) for purposes of operating or managing a national estuarine reserve and constructing appropriate reserve facilities, or
(iii) for purposes of conducting educational or interpretive activities; and
(B) to any coastal state or public or private person for purposes of supporting research and monitoring within a national estuarine reserve that are consistent with the research guidelines developed under subsection (c) of this section.

(2) Financial assistance provided under paragraph (1) shall be subject to such terms and conditions as the Secretary considers necessary or appropriate to protect the interests of the United States, including requiring coastal states to execute suitable title documents setting forth the property interest or interests of the United States in any lands and waters acquired in whole or part with such financial assistance.

(3) **(A)** The amount of the financial assistance provided under paragraph (1)(A)(i) with respect to the acquisition of lands and waters, or interests therein, for any one national estuarine reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or $5,000,000, whichever

amount is less.

(B) The amount of the financial assistance provided under paragraph (1)(A)(ii) and (iii) and paragraph (1)(B) may not exceed 70 percent of the costs incurred to achieve the purposes described in those paragraphs with respect to a reserve; except that the amount of the financial assistance provided under paragraph (1)(A)(iii) may be up to 100 percent of any costs for activities that benefit the entire System.

(C) Notwithstanding subparagraphs (A) and (B), financial assistance under this subsection provided from amounts recovered as a result of damage to natural resources located in the coastal zone may be used to pay 100 percent of the costs of activities carried out with the assistance.

(f) Evaluation of System performance

(1) The Secretary shall periodically evaluate the operation and management of each national estuarine reserve, including education and interpretive activities, and the research being conducted within the reserve.

(2) If evaluation under paragraph (1) reveals that the operation and management of the reserve is deficient, or that the research being conducted within the reserve is not consistent with the research guidelines developed under subsection (c) of this section, the Secretary may suspend the eligibility of that reserve for financial assistance under subsection (e) of this section until the deficiency or inconsistency is remedied.

(3) The Secretary may withdraw the designation of an estuarine area as a national estuarine reserve if evaluation under paragraph (1) reveals that--

(A) the basis for any one or more of the findings made under subsection (b)(2) of this section regarding that area no longer exists; or

(B) a substantial portion of the research conducted within the area, over a period of years, has not been consistent with the research guidelines developed under subsection (c) of this section.

(g) Report

The Secretary shall include in the report required under section 1462 of this title information regarding--

(1) new designations of national estuarine reserves;

(2) any expansion of existing national estuarine reserves;

(3) the status of the research program being conducted within the System; and

(4) a summary of the evaluations made under subsection (f) of this section.

16 U.S.C. § 1462. Coastal Zone Management Reports (Section 316)

(a) Biennial reports

The Secretary shall consult with the Congress on a regular basis concerning the administration of this chapter and shall prepare and submit to the President for transmittal to the Congress a report summarizing the administration of this chapter during each period of two consecutive fiscal years. Each report, which shall be transmitted to the Congress not later than April 1 of the year following the close of the biennial period to which it pertains, shall include, but not be restricted to (1) an identification of the state programs approved pursuant to this chapter during the preceding Federal fiscal year and a description of those programs; (2) a listing of the states participating in the provisions of this chapter and a description of the status of each state's programs and its accomplishments during the preceding Federal fiscal year; (3) an itemization of the allocation of funds to the various coastal states and a breakdown of the major projects and areas on which these funds were expended; (4) an identification of any state programs which have been reviewed and disapproved, and a statement of the reasons for such action; (5) a summary of evaluation findings prepared in accordance with subsection (a) of section 1458 of this title, and a description of any sanctions imposed under subsections (c) and (d) of section 1458 of this title; (6) a listing of all activities and projects which, pursuant to the provisions of subsection (c) or subsection (d) of section 1456 of this title, are not consistent with an applicable approved state management program; (7) a summary of the regulations issued by the Secretary or in effect during the preceding Federal fiscal year; (8) a summary of a coordinated national strategy and program for the Nation's coastal zone including identification and discussion of Federal, regional, state, and local responsibilities and functions therein; (9) a summary of outstanding problems arising in the administration of this chapter in order of priority; (10) a description of the economic, environmental, and social consequences of energy activity affecting the coastal zone and an evaluation of the effectiveness of financial assistance under section 1456a of this title in dealing with such consequences; (11) a description and evaluation of applicable interstate and regional planning and coordination mechanisms developed by the coastal states; (12) a summary and evaluation of the research, studies, and training conducted in support of coastal zone management; and (13) such other information as may be appropriate.

(b) Recommendations for legislation

The report required by subsection (a) of this section shall contain such recommendations for additional legislation as the Secretary deems necessary to achieve the objectives of this chapter and enhance its effective operation.

(c) Review of other Federal programs; report to Congress

(1) The Secretary shall conduct a systematic review of Federal programs, other than this chapter, that affect coastal resources for purposes of identifying conflicts between the objectives and administration of such programs and the purposes and policies of this chapter. Not later than 1 year after October 17, 1980, the Secretary shall notify each Federal agency having appropriate jurisdiction of any conflict between its program and the purposes and policies of this chapter identified as a result of such review.

(2) The Secretary shall promptly submit a report to the Congress consisting of the information required under paragraph (1) of this subsection. Such report shall include recommendations for changes necessary to resolve existing conflicts among Federal laws and programs that affect the uses of coastal resources.

16 U.S.C. § 1463. Rules and Regulations (Section 317)

The Secretary shall develop and promulgate, pursuant to section 553 of Title 5, after notice and opportunity for full participation by relevant Federal agencies, state agencies, local governments, regional organizations, port authorities, and other interested parties, both public and private, such rules and regulations as may be necessary to carry out the provisions of this chapter.

16 U.S.C. § 1464. Authorization of appropriations (Section 318)

(a) Sums appropriated to Secretary

There are authorized to be appropriated to the Secretary, to remain available until expended--

(1) for grants under sections 1455, 1455a, and 1456b of this title--
- **(A)** $47,600,000 for fiscal year 1997;
- **(B)** $49,000,000 for fiscal year 1998; and
- **(C)** $50,500,000 for fiscal year 1999; and

(2) for grants under section 1461 of this title--
- **(A)** $4,400,000 for fiscal year 1997;
- **(B)** $4,500,000 for fiscal year 1998; and
- **(C)** $4,600,000 for fiscal year 1999.

(b) Limitations

Federal funds received from other sources shall not be used to pay a coastal state's share of costs under section 1455 or 1456b of this title.

(c) Reversion to Secretary of unobligated State funds; availability of funds

The amount of any grant, or portion of a grant, made to a State under any section of this chapter which is not obligated by such State during the fiscal year, or during the second fiscal year after the fiscal year, for which it was first authorized to be obligated by such State shall revert to the Secretary. The Secretary shall add such reverted amount to those funds available for grants under the section for such reverted amount was originally made available.

16 U.S.C. § 1465. Appeals to the Secretary (Section 319)

(a) Notice

Not later than 30 days after the date of the filing of an appeal to the Secretary of a consistency determination under section 1456 of this title, the Secretary shall publish an initial notice in the Federal Register.

(b) Closure of record

(1) In general

Not later than the end of the 160-day period beginning on the date of publication of an initial notice under subsection (a) of this section, except as provided in paragraph (3), the Secretary shall immediately close the decision record and receive no more filings on the appeal.

(2) Notice

After closing the administrative record, the Secretary shall immediately publish a notice in the Federal Register that the administrative record has been closed.

(3) Exception

(A) In general

Subject to subparagraph (B), during the 160-day period described in paragraph (1), the Secretary may stay the closing of the decision record--

(i) for a specific period mutually agreed to in writing by the appellant and the State agency; or

(ii) as the Secretary determines necessary to receive, on an expedited basis--

(I) any supplemental information specifically requested by the Secretary to complete a consistency review under this chapter; or

(II) any clarifying information submitted by a party to the proceeding related to information in the

consolidated record compiled by the lead Federal permitting agency.

(B) Applicability

The Secretary may only stay the 160-day period described in paragraph (1) for a period not to exceed 60 days.

(c) Deadline for decision

(1) In general

Not later than 60 days after the date of publication of a Federal Register notice stating when the decision record for an appeal has been closed, the Secretary shall issue a decision or publish a notice in the Federal Register explaining why a decision cannot be issued at that time.

(2) Subsequent decision

Not later than 15 days after the date of publication of a Federal Register notice explaining why a decision cannot be issued within the 60-day period, the Secretary shall issue a decision.

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TITLE 15--COMMERCE AND FOREIGN TRADE

CHAPTER IX--NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, DEPARTMENT OF COMMERCE

PART 921--NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM REGULATIONS

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Authority: Section 315 of the Coastal Zone Management Act, as amended (16 U.S.C. 1461).
Source: 58 FR 38215, July 15, 1993, unless otherwise noted.

Sec. 921.1 Mission, goals and general provisions.

(a) The mission of the National Estuarine Research Reserve Program is the establishment and management, through Federal-state cooperation, of a national system (National Estuarine Research Reserve System or System) of estuarine research reserves (National Estuarine Research Reserves or Reserves) representative of the various regions and estuarine types in the United States. National Estuarine Research Reserves are established to provide opportunities for long-term research, education, and interpretation.

(b) The goals of the Program are to:

1. Ensure a stable environment for research through long-term protection of National Estuarine Research Reserve resources;
2. Address coastal management issues identified as significant through coordinated estuarine research within the System;
3. Enhance public awareness and understanding of estuarine areas and provide suitable opportunities for public education and interpretation;
4. Promote Federal, state, public and private use of one or more Reserves within the System when such entities conduct estuarine research; and
5. Conduct and coordinate estuarine research within the System, gathering and making available information necessary for improved understanding and management of estuarine areas.

(c) National Estuarine Research Reserves shall be open to the public to the extent permitted under state and Federal law. Multiple uses are allowed to the degree compatible with each Reserve's overall purpose as provided in the management plan (see Sec. 921.13) and consistent with paragraphs (a) and (b) of this section. Use levels are set by the state where the Reserve is located and analyzed in the management plan. The Reserve management plan shall describe the uses and establish priorities among these uses. The plan shall identify uses requiring a state permit, as well as areas where uses are encouraged or prohibited. Consistent with resource protection and research objectives, public access and use may be restricted to certain areas or components within a Reserve.

(d) Habitat manipulation for research purposes is allowed consistent with the following limitations. Manipulative research activities must be specified in the management plan, be consistent with the mission and goals of the program (see paragraphs (a) and (b) of this section) and the goals and objectives set forth in the Reserve's management plan, and be limited in nature and extent to the minimum manipulative activity necessary to accomplish the stated research objective. Manipulative research activities with a significant or long-term impact on Reserve resources require the prior approval of the state and the National Oceanic and Atmospheric Administration (NOAA). Manipulative research activities which can reasonably be expected to have a significant adverse impact on the estuarine resources and habitat of a Reserve, such that the activities themselves or their resulting short- and long-term consequences compromise the representative character and integrity of a Reserve, are prohibited. Habitat manipulation for resource management purposes is prohibited except as specifically approved by NOAA as: (1) A

restoration activity consistent with paragraph (e) of this section; or (2) an activity necessary for the protection of public health or the preservation of other sensitive resources which have been listed or are eligible for protection under relevant Federal or state authority (e.g., threatened/endangered species or significant historical or cultural resources) or if the manipulative activity is a long-term pre-existing use (i.e., has occurred prior to designation) occurring in a buffer area. If habitat manipulation is determined to be necessary for the protection of public health, the preservation of sensitive resources, or if the manipulation is a long-term pre-existing use in a buffer area, then these activities shall be specified in the Reserve management plan in accordance with Sec. 921.13(a)(10) and shall be limited to the reasonable alternative which has the least adverse and shortest term impact on the representative and ecological integrity of the Reserve.

(e) Under the Act an area may be designated as an estuarine Reserve only if the area is a representative estuarine ecosystem that is suitable for long-term research. Many estuarine areas have undergone some ecological change as a result of human activities (e.g., hydrological changes, intentional/unintentional species composition changes--introduced and exotic species). In those areas proposed or designated as National Estuarine Research Reserves, such changes may have diminished the representative character and integrity of the site. Although restoration of degraded areas is not a primary purpose of the System, such activities may be permitted to improve the representative character and integrity of a Reserve. Restoration activities must be carefully planned and approved by NOAA through the Reserve management plan. Historical research may be necessary to determine the ``natural" representative state of an estuarine area (i.e., an estuarine ecosystem minimally affected by human activity or influence). Frequently, restoration of a degraded estuarine area will provide an excellent opportunity for management oriented research.

(f) NOAA may provide financial assistance to coastal states, not to exceed, per Reserve, 50 percent of all actual costs or $5 million whichever amount is less, to assist in the acquisition of land and waters, or interests therein. NOAA may provide financial assistance to coastal states not to exceed 70 percent of all actual costs for the management and operation of, the development and construction of facilities, and the conduct of educational or interpretive activities concerning Reserves (see subpart I). NOAA may provide financial assistance to any coastal state or public or private person, not to exceed 70 percent of all actual costs, to support research and monitoring within a Reserve. Notwithstanding any financial assistance limits established by this Part, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available. Predesignation, acquisition and development, operation and management, special research and monitoring, and special education and interpretation awards are available under the National Estuarine Reserve Program. Predesignation awards are for site selection/feasibility, draft management plan preparation and conduct of basic characterization studies. Acquisition and development awards are intended primarily for acquisition of interests in land, facility construction and to develop and/or upgrade research, monitoring and education programs. Operation and management awards

provide funds to assist in implementing, operating and managing the administrative, and basic research, monitoring and education programs, outlined in the Reserve management plan. Special research and monitoring awards provide funds to conduct estuarine research and monitoring projects with the System. Special educational and interpretive awards provide funds to conduct estuarine educational and interpretive projects within the System.

(g) Lands already in protected status managed by other Federal agencies, state or local governments, or private organizations may be included within National Estuarine Research Reserves only if the managing entity commits to long-term management consistent with paragraphs (d) and (e) of this section in the Reserve management plan. Federal lands already in protected status may not comprise a majority of the key land and water areas of a Reserve (see Sec. 921.11(c)(3)).

(h) To assist the states in carrying out the Program's goals in an effective manner, NOAA will coordinate a research and education information exchange throughout the National Estuarine Research Reserve System. As part of this role, NOAA will ensure that information and ideas from one Reserve are made available to others in the System. The network will enable Reserves to exchange information and research data with each other, with universities engaged in estuarine research, and with Federal, state, and local agencies. NOAA's objective is a system- wide program of research and monitoring capable of addressing the management issues that affect long-term productivity of our Nation's estuaries.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998].

Sec. 921.2 Definitions

(a) Act means the Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq.

(b) Assistant Administrator means the Assistant Administrator for Ocean Services and Coastal Zone Management or delegee.

(c) Coastal state means a state of the United States, in or bordering on, the Atlantic, Pacific, or Arctic Ocean, the Gulf of Mexico, Long Island Sound, or one or more of the Great Lakes. For the purposes of these regulations the term also includes Puerto Rico, the Virgin Islands, Guam, the Commonwealth of the Northern Marianas Islands, the Trust Territories of the Pacific Islands, and American Samoa (see 16 U.S.C. 1453(4)).

(d) State agency means an instrumentality of a coastal state to whom the coastal state has delegated the authority and responsibility for the creation and/or management/operation of a National Estuarine Research Reserve. Factors indicative of this authority may include the power to receive and expend funds on behalf of the Reserve, acquire and sell or convey real and personal property interests, adopt rules for the protection of the Reserve, enforce rules applicable to the Reserve, or develop and implement research and education programs for the reserve. For the purposes of these regulations, the terms ``coastal state" and ``State agency" shall be synonymous.

(e) Estuary means that part of a river or stream or other body of water having unimpaired connection with the open sea, where the sea water is measurably diluted with fresh water derived from land drainage. The term also includes estuary-type areas with measurable freshwater influence and having unimpaired connections with the open sea, and estuary-type areas of the Great Lakes and their connecting waters (see 16 U.S.C. 1453(7)).

(f) National Estuarine Research Reserve means an area that is a representative estuarine ecosystem suitable for long-term research, which may include all of the key land and water portion of an estuary, and adjacent transitional areas and uplands constituting to the extent feasible a natural unit, and which is set aside as a natural field laboratory to provide long-term opportunities for research, education, and interpretation on the ecological relationships within the area (see 16 U.S.C. 1453(8)) and meets the requirements of 16 U.S.C. 1461(b). This includes those areas designated as National Estuarine Sanctuaries or Reserves under section 315 of the Act prior to enactment of the Coastal Zone Act Reauthorization Amendments of 1990 and each area subsequently designated as a National Estuarine Research Reserve.

Sec. 921.3 National Estuarine Research Reserve System Biogeographic Classification Scheme and Estuarine Typologies.

(a) National Estuarine Research Reserves are chosen to reflect regional differences and to include a variety of ecosystem types. A biogeographic classification scheme based on regional variations in the nation's coastal zone has been developed. The biogeographic classification scheme is used to ensure that the National Estuarine Research Reserve System includes at least one site from each region. The estuarine typology system is utilized to ensure that sites in the System reflect the wide range of estuarine types within the United States.

(b) The biogeographic classification scheme, presented in appendix I, contains 29 regions. Figure 1 graphically depicts the biogeographic regions of the United States.

(c) The typology system is presented in appendix II..

Sec. 921.4 Relationship to other provisions of the Coastal Zone Management Act, and to the Marine Protection, Research and Sanctuaries Act.

(a) The National Estuarine Research Reserve System is intended to provide information to state agencies and other entities involved in addressing coastal management issues. Any coastal state, including those that do not have approved coastal management programs under section 306 of the Act, is eligible for an award under the National Estuarine Research Reserve Program (see Sec. 921.2(c)).

(b) For purposes of consistency review by states with a federally approved coastal management program, the designation of a National Estuarine Research Reserve is deemed to be a Federal activity, which, if directly affecting the state's coastal zone, must be undertaken in a manner consistent to the maximum extent practicable with the approved state coastal management program as provided by section 1456(c)(1) of the Act, and implementing regulations at 15 CFR part 930, subpart C. In accordance with section 1456(c)(1) of the Act and the applicable regulations NOAA will be responsible for certifying that designation of the Reserve is consistent with the state's approved coastal management program. The state must concur with or object to the certification. It is recommended that the lead state agency for Reserve designation consult, at the earliest practicable time, with the appropriate state officials concerning the consistency of a proposed National Estuarine Research Reserve.

(c) The National Estuarine Research Reserve Program will be administered in close coordination with the National Marine Sanctuary Program (Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 U.S.C. 1431-1445), also administered by NOAA. Title III authorizes the Secretary of Commerce to designate discrete areas of the marine environment as National Marine Sanctuaries to protect or restore such areas for their conservation, recreational, ecological, historical, research,

educational or esthetic values. National Marine Sanctuaries and Estuarine Research Reserves may not overlap, but may be adjacent.

Sec. 921.10 General.

(a) A coastal state may apply for Federal financial assistance for the purpose of site selection, preparation of documents specified in Sec. 921.13 (draft management plan (DMP) and environmental impact statement (EIS)), and the conduct of limited basic characterization studies. The total Federal share of this assistance may not exceed $100,000. Federal financial assistance for preacquisition activities under Sec. 921.11 and Sec. 921.12 is subject to the total $5 million for which each Reserve is eligible for land acquisition. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carried out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more coastal states, each state is eligible for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Each separate National Estuarine Research Reserve is eligible for the full complement of funding. Financial assistance application procedures are specified in subpart I.

(b) In developing a Reserve program, a state may choose to develop a multiple-site Reserve reflecting a diversity of habitats in a single biogeographic region. A multiple-site Reserve allows the state to develop complementary research and educational programs within the individual components of its multi-site Reserve. Multiple-site Reserves are treated as one Reserve in terms of financial assistance and development of an overall management framework and plan. Each individual site of a proposed multiple-site Reserve shall be evaluated both separately under Sec. 921.11(c) and collectively as part of the site selection process. A coastal state may propose to establish a multiple-site Reserve at the time of the initial site selection, or at any point in the development or operation of the Reserve. If the state decides to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award is made for a single site, the proposal is subject to the requirements set forth in Sec. 921.33(b). However, a state may not propose to add one or more sites to an already designated Reserve if the operation and management of such Reserve has been found deficient and uncorrected or the research conducted is not consistent with the Estuarine Research Guidelines referenced in Sec. 921.51. In addition, Federal funds for the acquisition of a multiple-site Reserve remain limited to $5,000,000 (see Sec. 921.20). The funding for operation of a multiple-site Reserve is limited to the maximum allowed for any one Reserve per year (see Sec. 921.32(c)) and preacquisition funds are limited to $100,000 per Reserve. Notwithstanding the above, when financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, such assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 63 FR 26717, May 14, 1998].

Sec. 921.11 Site selection and feasibility.

(a) A coastal state may use Federal funds to establish and implement a site selection process which is approved by NOAA.

(b) In addition to the requirements set forth in subpart I, a request for Federal funds for site selection must contain the following programmatic information:

1. A description of the proposed site selection process and how it will be implemented in conformance with the biogeographic classification scheme and typology (Sec. 921.3);
2. An identification of the site selection agency and the potential management agency; and
3. A description of how public participation will be incorporated into the process (see Sec. 921.11(d)).

(c) As part of the site selection process, the state and NOAA shall evaluate and select the final site(s). NOAA has final authority in approving such sites. Site selection shall be guided by the following principles:

1. The site's contribution to the biogeographical and typological balance of the National Estuarine Research Reserve System. NOAA will give priority consideration to proposals to establish Reserves in biogeographic regions or subregions or incorporating types that are not represented in the system. (see the biogeographic classification scheme and typology set forth in Sec. 921.3 and appendices I and II);
2. The site's ecological characteristics, including its biological productivity, diversity of flora and fauna, and capacity to attract a broad range of research and educational interests. The proposed site must be a representative estuarine ecosystem and should, to the maximum extent possible, be an estuarine ecosystem minimally affected by human activity or influence (see Sec. 921.1(e)).
3. Assurance that the site's boundaries encompass an adequate portion of the key land and water areas of the natural system to approximate an ecological unit and to ensure effective conservation. Boundary size will vary greatly depending on the nature of the ecosystem. Reserve boundaries must encompass the area within which adequate control has or will be established by the managing entity over human activities occurring within the Reserve. Generally, Reserve boundaries will encompass two areas: Key land and water areas (or ``core area") and a buffer zone. Key land and water areas and a buffer zone will likely require significantly different levels of control (see Sec. 921.13(a)(7)). The term ``key land and water areas" refers to that core area within the Reserve that is so vital to the functioning of the estuarine ecosystem that it must be under a level of control sufficient to

ensure the long-term viability of the Reserve for research on natural processes. Key land and water areas, which comprise the core area, are those ecological units of a natural estuarine system which preserve, for research purposes, a full range of significant physical, chemical and biological factors contributing to the diversity of fauna, flora and natural processes occurring within the estuary. The determination of which land and water areas are ``key'' to a particular Reserve must be based on specific scientific knowledge of the area. A basic principle to follow when deciding upon key land and water areas is that they should encompass resources representative of the total ecosystem, and which if compromised could endanger the research objectives of the Reserve. The term buffer zone refers to an area adjacent to or surrounding key land and water areas and essential to their integrity. Buffer zones protect the core area and provide additional protection for estuarine-dependent species, including those that are rare or endangered. When determined appropriate by the state and approved by NOAA, the buffer zone may also include an area necessary for facilities required for research and interpretation. Additionally, buffer zones should be established sufficient to accommodate a shift of the core area as a result of biological, ecological or geomorphological change which reasonably could be expected to occur. National Estuarine Research Reserves may include existing Federal or state lands already in a protected status where mutual benefit can be enhanced. However, NOAA will not approve a site for potential National Estuarine Research Reserve status that is dependent primarily upon the inclusion of currently protected Federal lands in order to meet the requirements for Reserve status (such as key land and water areas). Such lands generally will be included within a Reserve to serve as a buffer or for other ancillary purposes; and may be included, subject to NOAA approval, as a limited portion of the core area;

4. The site's suitability for long-term estuarine research, including ecological factors and proximity to existing research facilities and educational institutions;
5. The site's compatibility with existing and potential land and water uses in contiguous areas as well as approved coastal and estuarine management plans; and
6. The site's importance to education and interpretive efforts, consistent with the need for continued protection of the natural system.

(d) Early in the site selection process the state must seek the views of affected landowners, local governments, other state and Federal agencies and other parties who are interested in the area(s) being considered for selection as a potential National Estuarine Research Reserve. After the local government(s) and affected landowner(s) have been contacted, at least one public meeting shall be held in the vicinity of the proposed site. Notice of such a meeting, including the time, place, and relevant subject matter, shall be announced by the state through the area's principal newspaper at least 15 days prior to the date of the meeting and by NOAA in the Federal Register.

(e) A state request for NOAA approval of a proposed site (or sites in the case of a multi-site Reserve) must contain a description of the proposed site(s) in relationship to each of the site selection principals (Sec. 921.11(c)) and the following information:

1. An analysis of the proposed site(s) based on the biogeographical scheme/typology discussed in Sec. 921.3 and set forth in appendices I and II;
2. A description of the proposed site(s) and its (their) major resources, including location, proposed boundaries, and adjacent land uses. Maps are required;
3. A description of the public participation process used by the state to solicit the views of interested parties, a summary of comments, and, if interstate issues are involved, documentation that the Governor(s) of the other affected state(s) has been contacted. Copies of all correspondence, including contact letters to all affected landowners must be appended;
4. A list of all sites considered and a brief statement of the reasons why a site was not preferred; and
5. A nomination of the proposed site(s) for designation as a National Estuarine Research Reserve by the Governor of the coastal state in which the state is located.

(f) A state proposing to reactivate an inactive site, previously approved by NOAA for development as an Estuarine Sanctuary or Reserve, may apply for those funds remaining, if any, provided for site selection and feasibility (Sec. 921.11a)) to determine the feasibility of reactivation. This feasibility study must comply with the requirements set forth in Sec. 921.11 (c) through (e).

Sec. 921.12 Post site selection.

(a) At the time of the coastal state's request for NOAA approval of a proposed site, the state may submit a request for funds to develop the draft management plan and for preparation of the EIS. At this time, the state may also submit a request for the remainder of the predesignation funds to perform a limited basic characterization of the physical, chemical and biological characteristics of the site approved by NOAA necessary for providing EIS information to NOAA. The state's request for these post site selection funds must be accompanied by the information specified in subpart I and, for draft management plan development and EIS information collection, the following programmatic information:

1. A draft management plan outline (see Sec. 921.13(a) below); and
2. An outline of a draft memorandum of understanding (MOU) between the state and NOAA detailing the Federal-state role in Reserve management during the initial period of Federal funding and expressing the state's long-term commitment to operate and manage the Reserve.

(b) The state is eligible to use the funds referenced in Sec. 921.12(a) after the proposed site is approved by NOAA under the terms of Sec. 921.11.

Sec. 921.13 Management plan and environmental impact statement development.

(a) After NOAA approves the state's proposed site and application for funds submitted pursuant to Sec. 921.12, the state may begin draft management plan development and the collection of information necessary for the preparation by NOAA of an EIS. The state shall develop a draft management plan, including an MOU. The plan shall set out in detail:

1. Reserve goals and objectives, management issues, and strategies or actions for meeting the goals and objectives;
2. An administrative plan including staff roles in administration, research, education/interpretation, and surveillance and enforcement;
3. A research plan, including a monitoring design;
4. An education/interpretive plan;
5. A plan for public access to the Reserve;
6. A construction plan, including a proposed construction schedule, general descriptions of proposed developments and general cost estimates. Information should be provided for proposed minor construction projects in sufficient detail to allow these projects to begin in the initial phase of acquisition and development. A categorical exclusion, environmental assessment, or EIS may be required prior to construction;
7. (i) An acquisition plan identifying the ecologically key land and water areas of the Reserve, ranking these areas according to their relative importance, and including a strategy for establishing adequate long-term state control over these areas sufficient to provide protection for Reserve resources to ensure a stable environment for research. This plan must include an identification of ownership within the proposed Reserve boundaries, including land already in the public domain; the method(s) of acquisition which the state proposes to use--acquisition (including less-than-fee simple options) to establish adequate long-term state control; an estimate of the fair market value of any property interest--which is proposed for acquisition; a schedule estimating the time required to complete the process of establishing adequate state control of the proposed research reserve; and a discussion of any anticipated problems. In selecting a preferred method(s) for establishing adequate state control over areas within the proposed boundaries of the Reserve, the state shall perform the following steps for each parcel determined to be part of the key land and water areas (control over which is necessary to protect the integrity of the Reserve for research purposes), and for those parcels required for research and interpretive support facilities or buffer purposes:
   (A) Determine, with appropriate justification, the minimum level of control(s) required [e.g., management agreement, regulation, less-than-fee simple property interest (e.g., conservation easement), fee simple property acquisition, or a combination of these approaches]. This does not preclude the future necessity of increasing the level of state control;
   (B) Identify the level of existing state control(s);
   (C) Identify the level of additional state control(s), if any, necessar to meet the

minimum requirements identified in paragraph (a)(7)(i)(A) of this section;
(D) Examine all reasonable alternatives for attaining the level of control identified in paragraph (a)(7)(i)(C) of this section, and perform a cost analysis of each; and
(E) Rank, in order of cost, the methods (including acquisition) identified in paragraph (a)(7)(i)(D) of this section.

(ii) An assessment of the relative cost-effectiveness of control alternatives shall include a reasonable estimate of both short-term costs (e.g., acquisition of property interests, regulatory program development including associated enforcement costs, negotiation, adjudication, etc.) and long-term costs (e.g., monitoring, enforcement, adjudication, management and coordination). In selecting a preferred method(s) for establishing adequate state control over each parcel examined under the process described above, the state shall give priority consideration to the least costly method(s) of attaining the minimum level of long-term control required. Generally, with the possible exception of buffer areas required for support facilities, the level of control(s) required for buffer areas will be considerably less than that required for key land and water areas. This acquisition plan, after receiving the approval of NOAA, shall serve as a guide for negotiations with landowners. A final boundary for the reserve shall be delineated as a part of the final management plan;

8. A resource protection plan detailing applicable authorities, including allowable uses, uses requiring a permit and permit requirements, any restrictions on use of the research reserve, and a strategy for research reserve surveillance and enforcement of such use restrictions, including appropriate government enforcement agencies;
9. If applicable, a restoration plan describing those portions of the site that may require habitat modification to restore natural conditions;
10. If applicable, a resource manipulation plan, describing those portions of the Reserve buffer in which long-term pre-existing (prior to designation) manipulation for reasons not related to research or restoration is occurring. The plan shall explain in detail the nature of such activities, shall justify why such manipulation should be permitted to continue within the reserve buffer; and shall describe possible effects of this manipulation on key land and water areas and their resources;
11. A proposed memorandum of understanding (MOU) between the state and NOAA regarding the Federal-state relationship during the establishment and development of the National Estuarine Research Reserve, and expressing a long-term commitment by the state to maintain and manage the Reserve in accordance with section 315 of the Act, 16 U.S.C. 1461, and applicable regulations. In conjunction with the MOU, and where possible under state law, the state will consider taking appropriate administrative or legislative action to ensure the long-term protection and operation of the National Estuarine Research Reserve. If other MOUs are necessary (such as with a Federal agency, another state agency or private organization), drafts of such MOUs must be included in the plan. All necessary MOU's shall be signed prior to Reserve designation; and

12. If the state has a federally approved coastal management program, a certification that the National Estuarine Research Reserve is consistent to the maximum extent practicable with that program. See Secs. 921.4(b) and 921.30(b).

(b) Regarding the preparation of an EIS under the National Environmental Policy Act on a National Estuarine Research Reserve proposal, the state and NOAA shall collect all necessary information concerning the socioeconomic and environmental impacts associated with implementing the draft management plan and feasible alternatives to the plan. Based on this information, the state will draft and provide NOAA with a preliminary EIS.

(c) Early in the development of the draft management plan and the draft EIS, the state and NOAA shall hold a scoping meeting (pursuant to NEPA) in the area or areas most affected to solicit public and government comments on the significant issues related to the proposed action. NOAA will publish a notice of the meeting in the Federal Register at least 15 days prior to the meeting. The state shall be responsible for publishing a similar notice in the local media.

(d) NOAA will publish a Federal Register notice of intent to prepare a draft EIS. After the draft EIS is prepared and filed with the Environmental Protection Agency (EPA), a Notice of Availability of the draft EIS will appear in the Federal Register. Not less than 30 days after publication of the notice, NOAA will hold at least one public hearing in the area or areas most affected by the proposed national estuarine research reserve. The hearing will be held no sooner than 15 days after appropriate notice of the meeting has been given in the principal news media by the state and in the Federal Register by NOAA. After a 45-day comment period, a final EIS will be prepared by the state and NOAA.

Sec. 921.20 General.

The acquisition and development period is separated into two major phases. After NOAA approval of the site, draft management plan and draft MOU, and completion of the final EIS, a coastal state is eligible for an initial acquisition and development award(s). In this initial phase, the state should work to meet the criteria required for formal research reserve designation; e.g., establishing adequate state control over the key land and water areas as specified in the draft management plan and preparing the final management plan. These requirements are specified in Sec. 921.30. Minor construction in accordance with the draft management plan may also be conducted during this initial phase. The initial acquisition and development phase is expected to last no longer than three years. If necessary, a longer time period may be negotiated between the state and NOAA. After Reserve designation, a state is eligible for a supplemental acquisition and development award(s) in accordance with Sec. 921.31. In this post-designation acquisition and development phase, funds may be used in accordance with the final management plan to construct research and educational facilities, complete any remaining land acquisition, for program development, and for restorative activities identified in the final management

plan. In any case, the amount of Federal financial assistance provided to a coastal state with respect to the acquisition of lands and waters, or interests therein, for any one National Estuarine Research Reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein or $5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998].

Sec. 921.21 Initial acquisition and development awards.

(a) Assistance is provided to aid the recipient prior to designation in:

1. Acquiring a fee simple or less-than-fee simple real property interest in land and water areas to be included in the Reserve boundaries (see Sec. 921.13(a)(7); Sec. 921.30(d));
2. Minor construction, as provided in paragraphs (b) and (c) of this section;
3. Preparing the final management plan; and
4. Initial management costs, e.g., for implementing the NOAA approved draft management plan, hiring a Reserve manager and other staff as necessary and for other management-related activities. Application procedures are specified in subpart I.

(b) The expenditure of Federal and state funds on major construction activities is not allowed during the initial acquisition and development phase. The preparation of architectural and engineering plans, including specifications, for any proposed construction, or for proposed restorative activities, is permitted. In addition, minor construction activities, consistent with paragraph (c) of this section also are allowed. The NOAA-approved draft management plan must, however, include a construction plan and a public access plan before any award funds can be spent on construction activities.

(c) Only minor construction activities that aid in implementing portions of the management plan (such as boat ramps and nature trails) are permitted during the initial acquisition and development phase. No more than five (5) percent of the initial acquisition and development award may be expended on such activities. NOAA must make a specific determination, based on the final EIS, that the construction activity will not be detrimental to the environment.

(d) Except as specifically provided in paragraphs (a) through (c) of this section, construction projects, to be funded in whole or in part under an acquisition and development award(s), may not be initiated until the Reserve receives formal designation (see Sec. 921.30). This requirement has been adopted to ensure that substantial progress

in establishing adequate state control over key land and water areas has been made and that a final management plan is completed before major sums are spent on construction. Once substantial progress in establishing adequate state control/acquisition has been made, as defined by the state in the management plan, other activities guided by the final management plan may begin with NOAA's approval.

(e) For any real property acquired in whole or part with Federal funds for the Reserve, the state shall execute suitable title documents to include substantially the following provisions, or otherwise append the following provisions in a manner acceptable under applicable state law to the official land record(s):

1. Title to the property conveyed by this deed shall vest in the [recipient of the award granted pursuant to section 315 of the Act, 16 U.S.C. 1461 or other NOAA approved state agency] subject to the condition that the designation of the [name of National Estuarine Reserve] is not withdrawn and the property remains part of the federally designated [name of National Estuarine Research Reserve]; and
2. In the event that the property is no longer included as part of the Reserve, or if the designation of the Reserve of which it is part is withdrawn, then NOAA or its successor agency, after full and reasonable consultation with the State, may exercise the following rights regarding the disposition of the property:
   (i) The recipient may retain title after paying the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the current fair market value of the property;
   (ii) If the recipient does not elect to retain title, the Federal Government may either direct the recipient to sell the property and pay the Federal Government an amount computed by applying the Federal percentage of participation in the cost of the original project to the proceeds from the sale (after deducting actual and reasonable selling and repair or renovation expenses, if any, from the sale proceeds), or direct the recipient to transfer title to the Federal Government. If directed to transfer title to the Federal Government, the recipient shall be entitled to compensation computed by applying the recipient's percentage of participation in the cost of the original project to the current fair market value of the property; and
   (iii) Fair market value of the property must be determined by an independent appraiser and certified by a responsible official of the state, as provided by Department of Commerce regulations at 15 CFR part 24, and Uniform Relocation Assistance and Real Property Acquisition for Federal and Federally assisted programs at 15 CFR part 11.

(f) Upon instruction by NOAA, provisions analogous to those of Sec. 921.21(e) shall be included in the documentation underlying less-then-fee-simple interests acquired in whole or part with Federal funds.

(g) Federal funds or non-Federal matching share funds shall not be spent to acquire a real property interest in which the state will own the land concurrently with another entity unless the property interest has been identified as a part of an acquisition strategy

pursuant to Sec. 921.13(7) which has been approved by NOAA prior to the effective date of these regulations.

(h) Prior to submitting the final management plan to NOAA for review and approval, the state shall hold a public meeting to receive comment on the plan in the area affected by the estuarine research reserve. NOAA will publish a notice of the meeting in the Federal Register at least 15 days prior to the public meeting. The state shall be responsible for having a similar notice published in the local newspaper(s).

Sec. 921.30 Designation of National Estuarine Research Reserves.

(a) The Under Secretary may designate an area proposed for designation by the Governor of the state in which it is located, as a National Esturaine Research Reserve if the Under Secretary finds:

1. The area is a representative estuarine ecosystem that is suitable for long-term research and contributes to the biogeographical and typological balance of the System;
2. Key land and water areas of the proposed Reserve, as identified in the management plan, are under adequate state control sufficient to provide long-term protection for reserve resources to ensure a stable environment for research;
3. Designation of the area as a Reserve will serve to enhance public awareness and understanding of estuarine areas, and provide suitable opportunities for public education and interpretation;
4. A final management plan has been approved by NOAA;
5. An MOU has been signed between the state and NOAA ensuring a long-term commitment by the state to the effective operation and implementation of the area as a National Estuarine Research Reserve;
6. All MOU's necessary for reserve management (i.e., with relevant Federal, state, and local agencies and/or private organizations) have been signed; and
7. The coastal state in which the area is located has complied with the requirements of subpart B.

(b) NOAA will determine whether the designation of a National Estuarine Research Reserve in a state with a federally approved coastal zone management program directly affects the coastal zone. If the designation is found to directly affect the coastal zone, NOAA will make a consistency determination pursuant to Sec. 307(c)(1) of the Act, 16 U.S.C. 1456, and 15 CFR part 930, subpart C. See Sec. 921.4(b). The results of this consistency determination will be published in the Federal Register when the notice of designation is published. See Sec. 921.30(c).

(c) NOAA will publish the notice of designation of a National Estuarine Research Reserve in the Federal Register. The state shall be responsible for having a similar notice published in the local media.

(d) The term state control in Sec. 921.30(a)(3) does not necessarily require that key land and water areas be owned by the state in fee simple. Acquisition of less-than-fee simple interests e.g., conservation easements) and utilization of existing state regulatory measures are encouraged where the state can demonstrate that these interests and measures assure adequate long-term state control consistent with the purposes of the research reserve (see also Secs. 921.13(a)(7); 921.21(g)). Should the state later elect to purchase an interest in such lands using NOAA funds, adequate justification as to the need for such acquisition must be provided to NOAA.

Sec. 921.31 Supplemental acquisition and development awards.

After National Estuarine Research Reserve designation, and as specified in the approved management plan, a coastal state may request a supplemental acquisition and/or development award(s) for acquiring additional property interests identified in the management plan as necessary to strengthen protection of key land and water areas and to enhance long-term protection of the area for research and education, for facility and exhibit construction, for restorative activities identified in the approved management plan, for administrative purposes related to acquisition and/or facility construction and to develop and/or upgrade research, monitoring and education/interpretive programs. Federal financial assistance provided to a National Estuarine Research Reserve for supplemental development costs directly associated with facility construction (i.e., major construction activities) may not exceed 70 percent of the total project cost, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs. NOAA must make a specific determination that the construction activity will not be detrimental to the environment. Acquisition awards for the acquisition of lands or waters, or interests therein, for any one reserve may not exceed an amount equal to 50 percent of the costs of the lands, waters, and interests therein of $5,000,000, whichever amount is less, except when the financial assistance is provided from amounts recovered as result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of all actual costs of activities carrier out with this assistance, as long as such funds are available. In the case of a biogeographic region (see appendix I) shared by two or more states, each state is eligible independently for Federal financial assistance to establish a separate National Estuarine Research Reserve within their respective portion of the shared biogeographic region. Application procedures are specified in subpart I. Land acquisition must follow the procedures specified in Secs. 921.13(a)(7), 921.21(e) and (f) and 921.81.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12540, Mar. 17, 1997; 63 FR 26717, May 14, 1998].

Sec. 921.32 Operation and management: Implementation of the management plan.

(a) After the Reserve is formally designated, a coastal state is eligible to receive Federal funds to assist the state in the operation and management of the Reserve including the management of research, monitoring, education, and interpretive programs. The purpose of this Federally funded operation and management phase is to implement the approved final management plan and to take the necessary steps to ensure the continued effective operation of the Reserve.

(b) State operation and management of the Reserves shall be consistent with the mission, and shall further the goals of the National Estuarine Research Reserve program (see Sec. 921.1).

(c) Federal funds are available for the operation and management of the Reserve. Federal funds provided pursuant to this section may not exceed 70 percent of the total cost of operating and managing the Reserve for any one year, except when the financial assistance is provided from amounts recovered as a result of damage to natural resources located in the coastal zone, in which case the assistance may be used to pay 100 percent of the costs. In the case of a biogeographic region (see Appendix I) shared by two or more states, each state is eligible for Federal financial assistance to establish a separate Reserve within their respective portion of the shared biogeographic region (see Sec. 921.10).

(d) Operation and management funds are subject to the following limitations:

1. Eligible coastal state agencies may apply for up to the maximum share available per Reserve for that fiscal year. Share amounts will be announced annually by letter from the Sanctuary and Reserves Division to all participating states. This letter will be provided as soon as practicable following approval of the Federal budget for that fiscal year.
2. No more than ten percent of the total amount (state and Federal shares) of each operation and management award may be used for construction-type activities.

[58 FR 38215, July 15, 1993, as amended at 62 FR 12541, Mar. 17, 1997].

Sec. 921.33 Boundary changes, amendments to the management plan, and addition of multiple-site components.

(a) Changes in the boundary of a Reserve and major changes to the final management plan, including state laws or regulations promulgated specifically for the Reserve, may be made only after written approval by NOAA. NOAA may require public notice, including notice in the Federal Register and an opportunity for public comment before approving a boundary or management plan change. Changes in the boundary of a Reserve involving the acquisition of properties not listed in the management plan or final EIS require public notice and the opportunity for comment; in certain cases, a categorical exclusion, an environmental assessment and possibly an environmental impact statement may be

required. NOAA will place a notice in the Federal Register of any proposed changes in Reserve boundaries or proposed major changes to the final management plan. The state shall be responsible for publishing an equivalent notice in the local media. See also requirements of Secs. 921.4(b) and 921.13(a)(11).

(b) As discussed in Sec. 921.10(b), a state may choose to develop a multiple-site National Estuarine Research Reserve after the initial acquisition and development award for a single site has been made. NOAA will publish notice of the proposed new site including an invitation for comments from the public in the Federal Register. The state shall be responsible for publishing an equivalent notice in the local newspaper(s). An EIS, if required, shall be prepared in accordance with section Sec. 921.13 and shall include an administrative framework for the multiple-site Reserve and a description of the complementary research and educational programs within the Reserve. If NOAA determines, based on the scope of the project and the issues associated with the additional site(s), that an environmental assessment is sufficient to establish a multiple-site Reserve, then the state shall develop a revised management plan which, concerning the additional component, incorporates each of the elements described in Sec. 921.13(a). The revised management plan shall address goals and objectives for all components of the multi-site Reserve and the additional component's relationship to the original site(s).

(c) The state shall revise the management plan for a Reserve at least every five years, or more often if necessary. Management plan revisions are subject to (a) above.

(d) NOAA will approve boundary changes, amendments to management plans, or the addition of multiple-site components, by notice in the Federal Register. If necessary NOAA will revise the designation document (findings) for the site.

Sec. 921.40 Ongoing oversight and evaluations of designated National Estuarine Research Reserves.

(a) The Sanctuaries and Reserve Division shall conduct, in accordance with section 312 of the Act and procedures set forth in 15 CFR part 928, ongoing oversight and evaluations of Reserves. Interim sanctions may be imposed in accordance with regulations promulgated under 15 CFR part 928.

(b) The Assistant Administrator may consider the following indicators of non-adherence in determining whether to invoke interim sanctions:

1. Inadequate implementation of required staff roles in administration, research, education/interpretation, and surveillance and enforcement. Indicators of inadequate implementation could include: No Reserve Manager, or no staff or insufficient staff to carry out the required functions.
2. Inadequate implementation of the required research plan, including the monitoring design. Indicators of inadequate implementation could include: Not

carrying out research or monitoring that is required by the plan, or carrying out research or monitoring that is inconsistent with the plan.

3. Inadequate implementation of the required education/interpretation plan. Indicators of inadequate implementation could include: Not carrying out education or interpretation that is required by the plan, or carrying out education/interpretation that is inconsistent with the plan.
4. Inadequate implementation of public access to the Reserve. Indicators of inadequate implementation of public access could include: Not providing necessary access, giving full consideration to the need to keep some areas off limits to the public in order to protect fragile resources.
5. Inadequate implementation of facility development plan. Indicators of inadequate implementation could include: Not taking action to propose and budget for necessary facilities, or not undertaking necessary construction in a timely manner when funds are available.
6. Inadequate implementation of acquisition plan. Indicators of inadequate implementation could include: Not pursuing an aggressive acquisition program with all available funds for that purpose, not requesting promptly additional funds when necessary, and evidence that adequate long-term state control has not been established over some core or buffer areas, thus jeopardizing the ability to protect the Reserve site and resources from offsite impacts.
7. Inadequate implementation of Reserve protection plan. Indicators of inadequate implementation could include: Evidence of non-compliance with Reserve restrictions, insufficient surveillance and enforcement to assure that restrictions on use of the Reserve are adhered to, or evidence that Reserve resources are being damaged or destroyed as a result of the above.
8. Failure to carry out the terms of the signed Memorandum of Understanding (MOU) between the state and NOAA, which establishes a long-term state commitment to maintain and manage the Reserve in accordance with section 315 of the Act. Indicators of failure could include: State action to allow incompatible uses of state-controlled lands or waters in the Reserve, failure of the state to bear its fair share of costs associated with long-term operation and management of the Reserve, or failure to initiate timely updates of the MOU when necessary.

Sec. 921.41 Withdrawal of designation.

The Assistant Administrator may withdraw designation of an estuarine area as a National Estuarine Research Reserve pursuant to and in accordance with the procedures of section 312 and 315 of the Act and regulations promulgated thereunder.

Appendix I to Part 921-- Biogeographic Classification Scheme.

Source: http://www.nerrs.noaa.gov/BGDefault.aspx?ID=302 , accessed May 31, 2012.

Acadian

1. Northern of Maine (Eastport to the Sheepscot River.)
2. Southern Gulf of Maine (Sheepscot River to Cape Cod.)

Virginian

3. Southern New England (Cape Cod to Sandy Hook.)
4. Middle Atlantic (Sandy Hook to Cape Hatteras.)
5. Chesapeake Bay.

Carolinian

6. North Carolinas (Cape Hatteras to Santee River.)
7. South Atlantic (Santee River to St. John's River.)
8. East Florida (St. John's River to Cape Canaveral.)

West Indian

9. Caribbean (Cape Canaveral to Ft. Jefferson and south.)
10. West Florida (Ft. Jefferson to Cedar Key.)

Louisianian

11. Panhandle Coast (Cedar Key to Mobile Bay.)
12. Mississippi Delta (Mobile Bay to Galveston.)
13. Western Gulf (Galveston to Mexican border.)

Californian

14. Southern California (Mexican border to Point Conception.)
15. Central California (Point Conception to Cape Mendocino.)
16. San Francisco Bay.

Columbian

17. Middle Pacific (Cape Mendocino to the Columbia River.)
18. Washington Coast (Columbia River to Vancouver Island.)
19. Puget Sound.

Great Lakes

20. Lake Superior (including St. Mary's River.)
21. Lakes Michigan and Huron (including Straits of Mackinac, St.

Clair River, and Lake St. Clair.)
22. Lake Erie (including Detroit River and Niagara Falls.)
23. Lake Ontario (including St. Lawrence River.)

Fjord
24. Southern Alaska (Prince of Wales Island to Cook Inlet.)
25. Aleutian Island (Cook Inlet Bristol Bay.)

Sub-Arctic
26. Northern Alaska (Bristol Bay to Damarcation Point.)

Insular
27. Hawaiian Islands.
28. Western Pacific Island.
29. Eastern Pacific Island.

Appendix II to Part 921-- Typology of National Estuarine Research Reserves.

Source: http://www.nerrs.noaa.gov/BGDefault.aspx?ID=303, accessed May 31, 2012.

This typology system reflects significant differences in estuarine characteristics that are not necessarily related to regional location. The purpose of this type of classification is to maximize ecosystem variety in the selection of national estuarine reserves. Priority will be given to important ecosystem types as yet unrepresented in the reserve system. It should be noted that any one site may represent several ecosystem types or physical characteristics.

Class I -- Ecosystem Types
Group I -- Shorelands
Group II -- Transition Areas
Group III -- Submerged Bottoms

Class II -- Physical Characteristics
Group I -- Geologic
Group II -- Hydrographic
Group III -- Chemical

Class I -- Ecosystem Types

Group I -- Shorelands

A. Maritime Forest-Woodland. That have developed under the influence of salt spray. It can be found on coastal uplands or recent features such as barrier islands and beaches, and may be divided into the following biomes:

1. Northern coniferous forest biome: This is an area of predominantly evergreens such as the sitka spruce (Picea), grand fir (Abies), and white cedar (Thuja), with poor development of the shrub and herb leyera, but high annual productivity and pronounced seasonal periodicity.
2. Moist temperate (Mesothermal) coniferous forest biome: Found along the west coast of North America from California to Alaska, this area is dominated by conifers, has relatively small seasonal range, high humidity with rainfall ranging from 30 to 150 inches, and a well-developed understory of vegetation with an abundance of mosses and other moisture-tolerant plants.
3. Temperate deciduous forest biome: This biome is characterized by abundant, evenly distributed rainfall, moderate temperatures which exhibit a distinct seasonal pattern, well-developed soil biota and herb and shrub layers, and numerous plants which produce pulpy fruits and nuts. A distinct subdivision of this biome is the pine edible

forest of the southeastern coastal plain, in which only a small portion of the area is occupied by climax vegetation, although it has large areas covered by edaphic climax pines.

4. Broad-leaved evergreen subtropical forest biome: The main characteristic of this biome is high moisture with less pronounced differences between winter and summer. Examples are the hammocks of Florida and the live oak forests of the Gulf and South Atlantic coasts. Floral dominants include pines, magnolias, bays, hollies, wild tamarine, strangler fig, gumbo limbo, and palms.

B. Coast shrublands. This is a transitional area between the coastal grasslands and woodlands and is characterized by woody species with multiple stems and a few centimeters to several meters above the ground developing under the influence of salt spray and occasional sand burial. This includes thickets, scrub, scrub savanna, heathlands, and coastal chaparral. There is a great variety of shrubland vegetation exhibiting regional specificity:

1. Northern areas: Characterized by Hudsonia, various erinaceous species, and thickets of Myricu, prunus, and Rosa.
2. Southeast areas: Floral dominants include Myrica, Baccharis, and Iles.
3. Western areas: Adenostoma, arcotyphylos, and eucalyptus are the dominant floral species.

C. Coastal grasslands. This area, which possesses sand dunes and coastal flats, has low rainfall (10 to 30 inches per year) and large amounts of humus in the soil. Ecological succession is slow, resulting in the presence of a number of seral stages of community development. Dominant vegetation includes mid-grasses (5 to 8 feet tall), such as Spartina, and trees such as willow (Salix sp.), cherry (Prunus sp.), and cottonwood (Pupulus deltoides.) This area is divided into four regions with the following typical strand vegetation:

1. Arctic/Boreal: Elymus;
2. Northeast/West: Ammophla;
3. Southeast Gulf: Uniola; and
4. Mid-Atlantic/Gulf: Spartina patens.

D. Coastal tundra. This ecosystem, which is found along the Arctic and Boreal coasts of North America, is characterized by low temperatures, a short growing season, and some permafrost, producing a low, treeless mat community made up of mosses, lichens, heath, shrubs, grasses, sedges, rushes, and herbaceous and dwarf woody plants. Common species include arctic/alpine plants such as Empetrum nigrum and Betula nana, the lichens Cetraria and Cladonia, and herbaceous plants such as Potentilla tridentata and Rubus chamaemorus. Common species on the coastal beach ridges of the high arctic desert include Bryas intergrifolia and Saxifrage oppositifolia. This area can be divided into two main subdivisions:

1. Low tundra: Characterized by a thick, spongy mat of living and undecayed vegetation, often with water and dotted with ponds when not frozen; and

2. High Tundra: A bare area except for a scanty growth of lichens and grasses, with underlaying ice wedges forming raised polygonal areas.

E. Coastal cliffs. This ecosystem is an important nesting site for many sea and shore birds. It consists of communities of herbaceous, graminoid, or low woody plants (shrubs, heath, etc.) on the top or along rocky faces exposed to salt spray. There is a diversity of plant species including mosses, lichens, liverworts, and ``higher'' plant representatives.

Group II -- Transition Areas

A. Coastal marshes. These are wetland areas dominated by grasses (Poacea), sedges (Cyperaceae), rushes (Juncaceae), cattails (Typhaceae), and other graminoid species and is subject to periodic flooding by either salt or freshwater. This ecosystem may be subdivided into: (a) Tidal, which is periodically flooded by either salt or brackish water; (b) nontidal (freshwater); or (c) tidal freshwater. These are essential habitats for many important estuarine species of fish and invertebrates as well as shorebirds and waterfowl and serve important roles in shore stabilization, flood control, water purification, and nutrient transport and storage.

B. Coastal swamps. These are wet lowland areas that support mosses and shrubs together with large trees such as cypress or gum.

C. Coastal mangroves. This ecosystem experiences regular flooding on either a daily, monthly, or seasonal basis, has low wave action, and is dominated by a variety of salt-tolerant trees, such as the red mangrove (Rhizophora mangle), black mangrove (Avicennia Nitida), and the white mangrove (Laguncularia racemosa.) It is also an important habitat for large populations of fish, invertebrates, and birds. This type of ecosystem can be found from central Florida to extreme south Texas to the islands of the Western Pacific.

D. Intertidal beaches. This ecosystem has a distinct biota of microscopic animals, bacteria, and unicellular algae along with macroscopic crustaceans, mollusks, and worms with a detritus-based nutrient cycle. This area also includes the driftline communities found at high tide levels on the beach. The dominant organisms in this ecosystem include crustaceans such as the mole crab (Emerita), amphipods (Gammeridae), ghost crabs (Ocypode), and bivalve mollusks such as the coquina (Donax) and surf clams (Spisula and Mactra.)

E. Intertidal mud and sand flats. These areas are composed of unconsolidated, high organic content sediments that function as a short-term storage area for nutrients and organic carbons. Macrophytes are nearly absent in this ecosystem, although it may be heavily colonized by benthic diatoms, dinoflaggellates, filamintous blue-green and green algae, and chaemosynthetic purple sulfur bacteria. This system may support a considerable population of gastropods, bivalves, and polychaetes, and may serve as a feeding area for a variety of fish and wading birds. In sand, the dominant fauna include the wedge shell Donax, the scallop Pecten, tellin shells Tellina, the heart urchin Echinocardium, the lug worm Arenicola, sand dollar Dendraster, and the sea pansy Renilla. In mud, faunal dominants adapted to low oxygen levels

include the terebellid Amphitrite, the boring clam Playdon, the deep sea scallop Placopecten, the Quahog Mercenaria, the echiurid worm Urechis, the mud snail Nassarius, and the sea cucumber Thyone.

F. Intertidal algal beds. These are hard substrates along the marine edge that are dominated by macroscopic algae, usually thalloid, but also filamentous or unicellular in growth form. This also includes the rocky coast tidepools that fall within the intertidal zone. Dominant fauna of these areas are barnacles, mussels, periwinkles, anemones, and chitons. Three regions are apparent:

1. Northern latitude rocky shores: It is in this region that the community structure is best developed. The dominant algal species include Chondrus at the low tide level, Fucus and Ascophylium at the mid-tidal level, and Laminaria and other kelplike algae just beyond the intertidal, although they can be exposed at extremely low tides or found in very deep tidepools.
2. Southern latitudes: The communities in this region are reduced in comparison to those of the northern latitudes and possesses algae consisting mostly of single-celled or filamentour green, blue-green, and red algae, and small thalloid brown algae.
3. Tropical and subtropical latitudes: The intertidal in this region is very reduced and contains numerous calcareous algae such as Porolithon and Lithothamnion, as well and green algae with calcareous particles such as Halimeda, and numerous other green, red, and brown algae.

Group III--Submerged Bottoms

A. Subtidal hardbottoms. This system is characterized by a consolidated layer of solid rock or large pieces of rock (neither of biotic origin) and is found in association with geomorphological features such as submarine canyons and fjords and is usually covered with assemblages of sponges, sea fans, bivalves, hard corals, tunicates, and other attached organisms. A significant feature of estuaries in many parts of the world is the oyster reef, a type of subtidal hardbottom. Composed of assemblages of organisms (usually bivalves), it is usually found near an estuary's mouth in a zone of moderate wave action, salt content, and turbidity. If light levels are sufficient, a covering of microscopic and attached macroscopic algae, such as keep, may also be found.

B. Subtidal softbottoms. Major characteristics of this ecosystem are an unconsolidated layer of fine particles of silt, sand, clay, and gravel, high hydrogen sulfide levels, and anaerobic conditions often existing below the surface. Macrophytes are either sparse or absent, although a layer of benthic microalgae may be present if light levels are sufficient. The faunal community is dominated by a diverse population of deposit feeders including polychaetes, bivalves, and burrowing crustaceans.

C. Subtidal plants. This system is found in relatively shallow water (less than 8 to 10 meters) below mean low tide. It is an area of extremely high primary production that provides food and refuge for a diversity of faunal groups, especially juvenile and adult fish, and in some regions,

manatees and sea turtles. Along the North Atlantic and Pacific coasts, the seagrass Zostera marina predominates. In the South Atlantic and Gulf coast areas, Thalassia and Diplanthera predominate. The grasses in both areas support a number of epiphytic organisms.

Class II--Physical Characteristics

Group I--Geologic

A. Basin type. Coastal water basins occur in a variety of shapes, sizes, depths, and appearances. The eight basic types discussed below will cover most of the cases:

1. Exposed coast: Solid rock formations or heavy sand deposits characterize exposed ocean shore fronts, which are subject to the full force of ocean storms. The sand beaches are very resilient, although the dunes lying just behind the beaches are fragile and easily damaged. The dunes serve as a sand storage area making them chief stabilizers of the ocean shorefront.
2. Sheltered coast: Sand or coral barriers, built up by natural forces, provide sheltered areas inside a bar or reef where the ecosystem takes on many characteristics of confined waters-abundant marine grasses, shellfish, and juvenile fish. Water movement is reduced, with the consequent effects pollution being more severe in this area than in exposed coastal areas.
3. Bay: Bays are larger confined bodies of water that are open to the sea and receive strong tidal flow. When stratification is pronounced the flushing action is augmented by river discharge. Bays vary in size and in type of shorefront.
4. Embayment: A confined coastal water body with narrow, restricted inlets and with a significant freshwater inflow can be classified as an embayment. These areas have more restricted inlets than bays, are usually smaller and shallower, have low tidal action, and are subject to sedimentation.
5. Tidal river: The lower reach of a coastal river is referred to as a tidal river. The coastal water segment extends from the sea or estuary into which the river discharges to a point as far upstream as there is significant salt content in the water, forming a salt front. A combination of tidal action and freshwater outflow makes tidal rivers well-flushed. The tidal river basin may be a simple channel or a complex of tributaries, small associated embayments, marshfronts, tidal flats, and a variety of others.
6. Lagoon: Lagoons are confined coastal bodies of water with restricted inlets to the sea and without significant freshwater inflow. Water circulation is limited, resulting in a poorly flushed, relatively stagnant body of water. Sedimentation is rapid with a great potential for basin shoaling. Shores are often gently sloping and marshy.
7. Perched coastal wetlands: Unique to Pacific islands, this wetland type found above sea level in volcanic crater remnants forms as a result of poor drainage characteristics of the crater rather than from sedimentation. Floral assemblages exhibit distinct zonation while the faunal constituents may include freshwater, brackish, and/or marine species. Example: Aunu's Island, American Samoa.

8. Anchialine systems: These small coastal exposures of brackish water form in lava depressions or elevated fossil reefs have only a subsurface connection in the ocean, but show tidal fluctuations. Differing from true estuaries in having no surface continuity with streams or ocean, this system is characterized by a distinct biotic community dominated by benthis algae such as Rhizoclonium, the mineral encrusting Schiuzothrix, and the vascular plant Ruppia maritima. Characteristic fauna which exhibit a high degree of endemicity, include the mollusks Theosoxus neglectus and Tcariosus. Although found throughout the world, the high islands of the Pacific are the only areas within the U.S. where this system can be found.

B. Basin structure. Estuary basins may result from the drowning of a river valley (coastal plains estuary), the drowning of a glacial valley (fjord), the occurrence of an offshore barrier (bar-bounded estuary), some tectonic process (tectonic estuary), or volcanic activity (volcanic estuary).

1. Coastal plains estuary: Where a drowned valley consists mainly of a single channel, the form of the basin is fairly regular forming a simple coastal plains estuary. When a channel is flooded with numerous tributaries an irregular estuary results. Many estuaries of the eastern United States are of this type.
2. Fjord: Estuaries that form in elongated steep headlands that alternate with deep U-shaped valleys resulting from glacial scouring are called fjords. They generally possess rocky floors or very thin veneers of sediment, with deposition generally being restricted to the head where the main river enters. Compared to total fjord volume river discharge is small. But many fjords have restricted tidal ranges at their mouths due to sills, or upreaching sections of the bottom which limit free movement of water, often making river flow large with respect to the tidal prism. The deepest portions are in the upstream reaches, where maximum depths can range from 800m to 1200m while sill depths usually range from 40m to 150m.
3. Bar-bounded estuary: These result from the development of an offshore barrier such as a beach strand, a line of barrier islands, reef formations a line of moraine debris, or the subsiding remnants of a deltaic lobe. The basin is often partially exposed at low tide and is enclosed by a chain of offshore bars of barrier islands broken at intervals by inlets. These bars may be either deposited offshore or may be coastal dunes that have become isolated by recent seal level rises.
4. Tectonic estuary: These are coastal indentures that have formed through tectonic processes such as slippage along a fault line (San Francisco Bay), folding or movement of the earth's bedrock often with a large inflow of freshwater.
5. Volcanic estuary: These coastal bodies of open water, a result of volcanic processes are depressions or craters that have direct and/or subsurface connections with the ocean and may or may not have surface continuity with streams. These formations are unique to island areas of volcanic orgin.

C. Inlet type. Inlets in various forms are an integral part of the estuarine environment as they regulate to a certain extent, the velocity and magnitude of tidal exchange, the degree of mixing, and volume of discharge to the sea.

1. Unrestricted: An estuary with a wide unrestricted inlet typically has slow currents, no significant turbulence, and receives the full effect of ocean waves and local disturbances which serve to modify the shoreline. These estuaries are partially mixed, as the open mouth permits the incursion of marine waters to considerable distances upstream, depending on the tidal amplitude and stream gradient.
2. Restricted: Restrictions of estuaries can exist in many forms: Bars, barrier islands, spits, sills, and more. Restricted inlets result in decreased circulation, more pronounced longitudinal and vertical salinity gradients, and more rapid sedimentation. However, if the estuary mouth is restricted by depositional features or land closures, the incoming tide may be held back until it suddenly breaks forth into the basin as a tidal wave, or bore. Such currents exert profound effects on the nature of the subtrate, turbidity, and biota of the estuary.
3. Permanent: Permanent inlets are usually opposite the mouths of major rivers and permit river water to flow into the sea.
4. Temporary (Intermittent): Temporary inlets are formed by storms and frequently shift position, depending on tidal flow, the depth of the sea, and sound waters, the frequency of storms, and the amount of littoral transport.

D. Bottom composition. The bottom composition of estuaries attests to the vigorous, rapid, and complex sedimentation processes characteristic of most coastal regions with low relief. Sediments are derived through the hydrologic processes of erosion, transport, and deposition carried on by the sea and the stream.

1. Sand: Near estuary mouths, where the predominating forces of the sea build spits or other depositional features, the shore and substrates of the estuary are sandy. The bottom sediments in this area are usually coarse, with a graduation toward finer particles in the head region and other zones of reduced flow, fine silty sands are deposited. Sand deposition occurs only in wider or deeper regions where velocity is reduced.
2. Mud: At the base level of a stream near its mouth, the bottom is typically composed of loose muds, silts, and organic detritus as a result of erosion and transport from the upper stream reaches and organic decomposition. Just inside the estuary entrance, the bottom contains considerable quantities of sand and mud, which support a rich fauna. Mud flats, commonly built up in estuarine basins, are composed of loose, coarse, and fine mud and sand, often dividing the original channel.
3. Rock: Rocks usually occur in areas where the stream runs rapidly over a steep gradient with its coarse materials being derived from the higher elevations where the stream slope is greater. The larger fragments are usually found in shallow areas near the stream mouth.

4. Oyster shell: Throughout a major portion of the world, the oyster reef is one of the most significant features of estuaries, usually being found near the mouth of the estuary in a zone of moderate wave action, salt content, and turbidity. It is often a major factor in modifying estuarine current systems and sedimentation, and may occur as an elongated island or peninsula oriented across the main current, or may develop parallel to the direction of the current.

Group II--Hydrographic

A. Circulation. Circulation patterns are the result of combined influences of freshwater inflow, tidal action, wind and oceanic forces, and serve many functions: Nutrient transport, plankton dispersal, ecosystem flushing, salinity control, water mixing, and more.

1. Stratified: This is typical of estuaries with a strong freshwater influx and is commonly found in bays formed from "drowned'' river valleys, fjords, and other deep basins. There is a net movement of freshwater outward at the top layer and saltwater at the bottom layer, resulting in a net outward transport of surface organisms and net inward transport of bottom organisms.
2. Non-stratified: Estuaries of this type are found where water movement is sluggish and flushing rate is low, although there may be sufficient circulation to provide the basis for a high carrying capacity. This is common to shallow embayments and bays lacking a good supply of freshwater from land drainage.
3. Lagoonal: An estuary of this type is characterized by low rates of water movement resulting from a lack of significant freshwater influx and a lack of strong tidal exchange because of the typically narrow inlet connecting the lagoon to the sea. Circulation whose major driving force is wind, is the major limiting factor in biological productivity within lagoons.

B. Tides. This is the most important ecological factor in an estuary as it affects water exchange and its vertical range determines the extent of tidal flats which may be exposed and submerged with each tidal cycle. Tidal action against the volume of river water discharged into an estuary results in a complex system whose properties vary according to estuary structure as well as the magnitude of river flow and tidal range. Tides are usually described in terms of the cycle and their relative heights. In the United States, tide height is reckoned on the basis of average low tide, which is referred to as datum. The tides, although complex, fall into three main categories:

1. Diurnal: This refers to a daily change in water level that can be observed along the shoreline. There is one high tide and one low tide per day.
2. Semidiurnal: This refers to a twice daily rise and fall in water that can be observed along the shoreline.
3. Wind/Storm tides: This refers to fluctuations in water elevation to wind and storm events, where influence of lunar tides is less.

C. Freshwater. According to nearly all the definitions advanced, it is inherent that all estuaries need freshwater, which is drained from the land and measurably dilutes seawater to create a brackish condition. Freshwater enters an estuary as runoff from the land either from a surface and/or subsurface source.

1. Surface water: This is water flowing over the ground in the form of streams. Local variation in runoff is dependent upon the nature of the soil (porosity and solubility), degree of surface slope, vegetational type and development, local climatic conditions, and volume and intensity of precipitation.
2. Subsurface water: This refers to the precipitation that has been absorbed by the soil and stored below the surface. The distribution of subsurface water depends on local climate, topography, and the porosity and permeability of the underlying soils and rocks. There are two main subtypes of surface water:
    a. Vadose water: This is water in the soil above the water table. Its volume with respect to the soil is subject to considerable fluctuation.
    b. Groundwater: This is water contained in the rocks below the water table, is usually of more uniform volume than vadose water, and generally follows the topographic relief of the land being high hills and sloping into valleys.

Group III--Chemical

A. Salinity. This reflects a complex mixture of salts, the most abundant being sodium chloride, and is a very critical factor in the distribution and maintenance of many estuarine organisms. Based on salinity, there are two basic estuarine types and eight different salinity zones (expressed in parts per thousand-ppt.)

1. Positive estuary: This is an estuary in which the freshwater influx is sufficient to maintain mixing, resulting in a pattern of increasing salinity toward the estuary mouth. It is characterized by low oxygen concentration in the deeper waters and considerable organic content in bottom sediments.
2. Negative estuary: This is found in particularly arid regions, where estuary evaporation may exceed freshwater inflow, resulting in increased salinity in the upper part of the basin, especially if the estuary mouth is restricted so that tidal flow is inhibited. These are typically very salty (hyperhaline), moderately oxygenated at depth, and possess bottom sediments that are poor in organic content.
3. Salinity zones (expressed in ppt):
    a. Hyperhaline--greater than 40 ppt.
    b. Euhaline--40 ppt to 30 ppt.
    c. Mixhaline--30 ppt to 0.5 ppt.
        (1) Mixoeuhaline--greater than 30 ppt but less than the adjacent euhaline sea.
        (2) Polyhaline--30 ppt to 18 ppt.
        (3) Mesohaline--18 ppt to 5 ppt.
        (4) Oligohaline--5 ppt to 0.5 ppt.
    d. Limnetic: Less than 0.5 ppt.

B. pH Regime: This is indicative of the mineral richness of estuarine waters and falls into three main categories:

1. Acid: Waters with a pH of less than 5.5.
2. Circumneutral: A condition where the pH ranges from 5.5 to 7.4.
3. Alkaline: Waters with a pH greater than 7.4.

APPENDIX B

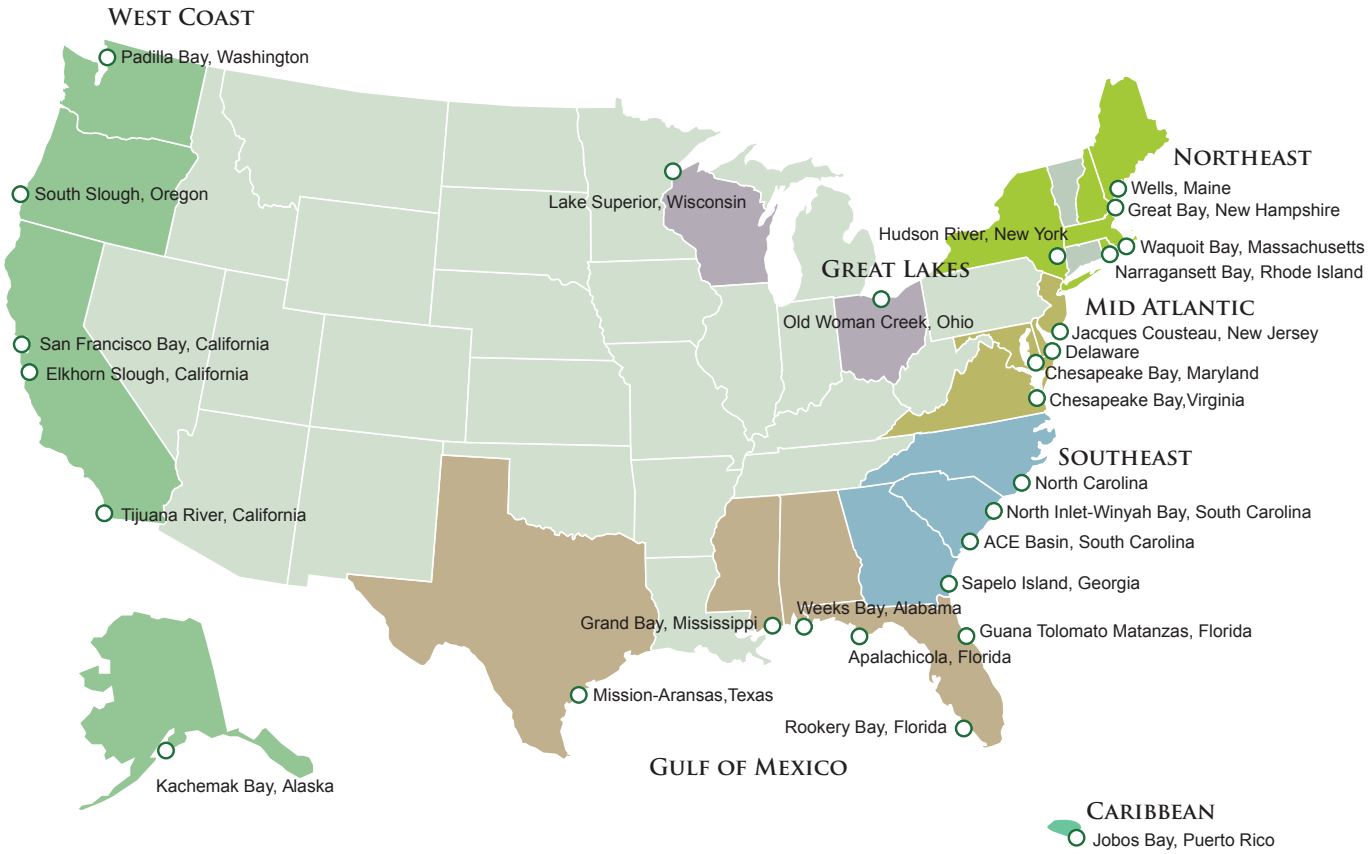
NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

2011-2016

National Estuarine Research Reserve System

STRATEGIC PLAN

National Estuarine Research Reserve System



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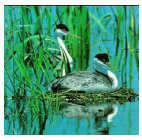
INTRODUCTION

Estuaries, where rivers meet the sea, are among the nation's most biologically rich and economically important ecosystems. They are also one of the most vulnerable – situated on the front lines of natural and human-induced change. The interconnection between the health of estuaries and society's economic and recreational well-being is increasingly evident, and coastal conservation is being driven by both ecological and societal needs. The National Estuarine Research Reserve System, a network of 28 protected areas along America's coasts, responds to these needs by providing platforms for learning and teaching, applying research to management, and practicing coastal stewardship. Each reserve in the national system serves as a place-based living laboratory and classroom where program development, research techniques, and management approaches can be piloted and applied to issues of local, regional, and national importance.

WHO WE ARE

Established by the Coastal Zone Management Act of 1972, as amended, the National Estuarine Research Reserve System is a state-federal partnership between the National Oceanic and Atmospheric Administration (NOAA) and the coastal states. It is administered by NOAA's Estuarine Reserves Division in the Office of Ocean and Coastal Resource Management. NOAA provides funding, coordination, national guidance for program implementation, and technical assistance. Coastal states are responsible for managing reserve resources and staff, providing matching funds, and implementing programs locally. Through this partnership, the Reserve System addresses local, regional, and national priorities and connects NOAA with on-the-ground projects, needs, and emerging issues.

Photo Credits: Paula Viveros, Diane Tulipani



HOW WE WORK

The Reserve System was founded on the principle that long-term protection of representative estuaries provides stable platforms for research and education and the application of management practices that will benefit the Nation's estuaries and coasts. Individual reserves serve as living laboratories for the study of estuaries and natural and man-made changes. Reserves employ place-based approaches to connect science to people, whether they are teachers, students, decision makers, or coastal residents. Reserves serve as demonstration sites where new ideas are tested. Through the implementation of System-wide programs in monitoring, training, and education, reserves also have regional and national impact. It is the integration of locally relevant reserve programs with System-wide approaches that fosters innovation and allows comparison of estuarine conditions across the country. Trusted long-term relationships with local communities, state and federal agencies, and other non-governmental entities form partnerships that amplify the impact of individual reserves and the Reserve System. The influence of reserve programs and products are felt well beyond the boundaries of individual sites. By working locally, regionally, and nationally, the Reserve System is more efficient and effective in addressing the key issues faced by coastal managers and communities today. In the next five years, the Reserve System will strengthen opportunities for place-based innovation that is transferable to other reserves and coastal management programs, while continuing the commitment to implementing robust System-wide programs in monitoring, training, and education.

The Reserve System is guided by several principles:

- Engage local communities and citizens to improve stewardship of coastal resources
- Create strong partnerships to enhance the success of Reserve programs
- Integrate research, education, and stewardship to address complex coastal problems
- Implement best management practices at reserves to lead by example
- Seek regional collaborations to extend the influence of reserve programs and products.

Photo Credits: Jennifer Greene, Amy Sauls

WHAT WE WORK ON

The Reserve System has identified climate change, water quality, and habitat protection as strategic areas of focus and investment over the next five years. These are the most significant issues for estuaries nationally and require local and regional responses. The Reserve System, as a place-based network of protected areas, is uniquely positioned to address these issues. While individual reserves will have other issues that are important locally, the Reserve System will focus on programs and projects that address climate change, water quality, and habitat protection.

A Graduate Research Fellow investigates how estuaries respond to nutrient load in the Guana-Tolomato-Matanzas (GTM) National Estuarine Research Reserve, Florida. Photo credit: Nikki Dix

Climate Change

Climate change will have significant impacts on estuaries and coasts by exacerbating existing stressors such as sea level/lake level change, inundation and flooding from storms, drought, and changes to freshwater inflows. Additional impacts such as ocean acidification and species shifts also will affect estuaries. These impacts are expected to vary regionally and increasingly affect coastal communities and economies (USGCRP 2009). Reserves are well positioned to monitor and study the impacts of climate change on estuaries and to work with communities to plan and adapt to these changes. Reserves can design and implement mitigation and adaptation practices in the construction of facilities and through stewardship projects. Reserve training and education programs can help communities understand and adapt to anticipated local and regional climate change impacts.

Habitat Protection

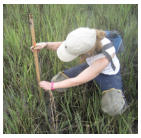
Coastal wetlands are being lost at a rate of approximately 60,000 acres per year, largely due to coastal development and

Marsh at Goodwin Islands, Chesapeake Bay Virginia National Estuarine Research Reserve Photo credit: George Cathcart

inundation (Stedman and Dahl 2008). The biologically rich habitats of estuaries and coastal watersheds provide essential functions such as nurseries for many commercially important fish and shellfish as well as protection for human communities from storm surge, storm water run-off, and flooding. Current stressors on coastal habitats will be amplified by climate change causing greater habitat loss and alteration. Reserves are well suited to map, monitor, and investigate habitat changes and develop, test, and implement methods for habitat protection and restoration. Reserves also transfer these best management practices through coastal training and community education programs.

Water Quality

In the most recent assessment of estuaries by NOAA, the U.S. Environmental Protection Agency and the U.S. Department of Agriculture, a majority of estuaries showed signs of eutrophication and algal blooms, which were strongly influenced by population growth and land use practices (Bricker 2007). Understanding and monitoring water quality trends provides critical information needed to improve ecosystem health and mitigate adverse impacts such as harmful algal blooms and hypoxia. Of equal importance is promoting and implementing best management practices that address land-based sources of pollution. Reserve's ability to couple long-term monitoring data with management practices on reserve lands and in adjacent coastal watersheds provides an opportunity to study the effectiveness of different management practices. By implementing consistent protocols, reserves are also in a position to detect regional and national trends over time, particularly for larger scale drivers such as climate change.



National Estuarine Research Reserve System

Vision

Resilient estuaries and coastal watersheds where human and natural communities thrive

Mission

To practice and promote stewardship of coasts and estuaries through innovative research, education, and training using a place-based system of protected areas

Cover Photo Credits: Jennifer Greene, Amy Sauls

GOALS AND OBJECTIVES

Protected Places

GOAL:
Estuaries and coastal watersheds are better protected and managed by implementing place-based approaches at Reserves.

OBJECTIVES:

1. Increase permanent protection and restoration of key areas in reserve watersheds to improve coastal habitat quantity, quality, and resiliency to climate change impacts.
2. Develop, demonstrate, and evaluate tools and practices at reserves that advance progress on habitat protection, water quality, and climate change impacts.
3. Expand biogeographic representation of the Nation's estuaries in the Reserve System by designating new reserves.

PRIORITY STRATEGIES:

1. Demonstrate best practices in land and estuarine stewardship and climate change adaptation at reserve properties and facilities.
2. Identify, prioritize, and implement land acquisition and habitat restoration projects taking into account climate change impacts.
3. Implement engagement programs to promote estuarine resource stewardship.
4. Designate new reserves in unrepresented biogeographic subregions and states as resources permit.

Science

GOAL:
NERRS scientific investigations improve understanding and inform decisions affecting estuaries and coastal watersheds.

OBJECTIVES:

1. Expand capacity to monitor changes in water quality and quantity, habitat, and biological indicators in response to land use and climate change drivers.
2. Improve understanding of the effects of climate change and coastal pollution on estuarine and coastal ecology, ecosystem processes, and habitat function.
3. Characterize coastal watersheds and estuary ecosystems and quantify ecosystem services to support ecosystem-based management of natural and built communities
4. Increase social science research and use of social information to foster coastal stewards that value and protect estuaries.

PRIORITY STRATEGIES:

1. Lead Reserve-based collaborative projects that connect scientists with intended users from problem definition through implementation.
2. Generate and disseminate periodic data syntheses and analyses of water quality and habitat change and the effects of climate change and other stressors at local and regional scales.
3. Implement monitoring and research projects that use reserves as sentinel sites for detecting and understanding the effects of sea level change and other climate change effects on estuaries.
4. Develop and implement strategies that build reserve capacity to conduct and use social science to address coastal management issues.

People

GOAL:
NERRS education and training increases participants' environmental literacy and ability to make science-based decisions related to estuaries and coastal watersheds.

OBJECTIVES:

1. Enhance the capacity and skills of teachers and students to understand and use NERRS data and information for inquiry-based learning.
2. Increase estuary literacy and promote active stewardship among public audiences through the development and delivery of tools and programs addressing climate change, habitat protection, and water quality.
3. Improve the capacity and skills of coastal decision makers to use and apply science-based information in decisions that affect estuaries and coastal watersheds.

PRIORITY STRATEGIES:

1. Provide place-based educational experiences that facilitate hands-on exploration of estuary environments.
2. Include relevant estuarine research and data in reserve professional training and education programs.
3. Implement teacher training programs using Estuary 101 curricula.
4. Expand training for coastal decision makers focused on climate change, habitat protection, and water quality issues.

REFERENCES

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United States Global Climate Research Program (USGCRP). 2009. Global Climate Change Impacts in the United States.

ACKNOWLEDGEMENTS

We gratefully acknowledge the contributions of the Reserve System to the content of this plan. We would like to particularly acknowledge the Reserve System Managers and Strategic Committee Members for their efforts and leadership in the plan's development.

Strategic Committee Members 2010

Committee Chair: Laurie McGilvray, Chief, Estuarine Reserves Division, NOAA
Committee Staff: Alison JG Krepp, Estuarine Reserves Division, NOAA

Terry Thompson, Manager, Kachemak Bay Reserve, Alaska
Kimberly Cole, Manager, Delaware Reserve, Delaware
Doug Bulthuis, Research Coordinator, Padilla Bay Reserve, Washington
Michele Dionne, Research Coordinator, Wells Reserve, Maine
Marina Psaros, Coastal Training Program Coordinator, San Francisco Bay Reserve, California
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Rachel Stevens, Stewardship Coordinator, Great Bay Reserve, New Hampshire
Kiersten Madden, Stewardship Coordinator Mission-Aransas Reserve, Texas
Cory Riley, Program Specialist, Estuarine Reserves Division, NOAA

NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

Mailing Address:
Estuarine Reserves Division, N/ORM5
Office of Ocean and Coastal Resource Management
NOAA National Ocean Service
1305 East West Highway
Silver Spring, MD 20910

Phone: 301-713-3155

www.nerrs.noaa.gov

APPENDIX C

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL

DELAWARE COASTAL
MANAGEMENT PROGRAM

89 KINGS HIGHWAY
DOVER, DELAWARE 19901

Phone: (302) 739- 9283
Fax: (302) 739-2048

June 24, 2013

Kimberly Cole, Program Manager
Delaware National Estuarine Research Reserve
818 Kitts Hummock Road
Dover, DE 19901

RE: Delaware Coastal Management Federal Consistency Determination
Draft 2013-2018 Delaware National Estuarine Research Reserve Management Plan

Dear Ms. Cole:

The Delaware Coastal Management Program (DCMP) has received and reviewed your consistency determination for the Draft 2013-2018 Delaware National Estuarine Research Reserve Management Plan. Based upon our review and pursuant to National Oceanic & Atmospheric Administration regulations (15 CFR 930), the DCMP concurs with your consistency determination for the above referenced project.

If you have any questions please do not hesitate to contact me or Tricia Arndt of my staff at (302) 739-9283.

Sincerely,

Sarah W. Cooksey

Sarah W. Cooksey, Administrator
Delaware Coastal Management Program

SWC/tka
cc: File 2013.0094

Delaware's good nature depends on you!

APPENDIX D

CZM
RECEIVED
FEB 27 2013
DELAWARE COASTAL
MANAGEMENT

Memorandum of Agreement
Between the
National Oceanic and Atmospheric Administration
And the
Delaware Department of Natural Resources and Environmental Control
Detailing the state-federal roles in the
Management of the Delaware National Estuarine Research Reserve

This Memorandum of Agreement states the provisions for the cooperative management of the Delaware National Estuarine Research Reserve (NERR) in the state of Delaware between the Department of Natural Resources and Environmental Control (DNREC) and the National Oceanic and Atmospheric Administration's (NOAA) Office of Ocean and Coastal Resource Management.

WHEREAS, this Memorandum of Agreement supersedes the previous "Memorandum of Understanding Between NOAA and the State of Delaware regarding the Delaware National Estuarine Research Reserve made on July 21, 1993.

WHEREAS, the state of Delaware has determined that the waters and related coastal habitats of Delaware National Estuarine Research Reserve provide unique opportunities for study of natural and human processes occurring within the estuarine ecosystems of the state to contribute to the science of estuarine ecosystem processes, enhance environmental education opportunities, and provide scientific information for effective coastal zone management in state of Delaware; and

WHEREAS, the state of Delaware has determined that the resources of the Delaware National Estuarine Research Reserve and the values they represent to the citizens of Delaware and the United States will benefit from the management of these resources as part of the National Estuarine Research Reserve System; and

WHEREAS, the National Oceanic and Atmospheric Administration has concurred with that finding and pursuant to its authority under section 315 of the Coastal Zone Management Act of 1972, as amended (CZMA, 16 U.S.C. 1461) and in accordance with implementing regulations at 15 CFR 921.30 has designated the Delaware National Estuarine Research Reserve; and

WHEREAS, the DNREC as the agency designated by the Governor of Delaware is responsible for managing the Delaware National Estuarine Research Reserve and acknowledges the value of state-federal cooperation for the long-term management of the reserve in a manner consistent with the purpose of their designation; and

WHEREAS, the management plan describes the goals, objectives, strategies/actions, administrative structure, and institutional arrangements for the reserve, including this MOA and others;

NOW THEREFORE, in consideration of the mutual agreements herein, NOAA and DNREC agree to the following:

ARTICLE I: TERRITORIAL-FEDERAL ROLES IN RESERVE MANAGEMENT

A. Delaware Department of Natural Resources and Environmental Control Role in Reserve Management

The Delaware Department of Natural Resources and Environmental Control shall:

1. be responsible for compliance with all federal laws and regulations, and ensure that the Delaware National Estuarine Research Reserve management plan is consistent with the provisions of the CZMA and implementing regulations;

2. ensure protection of the natural and cultural resources of the reserve, and ensure enforcement of the provisions of state law, including rules and regulations of the Delaware Coastal Management Program;

3. ensure adequate, long-term protection and management of lands included within the reserve boundary;

4. annually apply for, budget, and allocate funds received for reserve operations, research and monitoring, education and stewardship; and as necessary, land acquisition and reserve facility construction;

5. conduct and coordinate research and monitoring programs that encourage scientists from a variety of institutions to work together to improve coastal management through the use of the Reserve;

6. conduct and maintain programs that disseminate research results via materials, activities, workshops, and conferences to resource users, state and local agencies, school systems, general public, and other interested parties;

7. provide staff, and endeavor to secure state funding for the manager, education coordinator and research coordinator;

8. secure facilities and equipment required to implement the provisions within the reserve management plan;

9. ensure adequate funding for facilities operation and maintenance;

10. maintain effective liaison with local, regional, state, and federal policy makers, regulators and the general public;

11. serve as principal contact for issues involving proposed boundary changes and/or amendments to the reserve management plan;

12. respond to NOAA's requests for information, particularly cooperative agreement and grant progress reports and evaluation findings, including necessary actions and recommendations, made pursuant to Section 312 of the CZMA; and

13. expend funds in accordance with federal and state laws, the reserve management plan, and annual funding guidance from NOAA.

B. Federal Role in Reserve Management

NOAA's Office of Ocean and Coastal Resource Management shall:

1. administer the provisions of the Sections 315 and 312 of the CZMA to ensure that the reserve operates in accordance with goals of the reserve system and the Delaware National Estuarine Research Reserve management plan;

2. review and process applications for financial assistance from DNREC consistent with 15 CFR Part 921, for management and operation, and as appropriate, land acquisition and facility construction;

3. advise DNREC of existing and emerging national and regional issues that have bearing on the reserve and reserve system;

4. maintain an information exchange network among reserves, including available research and monitoring data and educational materials developed within the reserve system;

5. to the extent possible, facilitate NOAA resources and capabilities in support of reserve goals and programs.

C. General Provisions

1. Nothing in this agreement or subsequent financial assistance awards shall obligate either party in the expenditure of funds, or for future payments of money, in excess of appropriations authorized by law.

2. Upon termination of this agreement or any subsequent financial assistance awards to DNREC any equipment purchased for studies to further this agreement will be disposed of in accordance with 15 CFR 24.32.

3. A free exchange of research and assessment data between the parties is encouraged and is necessary to ensure success of cooperative studies.

D. Other Provisions

1. Nothing in this agreement diminishes the independent authority or coordination responsibility of either party in administering its respective statutory obligations. Nothing in this agreement is intended to conflict with current written directives or

policies of either party. If the terms of this agreement are inconsistent with existing written directives or policies of either party entering this agreement, then those portions of the agreement which are determined to be inconsistent with such written directives and policies shall be invalid; but the remaining terms not affected by the inconsistency shall remain in full force and effect. At the first opportunity for revision of this agreement, all necessary changes shall be made by either an amendment to this agreement or by entering in a new superseding agreement, whichever is deemed expedient to the interested parties. Should disagreement arise on the interpretation of the provisions and/or amendments of this agreement that cannot be resolved by negotiations at the operating level of each party, the area(s) of disagreement shall be stated in writing by each party and promptly presented to a mutually approved mediator for non-binding mediation. If the parties cannot agree on the choice of a mediator or if the mediation does not resolve the dispute to the mutual approval of the parties, the parties are free to pursue any other legal remedies that are available.

ARTICLE II: REAL PROPERTY ACQUIRED FOR PURPOSE OF THE RESERVE

As well as acknowledging the rest of the requirements set forth at 15 CFR Part 921, DNREC specifically acknowledges and will fully comply with conditions set forth at 15 CFR 921.21 (e), which specify the legal documentation requirements concerning the use and disposition of real property acquired for reserve purposes with federal funds under Section 315 of the CZMA.

ARTICLE III: PROGRAM EVALUATION

The Office of Ocean and Coastal Resource Management Division of NOAA will schedule periodic evaluations of DNREC performance in meeting the terms of this agreement, financial assistance awards, and the reserve management plan. Where findings of deficiency occur, NOAA may initiate action in accordance with the designation withdrawal or interim sanctions procedures established by the CZMA and applicable regulations at 15 CFR 921.40-41.

ARTICLE IV: EFFECTIVE DATE, REVIEW, AMENDMENT AND TERMINATION

A. This agreement is effective on the date of the last signature on this agreement and shall be in effect until terminated by either party.

B. The Parties will review this Agreement at least once every five years to determine whether it should be revised or terminated. The Agreement may only be amended by the mutual written consent of both parties.

C. This agreement may be terminated by mutual consent of both parties, or by NOAA if NOAA withdraws designation of the reserve within the reserve system, pursuant to applicable provisions of the CZMA and its implementing regulations as described under 15 CFR 923 Subpart L, or if NOAA finds that DNREC fails to comply with this MOA. The agreement may be terminated by DNREC with or without cause. Should this agreement be terminated, reimbursement of unexpended funds from financial assistance awards shall be determined on a pro rata basis according to the amount of work done by the parties at the time of

termination. Additionally, reimbursement for land purchased and facilities constructed with NOAA funds shall be consistent with terms and special award conditions of financial assistance awards.

D. If any clause, sentence or other portion of this MOA shall become illegal, null or void for any reason, the remaining portions of this MOA shall remain in full force and effect.

E. No waiver of right by either party of any provision of this MOA shall be binding unless expressly confirmed in writing by the party giving the waiver.

IN WITNESS THEREOF, the parties have caused this agreement to be executed.

Margaret Davidson
Acting Director
Office of Ocean and Coastal
Resource Management
National Ocean Service
National Oceanic and
Atmospheric Administration
U.S. Department of Commerce

2/25/13
Date

Collin P. O'Mara
Secretary
Delaware Department of
Natural Resources and
Environmental Control

9/18/12
Date

APPENDIX E

State and County Legal Authorities Affecting Resource Protection in the Delaware National Estuarine Research Reserve

Appendix E -1 The Wetlands Act

Wetlands Act
DE Code Title 7, Part VII, Chapter 66
Source: http://delcode.delaware.gov/title7/c066/index.shtml, accessed June 1, 2012.

§ 6601. Short title.

This chapter shall be known and may be cited as "The Wetlands Act."

7 Del. C. 1953, § 6601; 59 Del. Laws, c. 213, § 1.;

§ 6602. Purpose.

It is declared that much of the wetlands of this State have been lost or despoiled by unregulated dredging, dumping, filling and like activities and that the remaining wetlands of this State are in jeopardy of being lost or despoiled by these and other activities; that such loss or despoliation will adversely affect, if not entirely eliminate, the value of such wetlands as sources of nutrients to finfish, crustacea and shellfish of significant economic value; that such loss or despoliation will destroy such wetlands as habitats for plants and animals of significant economic and ecological value and will eliminate or substantially reduce marine commerce, recreation and aesthetic enjoyment; that such loss or despoliation will, in most cases, disturb the natural ability of wetlands to reduce flood damage and adversely affect the public health and welfare; that such loss or despoliation will substantially reduce the capacity of such wetlands to absorb silt and will thus result in the increased silting of channels and harbor areas to the detriment of free navigation. It is hereby determined that the coastal areas of Delaware are the most critical areas for the present and future quality of life in the State and that the preservation of the coastal wetlands is crucial to the protection of the natural environment of these coastal areas. Therefore, it is declared to be the public policy of this State to preserve and protect the productive public and private wetlands and to prevent their despoliation and destruction consistent with the historic right of private ownership of lands.

7 Del. C. 1953, § 6602; 59 Del. Laws, c. 213, § 1.;

§ 6603. Definitions.

(a) "Activity" means any dredging, draining, filling, bulkheading, construction of any kind, including but not limited to, construction of a pier, jetty, breakwater, boat ramp, or mining, drilling or excavation.

(b) "Authorized activity" includes any activity allowed after receipt of a permit from the Department.

(c) "Board" means the Environmental Appeals Board.

(d) "Department" means the Department of Natural Resources and Environmental Control.

(e) "Person" means any individual, group of individuals, contractor, supplier, installer, user, owner, partnership, firm, company, corporation, association, joint stock company, trust, estate, political

subdivision, administrative agency, public or quasi-public corporation or body, or any other legal entity, or its legal representative, agent or assignee.

(f) "Preexisting use" means any use of land, or water, or subaqueous lands, or of a structure or any combination of these which was lawfully in existence prior to and in active use on July 17, 1973, or any temporary or seasonal use in active use for 10 consecutive weeks within the last 12 months previous to July 17, 1973.

(g) "Secretary" means the Secretary of the Department of Natural Resources and Environmental Control.

(h) "Wetlands" shall mean those lands above the mean low water elevation including any bank, marsh, swamp, meadow, flat or other low land subject to tidal action in the State along the Delaware Bay and Delaware River, Indian River Bay, Rehoboth Bay, Little and Big Assawoman Bays, the coastal inland waterways, or along any inlet, estuary or tributary waterway or any portion thereof, including those areas which are now or in this century have been connected to tidal waters, whose surface is at or below an elevation of 2 feet above local mean high water, and upon which may grow or is capable of growing any but not necessarily all of the following plants:

Eelgrass (Zostera marina), Widgeon Grass (Ruppia maritima), Sago Pondweed (Potamogeton pectinatus), Saltmarsh Cordgrass (Spartina alterniflora), Saltmarsh Grass (Spartina cynosuroides), Saltmarsh Hay (Spartina patens), Spike Grass (Distichlis spicata), Black Grass (Juncus gerardii), Switch Grass (Panicum virgatum), Three Square Rush (Scirpus americanus), Sea Lavender (Limonium carolinianum), Seaside Goldenrod (Solidago sempervirens), Seablite (Suaeda maritima), Sea Blite (Suaeda linearis), Perennial Glasswort (Salicornia virginica), Dwarf Glasswort (Salicornia bigelovii), Samphire (Salicornia europaea), Marsh Aster (Aster tenuifolius), Saltmarsh Fleabane (Pluchea purpurascens var. succulenta), Mock Bishop's Weed (Ptilimnium capillaceum), Seaside Plantain (Plantago oliganthus), Orach (Atriplex patula var. hastata), Marsh Elder (Iva frutescens var. oraria), Goundsel Bush (Baccharis halimifolia), Bladderwrack (Fucus vesiculosus), Swamp Rose Mallow, Seaside Hollyhock or March Mallow (Hibiscus palustris), Torrey Rush (Scirpus torreyi), Narrow-leaved Cattail (Typha angustifolia), and Broad-leaved Cattail (T. latifolia) and those lands not currently used for agricultural purposes containing 400 acres or more of contiguous nontidal swamp, bog, muck or marsh exclusive of narrow stream valleys where fresh water stands most, if not all, of the time due to high water table, which contribute significantly to ground water recharge, and which would require intensive artificial drainage using equipment such as pumping stations, drain fields or ditches for the production of agricultural crops.

7 Del. C. 1953, § 6603; 59 Del. Laws, c. 213, § 1; 64 Del. Laws c. 293, § 1.;

§ 6604. Permit required.

(a) Any activity in the wetlands requires a permit from the Department except the activity or activities exempted by this chapter and no permit may be granted unless the county or municipality having jurisdiction has first approved the activity in question by zoning procedures provided by law.

(b) The Secretary shall consider the following factors prior to issuance of any permit:

(1) Environmental impact, including but not limited to, likely destruction of wetlands and flora and fauna; impact of the site preparation on tidal ebb and flow and the otherwise normal drainage of the area in question, especially as it relates to flood control; impact of the site preparation and proposed activity on land erosion; effect of site preparation and proposed activity on the quality and quantity of tidal waters, surface, ground and subsurface water resources and other resources;

(2) Aesthetic effect, such as the impact on scenic beauty of the surrounding area;

(3) The number and type of public and private supporting facilities required and the impact of such facilities on all factors listed in this subsection;

(4) Effect on neighboring land uses, including but not limited to, public access to tidal waters, recreational areas and effect on adjacent residential and agricultural areas;

(5) State, county and municipal comprehensive plans for the development and/or conservation of their areas of jurisdiction;

(6) Economic effect, including the number of jobs created and the income which will be generated by the wages and salaries of the jobs in relation to the amount of land required, and the amount of tax revenues potentially accruing to the state, county and local governments.

(c) The Secretary may require a bond in an amount and with surety and conditions sufficient to secure compliance with the conditions and limitations, if any, set forth in the permit. The particular amount and the particular conditions of the bond required shall be consistent with and in furtherance of the purposes of this chapter. The Secretary shall state for the record, the basis for the bonding requirements imposed with each permit granted. In the event of a breach of any condition of any such bond, the Attorney General may institute an action in Superior Court upon such bond and prosecute the same to judgment and execution.

7 Del. C. 1953, § 6604; 59 Del. Laws, c. 213, § 1.;

§ 6605. Preexisting use.

Any expansion or extension of a preexisting use requires a permit and no permit may be granted under this chapter unless the county or municipality having jurisdiction has first approved the use in question by zoning procedures provided by law.

7 Del. C. 1953, § 6605; 59 Del. Laws, c. 213, § 1.;

§ 6606. Exemptions.

Any of the following activities are exempt from permit requirements: Mosquito control activities authorized by the Department; construction of directional aids to navigation; duck blinds; foot bridges; the placing of boundary stakes; wildlife nesting structures; grazing of domestic animals; haying; hunting; fishing and trapping.

7 Del. C. 1953, § 6606; 59 Del. Laws, c. 213, § 1.;

§ 6607. Procedures; regulations; application fees.

(a) The Secretary shall administer this chapter.

(b) The Secretary shall inventory, as promptly as he or she is able, all wetlands within the State and prepare suitable maps. Such maps shall be filed with the Secretary of State and made available for public inspection at the offices of the Department. On completion of a wetlands boundary map for an area, the Secretary shall propose that wetlands within the area be designated as such in accordance with the map. Wetlands designation on the maps shall be conclusive for the purpose of this chapter upon adoption by the Secretary, subject to the outcome of any appeals taken under this section, and subsection (e) of this section. After such designation, the 2-foot elevation above local mean high water specified in § 6603 of this title shall not apply to any land outside the designated area.

(c) The Secretary shall adopt a wetlands designation or any other regulation only after holding a public hearing in accordance with § 6609 of this title.

(d) The Secretary shall, in furtherance of the purpose of this chapter, adopt regulations:

(1) Setting forth procedures, including provision for fees, which shall govern the processing of permit applications and the conduct of hearings;

(2) Elaborating standards consistent with § 6604 of this title by which each permit application will be reviewed and acted upon;

(3) Controlling or prohibiting activities on lands designated or proposed for designation as wetlands, which regulations may vary from area to area according to the ecological value of the subject wetlands and the threat to the health and welfare of the people of this State which their alteration would pose.

(4) Any fees collected under this chapter are hereby appropriated to the Department to carry out the purposes of this chapter. The Secretary shall report through the annual budget process the receipt, proposed use and disbursement of these funds.

(e) If an on-site evaluation by the Department establishes that an error exists in a wetlands map that has been adopted by the Department, the wetlands map containing the error may be corrected by the Department after the Department documents, in writing, the results of the on-site evaluation, and the Department gives the public notice of any proposed correction. For purposes of this subsection, the term "public notice" shall consist of having notice of the proposed correction, the name of the property owner, location of the property in issue and a description of the error, published in a daily newspaper of general circulation throughout the State and a newspaper of general circulation in the county in which the activity is proposed. Such notice shall be published at least 20 days in advance of any correction to a map by the Department. If the Department determines that it has received a meritorious objection to any proposed correction set forth in a public notice, the Department shall hold a public hearing in accordance with the procedures set forth in § 6609 of this title. Any Department correction made to an

adopted wetlands map shall be filed with the Secretary of State and made available for public inspection at the offices of the Department.

(f) The Secretary may waive any provision of the regulations adopted pursuant to this chapter when warranted under the following circumstances:

(1) Life-threatening emergencies.

(2) Actions required for public safety for which sufficient time is not available to follow the regulations.

(3) When imminent or catastrophic damage or loss of major infrastructure is likely if all provisions of the regulations are adhered to.

(4) Where the authority of the Department under this chapter overlaps with another statute, including but not limited to shellfish grounds (Chapter 19 of this title), beach preservation (Chapter 68 of this title) or subaqueous lands (Chapter 72 of this title) provided that the following criteria are met:

a. If, in the opinion of the Secretary, equal environmental impact review and regulation of the activity would be provided by either statute; and

b. Waiver of these regulations would not be contrary to the purposes of this chapter.

7 Del. C. 1953, § 6607; 59 Del. Laws, c. 213, § 1; 63 Del. Laws, c. 322, § 105(b); 64 Del. Laws, c. 61, §§ 1, 2; 70 Del. Laws, c. 186, § 1; 78 Del. Laws, c. 183, § 2.;

§ 6608. Permit applications.

(a) Any person desiring to obtain a permit required by § 6604 of this title shall submit an application in such form and accompanied by such plans, specifications and other information as required by applicable regulations.

(b) Upon receipt of an application in proper form, the Secretary shall advertise in a daily newspaper of statewide circulation and in a newspaper of general circulation in the county in which the activity is proposed:

(1) The fact that the application has been received; and

(2) A brief description of the nature of the application.

The Secretary may hold a public hearing with respect to any application if it is deemed to be in the best public interest. The Secretary shall hold a public hearing if he or she receives a written meritorious objection within 20 days of advertisement. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasoned statement of the permit's probable impact.

7 Del. C. 1953, § 6608; 59 Del. Laws, c. 213, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6609. Public hearings.

Any public hearing held by the Secretary or the Board concerning a regulation, permit application or alleged violation or appeal shall be conducted as follows:

(1) Notification shall be served upon the applicant, alleged violator, or appellant as summonses are served by registered or certified mail not less than 20 days before the time of said hearing. Not less than 20 days' notice shall also be published in a daily newspaper of general circulation throughout the State and a newspaper of general circulation in the county in which the activity is proposed. Such notice shall also be sent by mail simultaneously to persons who have listed their names and addresses with the Secretary to be notified. Such notice shall also be sent by mail simultaneously to all adjoining property owners. Notice shall outline the area concerned, activity involved, and the location where the application for a permit or other pertinent material is available for inspection.

(2) The permit applicant, alleged violator, or appellant may appear personally or by counsel at the hearing and produce any competent evidence in his or her behalf. The Secretary or the Secretary's duly authorized designee or the Board or its duly authorized designee may administer oaths, examine witnesses and issue, in the name of the Department or the Board, notices of hearings or subpoenae requiring the testimony of witnesses and the production of books, records or other documents relevant to any matter involved in such a hearing; and subpoenae shall also be issued at the request of the applicant or alleged violator. In case of contumacy or refusal to obey a notice of hearing or subpoena under this section, the Superior Court in the county in which the hearing is held shall have jurisdiction, upon application of the Secretary or the Chairperson of the Board, to issue an order requiring such person to appear and testify or produce evidence as the case may require.

(3) A verbatim transcript of testimony at the hearing shall be prepared and shall, along with the exhibits and other documents introduced by the Secretary or other party, constitute the record.

The Secretary or the Secretary's duly authorized designee or the Board or its duly authorized designee shall make findings of fact based on the record. The Secretary or the Board shall then enter such order as will best further the purpose of this chapter, and shall state reasons. The Secretary or the Board shall promptly give written notice to the persons affected by such order.

7 Del. C. 1953, § 6609; 59 Del. Laws, c. 213, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6610. Appeal to Board.

Any person whose interest is substantially affected by any action of the Secretary may appeal to the Environmental Appeals Board within 20 days after the Secretary has announced the decision.

7 Del. C. 1953, § 6611; 59 Del. Laws, c. 213, § 1; 64 Del. Laws, c. 293, § 2.;

§ 6611. [Reserved.]

§ 6612. Appeal from Board's decision.

(a) Any person or persons, jointly or severally affected by any decision or nondecision of the Board, or any taxpayer, or any officer, department, board or bureau of the State, may appeal to the Superior Court in and for the county in which the use in question is wholly or principally located by filing a petition, duly verified, setting forth that such decision is illegal, in whole or in part, specifying the grounds of the illegality. Any such appeal shall be perfected within 30 days of the decision of the Board.

(b) The Court may affirm, reverse or modify the Board's decision. The Board's findings of fact shall not be set aside unless the Court determines that the record contains no substantial evidence that would reasonably support the findings. If the Court finds that additional evidence should be taken, the Court may remand the cause to the Board for completion of the record.

7 Del. C. 1953, § 6612; 59 Del. Laws, c. 213, § 1.;

§ 6613. Taking without just compensation.

If the Superior Court finds that the action appealed from constitutes a taking without just compensation, it shall invalidate the order and grant appropriate relief, unless the Secretary at this stage, consents to the reversal or modification of his or her decision. However, the Secretary may, through negotiation or condemnation proceedings under Chapter 61 of Title 10, acquire the fee simple or any lesser interest, including but not limited to, a perpetual negative easement or other interest which assures that the affected land shall not thereafter be altered, dredged, dumped upon, filled or otherwise altered subject to any reasonable reservations to the landowner as the Secretary may have stipulated to prior to assessment of damages. A decision of the Superior Court that the action appealed from constitutes a taking without just compensation shall not become effective for 2 years of the date of decision and shall not become effective at all if within that period the Secretary has initiated action to acquire fee simple or any lesser interest in the wetlands in question. A finding of the Superior Court that the denial of a permit or the restrictions imposed by a granted permit constitutes a taking without just compensation shall not affect any land other than that of the petitioning landowner. If the Secretary has not initiated action to acquire fee simple or any lesser interest in the wetlands in question within 2 years from the date of a final court ruling, the permit must be granted as applied.

7 Del. C. 1953, § 6613; 59 Del. Laws, c. 213, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6614. Cease and desist orders.

The Secretary shall have the power to issue an order to any person violating any rule, regulation or order or permit condition or provision of this chapter to cease and desist from such violation. Any cease and desist order issued pursuant to this section shall expire (1) after 30 days of its issuance, or (2) upon withdrawal of said order by the Secretary, or (3) when the order is suspended by an injunction, whichever occurs first.

7 Del. C. 1953, § 6614; 59 Del. Laws, c. 213, § 1.;

§ 6615. Injunction.

Action for injunctive relief may be brought by the Secretary to prevent a violation of this chapter or a permit condition. The Court of Chancery may, at its discretion, require bond in the appropriate amount.

7 Del. C. 1953, § 6615; 59 Del. Laws, c. 213, § 1.;

§ 6616. Right of entry.

The Secretary or the Secretary's duly authorized designee, in regulating any activity over which he or she has jurisdiction pursuant to this chapter, may enter, at reasonable times, upon any private or public property for the purpose of determining whether a violation exists of a statute or regulation enforceable by him or her, upon giving written notice, and after presenting official identification to the owner, occupant, custodian or agent of said property.

7 Del. C. 1953, § 6616; 59 Del. Laws, c. 213, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6617. Penalties.

(a) Any person who intentionally or knowingly violates any rule, regulation, order, permit condition or provision of this chapter shall be fined not less than $500 or more than $10,000 for each offense. Continuance of any activity prohibited by this chapter during any part of a day shall constitute a separate offense. Any person found guilty of violating any cease and desist order of the Secretary shall be fined for each offense, starting from the date of receipt of the order. The Superior Court shall have jurisdiction of offenses under this subsection.

(b) Any person who violates any rule, regulation, order, permit condition or provision of this chapter shall be fined not less than $50 or more than $500 for each violation. Each day of violation shall be considered as a separate violation. The Justices of the Peace Courts shall have jurisdiction of offenses under this subsection.

(c) Any person who violates a provision of this chapter, any condition or limitation in a permit rule, regulation or order shall be liable for a civil penalty of not less than $1,000 nor more than $10,000 for each completed violation. The Superior Court shall have jurisdiction of offenses under this subsection.

(d) In addition to any penalties imposed under this section or injunctive relief under § 6615 of this title, a person who effects or permits any activity in wetlands in violation of this chapter may be liable to the State for the cost of restoration of the affected wetland to its condition prior to such violation insofar as that is technically feasible. The Attorney General of the State, upon complaint of the Secretary, shall institute a civil action to recover such damages, or may request such cost of restoration to be imposed in the Chancery Court injunctive action or Superior Court civil action.

7 Del. C. 1953, § 6617; 59 Del. Laws, c. 213, § 1; 63 Del. Laws, c. 249, § 1.;

§ 6618. Inconsistent laws superseded; all other laws unimpaired.

All laws or ordinances inconsistent with any provision of this chapter are hereby superseded to the extent of the inconsistency; provided, that present and future zoning powers of all counties and

municipalities, to the extent that said powers are not inconsistent with this chapter, shall not hereby be impaired; and provided, that a permit granted under this chapter shall not authorize an activity in contravention of county or municipal zoning regulations.

7 Del. C. 1953, § 6618; 59 Del. Laws, c. 213, § 1.;

§ 6619. Liberal construction.

This chapter, being necessary for the welfare of the State and its inhabitants, shall be liberally construed in order to preserve the wetlands of the State.

7 Del. C. 1953, § 6619; 59 Del. Laws, c. 213, § 1.;

§ 6620. Federal aid; other funds.

The Department may cooperate with and receive moneys from the federal government, state or local government or any industry or other source. Such moneys received are appropriated and made available for the study and preservation of the wetlands.

7 Del. C. 1953, § 6620; 59 Del. Laws, c. 213, § 1.;

Appendix E-2. Coastal Zone Act

The Coastal Zone Act
DE Code Title 7, Part VII, Chapter 70
Source: http://delcode.delaware.gov/title7/c070/index.shtml, accessed June 1, 2012.

§ 7001. Purpose.

It is hereby determined that the coastal areas of Delaware are the most critical areas for the future of the State in terms of the quality of life in the State. It is, therefore, the declared public policy of the State to control the location, extent and type of industrial development in Delaware's coastal areas. In so doing, the State can better protect the natural environment of its bay and coastal areas and safeguard their use primarily for recreation and tourism. Specifically, this chapter seeks to prohibit entirely the construction of new heavy industry in its coastal areas, which industry is determined to be incompatible with the protection of that natural environment in those areas. While it is the declared public policy of the State to encourage the introduction of new industry into Delaware, the protection of the environment, natural beauty and recreation potential of the State is also of great concern. In order to strike the correct balance between these 2 policies, careful planning based on a thorough understanding of Delaware's potential and the State's needs is required. Therefore, control of industrial development other than that of heavy industry in the coastal zone of Delaware through a permit system at the state level is called for. It is further determined that offshore bulk product transfer facilities represent a significant danger of pollution to the coastal zone and generate pressure for the construction of industrial plants in the coastal zone, which construction is declared to be against public policy. For these reasons, prohibition against bulk product transfer facilities in the coastal zone is deemed imperative.

7 Del. C. 1953, § 7001; 58 Del. Laws, c. 175; 70 Del. Laws, c. 186, § 1.;

§ 7002. Definitions.

(a) "Board" shall mean the Coastal Zone Industrial Control Board.

(b) "Bulk product transfer facility" means any port or dock facility, whether an artificial island or attached to shore by any means, for the transfer of bulk quantities of any substance from vessel to onshore facility or vice versa. Not included in this definition is a docking facility or pier for a single industrial or manufacturing facility for which a permit is granted or which is a nonconforming use. Likewise, docking facilities for the Port of Wilmington are not included in this definition.

(c) "Environmental impact statement" means a detailed description as prescribed by the Department of Natural Resources and Environmental Control of the effect of the proposed use on the immediate and surrounding environment and natural resources such as water quality, fisheries, wildlife and the aesthetics of the region.

(d) "Heavy industry use" means a use characteristically involving more than 20 acres, and characteristically employing some but not necessarily all of such equipment such as, but not limited to,

smokestacks, tanks, distillation or reaction columns, chemical processing equipment, scrubbing towers, pickling equipment and waste-treatment lagoons; which industry, although conceivably operable without polluting the environment, has the potential to pollute when equipment malfunctions or human error occurs. Examples of heavy industry are oil refineries, basic steel manufacturing plants, basic cellulosic pulp-paper mills, and chemical plants such as petrochemical complexes. An incinerator structure or facility which, including the incinerator, contains 5,000 square feet or more, whether public or private, is "heavy industry" for purpose of this chapter. Generic examples of uses not included in the definition of "heavy industry" are such uses as garment factories, automobile assembly plants and jewelry and leather goods manufacturing establishments, and on-shore facilities, less than 20 acres in size, consisting of warehouses, equipment repair and maintenance structures, open storage areas, office and communications buildings, helipads, parking space and other service or supply structures required for the transfer of materials and workers in support of off-shore research, exploration and development operations; provided, however, that on-shore facilities shall not include tank farms or storage tanks.

(e) "Manufacturing" means the mechanical or chemical transformation of organic or inorganic substances into new products, characteristically using power-driven machines and materials handling equipment, and including establishments engaged in assembling component parts of manufactured products, provided the new product is not a structure or other fixed improvement.

(f) "Nonconforming use" means a use, whether of land or of a structure, which does not comply with the applicable use provisions in this chapter where such use was lawfully in existence and in active use prior to June 28, 1971.

(g) "Person" shall include, but not be limited to, any individual, group of individuals, contractor, supplier, installer, user, owner, partnership, firm, company, corporation, association, joint-stock company, trust, estate, political subdivision, administrative agency, public or quasi-public corporation or body, or any other legal entity, or its legal representative, agent or assignee.

(h) "The coastal zone" is defined as all that area of the State, whether land, water or subaqueous land between the territorial limits of Delaware in the Delaware River, Delaware Bay and Atlantic Ocean, and a line formed by certain Delaware highways and roads as follows:

Beginning at the Delaware-Pennsylvania line at a place where said line intersects U.S. Route 13; thence southward along the said U.S. Route 13 until it intersects the right-of-way of U.S. Route I-495; thence along said I-495 right-of-way until the said I-495 right-of-way intersects Delaware Route 9 south of Wilmington; thence along said Delaware Route 9 to the point of its intersection with Delaware Route 273; thence along said Delaware Route 273 to U.S. 13; thence along U.S. 13 to Maintenance Road 409; thence along Maintenance Road 409 to Delaware Road 71; thence along Delaware Road 71 to its intersection with Delaware Road 54; thence along Delaware Road 54 to Delaware Road 896; thence along Delaware Road 896 to Maintenance Road 396; thence along Maintenance Road 396 to Maintenance Road 398; thence along Maintenance Road 398 to the Maryland state line; thence southward along the Maryland state line to Maintenance Road 433; thence along Maintenance Road 433 to Maintenance Road 63; thence along Maintenance Road 63 to Maintenance Road 412; thence

along Maintenance Road 412 to U.S. 13; thence along U.S. 13 to Delaware 299 at Odessa; thence along Delaware Route 299 to its intersection with Delaware Route 9; thence along Delaware Route 9 to U.S. 113; thence along U.S. Route 113 to Maintenance Road 8A; thence along Maintenance Road 8A to Maintenance Road 7 to the point of its intersection with Delaware Route 14; thence along Delaware Route 14 to Delaware Route 24; thence along Delaware Route 24 to Maintenance Road 331; thence along Maintenance Road 331 to Maintenance Road 334; thence along Maintenance Road 334 to Delaware Route 26; thence along Delaware Route 26 to Maintenance Road 365; thence along Maintenance Road 365 to Maintenance Road 84; thence along Maintenance Road 84 to Maintenance Road 384; thence along Maintenance Road 384 to Maintenance Road 382A; thence along Maintenance Road 382A to Maintenance Road 389; thence along Maintenance Road 389 to Maintenance Road 58; thence along Maintenance Road 58 to Maintenance Road 395; thence along Maintenance Road 395 to the Maryland state line.

7 Del. C. 1953, § 7002; 58 Del. Laws, c. 175; 61 Del. Laws, c. 116, § 88(a); 62 Del. Laws, c. 119, §§ 1, 2; 63 Del. Laws, c. 191, § 1(a); 71 Del. Laws, c. 348, § 1.;

§ 7003. Uses absolutely prohibited in the coastal zone.

Heavy industry uses of any kind not in operation on June 28, 1971, are prohibited in the coastal zone and no permits may be issued therefor. In addition, offshore gas, liquid or solid bulk product transfer facilities which are not in operation on June 28, 1971, are prohibited in the coastal zone, and no permit may be issued therefor. Provided, that this section shall not apply to public sewage treatment or recycling plants. A basic steel manufacturing plant in operation on June 28, 1971, may continue as a heavy industry use in the coastal zone notwithstanding any temporary discontinuance of operations after said date, provided that said discontinuance does not exceed 2 years. An incinerator is neither "public sewage treatment" nor a "recycling plant" for the purpose of this chapter.

7 Del. C. 1953, § 7003; 58 Del. Laws, c. 175; 64 Del. Laws, c. 240, § 6; 66 Del. Laws, c. 256, § 1; 71 Del. Laws, c. 348, § 2.;

§ 7004. Uses allowed by permit only; nonconforming uses.

(a) Except for heavy industry uses, as defined in § 7002 of this title, manufacturing uses not in existence and in active use on June 28, 1971, are allowed in the coastal zone by permit only, as provided for under this section. Any nonconforming use in existence and in active use on June 28, 1971, shall not be prohibited by this chapter and all expansion or extension of nonconforming uses, as defined herein, and all expansion or extension of uses for which a permit is issued pursuant to this chapter, are likewise allowed only by permit. Provided, that no permit may be granted under this chapter unless the county or municipality having jurisdiction has first approved the use in question by zoning procedures provided by law.

(b) In passing on permit requests, the Secretary of the Department of Natural Resources and Environmental Control and the State Coastal Zone Industrial Control Board shall consider the following factors:

(1) Environmental impact, including but not limited to, probable air and water pollution likely to be generated by the proposed use under normal operating conditions as well as during mechanical malfunction and human error; likely destruction of wetlands and flora and fauna; impact of site preparation on drainage of the area in question, especially as it relates to flood control; impact of site preparation and facility operations on land erosion; effect of site preparation and facility operations on the quality and quantity of surface, ground and subsurface water resources, such as the use of water for processing, cooling, effluent removal, and other purposes; in addition, but not limited to, likelihood of generation of glare, heat, noise, vibration, radiation, electromagnetic interference and obnoxious odors.

(2) Economic effect, including the number of jobs created and the income which will be generated by the wages and salaries of these jobs in relation to the amount of land required, and the amount of tax revenues potentially accruing to state and local government.

(3) Aesthetic effect, such as impact on scenic beauty of the surrounding area.

(4) Number and type of supporting facilities required and the impact of such facilities on all factors listed in this subsection.

(5) Effect on neighboring land uses including, but not limited to, effect on public access to tidal waters, effect on recreational areas and effect on adjacent residential and agricultural areas.

(6) County and municipal comprehensive plans for the development and/or conservation of their areas of jurisdiction.

7 Del. C. 1953, § 7004; 58 Del. Laws, c. 175; 61 Del. Laws, c. 116, § 88(c); 63 Del. Laws, c. 191, § 1(a), (b); 68 Del. Laws, c. 347, § 1.;

§ 7005. Administration of this chapter.

(a) The Department of Natural Resources and Environmental Control shall administer this chapter. All requests for permits for manufacturing land uses and for the expansion or extension of nonconforming uses as herein defined in the coastal zone shall be directed to the Secretary of the Department of Natural Resources and Environmental Control. Such requests must be in writing and must include:

(1)a. Evidence of approval by the appropriate county or municipal zoning authorities;

b. A detailed description of the proposed construction and operation of the use; and

c. An environmental impact statement.

(2) The Secretary of the Department of Natural Resources and Environmental Control shall hold a public hearing and may request further information of the applicant. The Secretary of the Department of Natural Resources and Environmental Control shall first determine whether the proposed use is, according to this chapter and regulations issued pursuant thereto:

a. A heavy industry use under § 7003 of this title;

b. A use allowable only by permit under § 7004 of this title; or

c. A use requiring no action under this chapter.

The Secretary of the Department of Natural Resources and Environmental Control shall then, if he or she determines that § 7004 of this title applies, reply to the request for a permit within 90 days of receipt of the said request for permit, either granting the request, denying same, or granting the request but requiring modifications; the Secretary shall state the reasons for his or her decision.

(b) The Secretary of the Department of Natural Resources and Environmental Control may issue regulations including, but not limited to, regulations governing disposition of permit requests, and setting forth procedures for hearings before himself or herself and the Board. Provided, that all such regulations shall be subject to approval by the Board.

(c) The Secretary of the Department of Natural Resources and Environmental Control shall develop and propose a comprehensive plan and guidelines for the State Coastal Zone Industrial Control Board concerning types of manufacturing uses deemed acceptable in the coastal zone and regulations for the further elaboration of the definition of "heavy industry" in a manner consistent with the purposes and provisions of this chapter. Such plan and guidelines shall become binding regulations upon adoption by the Board after public hearing. The Board may alter said regulations at any time after a public hearing. Provided, that any such regulations shall be consistent with §§ 7003 and 7004 of this title.

(d) The Department of Natural Resources and Environmental Control and all agencies of state government shall assist the State Coastal Zone Industrial Control Board in developing policies and procedures, and shall provide the Board with such information as it shall require.

(e) The Secretary shall annually prepare a schedule of fees for permits issued pursuant to this section and submit the same as part of the Department's annual operating budget proposal.

7 Del. C. 1953, § 7005; 58 Del. Laws, c. 175; 61 Del. Laws, c. 116, § 88(a), (c); 63 Del. Laws, c. 191, § 1(a), (b); 68 Del. Laws, c. 86, § 8; 70 Del. Laws, c. 186, § 1.;

§ 7006. State Coastal Zone Industrial Control Board created; composition; conflict of interest; quorum.

There is hereby created a State Coastal Zone Industrial Control Board, which shall have 9 voting members. Five of these shall be regular members appointed by the Governor and confirmed by the Senate. No more than 2 of the regular members shall be affiliated with the same political party. At least 1 regular member shall be a resident of New Castle County, 1 a resident of Kent County and 1 a resident of Sussex County, provided that no more than 2 residents of any county shall serve on the Board at the same time. The additional 4 members shall be the Director of the Delaware Economic Development Office, and the chairpersons of the planning commissions of each county, who shall be ex officio voting members. The term of 1 appointed regular member shall be for 1 year; 1 for 2 years; 1 for 3 years; 1 for 4 years; and the chairperson, to be designated as such by the Governor, and serve at the Governor's pleasure. Thereafter, all regular members shall be appointed for 5-year terms. The members shall receive no compensation except for expenses. Any member of the Board with a conflict of interest in a

matter in question shall disqualify himself or herself from consideration of that matter. A majority of the total membership of the Board less those disqualifying themselves shall constitute a quorum. A majority of the total membership of the Board shall be necessary to make a final decision on a permit request.

7 Del. C. 1953, § 7006; 58 Del. Laws, c. 175; 63 Del. Laws, c. 191, § 1(c), (d); 69 Del. Laws, c. 458, § 1; 70 Del. Laws, c. 186, § 1.;

§ 7007. Appeals to State Coastal Zone Industrial Control Board.

(a) The State Coastal Zone Industrial Control Board shall have the power to hear appeals from decisions of the Secretary of the Department of Natural Resources and Environmental Control made under § 7005 of this title. The Board may affirm or reverse the decision of the Secretary of the Department of Natural Resources and Environmental Control with respect to applicability of any provisions of this chapter to a proposed use; it may modify any permit granted by the Secretary of the Department of Natural Resources and Environmental Control, grant a permit denied by the Secretary, deny a permit or confirm the Secretary's grant of a permit. Provided, however, that the Board may grant no permit for uses prohibited in § 7003 herein.

(b) Any person aggrieved by a final decision of the Secretary of the Department of Natural Resources and Environmental Control under § 7005(a) of this title may appeal same under this section. Appellants must file notice of appeal with the State Coastal Zone Industrial Control Board within 14 days following announcement by the Secretary of the Department of Natural Resources and Environmental Control of his or her decision. The State Coastal Zone Industrial Control Board must hold a hearing and render its decision in the form of a final order within 60 days following receipt of the appeal notification.

(c) Whenever a decision of the Secretary of the Department of Natural Resources and Environmental Control concerning a permit request is appealed, the Board shall hold a public hearing at which the appellant may be represented by counsel. All proceedings in such a hearing shall be made a matter of record and a transcript or recording of all proceedings kept, and the public may attend and be heard.

(d) The Board shall publicly announce by publication in at least 1 newspaper of daily publication in the county in which the site designated in the request is wholly or principally located and in at least 1 newspaper of daily publication and general circulation throughout the State the time, location and subject of all hearings under this section at least 10 days prior thereto.

7 Del. C. 1953, § 7007; 58 Del. Laws, c. 175; 61 Del. Laws, c. 116, § 88(c); 63 Del. Laws, c. 191, § 1(a), (b); 70 Del. Laws, c. 186, § 1.;

§ 7008. Appeals to Superior Court.

Any person aggrieved by a final order of the State Coastal Zone Industrial Control Board under § 7007 of this title may appeal the Board's decision to Superior Court in and for the county of the location of the land in question. Likewise, the Secretary of the Department of Natural Resources and Environmental Control may appeal from any modification by the Board of his or her ruling. The appeal shall be commenced by filing notice thereof with Superior Court not more than 20 days following announcement

of the Board's decision. The Court may affirm the Board's order in its entirety, modify same or reverse said order. In either case, the appeal shall be based on the record of proceedings before the Board, the only issue being whether the Board abused its discretion in applying standards set forth by this chapter and regulations issued pursuant thereto to the facts of the particular case. The Superior Court may by rule prescribe procedure by which it will receive, hear and make disposition of appeals under this chapter. Provided, that no appeal under this chapter shall stay any cease and desist order or injunction issued pursuant to this chapter.

7 Del. C. 1953, § 7008; 58 Del. Laws, c. 175; 61 Del. Laws, c. 116, § 88(c); 63 Del. Laws, c. 191, § 1(a), (b); 70 Del. Laws, c. 186, § 1.;

§ 7009. Condemnation.

If Superior Court rules that a permit's denial, or restrictions imposed by a granted permit, or the operation of § 7003 or § 7004 of this title, is an unconstitutional taking without just compensation, the Secretary of the State Department of Natural Resources and Environmental Control may, through negotiation or condemnation proceedings under Chapter 61 of Title 10, acquire the fee simple or any lesser interests in the land. If the Secretary does not use this authority to acquire the fee simple or any lesser interests in the land within 5 years from the date of the Court's ruling, the permit must be granted as applied for.

7 Del. C. 1953, § 7009; 58 Del. Laws, c. 175.;

§ 7010. Cease and desist orders.

The Attorney General shall have the power to issue a cease and desist order to any person violating any provision of this chapter ordering such person to cease and desist from such violation. Provided, that any cease and desist order issued pursuant to this section shall expire (1) after 30 days of its issuance, or (2) upon withdrawal of said order by the Attorney General, or (3) when the order is superseded by an injunction, whichever occurs first.

7 Del. C. 1953, § 7010; 58 Del. Laws, c. 175.;

§ 7011. Penalties.

Any person who violates this chapter shall be fined not more than $50,000 for each offense. The continuance of an activity prohibited by this chapter during any part of a day shall constitute a separate offense. Superior Court shall have exclusive original jurisdiction over offenses under this chapter.

7 Del. C. 1953, § 7011; 58 Del. Laws, c. 175.;

§ 7012. Injunctions.

The Court of Chancery shall have jurisdiction to enjoin violations of this chapter.

7 Del. C. 1953, § 7012; 58 Del. Laws, c. 175.;

§ 7013. Inconsistent laws superseded; all other laws unimpaired; certain uses not authorized.

All laws or ordinances inconsistent with any provision of this chapter are hereby superseded to the extent of the inconsistency. Provided, that present and future zoning powers of all counties and municipalities, to the extent that said powers are not inconsistent with this chapter, shall not hereby be impaired; and provided that a permit granted under this chapter shall not authorize a use in contravention of county or municipal zoning regulations.

7 Del. C. 1953, § 7013; 58 Del. Laws, c. 175.;

Appendix E-3. Subaqueous Lands Act

The Subaqueous Lands Act
DE Code Title 7, Part VII, Chapter 72.
Source: http://delcode.delaware.gov/title7/c072/index.shtml, accessed June 1, 2012.

§ 7201. Purposes.

Subaqueous lands within the boundaries of Delaware constitute an important resource of the State and require protection against uses or changes which may impair the public interest in the use of tidal or nontidal waters. The purposes of this chapter are to empower the Secretary to deal with or to dispose of interest in public subaqueous lands and to place reasonable limits on the use and development of private subaqueous lands, in order to protect the public interest by employing orderly procedures for granting interests in public subaqueous land and for issuing permits for uses of or changes in private subaqueous lands. To this end, this chapter empowers the Secretary to adopt rules and regulations to effectuate the purposes of the chapter, to apply to the courts for aid in enforcing this statute and the rules and regulations adopted pursuant hereto, and to convey interests in subaqueous lands belonging to the State.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 76, § 1; 72 Del. Laws, c. 474, § 3.;

§ 7202. Definitions.

(a) "Department" means the Department of Natural Resources and Environmental Control.

(b) "Maintenance" means the actions required to return a channel, bridge, culvert, stormwater basin or water control structure to its full operational condition or to prevent a decline in its utility. These actions shall not change the purpose, scope or capacity of the channel, bridge, culvert, stormwater basin or water control structure.

(c) "Ordinary high water mark" means, for nontidal waters, the line at which the presence and action of water are so continuous in all ordinary years so as to leave a distinct mark on a bank either by erosion or destruction of terrestrial (nonaquatic) vegetation, or that can be determined by other physical or biological means.

(d) "Reconstruction" means the rebuilding of a channel, bridge, culvert, stormwater basin or water control structure that requires significant renovation or repair of their major structural features. This rebuilding shall be characterized by a replacement or major restorative effort similar to the degree required in the original design and construction of the channel, bridge, culvert, stormwater basin or water control structure. This rebuilding shall not change the purpose, scope or capacity of the channel, bridge, culvert, stormwater basin or water control structure.

(e) "Retrofitting" means a change in design, construction or materials to an existing bridge, culvert, stormwater basin or water control structure in order to incorporate later improvements or to reflect new standards, criteria or needs not considered in the original design and construction.

(f) "Secretary" means the Secretary of the Department of Natural Resources and Environmental Control.

(g) "Subaqueous lands" means submerged lands and tidelands.

(h) "Submerged lands" means:

(1) Lands lying below the line of mean low tide in the beds of all tidal waters within the boundaries of the State;

(2) Lands lying below the plane of the ordinary high water mark of nontidal rivers, streams, lakes, ponds, bays and inlets within the boundaries of the State as established by law; and

(3) Specific manmade lakes or ponds as designated by the Secretary.

(i) "Tidelands" means lands lying between the line of mean high water and the line of mean low water.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 76, § 2; 68 Del. Laws, c. 268, § 1; 72 Del. Laws, c. 474, § 1.;

§ 7203. Jurisdiction.

(a) The Secretary shall have jurisdiction over any project involving ungranted subaqueous lands owned by the State, and shall have jurisdiction and authority to convey a fee simple of lesser interest or to grant an easement with respect to all projects involving these lands. All jurisdiction and authority remaining in the State as to subaqueous lands for which leases have been made or may be made is invested in the Secretary.

(b) Owners of private subaqueous lands must obtain a permit from the Department before making any use of such lands which may contribute to the pollution of public waters, infringe upon the rights of the public, infringe upon the rights of other private owners or make connection with public subaqueous lands.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 76, § 3.;

§ 7204. Ejectment of trespassers.

The Department may eject from any subaqueous lands owned by the State any person, firm or corporation trespassing upon any such lands, including the fixed mooring of floating structures, through appropriate action in the courts of this State.

65 Del. Laws, c. 508, § 2.;

§ 7205. Permits required.

(a) No person shall deposit material upon or remove or extract materials from, or construct, modify, repair or reconstruct, or occupy any structure or facility upon submerged lands or tidelands without first having obtained a permit, lease or letter of approval from the Department. Such permit, lease or letter of approval, if granted, may include reasonable conditions required in the judgment of the Department

to protect the interests of the public. The Department may adopt regulations setting fees for such permits. If it is determined that granting the permit, lease or approval will result in loss to the public of a substantial resource, the permittee may be required to take measures which will offset or mitigate the loss. This section shall not apply to any repairs or structural replacements which are above the mean low tide and which do not increase any dimensions or change the use of the structure.

(b) The Secretary shall annually prepare a schedule of fees for permits issued pursuant to this section and submit the same as part of the Department's annual operating budget proposal.

(c) The Secretary may waive any provision of the regulations adopted pursuant to this chapter when warranted under the following circumstances:

(1) Life-threatening emergencies.

(2) Actions required for public safety for which sufficient time is not available to follow the regulations.

(3) When imminent or catastrophic damage or loss of major infrastructure is likely if all provisions of the regulations are adhered to.

(4) Where the authority of the Department under this chapter overlaps with another statute, including but not limited to shellfish grounds (Chapter 19 of this title), wetlands (Chapter 66 of this title) or beach preservation (Chapter 68 of this title) provided that the following criteria are met:

a. If, in the opinion of the Secretary, equal environmental impact review and regulation of the activity would be provided by either statute; and

b. Waiver of these regulations would not be contrary to the purposes of this chapter.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 86, § 9; 78 Del. Laws, c. 183, § 3.;

§ 7206. Easements and transfers of title.

(a) Pursuant to this chapter, the Secretary shall have exclusive jurisdiction and authority over all projects to convey a fee simple or lesser interest or to grant easements with respect to subaqueous lands belonging to the State. All jurisdiction and authority to convey a fee simple or lesser interest or to grant easements over subaqueous lands as to which grants have been made or may be made is vested in the Secretary. All leases for shellfish grounds shall be made pursuant to Chapter 19 of this title.

(b) All members of the General Assembly shall be given 2 weeks' notice of intent to convey any interest in subaqueous lands.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 76, § 4.;

§ 7207. Application.

(a) Each applicant for a lease, permit or grant, pursuant to this chapter, shall file with the Secretary a request stating in detail the type of lease, permit or grant desired, showing the location of the area and containing specifications for any proposed construction.

(b) The Secretary may require such additional information as will enable him or her to consider the application properly. He or she may require an environmental assessment to be provided if he or she determines that the proposed use or activity may have a substantial adverse effect upon the environment.

(c) The Secretary may request of any state agency a report or recommendation concerning any application before the Department.

(d) Upon receipt of an application in proper form, the Secretary shall advertise in a daily newspaper of statewide circulation and in a newspaper of general circulation in the county in which the activity is proposed:

(1) The fact that the application has been received;

(2) A brief description of the nature of the application; and

(3) A statement that a public hearing may be requested by any interested person who offers a meritorious objection to the application.

(e) If the Secretary decides that an objection is not meritorious, he or she shall then provide a written response so stating his or her reasons.

65 Del. Laws, c. 508, § 2; 70 Del. Laws, c. 186, § 1.;

§ 7208. Hearing.

(a) A public hearing shall be held:

(1) If a grant or lease for a period of time in excess of 20 years is sought; or

(2) If the Secretary determines that a public hearing is in the public interest; or

(3) If a written meritorious objection to the application is received within 20 days of the advertisement of the public notice for the application. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and provides a reasoned statement of the action's probable impact.

(b) Notice of the public hearing shall be sent to the applicant, to immediately adjacent property owners and to any interested person who requests it, and such notice shall be published in the same manner as the application.

(c) The Secretary shall make a written statement of reasons to be placed with the application if a public hearing is not held.

65 Del. Laws, c. 508, § 2; 69 Del. Laws, c. 50, § 1; 72 Del. Laws, c. 474, § 2.;

§ 7209. Published notice.

(a) The published notice shall contain a general description of the location of the property and a statement of the nature of the lease, permit or grant sought to be acquired.

(b) If the advertisement is also used to provide notice of a public hearing, it shall also give the time, date and place of the hearing, which shall occur not less than 20 days following the publication of the advertisement.

65 Del. Laws, c. 508, § 2.;

§ 7210. Appeals to Environmental Appeals Board.

Any person whose interest is substantially affected by any action of the Secretary or of the Department taken pursuant to this chapter, may appeal to the Environmental Appeals Board as established by § 6007 of this title within 20 days after the announcement of the decision. Such appeal shall be governed by §§ 6008 and 6009 of this title. There shall be no appeal of a decision by the Secretary to deny a permit on any matter involving state-owned subaqueous lands.

65 Del. Laws, c. 508, § 2; 68 Del. Laws, c. 76, § 5.;

§ 7211. Costs, deposits and fees.

(a) All costs for the proceedings under this chapter shall be assessed against the applicant.

(b) The Secretary may require a deposit at the time of the application or at any other time to insure the payment of the costs.

(c) All costs and deposits and all fees collected under this chapter are hereby appropriated to the Department to carry out the purposes of this chapter.

65 Del. Laws, c. 508, § 2.;

§ 7212. Rules; delegation.

The Secretary may after public hearing, adopt, amend, modify or repeal rules or regulations to effectuate the policy and purposes of this chapter. The Secretary may delegate his or her powers or duties under this chapter, except the power to convey or to lease or grant easements in subaqueous lands.

65 Del. Laws, c. 508, § 2; 70 Del. Laws, c. 186, § 1.;

§ 7213. Existing rights.

This chapter shall not change the law of this State relating to existing property, riparian or other rights of this State or other persons in submerged, tidelands or filled lands.

65 Del. Laws, c. 508, § 2.;

§ 7214. Violations; enforcement; civil and criminal penalties.

(a) The Secretary shall enforce this chapter.

(b) Whoever violates this chapter, or any rule, regulation or condition of a lease or permit issued pursuant to authority granted in this chapter, or an order of the Secretary, shall be punishable as follows:

(1) If the violation has been completed, by a civil penalty of not less than $1,000 nor more than $10,000 for each completed violation. Each day of continued violation shall be considered as a separate violation. The Superior Court shall have jurisdiction of a violation in which a civil penalty is sought.

(2) If the violation is continuing or threatening to begin, the Secretary may, in addition to seeking a monetary penalty as provided in paragraph (b)(1) of this section, seek a temporary restraining order, a temporary injunction or permanent injunction in the Court of Chancery.

(c) Whoever violates this chapter, or any rule or regulation promulgated thereunder, or any rule or regulation in effect at the time of the enactment of this chapter or any lease or permit condition, or any order of the Secretary, shall be punishable by a criminal penalty of not less than $50 nor more than $500 for each violation. Each day of violation shall be considered as a separate violation. The Courts of the Justice of the Peace shall have jurisdiction of offenses under this subsection.

(d) Any person who knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained under this chapter, or under any lease or permit, rule, regulation or order issued under this chapter, who falsifies, tampers with or knowingly renders inaccurate any monitoring device or method required to be maintained under this chapter, shall, upon conviction, be punished by a fine of not less than $500 nor more than $5,000, or by imprisonment for not more than 6 months, or both. The Superior Court shall have jurisdiction of offenses under this subsection.

65 Del. Laws, c. 508, § 2.;

§ 7215. Cease and desist order.

The Secretary shall have the power to issue an order to any person violating any rule or regulation or permit condition or lease condition or provision of this chapter to cease and desist from such violation. Any cease and desist order issued pursuant to this section shall expire:

(1) After 30 days of its issuance;

(2) Upon withdrawal of said order by the Secretary; or

(3) When the order is superseded by an injunction, whichever occurs first.

65 Del. Laws, c. 508, § 2.;

§ 7216. Interference with Department personnel.

No person shall obstruct, hinder, delay or interfere with, by force or otherwise, the performance by Department personnel of any duty under this chapter, or any rule or regulation or order or permit or decision, promulgated or issued thereunder.

65 Del. Laws, c. 508, § 2.;

§ 7217. Special exemptions.

(a) This chapter shall not apply to any work performed by any state, county, municipal government or conservation district, or their designated contractor, when that work occurs in nontidal submerged lands in the Delaware Atlantic Coastal Plain Province with a contributing drainage area of less than 800 acres.

(b) This chapter shall not apply to maintenance, reconstruction or retrofitting work performed by or with the assistance of any state, county, municipal government or conservation district when that work occurs in any nontidal submerged lands. Such maintenance, reconstruction or retrofitting work shall comply with the standards and specifications associated with best management practices in the Delaware Erosion and Sediment Control Handbook, 1989 or as revised (68 Del. Laws, c. 268, § 2).

(c) This chapter shall not apply to any work in agricultural drainage ditches created from nonsubaqueous lands that are designed according to reasonable drainage standards, when performed by or with the assistance of any state, county, municipal government or conservation district.

(d) This chapter shall not apply to ponds constructed in uplands when those ponds are constructed by or with the assistance of any state, county, municipal government or conservation district.

(e) This chapter shall not apply to stormwater ponds that are permitted in accordance with Chapter 40 of this title or to farm ponds or other ponds whose only source of hydrology is groundwater.

(f) The lease provisions of this chapter shall not apply to any wastewater conveyance or treatment works system owned or operated by the State or any county or municipal government with the State.

(g) This chapter shall not apply to subaqueous archaeological resources and unmarked human burials and human skeletal remains, which are regulated by the Department of State, Division of Historical and Cultural Affairs pursuant to Chapters 53 and 54 of this title.

68 Del. Laws, c. 268, § 2; 72 Del. Laws, c. 474, § 4; 75 Del. Laws, c. 153, § 12.;

Appendix E-4. Antiquities Act.

The Antiquities Act.
DE Code Title 7, Part VI, Chapter 53 (Archaeological Resources in the State)
Source: http://delcode.delaware.gov/title7/c053/index.shtml, accessed June 1, 2012.

Subchapter I. General Provisions

§ 5301. Duties of the Department of State.

The duties of the Department of State relative to archaeology within the State are as follows:

(1) To sponsor, engage in and direct archaeological research in this State and to encourage and coordinate archaeological research undertaken by any archaeological society, institution, agency or association of the State;

(2) To encourage cooperation among State agencies in the preservation, protection and excavation of archaeological resources which have or may come into the custody of any other agency of this State;

(3) To protect and encourage the preservation of archaeological resources located on privately owned lands in this State;

(4) To recover and preserve archaeological resources discovered during the course of any public construction in this State, when deemed appropriate by the Director of the Division of Historical and Cultural Affairs of the Department of State, and when the discovery is not subject to federal laws or other state laws that may require an archaeological investigation be conducted;

(5) To cooperate with and assist the University of Delaware and other public institutions of this State in the preservation and protection of archaeological resources;

(6) To furnish materials and objects to the Delaware State Museum, and/or other museums in the State, suitable for demonstrating and interpreting the State's history and heritage;

(7) To furnish exhibits and/or other materials to public and private schools of this State, and to assist in the instruction of students on the State's history and heritage, and the discipline of archaeology;

(8) To cooperate with similar agencies and institutions of other states and the federal government for the general purpose of preserving archaeological resources of this State, and to ensure that all such activity of agencies and institutions is in the best interest of the State;

(9) To publish or otherwise disseminate information resulting from archaeological research conducted in this State;

(10) To enforce the laws regulating archaeological resources situated on state-owned or state-controlled lands, including subaqueous lands.

75 Del. Laws, c. 153, § 2.;

§ 5302. Rules, regulations and guidelines.

The Division of Historical and Cultural Affairs, with the approval of the Department of State, may formulate and adopt such rules, regulations, standards and guidelines as it deems necessary for the effective execution of its purposes under this chapter.

75 Del. Laws, c. 153, § 2.;

Subchapter II. Archaeological Resources in or on State Lands

§ 5303. Purposes.

(a) The General Assembly finds that:

(1) Archaeological resources in or on state lands are an integral and irreplaceable part of the State's heritage;

(2) Archaeological resources are valued as nonrenewable resources that provide educational, scientific, social and economic benefits for all citizens;

(3) These resources are increasingly endangered because of their commercial attractiveness and the effects of natural forces and human intervention;

(4) Existing state laws do not provide adequate protection to prevent the loss and destruction of these archaeological resources resulting from such causes; and

(5) There is a wealth of archaeological information which has been legally obtained by private individuals for noncommercial purposes and which could voluntarily be made available to professional archaeological institutions to further the educational, scientific, social and economic benefits for all citizens.

(b) The purpose of this subchapter is to secure, for the present and future benefit of the people of Delaware, the protection of archaeological resources which are in or on state lands, including subaqueous lands, to increase awareness and encourage meaningful stewardship of the State's archaeological heritage, and to foster increased cooperation and exchange of information among governmental authorities, the professional archaeological community, and private individuals having collections of archaeological resources and data.

75 Del. Laws, c. 153, § 2.;

§ 5304. Definitions.

(a) "Abandoned shipwreck" means any shipwreck to which title has been voluntarily given up by the owner or by the owner not taking action after a wreck incident to claim title.

(b) "Archaeological investigation" means any surface collection, subsurface tests, excavation, or other activity that results in the disturbance or removal of archaeological resources.

(c) "Archaeological resource" means any artifact or material remains of past human life or activities which are at least 50 years old and are of archaeological interest, including but not limited to pottery, basketry, whole or fragmentary tools, implements, containers, weapons, weapon projectiles, by-products resulting from manufacture or use of human-made or natural materials, surface or subsurface structures or portions thereof, earthworks, fortifications, ceremonial structures or objects, cooking pits, refuse pits, hearths, kilns, post molds, middens, and shipwrecks; the site, location, or context in which such artifacts or material remains are situated; and any portion or piece of any of the foregoing.

(d) "Department" means the Department of State.

(e) "Director" means the Director of the Division of Historical and Cultural Affairs of the Department of State.

(f) "Division" means the Division of Historical and Cultural Affairs of the Department of State.

(g) "Embedded" means firmly affixed in the subaqueous lands such that the use of tools of excavation is required in order to move bottom sediments to gain access to a shipwreck, its cargo and any part thereof, or to any other archaeological resource.

(h) "Historic shipwreck" means a shipwreck that is listed in or eligible for listing in the National Register of Historic Places.

(i) "National Register of Historic Places" means the nation's official list of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture maintained by the United States National Park Service, Department of the Interior.

(j) "Of archaeological interest" means capable of providing scientific or humanistic understandings of past human behavior, cultural adaptation, and related topics through the application of scientific or scholarly techniques such as controlled observation, contextual measurement, controlled collection, analysis, interpretation and explanation.

(k) "Ordinary high water mark" means, for nontidal waters, the line at which the presence and action of water are so continuous in all ordinary years so as to leave a distinct mark on a bank either by erosion or destruction of terrestrial (nonaquatic) vegetation, or that can be determined by other physical or biological means.

(l) "Person" means an individual, corporation, partnership, trust, institution, association, or any other private entity or any officer or employee, agent, department, or instrumentality of the United States or of any state or political subdivision thereof.

(m) "Qualified person" means a person meeting the United States Secretary of the Interior's Professional Qualification Standards for Archeology (48 FR 44716; 36 CFR Part 61), as determined by the Director.

(n) "Secretary" means the Secretary of State.

(o) "Shipwreck" means a vessel or wreck, its cargo and other contents.

(p) "State lands" means any lands owned or controlled by the State of Delaware, including subaqueous lands.

(q) "Subaqueous lands" means submerged lands and tidelands.

(r) "Submerged lands" means:

(1) Lands lying below the line of mean low tide in the beds of all tidal waters within the boundaries of the State;

(2) Lands lying below the plane of the ordinary high water mark of nontidal rivers, streams, lakes, ponds, bays and inlets within the boundaries of the State as established by law; and

(3) Specific manmade lakes or ponds as designated by the Secretary of the Department of Natural Resources and Environmental Control.

(s) "Terrestrial lands" means lands owned or controlled by the State lying above the line of mean low tide.

(t) "Tidelands" means lands lying between the line of mean high water and the line of mean low water.

75 Del. Laws, c. 153, § 2.;

§ 5305. Authority to enhance, preserve and protect archaeological resources.

(a) The title to all archaeological resources in or on State lands, including those in or on subaqueous lands, is hereby declared to be under the exclusive domain and control of the State. Further, as provided for under the Abandoned Shipwreck Act (Pub. L. 100-298; 43 U.S.C. §§ 2101-2106), and Guidelines therefore (55 FR 50115, 55 FR 51528), 56 FR 7875:

(1) The State has title to all shipwrecks embedded in subaqueous lands of this State; and

(2) The State has title to every shipwreck located on the State's subaqueous lands, if the shipwreck is listed in or determined eligible for listing in the National Register of Historic Places (16 U.S.C. § 470a; [former] 33 CFR Part 63 [repealed]; 36 CFR Part 60).

(b) The State's authority to enhance, preserve and protect archaeological resources in or on state lands is vested solely in the Department.

(c) Notwithstanding the jurisdictional provisions of § 7203 of this title, the Department is the custodian of archaeological resources in or on the State's subaqueous lands, including but not limited to shipwrecks to which the State has title under § 5305(a) of this title.

75 Del. Laws, c. 153, § 2.;

§ 5306. Jurisdiction and inter-agency cooperation.

(a) When an archaeological resource is located within the jurisdiction of another state agency, the Division shall coordinate the review and evaluation of permit applications issued pursuant to § 5309 of this title to ensure conformance with all applicable laws and regulations.

(b) Any agency whose activities may affect state-owned shipwrecks shall consult with the Division, provide the Division the opportunity to review and comment on the proposed activity, and take into account the effects of the activity on such resources. This review will not substitute for consultation under Section 106 of the National Historic Preservation Act [16 U.S.C. § 470f] or Section 307 of the Coastal Zone Management Act [16 U.S.C. § 1456], if applicable.

(c) The Division may enter into agreements with state land managing agencies for the purposes of enhancing, preserving, protecting and promoting good stewardship of archaeological resources located in or on State lands managed by those agencies.

(d) All state land managing agencies shall cooperate with the Division in implementing the provisions of this chapter.

(e) All state and local law-enforcement agencies and officers are hereby empowered to, and shall assist the Division in carrying out its duties under this chapter.

75 Del. Laws, c. 153, § 2.;

§ 5307. Restriction or closure of public access.

(a) The Division may temporarily restrict or close public access to any archaeological resource and its surrounding location or context in or on State lands, including subaqueous lands, and including public beaches notwithstanding the jurisdictional provisions of § 6803 of this title, whenever:

(1) In the judgment of the Director a condition constituting an imminent threat to an archaeological resource exists, which may cause harm to the qualities that make the resource of archaeological interest. Such threats may be due to the effects of natural forces or human intervention;

(2) The Director finds that an archaeological investigation is needed to determine if a resource is of archaeological interest; and/or

(3) The Director has issued a permit for archaeological investigation of an archaeological resource under § 5309 of this title, or the Division is conducting an archaeological investigation of an archaeological resource.

(b) The Director shall consult with the state land managing agency with jurisdiction over the lands in or on which the archaeological resource is located to define: the area to be restricted or closed; the anticipated period of the restriction or closure; how the restriction or closure will be posted to provide public notice; how the restriction or closure will be monitored or enforced; and, if the restriction or closure occurs pursuant to paragraph (a)(1) of this section, the steps that the Director and the other state land managing agency must take to alleviate the threat to the archaeological resource.

(c) The period of a restriction or closure under this section may not exceed 90 days, unless occurring pursuant to paragraph (a)(3) of this section, in which case the period of the restriction or closure is the term of the permit. The Director may, with the approval of the Secretary of State, extend a period of restriction or closure.

(1) The Director shall first consult with the state land managing agency in or on which the archaeological resource is located, as to the need for extending the period; and

(2) When occurring pursuant to paragraph (a)(1) of this section, the Director shall hold a public hearing; the Director shall take into account the comments provided at the public hearing, and within 15 days notify local governments and the public of the Director's decision on whether or not to extend the restriction or closure of access. The Director shall publish that decision in a daily newspaper of statewide circulation and in a newspaper of general circulation in the county in which the restriction or closure will occur.

(d) The Director may, with the approval of the Secretary of State, indefinitely restrict access to and recovery of certain shipwrecks to which the State holds title or terrestrial sites in or on state lands that have particular archaeological and/or environmental values.

(e) The Director may permit public access to certain shipwrecks to which the State holds title with appropriate restrictions to protect their archaeological and/or environmental values.

(f) Any person whose interest is substantially affected may appeal a decision of the Division made pursuant to this subsection regarding access to an archaeological resource. The appeal must be made to the Secretary, and filed with the Secretary within 60 days from the issuance of the Division's decision. The appeal must be conducted in accordance with the Administrative Procedures Act, § 10101 et seq. of Title 29. If an appellant exhausts all administrative remedies, the appellant is entitled to judicial review in accordance with subchapter V of the Administrative Procedures Act [§ 10141 et seq. of Title 29].

75 Del. Laws, c. 153, § 2; 70 Del. Laws, c. 186, § 1.;

§ 5308. Permit required.

No person may excavate, collect, salvage, recover, remove, damage, or otherwise alter or deface any archaeological resource or its surrounding location or context, located in or on state lands, including subaqueous lands, without first having obtained a permit from the Division.

39 Del. Laws, c. 11, § 2; 7 Del. C. 1953, § 5302; 64 Del. Laws, c. 138, §§ 4-6; 69 Del. Laws, c. 430, § 2; 70 Del. Laws, c. 186, § 1; 75 Del. Laws, c. 153, § 2.;

§ 5309. Permit application.

(a) Any qualified person may apply to the Division for a permit to conduct archaeological investigations on state lands. The application must contain information that the Division considers necessary, including

information concerning the time, scope, location, specific purpose of the proposed work, and proposed disposition of recovered materials and associated records.

(b) The Division shall issue a permit pursuant to an application under subsection (a) of this section if the Division finds that:

(1) The applicant is qualified to carry out the permitted activity;

(2) The proposed activity is undertaken for the purpose of furthering archaeological knowledge in the public interest;

(3) The archaeological resources which are excavated or removed from state lands, including subaqueous lands, will remain the property of the State. Those resources and copies of associated archaeological records and data will be preserved by a qualified university, museum, or other scientific or educational institution, except as may be provided for under a shipwreck management program established pursuant to § 5316 of this title;

(4) The activity pursuant to the permit is not inconsistent with any management plan applicable to the state lands concerned; and

(5) The proposed activity will not interfere with archaeological investigations being conducted or planned by the Division.

(c) A permit may contain any terms, conditions, or limitations which the Division considers necessary to achieve the intent of the chapter in the best interest of the State. A permit must identify the person responsible for carrying out the archaeological investigation. The Division may set reasonable permit fees that approximate and reasonably reflect the costs necessary to defray the expenses of the Division for its services. Any fees collected by the Division under this section are hereby appropriated to the Division to carry out the purposes of this chapter.

(d) The Division may renew a permit upon or prior to expiration, upon such terms as the applicant and the Division may mutually agree. Holders of permits are responsible for obtaining permission of any federal agencies having jurisdiction, including but not limited to the United States Coast Guard, the United States Department of the Navy and the United States Army Corps of Engineers, and of state agencies having jurisdiction, including but not limited to the Department of Natural Resources and Environmental Control, prior to conducting any archaeological investigation on subaqueous or terrestrial state lands.

(e) The Division may suspend a permit issued under this chapter upon the determination that the permit holder has violated any provision of § 5312(a), (b), (c) or (d) of this title. The Division may revoke a permit upon the assessment of a civil penalty under § 5312(e) of this title against the permit holder, or upon the permit holder's conviction under § 5312(f) of this title. The Division may suspend or revoke a permit if the permit holder has not substantially commenced or is not diligently pursuing the archaeological investigation.

(f) Any permit applicant or permit holder may appeal the denial, suspension, or revocation of a permit by the Division. An appeal must be made to the Secretary and filed with the Secretary within 60 days from the issuance of the Division's decision. The appeal must be conducted in accordance with the Administrative Procedures Act, § 10101 et seq. of Title 29. If an appellant exhausts all administrative remedies, the appellant is entitled to judicial review in accordance with subchapter V of the Administrative Procedures Act [§ 10141 et seq. of Title 29].

75 Del. Laws, c. 153, § 2.;

§ 5310. Qualified repositories.

The University of Delaware and the Division of Historical and Cultural Affairs are designated as properly qualified repositories within the meaning of this chapter.

39 Del. Laws, c. 11, § 2; 48 Del. Laws, c. 219, § 1; 7 Del. C. 1953, § 5303; 64 Del. Laws, c. 138, § 7; 75 Del. Laws, c. 153, § 2.;

§ 5311. Repository of artifacts or material remains.

All artifacts or material remains found in or on state lands, including subaqueous lands, and related records resulting from research, surveys and excavation conducted under a permit must be deposited for permanent preservation in either the University of Delaware Department of Anthropology or the Division of Historical and Cultural Affairs, or in a qualified repository approved by the Director, except as may be provided for under a shipwreck management program established pursuant to § 5316 of this title.

39 Del. Laws, c. 11, § 3; 43 Del. Laws, c. 194, § 1; 48 Del. Laws, c. 219, § 2; 7 Del. C. 1953, § 5304; 64 Del. Laws, c. 138, §§ 8-11; 75 Del. Laws, c. 153, § 2.;

§ 5312. Prohibited acts, criminal and civil penalties.

(a) A person may not excavate, collect, salvage, recover, remove, damage, or otherwise alter or deface any archaeological resource, or its surrounding location or context, located on State lands, including subaqueous lands, unless such activity is pursuant to a permit issued under § 5309 of this title.

(b) A person may not sell, transfer, exchange, transport, purchase, receive or offer to sell, transfer, exchange, transport, purchase or receive any archaeological resource as defined in § 5303 of this title, unless the Division specifically allows for such activity under a permit issued pursuant to § 5309 of this title and/or as may be provided for under a shipwreck management program established pursuant to § 5316 of this title.

(c) A person may not possess, use, or employ on lands owned or controlled by the State, including subaqueous lands, tools or devices designed, modified or commonly used for the excavation, collection, salvage, recovery or removal of archaeological resources or otherwise designed or modified for activities

prohibited by this chapter, excluding individuals permitted or authorized to possess such tools and devices in accordance with the requirements of this chapter.

(d) A person may not knowingly make a false statement, representation or certification in any application for permits granted under this chapter.

(e) Whoever violates or counsels, procures, solicits, or employs another to violate:

(1) Any prohibition contained in this chapter;

(2) Any condition or limitation in a permit issued pursuant to this chapter; or

(3) Any rule or regulation promulgated under this chapter

shall, upon conviction, be sentenced to pay a fine of not less than $1000 but not exceeding $10,000, or to imprisonment of up to 30 days, or both. Each day of excavation, alteration, destruction, injury or other violation is considered a separate offense and is punishable as such. Unauthorized tools or devices seized from violators of subsection (c) of this section may be ordered forfeited to the State without compensation. Further, restitution may be ordered to compensate the State for the cost of remedying or remediating any violation of this chapter. The Superior Court has jurisdiction of offenses under this chapter.

(f) Whoever violates or counsels, procures, solicits or employs another person to violate:

(1) Any prohibition contained in this chapter;

(2) Any condition or limitation in a permit issued pursuant to this chapter; or

(3) Any rule or regulation promulgated hereunder

shall be assessed a civil penalty of not less than $1000 but not exceeding $10,000. The Superior Court shall have jurisdiction of a violation in which a civil penalty is sought.

(g) Any expenses or civil penalties collected by the Division under this section may be allocated to the Division, subject to the approval of the Department, to carry out the purposes of this chapter.

39 Del. Laws, c. 11, §§ 1, 5; 7 Del. C. 1953, §§ 5301, 5306; 64 Del. Laws, c. 138, §§ 2, 3, 14; 69 Del. Laws, c. 430, §§ 1, 3-5; 75 Del. Laws, c. 153, § 2.;

§ 5313. Exemptions.

(a) The provisions of §§ 5308, 5309, and 5312(c) of this title do not apply to activities of State agencies which are:

(1) Already subject to federal laws or regulations relating to archaeological resources, or

(2) Not intended as archaeological activities, such as, but not limited to, surveying, environmental remediation, soil testing, construction, or property maintenance. State agencies are encouraged to

advise the Division of any archaeological resources found during the course of such activities, pursuant to the letter or spirit of § 5306 of this title.

(b) This chapter does not apply to public use areas on lands along the Atlantic coast from Cape Henlopen south to the state line, situated between the mean low water line and the base of the primary dune, unless otherwise restricted or closed by the Director under the authority of § 5307 of this title.

69 Del. Laws, c. 430, § 6; 75 Del. Laws, c. 153, § 2.;

§ 5314. Confidentiality.

If the Director has reason to believe that disclosure of the exact location or nature of an archaeological resource would lead to vandalism, pilferage, damage, or otherwise pose a risk of harm to the resource or to the site at which the resource is located, regardless of ownership of the property, the Director may:

(1) Elect not to disclose such information to the public;

(2) Provide the public with only general information about the resource and/or its location, when notifying the public of a restriction or closure of access to a state archaeological resource under § 5307 of this title, or under provisions applicable to shipwrecks to which the State has title.

75 Del. Laws, c. 153, § 2.;

§ 5315. Cooperation with private individuals.

(a) The Division shall take any action necessary and consistent with the purposes of the chapter to foster and improve the communication, cooperation, and exchange of information between the Division and:

(1) Private individuals having collections of archaeological resources and data which were obtained through legal means;

(2) Professional archaeologists and associations of professional archaeologists concerned with the archaeological resources of Delaware and of the United States.

(b) In order to protect and preserve archaeological resources which are found on privately owned lands in this State, it is a declaration and statement of legislative intent that archaeological excavations on privately owned lands are discouraged, except in accordance with and pursuant to the spirit and policy of this chapter; and persons having knowledge of the location of archaeological resources in Delaware are encouraged to communicate such information to the Director or to the Chairperson of the Department of Anthropology of the University of Delaware.

39 Del. Laws, c. 11, § 4; 43 Del. Laws, c. 194, § 2; 48 Del. Laws, c. 219, § 3; 7 Del. C. 1953, § 5305; 64 Del. Laws, c. 138, §§ 12, 13; 70 Del. Laws, c. 186, § 1; 75 Del. Laws, c. 153, § 2.;

§ 5316. Shipwreck Management Program.

The Division may establish a Shipwreck Management Program, in cooperation with other state and federal agencies experienced in the management of subaqueous lands and resources, to encourage the identification, protection, and, where appropriate, the recovery and disposition of abandoned shipwrecks embedded in or located on state-owned or state-controlled subaqueous lands. The Division is authorized to establish a professional staff for the purpose of implementing the Program.

75 Del. Laws, c. 153, § 2.;

Appendix E-5. Natural Areas Preservation System Act

The Natural Areas Preservation System Act
DE Code Title 7, Part VII, Chapter 73
Source: http://delcode.delaware.gov/title7/c073/index.shtml, accessed June 1, 2012.

§ 7301. Statement of policy.

(a) Because of the continuing growth of the population and the development of the economy of the State, it is necessary and desirable that areas of unusual natural significance be set aside and preserved for the benefit of present and future generations before they have been destroyed, for once destroyed they cannot be wholly restored. Such areas are irreplaceable as laboratories for scientific research, as reservoirs of natural materials -- not all of the uses of which are now known, as habitats for plant and animal species and biotic communities whose diversity enriches the meaning and enjoyment of human life, as living museums where people may observe natural biotic and environmental systems of the earth and the interdependence of all forms of life, and as reminders of the vital dependence of the health of the human community upon the health of the natural communities of which it is an inseparable part.

(b) It is essential to the people of the State that they retain the opportunities to maintain close contact with such living communities and environmental systems of the earth and to benefit from the scientific, educational, esthetic, recreational and cultural values they possess. It is therefore the public policy of the State that a registry of such areas be established and maintained by the Department of Natural Resources and Environmental Control, that such areas be acquired and preserved by the State, and that other agencies, organizations and individuals, both public and private, be encouraged to set aside such areas for the common benefit of the people of present and future generations.

61 Del. Laws, c. 212, § 2.;

§ 7302. Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them except where the context clearly indicates a different meaning:

(1) "Articles of dedication" shall mean the writing by which any estate, interest or right in an area is formally dedicated as permitted by § 7306 of this title.

(2) "Council" shall mean the Delaware Natural Areas Advisory Council.

(3) "Dedicate" and "dedication" shall mean the transfer to the Department of Natural Resources and Environmental Control, for and on behalf of the State, of an estate, interest or right in an area in any manner permitted by § 7306 of this title.

(4) "Department" shall mean the Department of Natural Resources and Environmental Control.

(5) "Natural area" shall mean an area of land or water, or of both land and water, whether in public or private ownership, which either retains or has reestablished its natural character (although it need not

be undisturbed), or has unusual flora or fauna, or has biotic, geological, scenic or archaeological features of scientific or educational value.

(6) "Nature preserve" shall mean a natural area, any estate, interest or right in which has been formally dedicated under this chapter.

(7) "Secretary" shall mean the Secretary of the Department of Natural Resources and Environmental Control.

(8) "System" shall mean the nature preserves held under this chapter.

61 Del. Laws, c. 212, § 2.;

§ 7303. Statement of purpose.

In order to secure for the people of the State of present and future generations the benefits of an enduring resource of areas having 1 or more of the characteristics referred to in § 7302(5) of this title, the State, acting through the Department, shall acquire and hold in trust for the benefit of the people an adequate system of nature preserves for the following uses and purposes:

(1) For scientific research in such fields as ecology, taxonomy, genetics, forestry, pharmacology, agriculture, soil science, geology, conservation, archaeology and other subjects;

(2) For the teaching of biology, natural history, ecology, geology, conservation and other subjects;

(3) As habitats for plant and animal species and communities and other natural objects;

(4) As reservoirs of natural materials;

(5) As places of natural interest and beauty;

(6) As living illustrations of our natural heritage wherein one may observe and experience natural biotic and environmental systems of the earth and their processes;

(7) To promote understanding and appreciation of the scientific, educational, esthetic, recreational and cultural values of such areas by the people of the State;

(8) For the preservation and protection of nature preserves against modification or encroachment resulting from occupation, development or other use which would destroy their natural or esthetic conditions.

In order to give recognition to natural areas, the Department shall establish and maintain a registry of natural areas of unusual significance, but no area so registered shall be a nature preserve unless and until it shall have been dedicated as provided for in § 7306 of this title.

61 Del. Laws, c. 212, § 2.;

§ 7304. Designation of Office of Nature Preserves.

There is hereby designated within the Department an Office of Nature Preserves, which shall administer for the Department this chapter.

61 Del. Laws, c. 212, § 2.;

§ 7305. Delaware Natural Areas Advisory Council.

(a) There is hereby created a Delaware Natural Areas Advisory Council to advise the Secretary of the Department on the administration of nature preserves and the preservation of natural areas.

(b) The Council shall have 8 members. The Secretary of the Department of Natural Resources and Environmental Control shall be an ex officio member of the Council, with a voice in its deliberations, but without the power to vote. The other members, appointed by the Governor of the State, with the advice and consent of the Senate, shall be persons who have been active or have demonstrated an interest in preserving natural areas, and shall include members of public and private educational organizations, conservation organizations, industry leaders active in environmental matters, sport hunting organizations, and sport fishing organizations and shall not include more than 4 persons who belong to the same political party. Council members shall serve for a period of 4 years, except that members initially appointed to the Council shall serve as follows: Two members shall serve for 1 year; 2 members shall serve for 2 years; 2 members shall serve for 3 years; and, 2 persons shall serve for 4 years.

(c) The Department shall furnish clerical, technical, legal and other services required by the Council in the performance of its official duties.

(d) Members of the Council shall receive no compensation but may be reimbursed for their actual and necessary expenses incurred in the performance of their official duties. The Council shall hold at least 1 regular meeting in each quarter of each calendar year and shall keep a record of its proceedings, which shall be open to the public for inspection.

(e) The Council shall:

(1) Review and make recommendations on the Department's criteria for acquisition and dedication of nature preserves;

(2) Review and make recommendations regarding inventories and registries of natural areas and nature preserves;

(3) Review and make recommendations on departmental plans for the selection of particular natural areas for state acquisition;

(4) Advise the Secretary on policies, rules and regulations governing the management, protection and use of nature preserves;

(5) Recommend the extent and type of visitation and use to be permitted within each nature preserve;

(6) Advise and consult with the Secretary and departmental employees on preservation matters;

(7) Advise and consult regarding any change from dedicated status of a nature preserve;

(8) Within 10 days of receiving plans from the Department for the selection of particular natural areas for state acquisition, issue written notice to adjacent landowners that such areas are being considered for state acquisition.

61 Del. Laws, c. 212, § 2; 63 Del. Laws, c. 240, § 1.;

§ 7306. Dedication process.

(a) The Department is authorized and empowered, for and on behalf of the State, to acquire nature preserves by gift, devise, purchase, exchange or any other method of acquiring real property or any estate, interest or right therein, provided that such acquisition shall not be made through the exercise of the power of eminent domain, and further provided that any interest owned by the State or by any subdivision thereof may be dedicated only by voluntary act of the agency having jurisdiction thereof. The Department may acquire the fee simple interest in an area or any 1 or more lesser estates, interests and rights therein, including (without limitation upon the generality of the foregoing by reason of specification) a leasehold estate, an easement either appurtenant or in gross and either granting the State specified rights of use or denying to the grantor specified rights of use or both, a license, a covenant, and other contractual rights. A nature preserve may be acquired voluntarily for such consideration as the Department deems advisable or without consideration.

(b) The Secretary of the Department, upon the advice and concurrence of the Council, shall accept natural areas by articles of dedication or gift. A nature preserve is established when articles of dedication have been filed by or at the direction of the owner of land, or a governmental agency having ownership or control thereof, in the office of the county recorder of the county in which the land is located.

(c) Articles of dedication shall be executed by the owner of the land in the same manner and with the same effect as a conveyance of an interest in land and shall be irrevocable except as provided in this section. The county recorder may not accept articles of dedication for recording unless they contain terms restricting the use of the land which adequately provide for its preservation and protection against modification or encroachment resulting from occupation, development or other use which would destroy its natural or esthetic conditions for 1 or more of the uses and purposes set forth in this section.

(d) Articles of dedication may contain provisions for the management, custody and transfer of land, provisions defining the rights of the owner or operating agency and the Department, and such other provisions as may be necessary or advisable to carry out the uses and purposes for which the land is dedicated. They may contain conditions under which the owner and the Department may agree to rescind the articles.

(e) The Department may make or accept amendments of any articles of dedication upon terms and conditions that will not destroy the natural or esthetic condition of a preserve. If the fee simple interest

in the area is not held by the State, no amendment shall be made without the written consent of the owner. Each amendment shall be recorded in the same manner as the articles of dedication.

61 Del. Laws, c. 212, § 2.;

§ 7307. Additional powers and duties of Department.

In furtherance of the purposes of this chapter and in implementation of the powers and duties elsewhere provided in this chapter, the Department shall have the following additional powers and duties:

(1) To formulate policies for the selection, acquisition, use, management and protection of nature preserves;

(2) To formulate policies for the selection of areas suitable for registration under this chapter;

(3) To formulate policies for the dedication of areas as nature preserves;

(4) To determine, supervise and control the management of nature preserves and to make, publish and amend from time to time rules and regulations necessary or advisable for the use and protection of nature preserves;

(5) To encourage and recommend the dedication of areas as nature preserves;

(6) To make surveys and maintain registries and records of unique natural areas within the State;

(7) To carry on interpretive programs and publish and disseminate information pertaining to nature preserves and other areas within the State; and

(8) To promote and assist in the establishment, restoration and protection of, and advise in the management of, natural areas and other areas of educational or scientific value and otherwise to foster and aid in the establishment, restoration and preservation of natural conditions within the State elsewhere than in the system.

61 Del. Laws, c. 212, § 2.;

§ 7308. Change in status from that of dedicated nature preserve.

Nature preserves dedicated under § 7306 of this title are to be held in trust, for the uses and purposes set forth for the benefit of the people of the State of present and future generations. They shall be managed and protected in the manner approved by, and subject to, the rules and regulations established by the Department. They shall not be taken for any other use except another public use after a finding by the Department of the existence of an imperative and unavoidable public necessity for such other public use and with the approval of the Governor after consultation with the Advisory Council, and by act of the General Assembly not less than 6 months from the date of the Governor's approval. Except as may otherwise be provided by the articles of dedication, the Department may grant, upon such terms and conditions as it may determine, an estate, interest or right in, or dispose of, a

nature preserve, but only after a finding by the Department of the existence of an imperative and unavoidable public necessity for such grant of disposition, and with the approval of the Governor after consultation with the Advisory Council, and by act of the General Assembly not less than 6 months from the date of the Governor's approval.

61 Del. Laws, c. 212, § 2.;

§ 7309. Public participation.

Before the Department makes any finding of the existence of an imperative and unavoidable public necessity, or grants any estate, interest or right in a nature preserve or disposes of a nature preserve or of any estate, interest or right therein, as provided in § 7308 of this title, it shall give notice of such proposed action and an opportunity for any person to be heard at a public hearing in the county in which the preserve is located. The public hearing shall be published at least once in newspapers with a statewide circulation and general circulation in the county in which the nature preserve is located. The notice shall set forth the substance of the proposed action and describe, with or without legal description, the nature preserve affected, and shall specify a place and time not less than 30 days after such publication for a public hearing before the Department on such proposed action. All persons desiring to be heard shall have a reasonable opportunity to be heard prior to action by the Department on such proposal.

61 Del. Laws, c. 212, § 2.;

§ 7310. Enforcement.

Enforcement of this chapter, including enforcement of the articles of dedication, shall be the responsibility of the Department.

61 Del. Laws, c. 212, § 2.;

§ 7311. Transfer of natural areas.

All units, departments, agencies and instrumentalities of the State, including (without limitation upon the generality of the foregoing by reason of specification) counties, municipalities, schools, colleges and universities, are empowered and urged to dedicate as nature preserves suitable areas or portions of areas within their jurisdiction.

61 Del. Laws, c. 212, § 2.;

§ 7312. Additional protection unimpaired.

Nothing contained in this chapter shall be construed as interfering with the purposes stated in the establishment of or pertaining to any state or local park, preserve, wildlife refuge or other area or the proper management and development thereof, except that any agency administering an area dedicated as a nature preserve under this chapter shall be responsible for preserving the character of the area in accordance with the articles of dedication and the applicable rules and regulations with respect thereto

established by the Department from time to time. Neither the dedication of an area as a nature preserve nor any action taken by the Department under any of the provisions of this chapter shall void or replace any protective status under law which the area would have were it not a nature preserve, and the protective provisions of this chapter shall be supplemental thereto.

61 Del. Laws, c. 212, § 2.;

Appendix E-6. Conservation Easements

Conservation Easements
DE Code Title 7, Part VII, Chapter 69
Source: http://delcode.delaware.gov/title7/c069/index.shtml, accessed June 1, 2012.

§ 6901. Definitions.

As used in this chapter, unless the context otherwise requires:

(1) "Conservation easement" means a nonpossessory interest of a holder in real property imposing limitations or affirmative obligations, the purposes of which include retaining or protecting natural, scenic or open-space values of real property, assuring its availability for agricultural, forest, recreational or open-space use, protecting natural resources, fish and wildlife habitat, rare species and natural communities maintaining or enhancing air or water quality or preserving the historical, architectural, archaeological or cultural aspects of real property.

(2) "Holder" means:

a. A governmental body empowered to hold an interest in real property under the laws of this State or of the United States; and

b. A charitable corporation, charitable association or charitable trust, the purposes or powers of which include retaining or protecting the natural, scenic or open-space values of real property, assuring the availability of real property for agricultural, forest, recreational or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, archaeological or cultural aspects of real property.

(3) "Third-party right of enforcement" shall mean a right provided in a conservation easement to enforce any of its terms and which is granted to a governmental body, charitable corporation, charitable association or charitable trust which, although eligible to be a holder, is not a holder.

70 Del. Laws, c. 552, § 1.;

§ 6902. Creation, conveyance, acceptance and duration.

(a) Except as otherwise provided in this chapter, a conservation easement may be created, conveyed, recorded, assigned, released, modified, terminated or otherwise altered or affected in the same manner as other easements.

(b) No right or duty in favor of or against a holder and no right in favor of a person having a third-party right of enforcement arises under a conservation easement before its acceptance by the holder and a recordation of that acceptance.

(c) Except as provided in § 6903(b) of this title, a conservation easement is unlimited in duration unless the instrument creating it otherwise provides.

(d) An interest in real property in existence at the time a conservation easement is created is not impaired by it, unless the owner of the interest is a party to the conservation easement or consents to it.

70 Del. Laws, c. 552, § 1.;

§ 6903. Judicial actions.

(a) An action affecting a conservation easement may be brought by:

(1) An owner of an interest in the real property burdened by the easement;

(2) A holder of the easement;

(3) A person having a third-party right of enforcement; or

(4) A person authorized by other law.

(b) This chapter does not affect the power of a court to modify or terminate a conservation easement in accordance with the principles of law and equity.

70 Del. Laws, c. 552, § 1.;

§ 6904. Validity.

A conservation easement is valid even though:

(1) It is not appurtenant to an interest in real property;

(2) It can be or has been assigned to another holder;

(3) It is not of a character that has been recognized traditionally at common law;

(4) It imposes a negative burden;

(5) It imposes affirmative obligations upon the owner of an interest in the burdened property or upon the holder;

(6) The benefit does not touch or concern real property; or

(7) There is no privity of estate or of contract.

70 Del. Laws, c. 552, § 1.;

§ 6905. Applicability.

(a) This chapter applies to any interest created after July 18, 1996, which complies with this chapter, whether or not such interest is designated as a conservation easement, covenant, equitable servitude, restriction, easement or otherwise.

(b) This chapter applies to any interest created before July 18, 1996, if it would have been enforceable had it been created after July 18, 1996, unless such retroactive application contravenes the constitution or laws of this State or the United States.

(c) This chapter does not invalidate any interest, whether designated as a conservation or preservation easement or as a covenant, equitable servitude, restriction, easement or otherwise that is enforceable under other law of this State.

70 Del. Laws, c. 552, § 1.;

Appendix E-7. Erosion and Sedimentation Control and Stormwater Management

Erosion and Sedimentation Control
DE Code Title 7, Part IV, Chapter 40
Source: http://delcode.delaware.gov/title7/c040/index.shtml, accessed June 1, 2012.

§ 4001. Legislative findings and statement of policy.

(a) Legislative findings. -- The General Assembly finds that erosion and sedimentation continue to present serious problems throughout the State, and that the removal of a stable ground cover in conjunction with the decrease in the infiltration capability of soils resulting from the creation of additional impervious areas such as roads and parking lots has accelerated the process of soil erosion and sediment deposition resulting in pollution of the waters of the State. This damages domestic, agricultural, industrial, recreational, fish and wildlife and other resource uses. The General Assembly further finds that accelerated stormwater runoff increases flood flows and velocities, contributes to erosion, sedimentation, and degradation of water quality, overtaxes the carrying capacity of streams and storm sewers, greatly increases the costs of public facilities in carrying and controlling stormwater, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health, welfare, and safety.

(b) Statement of policy. -- In consideration of these legislative findings, it is declared to be the policy of this chapter to strengthen and extend the present erosion and sediment control activities and programs of this State for both rural and urban lands and to provide for control and management of stormwater runoff consistent with sound water and land use practices. These activities will reduce to the extent possible any adverse effects of stormwater runoff on the water and lands of the State. This policy, to be carried out by establishing and implementing by the Department of Natural Resources and Environmental Control, hereinafter referred to as the "Department," in cooperation with conservation districts, counties, municipalities and other local governments and subdivisions of this State, and other public and private entities, a statewide comprehensive and coordinated erosion and sediment control and stormwater management program to conserve and protect land, water, air and other resources of the State. This program shall be consistent with, and coordinated with other environmental programs implemented by the Department such as wetlands protection and groundwater protection.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4002. Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

(1) "Certified construction reviewer" means an individual who has passed a departmental sponsored or approved training course and who provides on-site construction review for sediment control and stormwater management in accordance with regulations promulgated under this chapter.

(2) "Designated watershed or subwatershed" means a watershed or subwatershed proposed by a conservation district, county, municipality or state agency and approved by the Department. The Department may establish additional requirements due to existing water quantity or water quality problems. These requirements shall be implemented on an overall watershed or subwatershed master plan developed for water quality and/or water quantity protection.

(3) "Land disturbing activity" means any land change or construction activity for residential, commercial, industrial and institutional land use which may result in soil erosion from water or wind or movement of sediments or pollutants into state waters or onto lands in the State, or which may result in accelerated stormwater runoff, including, but not limited to, clearing, grading, excavating, transporting and filling of land. This paragraph does not apply to commercial forestry practices.

(4) "Person" means any state or federal agency, individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission board, public or private institution, utility, cooperative, municipality or other political subdivision of this State, any interstate body, or any other legal entity.

(5) "Responsible personnel" means any foreperson or superintendent who is in charge of on-site clearing and land disturbing activities for sediment and stormwater control associated with a construction project.

(6) "Sediment and stormwater management plan" or "plan" means a plan for the control of soil erosion, sedimentation, stormwater quantity and water quality impacts which may result from any land disturbing activity.

(7) "State waters" means any and all waters, public or private, on the surface of the earth which are contained within, flow through or border upon the State or any portion thereof.

(8) "Stormwater" means the runoff of water from the surface of the land resulting from any form of precipitation and including snow or ice melt.

(9) "Stormwater management" means:

a. For water quantity control, a system of vegetative, structural, and other measures that controls the volume and rate of stormwater runoff which may be caused by land disturbing activities or activities upon the land; and

b. For water quality control, a system of vegetative structural, and other measures that controls adverse effects on water quality that may be caused by land disturbing activities or activities upon the land.

(10) "Stormwater utility" means the establishment of an administrative organization that has been created for the purposes of funding sediment control, stormwater management or flood control planning, design, construction, maintenance, and overall resource needs by authorized and imposed charges.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1; 69 Del. Laws, c. 350, §§ 1, 2; 70 Del. Laws, c. 186, § 1.;

§ 4003. Duties of persons engaged in land disturbing activities.

(a) After July 1, 1991, unless exempted, no person shall engage in land disturbing activities without submitting a sediment and stormwater management plan to the appropriate plan approval authority and obtaining a permit to proceed.

(b) Projects which do not alter stormwater runoff characteristics may be required to provide water quality enhancement even if the predevelopment runoff characteristics are unchanged. Criteria will be detailed in the regulations regarding level of water quality control and variance procedures.

(c) Each land developer shall certify, on the sediment and stormwater management plan submitted for approval, that all land clearing, construction, development, and drainage will be done according to the approved plan.

(d) All approved land disturbing activities shall have associated therein at least 1 individual who functions as responsible personnel.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4003A. Runoff Control near Mill Creek, Little Mill, Red Clay, White Clay Creek, Persimmon Creek and Shellpot Creek.

All land development subject to Chapter 40 of this title in the Mill Creek, Little Mill Creek, Red Clay Creek, White Clay Creek, Persimmon Creek and Shellpot Creek watersheds of New Castle County will, in addition to meeting all other requirements for stormwater management, be required to demonstrate successful management of any increase in stormwater runoff volume from predevelopment land use conditions. Successful management of increased stormwater volume shall include but not be limited to; recharge, infiltration and reuse where soils and site conditions are applicable. For any increase in volume that cannot be recharged, infiltrated or reused, volume management may be achieved by modifying the release rate for the increase in volume so as not to increase the flood elevation for all storms up to and including the 100-year return period.

75 Del. Laws, c. 433, § 1.;

§ 4004. Applicability.

(a) The provisions of this chapter shall not apply to agricultural land management practices unless the conservation district or the Department determines that the land requires a new or updated soil and water conservation plan, and the owner or operator of the land has refused either to apply to a conservation district for the development of such a plan, or to implement a plan developed by a conservation district.

(b) Unless a waiver is granted the construction of agricultural structures such as broiler houses, machine sheds, repair shops, and other major buildings shall require approval of a sediment and stormwater management plan, by the appropriate plan approval agency, prior to the initiation of construction.

(c) Utility projects disturbing less than 5,000 square feet of land are not subject to the provisions of this chapter.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4005. Program funding and financial assistance.

(a) The Department, conservation districts, counties or municipalities are authorized to receive from federal, state, or other public or private sources financial, technical or other assistance for use in accomplishing the purposes of this chapter. The Department may allocate, as necessary or desirable, any funds received to conservation districts, counties or municipalities for the purpose of effectuating this chapter.

(b) The conservation districts, counties and municipalities shall have authority to adopt a fee system to help fund program implementation. That fee system shall be implemented by the designated plan approval agency to fund overall program management, plan review, construction review, enforcement needs and maintenance responsibilities. In those situations where the Department becomes the designated plan approval agency, the Department may assess a plan review and inspection fee. That fee shall not exceed $80 per disturbed acre per project. There shall be no duplication of fees by the various implementing agencies for an individual land disturbing activity and the fee schedule shall be based upon the costs to the Department, conservation districts, counties or municipalities to implement and administer the program. In addition, the Department of Transportation is authorized to act as the designated plan approval agency in those situations where a public utility engages in land-disturbing activity for which a permit is required because of a project initiated by the Department of Transportation, subject to the following provisions:

(1) If the land-disturbing activity takes place on an existing right-of-way of the Department of Transportation, that Department is permitted to assess and collect a fee for this purpose which shall not exceed $125 per acre, with a $250 minimum.

(2) If the land-disturbing activity takes place adjacent to but not upon an existing right-of-way of the Department of Transportation, the fee contemplated by paragraph (b)(1) of this section is waived.

(c) Authority is also granted to the Department, conservation districts, counties or municipalities to establish a stormwater utility as an alternative to total funding under the fee system. The stormwater utility shall be developed for the designated watersheds and may fund such activities as long range watershed master planning, watershed retrofitting, and facility maintenance. This fee system shall be reasonable and equitable so that each contributor of runoff to the system, including state agencies, shall pay to the extent to which runoff is contributed. Criteria for the implementation of the stormwater utility shall be established in regulations promulgated under this chapter. The implementation of a

stormwater utility will necessitate the development of a local utility ordinance prior to its implementation.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1; 70 Del. Laws, c. 177, § 1.;

§ 4006. State management program.

(a) The Department shall, in cooperation with appropriate state and federal agencies, conservation districts, other governmental subdivisions of the State, and the regulated community develop a state stormwater management program. This program shall take into consideration both quantity and quality of water, and shall be integrated with, and made a part of the amended state erosion and sediment control program to create a sediment and stormwater program.

(b) In carrying out this chapter, the Department shall have the authority to:

(1) Provide technical and other assistance to districts, counties, municipalities and state agencies in implementing this chapter;

(2) Develop and publish, as regulation components, minimum standards, guidelines and criteria for delegation of sediment and stormwater program components, and model sediment and stormwater ordinances for use by districts, counties and municipalities;

(3) Review the implementation of all components of the statewide sediment and stormwater program that have been delegated to either the conservation districts, counties, municipalities or other state agencies in reviews to be accomplished at least once every 3 years;

(4) Require that appropriate sediment and stormwater management provisions be included in all new erosion and sediment control plans developed pursuant to this chapter;

(5) Cooperate with appropriate agencies of the United States or other states or any interstate agency with respect to sediment control and stormwater management;

(6) Conduct studies and research regarding the causes, effects and hazards of stormwater and methods to control stormwater runoff;

(7) Conduct and supervise educational programs with respect to sediment control and stormwater management;

(8) Require the submission to the Department of records and periodic reports by conservation districts, tax ditch organization, county and municipal agencies as may be necessary to carry out this chapter;

(9) Review and approve designated watersheds for the purpose of this chapter;

(10) Establish a maximum life of 3 years for the validation of approved plans. The regulations shall specify variances which expand this time limitation in specific situation; and

(11) Establish a means of communication, such as a newsletter, so that information regarding program development and implementation can be distributed to interested individuals.

(c) The Department shall develop such regulations in conjunction with and with substantial concurrence of a regulatory advisory committee, appointed by the Secretary, which shall include representatives of the regulated community and others affected by this chapter. The recommendations of this committee shall be presented at all public workshops and hearings related to the adoption of the regulations implementing this chapter. Prior to final promulgation of regulations under this chapter, the Secretary shall explain, in writing, any differences between the advisory committee recommendations and the final regulations. The regulations may include, but are not limited to, the following items:

(1) Criteria for the delegation of program elements;

(2) Types of activities that require a sediment and stormwater management permit;

(3) Waivers, exemptions and variances;

(4) Sediment and stormwater plan approval fees and performance bonds;

(5) Criteria for distribution of funds collected by sediment and stormwater plan approval fees;

(6) Criteria for implementation of a stormwater runoff utility;

(7) Specific design criteria and minimum standards and specifications;

(8) Permit application and approval requirements;

(9) Criteria for approval of designated watersheds;

(10) Criteria regarding attendance and completion of departmental sponsored or approved training courses in sediment and stormwater control that will be required of certified construction reviewers and responsible personnel;

(11) Construction review; and

(12) Maintenance requirements for sediment control during construction and stormwater management structures after construction is completed.

(d) The Department may adopt, amend, modify or repeal rules or regulations after public hearing to effectuate the policy and purposes of this chapter. The conduct of all hearings conducted pursuant to this chapter and the promulgation process shall be in accordance with the relevant provisions of Chapter 60 of this title.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4007. Local sediment and stormwater programs.

(a) Pursuant to regulations promulgated by the Department, each conservation district, county, municipality or state agency may adopt, and submit to the Department for approval, 1 or more components of a sediment and stormwater program for the area within its jurisdiction.

(b) Requests for delegation of program elements shall be submitted within 6 months of the promulgation of state regulations, and by January 1 of subsequent years if delegation is desired at a future date. The Secretary shall grant or deny such a request on or before April 1 of the year for which delegation is sought.

(c) Delegation, once applied for, shall become effective on July 1 and shall not exceed 3 years, at which time delegation renewal is required.

(d) A district, county, municipality or state agency may develop the program in cooperation with any other governmental subdivisions.

(e) Initial consideration regarding delegation of program elements shall be given to the conservation districts, since the conservation districts, having unique capabilities and areawide responsibilities, are in an ideal position to coordinate and implement local sediment and stormwater programs.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4008. Interim program.

(a) Prior to July 1, 1991, requirements for sediment control shall be as provided in existing erosion and sediment control regulations promulgated September 26, 1980. Also, until July 1, 1991, any state or locally developed regulation or criterion for stormwater management shall remain in effect at the discretion of the implementing authority.

(b) Projects approved prior to July 1, 1991, but which are under construction after July 1, 1991, shall be subject to the penalty provisions contained in § 4015 of this title.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4009. Failure of conservation districts, counties, municipalities or state agencies to implement delegated program elements.

(a) If, at any time, the Department finds that a conservation district, county, municipality or state agency has failed to implement program elements that the Department has delegated, the Department shall provide written notice of violation to the conservation district, county, municipality or state agency.

(b) Within 60 days of receipt of the notice of violation, the conservation district, county, municipality or state agency shall report to the Department the action which it has taken to comply with the requirements set forth in the violation notice.

(c) If after 120 days of receipt of the notice of violation, the conservation district, county, municipality or state agency has failed to comply satisfactorily with requirements set forth in the notice of violation, the Department may suspend or revoke the delegated authority.

(d) If at any time, a program element delegation is being considered for suspension or revocation, an opportunity for a hearing before the Secretary or the Secretary's designee shall be provided prior to such suspension or revocation.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1; 70 Del. Laws, c. 186, § 1.;

§ 4010. State and federal projects.

After July 1, 1991, a state or federal agency may not undertake any land clearing, soil movement, or construction activity unless the agency has submitted a sediment and stormwater management plan to the Department and received its approval. The only variation to this requirement shall be when delegation of the plan approval process has been granted by the Department to a specific state or federal agency.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4011. Designated watersheds or subwatersheds.

(a) Watersheds or subwatersheds approved as designated watersheds or subwatersheds by the Department shall have the regulatory requirements clearly specified through a watershed approach to nonpoint pollution control or flood control. The watershed approach shall result in a specific plan, developed or approved by the Department, for the designated watershed or subwatershed that contains the following information:

(1) Stormwater quantity or quality problem identification;

(2) The overall needs of the watershed, not just the additional impacts of new development activities;

(3) Alternative approaches to address the existing and future problems;

(4) A defined approach which includes the overall costs and benefits;

(5) A schedule for implementation;

(6) Funding sources and amounts; and

(7) A public hearing process prior to departmental approval.

(b) Upon approval of the designated watershed or subwatershed plan, all projects undertaken in that watershed or subwatershed shall have stormwater requirements placed upon them that are consistent with the designated watershed or subwatershed plan.

67 Del. Laws, c. 234, § 1.;

§ 4012. Construction review and enforcement.

(a) With respect to approved sediment and stormwater plans, the agency responsible for construction review during and after construction completion shall ensure that periodic reviews are undertaken, implementation is accomplished in accordance with the approved plans, and the required measures are functioning in an effective manner. Notice of such right of construction review shall be included in the sediment and stormwater management plan certification. The agency responsible for construction review may, in addition to local enforcement options, refer a site violation to the Department for additional action.

(b) Referral of a site violation to the Department may initiate a departmental construction review of the site to verify site conditions. That construction review may result in the following actions:

(1) Notification through appropriate means to the person engaged in a land disturbing activity and the contractor to comply with the approved plan within a specified time frame.

(2) Notification of plan inadequacy, with a time frame for the person engaged in a land disturbing activity to submit a revised sediment and stormwater plan to the appropriate plan approval agency and to receive its approval with respect thereto.

(c) Failure of the person engaged in the land disturbing activity or the contractor to comply with departmental requirements may result in the following actions in addition to other penalties as provided in this chapter.

(1) The Department shall have the power to issue a cease and desist order to any person violating any provision of this chapter by ordering such person to cease and desist from any site work activity other than those actions necessary to achieve compliance with any administrative order.

(2) The Department may request that the appropriate plan approval agency refrain from issuing any further building or grading permits to the person having outstanding violations until those violations have been remedied.

61 Del. Laws, c. 522, § 1; 66 Del. Laws, c. 202, § 1; 67 Del. Laws, c. 234, § 1.;

§ 4013. Approval of certified construction reviewers.

(a) Based on criteria established by the Department through regulation and any additional criteria established by the agency implementing the plan review and construction elements of the sediment and stormwater program, the person engaged in a land disturbing activity may be required to provide for construction review by a certified construction reviewer.

(b) Individuals functioning as certified construction reviewers must attend and pass a departmental sponsored or approved construction review training course. The Department will establish, through regulation, the length of time for which the certification will last and procedure for renewal. The

construction reviewers shall also function under the direction of a registered professional engineer licensed to practice engineering in the State.

(c) The responsibility of the certified construction reviewer will be to ensure the adequacy of construction pursuant to the approved sediment and stormwater management plan.

(d) The certified construction reviewer shall be responsible for the following items:

(1) Provision of a construction review of active construction sites on at least a weekly basis, as determined on a case-by-case basis by the plan review and construction review agencies, or as required by regulations promulgated pursuant to this chapter;

(2) Within 5 calendar days, informing the person engaged in the land disturbing activity, and the contractor, by a written construction review report of any violations of the approved plan or inadequacies of the plan. The plan approval agency shall be informed, if the approved plan is inadequate, within 5 working days. In addition, the appropriate construction review agency shall receive copies of all construction review reports; and

(3) Referral of the project to the Department for appropriate enforcement action if the person engaged in the land disturbing activity fails to address the items contained in the written construction review report. Verbal notice shall be made to the Department within 2 working days and written notice shall be provided to the Department within 5 working days.

(e) If the Secretary or the Secretary's designee determines that a certified construction reviewer is not providing adequate site control or is not referring problem situations to the Department, the Secretary or the Secretary's designee may suspend or revoke the certification of the construction reviewer.

(f) In any situation where a certified construction reviewer's approval is being suspended or revoked, an opportunity for hearing before the Secretary or the Secretary's designee shall be provided. During any suspension or revocation, the certified construction reviewer shall not be allowed to provide construction reviews pursuant to this chapter.

(g) The failure to assign a departmental approved certified construction reviewer to a land disturbing activity, when required by the approved plan, will place that project in violation of this chapter and result in appropriate administrative and/or enforcement action.

67 Del. Laws, c. 234, § 1; 70 Del. Laws, c. 186, § 1.;

§ 4014. Training of responsible personnel.

After July 1, 1991, any applicant seeking sediment and stormwater plan approval shall certify to the appropriate approval agency that all responsible personnel involved in the construction project will have a certificate of attendance at a departmentally sponsored or approved training course for the control of sediment and stormwater before initiation of any land disturbing activity. The certificate of attendance

shall be valid until the Department notifies the individual or announces in local newspapers that recertification is required due to a change in course content.

67 Del. Laws, c. 234, § 1.;

§ 4015. Penalties.

(a) Any person who violates any rule, regulation, order, condition imposed in an approved plan or other provision of this chapter shall be fined not less than $200 or more than $2,000 for each offense. Each day that the violation continues shall constitute a separate offense. The Justice of the Peace Courts shall have jurisdiction of offenses brought under this subsection.

(b) Any person who intentionally, knowingly, and after written notice to comply, violates or refuses to comply with any notice issued pursuant to § 4012 of this title shall be fined not less than $500 or more than $10,000 for each offense. Each day the violation continues shall constitute a separate offense. The Superior Court shall have jurisdiction of offenses brought under this subsection.

61 Del. Laws, c. 522, § 1; 66 Del. Laws, c. 196, §§ 1, 2; 67 Del. Laws, c. 234, § 1; 69 Del. Laws, c. 349, § 1.;

§ 4016. Injunctions.

The Court of Chancery shall have jurisdiction to enjoin violations of this chapter. The appropriate program element authority, the Department or any aggrieved person who suffers damage or is likely to suffer damage because of a violation or threatened violation of this chapter may apply to the Chancery Court for injunctive relief. Among any other appropriate forms of relief, the Chancery Court may direct the violator to restore the affected land or water impacted area to its original condition.

61 Del. Laws, c. 522, § 1; 67 Del. Laws, c. 234, § 1.;

Sediment and Stormwater Regulations

Sediment and Stormwater Program, Division of Watershed Stewardship, Department of Natural Resources and Environmental Control

Source: http://regulations.delaware.gov/AdminCode/title7/5000/5101.shtml#TopOfPage, accessed June 1, 2012.

1.0 Scope

1.1 Stormwater runoff may reasonably be expected to be a source of pollution to waters of the State, and may add to existing flooding problems. The implementation of a statewide sediment and stormwater program will prevent existing water quantity and water quality problems from becoming worse, and in some cases, reduce existing problems.

1.2 Sediment and stormwater approvals are required for land changes or construction activities for residential, commercial, industrial, or institutional land use which are not exempted or waived by these Regulations. Requirements under these Regulations do not apply to agricultural land management practices unless the Conservation District or the Department determines that the land requires a soil and water conservation plan, and the owner or operator of the land has refused either to apply to a Conservation District for the development of such a plan, or to implement a plan developed by a Conservation District.

1.3 The Department intends that, to the extent possible, the provisions of these Regulations be delegated to either the Conservation Districts, local governments, or other State agencies. Those program provisions which are subject to delegation include sediment and stormwater management plan approval, inspection during construction, post-construction inspection, and education and training. Initial consideration regarding delegation of program components shall be given to the Conservation Districts.

1.4 The implementation of a stormwater utility represents a comprehensive approach to program funding and implementation. The activities which may be undertaken by a stormwater utility include not only assessment, collection, and funding activities, but also carrying out provisions of adopted stormwater management plans. These provisions may include contracting for such services as project construction, project maintenance, project inspection, and enforcement of installation and maintenance requirements imposed with respect to approved land disturbing activities.

8 DE Reg. 1172 (2/01/05)

2.0 Definitions

As used in these regulations, the following terms shall have the meanings indicated below:

"Adverse Impact" means a negative impact to land or waters resulting from a construction or development activity. The negative impact includes increased risk of flooding; degradation of water

quality; increased sedimentation; reduced groundwater recharge; negative impacts on aquatic organisms; negative impacts on wildlife and other resources, and threatened public health.

"Agricultural Land Management Practices" means those methods and procedures generally accepted by the Conservation Districts and used in the cultivation of land in order to further crop and livestock production and conservation of related soil and water resources.

"Applicant" means a person, firm, or governmental agency who executes the necessary forms to obtain plan approval for a land disturbing activity.

"Appropriate Plan Approval Agency" means the Department, Conservation District, county, municipality, or State agency that is responsible in a jurisdiction for review and approval of sediment and stormwater management plans.

"As-Built Plans or Record Documents" means a set of engineering or site drawings that delineate the specific approved stormwater management facility as actually constructed.

"Certified Construction Reviewer" means those individuals, having passed a Departmental sponsored or approved training course, who provide on-site inspection for sediment control and stormwater management in accordance with these regulations.

"Delegation" means the acceptance of responsibility by a Conservation District, county, municipality, or State agency for the implementation of one or more elements of the statewide sediment and stormwater management program.

"Department" means the Department of Natural Resources and Environmental Control.

"Designated Watershed or Subwatershed" means a watershed or subwatershed proposed by a Conservation District, county, municipality, or State agency and approved by the Department. The Department may establish additional requirements in these watersheds and subwatersheds due to existing water quantity or water quality problems. These requirements shall be implemented on an overall watershed or subwatershed master plan that is developed for water quality and/or water quantity protection.

"Detention Structure" means a permanent stormwater management structure whose primary purpose is to temporarily store stormwater runoff and release the stored runoff at controlled rates.

"Develop Land" means to change the runoff characteristics of a parcel of land in conjunction with residential, commercial, industrial, or institutional construction or alteration.

"Developer" means a person undertaking, or for whose benefit, activities covered by these regulations are commenced and/or carried out.

"Drainage Area" means that area contributing runoff to a single point measured in a horizontal plane, which is enclosed by a ridge line.

“Easement” means a grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.

“Erosion and Sediment Control” means the control of solid material, both mineral and organic, during a land disturbing activity, to prevent its transport out of the disturbed area by means of air, water, gravity, or ice.

“Exemption” means those land development activities that are not subject to the sediment and stormwater requirements contained in these regulations.

“Grading” means excavating, filling (including hydraulic fill) or stockpiling of earth materials, or any combination thereof, including the land in its excavated or filled condition.

“Green Technology Best Management Practices (BMP's)” means those practices that achieve stormwater management objectives by applying the principles of filtration, infiltration and storage most often associated with natural vegetation and undisturbed soils while minimizing a reliance on structural components. They may also be constructed using an imported soil medium and planted with vegetation designed to promote the natural hydrologic process. These practices include, but are not limited to, vegetative filtration, riparian buffer plantings, bio-retention areas, vegetative flow conveyance, as well as recharge and surface storage in undisturbed natural areas.

“Infiltration” means the passage or movement of water through the soil profile.

“Land Disturbing Activity” means a land change or construction activity for residential, commercial, industrial, and institutional land use which may result in soil erosion from water or wind or movement of sediments or pollutants into State waters or onto lands in the State, or which may result in accelerated stormwater runoff, including, but not limited to, clearing, grading, excavating, transporting and filling of land.

“Off-site Stormwater Management” means the design and construction of a stormwater management facility that is necessary to control stormwater from more than one land disturbing activity.

“On-site Stormwater Management” means the design and construction of stormwater management practices that are required for a specific land disturbing activity.

“Person” means any State or federal agency, individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, municipality or other political subdivision of this State, any interstate body or any other legal entity.

“Redevelopment” means a land disturbance activity that alters the use of land but does not necessarily alter the pre-development runoff characteristics.

"Responsible Personnel" means a foreman or superintendent who is in charge of on-site clearing and land disturbing activities for sediment and stormwater control associated with a construction project.

"Sediment" means soils or other surficial materials transported and/or deposited by the action of wind, water, ice or gravity as a product of erosion.

"Sediment and Stormwater Management Plan" (or Detailed Plan) means a plan for the control of soil erosion, sedimentation, stormwater quantity, and water quality impacts resulting from any land disturbing activity.

"Stabilization" means the prevention of soil erosion by surface runoff or wind through the establishment of a soil cover through the implementation of vegetative or structural measures. Examples include, but are not limited to, straw mulch with temporary or permanent vegetation, wood chips, and stone or gravel ground cover.

"Standard Plan" means a set of pre-defined standards and/or specifications for minor land disturbing activities that may preclude the preparation of a detailed plan under specific conditions.

"State Waters" means any and all waters, public or private, on the surface of the earth which are contained within, flow through or border upon the State or any portion thereof.

"Stormwater" means the runoff of water from the surface of the land resulting from precipitation or snow or ice melt.

"Stormwater Management" means:

• for water quantity control, a system of vegetative, structural, and other measures that may control the volume and rate of stormwater runoff which may be caused by land disturbing activities or activities upon the land; and

• for water quality control, a system of vegetative, structural, and other measures that control adverse effects on water quality that may be caused by land disturbing activities or activities upon the land.

"Stormwater Utility" means an administrative organization that has been established for the purposes of funding sediment control, stormwater management or flood control planning, design, construction, maintenance, and overall resource needs by authorized and imposed charges.

"Tidewater" means water that alternately rises and falls due to the gravitational attraction of the moon and sun and is under the regulatory authority of 7 **Del.C.** Ch. 72. Examples of tidewaters include the Atlantic Ocean, the Delaware Bay, and the Delaware Inland Bays.

"Variance" means the modification of the minimum sediment and stormwater management requirements for specific circumstances where strict adherence of the requirements would result in unnecessary hardship and not fulfill the intent of these regulations.

"Waiver" means the relinquishment from sediment and stormwater management requirements by the appropriate plan approval authority for a specific development on a case-by-case review basis.

"Water Quality" means those characteristics of stormwater runoff from a land disturbing activity that relate to the chemical, physical, biological, or radiological integrity of water.

"Water Quantity" means those characteristics of stormwater runoff that relate to the rate and volume of the stormwater runoff to downstream areas resulting from land disturbing activities.

"Watershed" means the total or partial drainage area contributing stormwater runoff to a single point.

8 DE Reg. 1172 (2/01/05)

3.0 Exemptions, Waivers, and Variances

3.1 The following activities are exempt from both sediment control and stormwater management requirements established by these regulations:

3.1.1 Agricultural land management practices, unless the local Conservation District or the Department determines that the land requires a new or updated soil and water conservation plan, and the owner or operator of the land has refused either to apply to a Conservation District for the development of such a plan, or to implement a plan developed by a Conservation District;

3.1.2 Developments or construction that disturb less than 5,000 square feet;

3.1.3 Land development activities which are regulated under specific State or federal laws which provide for managing sediment control and stormwater runoff. An example of this exemption would be specific permits required under the National Pollutant Discharge Elimination System when discharges are a combination of stormwater and industrial or domestic wastewater or which must comply with Parts 122, 123, and 124 of Title 40 of the Code of Federal Regulations. The Department shall ensure that all land developments which are regulated under specific State or federal laws are coordinated with delegated plan approval agencies to ensure compatibility of requirements

3.1.4 Projects which are emergency in nature that are necessary to protect life or property such as bridge, culvert, or pipe repairs and above ground or underground electric and gas utilities or public utility restoration. The emergency nature of a project may preclude prior plan review and approval, but subsequent inspection may necessitate sediment control or site stabilization in accordance with the provisions of this Chapter. The appropriate plan approval agency shall be notified orally or in writing within 48 hours of the initiation of such emergency activity.

The appropriate plan approval agency shall determine and approve of the emergency nature of a project. If the nature of the emergency will require more than 120 days to accomplish construction, formal approval shall be obtained for sediment control and stormwater management. These activities must still comply with other State, federal, and local requirements.

3.1.5 Commercial forest harvesting operations that meet the requirements of the Department of Agriculture under 3 **Del.C.** Ch. 29, Subchapter VI.

3.2 Appropriate Plan Approval Agencies may grant waivers from the stormwater management requirements of these regulations for individual developments provided that a written request is submitted by the applicant containing descriptions, drawings, and any other information that is necessary to evaluate the proposed development. A separate written waiver request shall be required if there are subsequent additions, extensions, or modifications which would alter the approved stormwater runoff characteristics to a development receiving a waiver.

3.2.1 A project may be eligible for a waiver of stormwater management for both quantitative and qualitative control if the applicant can demonstrate that:

3.2.1.1 The proposed project will return the disturbed area to a pre-development runoff condition and the pre-development cover is unchanged at the conclusion of the project; or

3.2.1.2 The proposed project consists of a linear disturbance of less than ten (10) feet in width; or

3.2.1.3 The project is for an individual residential detached unit or agricultural structure, and the total disturbed area of the site is less than one acre; or

3.2.1.4 The proposed project is for agricultural structures in locations included in current soil and water conservation plans that have been approved by the appropriate Conservation District.

3.2.2 A project may be eligible for a waiver or variance of stormwater management for water quantity control if the applicant can demonstrate that:

3.2.2.1 The proposed project will not generate an increase in the 2-year post-development peak discharge rate of more than ten (10) percent above the 2-year pre-development peak discharge rate and will have no adverse impact on the receiving wetland, watercourse, or waterway; or

3.2.2.2 Provisions will be made or exist for a nonerosive conveyance system to tidewater by either a closed drainage system or by open channel flow that has adequate capacity to contain the runoff events being considered as a requirement of these regulations; or

3.2.2.3 The location of a project within a watershed would aggravate downstream flooding by the imposition of peak control requirements.

3.3 The plan approval agency may grant a written variance from any requirement of these regulations if there are exceptional circumstances applicable to the site such that strict adherence to the provisions of these regulations will result in unnecessary hardship and not fulfill the intent of these regulations. A written request for variance shall be provided to the plan approval agency and shall state the specific variances sought and the reasons for their granting. The plan approval agency shall not grant a variance unless and until sufficient specific reasons justifying the variance are provided by the applicant.

8 DE Reg. 1172 (2/01/05)

4.0 Departmental Responsibilities

4.1 The Department is responsible for the implementation and supervision of the sediment and stormwater program which is established by 7 **Del.C.** Ch. 40. This responsibility shall include, but not be limited to, the authority to:

4.1.1 Provide technical and other assistance to Conservation Districts, counties, municipalities, federal, and State agencies in implementing this Chapter;

4.1.2 Develop and publish, as regulation components, minimum standards, guidelines and criteria for delegation of sediment and stormwater program components, and model sediment and stormwater ordinances for use by Conservation Districts, counties, State agencies, and municipalities;

4.1.3 Review the implementation of all components of the statewide sediment and stormwater management program that have been delegated to either the Conservation Districts, counties, municipalities, or other State agencies in reviews to be accomplished at least once every three years;

4.1.4 Require that appropriate sediment and stormwater management provisions be included in all new erosion and sediment control plans developed pursuant to these regulations;

4.1.5 Cooperate with appropriate agencies of the United States or other states or any interstate agency with respect to sediment control and stormwater management;

4.1.6 Conduct studies and research regarding the causes, effects, and hazards of stormwater and methods to control stormwater runoff;

4.1.7 Conduct and supervise educational programs with respect to sediment control and stormwater management;

4.1.8 Require the submission to the Department of records and periodic reports by Conservation Districts, tax ditch organizations, county, and municipal agencies as may be necessary to carry out these regulations;

4.1.9 Review and approve designated watersheds;

4.1.10 Establish a maximum life of three years for the validation of approved plans. These regulations shall specify variances which expand this time limitation in specific situations; and

4.1.11 Establish a means of communication, such as a newsletter, so that information regarding program development and implementation can be distributed to interested individuals.

4.2 Matters of policy, procedures, standards, criteria, approvals, inspection, or enforcement relating to the Sediment and Stormwater Chapter shall be established by the Department subject to the jurisdiction of the Secretary of the Department. Sediment and stormwater programs or portions of programs which are delegated to the Conservation Districts, counties, municipalities, or State agencies shall include

sediment and stormwater criteria consistent with the standards, procedures, and regulations of the Department.

A variation of requirements by the delegated agency on a specific watershed will not be valid unless approved by the Department. All State and federal development in the watershed shall be reviewed subject to the same variations and requirements by the delegated State agency or Department as appropriate.

4.3 In situations where public notification and comment are required before an action is taken by the Department, the Regulatory Advisory Committee shall have an opportunity to review the proposed Departmental action and provide input to the Department regarding the action.

5.0 Criteria for Delegation of Program Elements

5.1 Conservation Districts, counties, municipalities, and State agencies may seek delegation of four program elements relating to the implementation of the statewide sediment and stormwater program. Delegation may be granted by the Secretary for review and approval of sediment and stormwater management plans, inspection during construction, subsequent maintenance inspection, and education and training. Program elements that are delegated shall be implemented according to Chapter 40 and these regulations.

5.2 The Secretary, or his designee, shall grant delegation of one or more program elements to any Conservation District, county, municipality, or State agency seeking delegation that is found capable of providing compliance with Chapter 40 and these regulations. The final decision regarding delegation shall be made only after an opportunity has been provided for public review and comment. Initial consideration regarding delegation of program elements shall be given to the Conservation Districts. The Conservation Districts, having unique capabilities and area wide responsibilities are in ideal positions to coordinate and implement local sediment and stormwater programs.

5.3 Requests for delegation of more than one program element may be accomplished by the submission of one request for all the elements requested. A concern by the Department over one element will not jeopardize delegation of other requested program elements.

5.4 To be considered capable of providing compliance with Chapter 40 and these regulations, applications for delegation of program elements shall contain the following requisite items.

5.4.1 Requests for delegation of plan approval responsibility shall include the following information:

5.4.1.1 Ordinance or program information detailing the plan approval process,

5.4.1.2 Plan review check lists and plan submission requirements,

5.4.1.3 Sediment and stormwater criteria, including waiver and variance procedures, that meet minimum standards established by these regulations,

5.4.1.4 Assurance of adequate personnel allocations and expected time frames for plan review which meet the requirements of Section 8(9), and

5.4.1.5 Assurance that plan reviewers will attend Departmental training programs in related fields such as wetlands identification, subaqueous permits requirements, etc.

5.4.2 Requests for delegation of inspection during construction shall include the following information:

5.4.2.1 Inspection and referral procedures,

5.4.2.2 Time frames for inspection of active land disturbing activities,

5.4.2.3 Inspection forms,

5.4.2.4 Assurance of adequate personnel allocations or a timetable to obtain adequate personnel,

5.4.2.5 Criteria for the Certified Construction Reviewer if utilized, and

5.4.2.6 Procedures and time frames for processing complaints.

5.4.3 Requests for delegation of maintenance inspection responsibility shall include the following information:

5.4.3.1 Inspection and referral procedures,

5.4.3.2 Inspection forms,

5.4.3.3 Time frames, not exceeding one year, for inspection of completed stormwater management structures, and

5.4.3.4 Assurance of adequate personnel allocation or a timetable to obtain adequate personnel.

5.4.4 Requests for delegation of education and training responsibility shall include the following information:

5.4.4.1 Types of educational and training activities to be accomplished,

5.4.4.2 Frequency of activities,

5.4.4.3 Names and backgrounds of those individuals conducting the training, and

5.4.4.4 Procedures and timetables to notify the Department of educational programs.

5.5 A Conservation District, county, municipality, or State agency which has been granted delegation of one or more program elements may establish alternative requirements which are compatible with or are more stringent than Departmental requirements. These alternative requirements may be implemented only when prior Departmental approval has been granted. These alternative requirements shall apply in lieu of the provisions of these regulations in the specific program element that has been

delegated. Alternative requirements shall be implemented only after public notice has been provided which would allow for public review and comment prior to Departmental approval.

5.6 Delegation of authority for one or more program elements may be granted for a maximum time frame of three years. After three years a new application to the Department must be made. Over the time frame for which delegation has been granted, the Department will evaluate delegation implementation, coordinate review findings with the delegated authority, and determine if the new delegation should be granted.

5.7 A Conservation District, county, municipality, or State agency requesting or renewing delegation shall submit a written request to the Secretary on or before January 1 of the year immediately preceding the fiscal year for which delegation or renewal of delegation is sought.

5.8 The Secretary shall, in writing, grant or deny delegation on or before April 1 of the year during which delegation is sought. The Secretary may not deny a requested delegation unless opportunity has been afforded to the appropriate officials to present arguments. Delegation shall be effective July 1 of that year and extend no more than three years, unless renewed. In the event that the Department does not act on the renewal request by April 1, the delegated authority submitting the request would be entitled to continue operating for a subsequent three year time period unless action is taken by the Department to suspend the program.

5.9 If the Secretary determines that a delegated program falls below acceptable standards established by these regulations, delegation may be suspended after opportunity is afforded for a hearing. During a period of suspension, the program element shall revert to the Department for implementation. Funds set aside by a delegated agency, that were collected through fees established by the plan approval agency, shall be transferred to the Department for use if delegation is suspended.

5.10 A delegated authority may sub-delegate program elements, with Departmental concurrence, to a stormwater utility or other responsible entity or agency.

5.11 The Department shall maintain, and make available upon request, a listing of the current status of delegation for all jurisdictions within the State.

6.0 Plan Approval Fees, Maintenance Fees, and Performance Bonds

6.1 The establishment of plan approval fees, not involving stormwater utilities, shall be in accordance with the following items:

6.1.1 Delegation of program elements will depend, to a large extent, on funding and personnel commitments. If the delegated jurisdiction has a source of funding that is provided through State General or local revenues, then the implementation of the delegated component will not necessitate the imposition of a plan approval fee to cover the cost of the delegated program component.

6.1.2 In the event that one component of an overall sediment and stormwater management program is not funded through the use of general or special funds, a non-refundable plan approval fee will be

collected at the time that the sediment and stormwater management plan or application for waiver or variance is submitted or approved. The plan approval fee will provide for the unfunded costs of plan review, administration and management of the approval agency, construction review, maintenance inspection, and education and training. The plan review or permit approval agency, whether delegated or the Department, shall be responsible for the collection of the plan approval fee.

Unless all program elements in a county or municipality have been delegated to a single agency, the funds collected not supporting the plan review function shall be distributed to the appropriate agencies.

6.1.3 The number of needed personnel and the direct and indirect expenses associated with those personnel shall be developed by the agencies requesting delegation in a specific jurisdiction in conjunction with and with the concurrence of the Department. Those expenses will then form the basis for determining unit plan approval costs.

6.1.4 Prior to plan approval, a fee may be assessed by the appropriate plan approval agency for those activities approved prior to July 1, 1991 for which construction will initiate after July 1, 1991.

6.1.5 Where the Department becomes the designated plan approval agency, the Department may assess a plan review and construction review fee. That fee shall not exceed $80.00 per disturbed acre per project.

6.1.6 The use of Certified Construction Reviewers for sediment control and the submission of “As Built or Record Document” certification regarding stormwater management construction may reduce the inspection requirements for the delegated agency but may not eliminate that inspection requirement. Periodic overview inspections will still be necessary to ensure construction management.

6.2 The imposition of a financial guarantee, based on existing local authority, may be required by the plan approval agency to ensure that construction of the stormwater management practices was accomplished according to the approved sediment and stormwater management plan. The developer, when required, shall submit to the plan approval agency a surety or cash bond, or irrevocable letter of credit prior to the issuance of any building or grading permit for construction of any land disturbing activity that requires a stormwater management facility.

The amount of the security shall not exceed 150% of the total estimated construction cost of the stormwater management facility. The financial guarantee so required shall include provisions relative to forfeiture for failure to complete work specified in the approved stormwater management plan, compliance with all the provisions of these regulations, and other applicable laws and regulations, and any time limitations. The financial guarantee, fully or partially, shall not be released without a final inspection of the completed work and, when required, after submission of “As Built or Record Document” plans, and after written confirmation by the design engineer that construction was accomplished according to the approved plans. A partial release of the financial guarantee shall be allowed only to the extent that the work already accomplished would warrant such release.

6.3 A maintenance fee may be required on approvals granted for stormwater management structures that will be maintained by a Conservation District, county, or municipality. A fee mechanism shall be established prior to the final release of any required financial guarantee or final approval of the completed stormwater management structure by the designated construction review agency.

8 DE Reg. 1172 (2/01/05)

7.0 Criteria for Implementation of a Stormwater Utility

The implementation of a stormwater utility will necessitate the development of a local utility ordinance prior to its implementation. There are essential components that an ordinance must contain to function as a funding mechanism for stormwater management and those components shall include, but not be limited to, the following items:

7.1 The financing of a stormwater utility with a user charge system must be reasonable and equitable so that each user of the stormwater system pays to the extent to which the user contributes to the need for the stormwater system, and that the charges bear a substantial relationship to the cost of the service. The use of county and municipal taxpayer rolls and accounting systems are allowed for the assessment and collection of fees.

7.2 The intent of the utility must be clearly defined regarding program components that are to be funded through the utility. Those components may include but not be limited to the following activities:

7.2.1 Preparation of long range watershed master plans for stormwater management,

7.2.2 Annual inspections of all stormwater management facilities, both public and private,

7.2.3 Undertaking regular maintenance, through contracting or other means, of stormwater management structures that have been accepted for maintenance,

7.2.4 Plan review and inspection of sediment control and stormwater management plans and practices, and

7.2.5 Retrofitting designated watersheds, through contracting or other means, to reduce existing flooding problems or to improve water quality.

7.3 The authority for the creation of the stormwater utility and the imposition of charges to finance sediment and stormwater activities is conferred in 7 **Del.C.** Ch. 40. The application of a stormwater utility by means of a local ordinance shall not be deemed a limitation or repeal of any other powers granted by State statute.

7.4 The creation of a stormwater utility shall include the following components:

7.4.1 The boundaries of the utility, such as watersheds or jurisdictional boundaries as identified by the local governing body,

7.4.2 The creation of a management entity,

7.4.3 Identification of stormwater problems,

7.4.4 Method for determining utility charges,

7.4.5 Procedures for investment and reinvestment of funds collected, and

7.4.6 An appeals or petition process.

7.5 As established by local ordinance, the local governing agency shall have responsibility for implementing all aspects of the utility including long range planning, plan implementation, capital improvements, maintenance of stormwater facilities, determination of charges, billing, and hearing of appeals and petitions. The local agency also will have responsibility for providing staff support for utility implementation

In the event that an agency or department other than the one in which the utility is located is best equipped to undertake a particular task, the local governing agency shall ensure that appropriate interagency charges are determined such that all costs of stormwater management are reflected in the utility budget and that utility charges finance all aspects of stormwater management.

7.6 With respect to new stormwater management facilities constructed by private developers, the local governing agency shall develop criteria for use in determining whether these will be maintained by the utility or by the facility owner. Such criteria may include whether the facility has been designed primarily to serve residential users and whether it has been designed primarily for purposes of stormwater management. In situations where it is determined that public maintenance is not preferable, standards shall be developed to ensure that inspection of facilities occurs annually and that facilities are maintained as needed.

7.7 The use of charges is limited to those purposes for which the utility has been established, including but not limited to: planning; acquisition of interests in land including easements; design and construction of facilities; maintenance of the stormwater system; billing and administration; and water quantity and water quality management, including monitoring, surveillance, private maintenance inspection, construction inspection, and other activities which are reasonably required.

8.0 Plan Application and Approval Process

8.1 After July 1, 1991, unless a particular activity is exempted by these regulations, a person may not disturb land without an approved sediment and stormwater management plan from the appropriate plan approval agency. A grading or building permit may not be issued for a property unless a sediment and stormwater management plan has been approved that is consistent with the following items:

8.1.1 7 **Del.C.** Ch. 40, relating to erosion and sediment control and stormwater management, and;

8.1.2 These regulations, or duly adopted county or municipal ordinances that are adopted as a part of the delegation process and relate to the intent of these regulations.

8.2 A sediment and stormwater management plan or an application for a waiver shall be submitted to the appropriate plan approval agency by the developer for review and approval for a land disturbing activity, unless otherwise exempted. The sediment and stormwater management plan shall contain supporting computations, drawings, and sufficient information describing the manner, location, and type of measures in which stormwater runoff will be managed from the entire development. The appropriate plan approval agency shall review the plan to determine compliance with the requirements of these regulations prior to approval. The approved sediment and stormwater management plan shall serve as the basis for water quantity and water quality control on all subsequent construction.

8.3 The sediment and stormwater management plan shall not be considered approved without the inclusion of an approval stamp with signature and date, on the plans by the appropriate plan approval agency.

8.4 All sediment and stormwater management plans submitted for approval shall contain certification by the owner or developer that clearing, grading, construction, or development will be accomplished pursuant to the plan and that responsible personnel involved in the land disturbance will have a Certification of Training at a Departmental sponsored or approved training program for the control of erosion and sediment control before initiation of the project. The Certification of Training for responsible personnel requirement may be waived by the appropriate plan approval agency on any project involving silviculture or fewer than four residential homes.

8.5 All sediment and stormwater management plans shall contain certification by the owner or developer of the right of the Department or delegated inspection agency to conduct on-site inspections.

8.6 A grading or building permit issued by a local jurisdiction may be suspended or revoked after written notice is given to the permittee by the responsible delegated agency or the Department for any of the following reasons:

8.6.1 Violations of the conditions of the sediment and stormwater management plan approval;

8.6.2 Changes in site runoff characteristics upon which a waiver was granted;

8.6.3 Construction not in accordance with the approved plans;

8.6.4 Noncompliance with correction notice or stop work order issued for the construction of the sediment control practices or the stormwater management facilities;

8.6.5 An immediate danger exists in a downstream area in the opinion of the appropriate plan approval or inspection agency, or the Department; or

8.6.6 Failure to submit stormwater management “As Built or Record Document” plans, when required, at the completion of the project.

8.7 Approved plans remain valid for 3 years from the date of an approval, unless specifically extended or renewed by the appropriate plan approval agency. The basis for extension or renewal may include, but not limited to, the following items:

8.7.1 Failure to initiate the approved project for reasons acceptable to the appropriate plan approval agency such as funding or other agency permit delays; or

8.7.2 Time duration for a type of activity that typically exceeds three years.

8.8 Projects which have been approved prior to July 1, 1991, and where site clearing has not been initiated on the project within two years, shall be resubmitted to the appropriate plan approval agency for review and approval subject to the requirements of these regulations.

8.9 Upon receipt of a completed application for sediment and stormwater management, the appropriate plan approval agency shall accomplish its review within 30 calendar days, and have either the approval or review comments transmitted to the applicant. If that 30 day time frame cannot be met, the appropriate plan approval agency shall notify the applicant of the reasons for delay, and an expected time frame not to exceed an additional 30 days, when that review will be accomplished.

8 DE Reg. 1172 (2/01/05)

9.0 Criteria for Designated Watersheds

The concept of designated watersheds is intended, not only to prevent existing water quantity and water quality problems from getting worse, but also to reduce existing flooding problems and to improve existing water quality or meet State Water Quality Standards in selected watersheds. Criteria is established for designated watersheds and that criteria will depend on whether the specific problems of the watershed are water quantity or water quality oriented. Water quantity and water quality concerns will be considered in all designated watersheds, but the overall emphasis for each designated watershed will depend on its existing and anticipated problems.

9.1 To initiate consideration of a watershed for Designated Watershed or Subwatershed status, a watershed shall be recommended by a Conservation District, county, municipality, or State agency, to the Department. Upon recommendation to the Department, all involved agencies at the local level will be contacted and their input received prior to any watershed study being initiated.

9.2 Included with the recommendation of a watershed for Designated Watershed or Subwatershed status to the Department shall be an identification of the specific problems that exist in the watershed so that the pursuit of a watershed study is warranted. Inclusion in these regulations as a Designated Watershed or Subwatershed requires approval by the Department that a significant water quantity or water quality problem exists that would necessitate this joint State, District, and local government involvement. Also, inclusion of a watershed as a Designated Watershed or Subwatershed will necessitate a public hearing process. The process of problem identification shall be based on the following information:

9.2.1 To initiate a watershed study based on water quality considerations the following information must be submitted:

9.2.1.1 Existing water quality data that has been collected as a result of the overall statewide water quality inventory process, or

9.2.1.2 Other water quality data collected through specific sampling that was accomplished in the watershed, or

9.2.1.3 Submission of a water quality assessment that was accomplished using a qualitative collection method of benthic macroinvertebrates.

9.2.2 To initiate a watershed study based on flooding or water quantity considerations the following information must be submitted:

9.2.2.1 Estimated annual flood damage to either private, residential, commercial, industrial, or public properties, or

9.2.2.2 Number of residences or industries in the floodplain, or

9.2.2.3 The history of flooding in the watershed, or

9.2.2.4 Measures already taken to minimize or reduce flooding, or

9.2.2.5 Dangers to public health and welfare.

9.3 Upon modification of these regulations to include a watershed as a Designated Watershed or Subwatershed an advisory group will be established that will guide the overall watershed study. The advisory group will be appointed by the Secretary and will include State, District, and local representatives in addition to representatives of the regulated community and others affected by the results of the study.

9.4 The general components contained in the actual watershed studies shall be the following items:

9.4.1 Stormwater quantity or water quality problem identification,

9.4.2 The overall needs of the watershed including the additional impacts of new development activities,

9.4.3 Alternative approaches to address the existing and future problems,

9.4.4 A selected approach that includes the overall costs and benefits,

9.4.5 Schedule for implementation,

9.4.6 Funding sources that are available for the actual implementation of study recommendations, and

9.4.7 A public hearing process prior to final Departmental approval.

9.5 The following goals are to be obtained through the implementation of the Designated Watershed or Subwatershed program:

9.5.1 Reduction of existing flooding or water quality impacts,

9.5.2 Prevention of future flooding or water quality impacts, and

9.5.3 Minimization of economic and social losses.

9.6 Specific plan components of a water quality watershed study shall include, but not be limited to, the following items:

9.6.1 The limits of the watershed,

9.6.2 An inventory of existing water quality data,

9.6.3 An inventory of areas having significant natural resource value as defined in existing State or local studies as they may be impacted by the construction or location of stormwater control structures,

9.6.4 An inventory of areas of historical and archaeological value identified in existing State or local studies as they may be impacted by the construction or location of stormwater control structures,

9.6.5 A map or series of maps of the watershed showing the following information:

9.6.5.1 Watershed topography,

9.6.5.2 Significant geologic formations,

9.6.5.3 Soils information,

9.6.5.4 Existing land use based on existing zoning,

9.6.5.5 Proposed land use based on expected zoning or comprehensive plans,

9.6.5.6 Location of tidal and nontidal wetlands, and

9.6.5.7 Locations where water quality data were obtained.

9.6.6 An evaluation of water quantity concerns so that flooding does not become a problem in the watershed.

9.7 Specific components of a water quantity based study shall include, but not be limited to, the following items:

9.7.1 The limits of the watershed,

9.7.2 An inventory of historic flood damage sites, including frequency and damage estimates,

9.7.3 An inventory of areas of significant natural resource value as noted in existing State and local studies as they may be impacted by the construction or location of stormwater control structures,

9.7.4 An inventory of areas of historical and archaeological value identified in existing State and local studies as they may be impacted by the construction or location of stormwater control structures,

9.7.5 A map or series of maps of the watershed showing the following information:

9.7.5.1 Watershed topography,

9.7.5.2 Soils information,

9.7.5.3 Existing land use based on existing zoning,

9.7.5.4 Proposed land use based on expected zoning or comprehensive plans,

9.7.5.5 Locations of tidal and nontidal wetlands,

9.7.5.6 Locations of existing flooding problems including floor and corner elevations of structures already impacted, and

9.7.5.7 100 year floodplain delineations, water surface profiles, and storm hydrographs at selected watershed location.

9.7.6 An evaluation of water quality concerns so that water quality degradation does not become a problem in the watershed.

9.8 The initiation of studies for Designated Watersheds or Subwatersheds depends on the availability of funding for the study. Once a watershed has been designated, the Department will make every effort to secure funding through federal, State, or local means.

9.9 The Department is designated as the agency responsible for administering designated watershed or subwatershed studies with the advice of the advisory group appointed by the Secretary. Recommendations based on the results of the watershed study will only be made with the overall consent of the advisory group.

9.10 The formal results of the Designated Watershed or Subwatershed study will require formal acceptance by the local Conservation District Board of Supervisors and the local governing body of the appropriate county or municipality.

9.11 Implementation of the results of the Designated Watershed or Subwatershed study will necessitate the development and implementation of a dedicated funding source such as a stormwater utility to ensure design, construction, and maintenance of needed structures is accomplished.

9.12 Those watersheds or subwatersheds designated due to existing water quantity or water quality problems include the following:

9.12.1 Dover/Silver Lake/St. Jones River and all drainage areas upstream of the Silver Lake dam.

10.0 Specific Design Criteria and Minimum Standards and Specifications

10.1 General submission requirements for all projects requiring sediment and stormwater management approval include the following information:

10.1.1 A standard application form,

10.1.2 A vicinity map indicating north arrow, scale, and other information necessary to locate the property or tax parcel,

10.1.3 A plan at an appropriate scale accompanied by a design report and indicating at least:

10.1.3.1 Name and address of:

10.1.3.1.1 The owner of the property where the project is proposed;

10.1.3.1.2 The land developer; and

10.1.3.1.3 The applicant.

10.1.3.2 The existing and proposed topography, as required on a case by case basis.

10.1.3.3 The proposed grading and earth disturbance including:

10.1.3.3.1 Surface area involved; and

10.1.3.3.2 Limits of grading including limitation of mass clearing and grading whenever possible.

10.1.3.4 Stormwater management and stormwater drainage computations, including:

10.1.3.4.1 Pre- and post-development velocities, peak rates of discharge, and inflow and outflow hydrographs of stormwater runoff at all existing and proposed points of discharge from the site,

10.1.3.4.2 Site conditions around points of all surface water discharge including vegetation and method of flow conveyance from the land disturbing activity, and

10.1.3.4.3 Design details for structural controls.

10.1.3.5 Erosion, sediment control, and stormwater management provisions including:

10.1.3.5.1 Provisions to preserve top soil and limit disturbance;

10.1.3.5.2 Details of site grading, and;

10.1.3.5.3 Design details for structural controls which includes diversions and swales.

10.1.4 Federal Emergency Management Agency flood maps and federal and State protected wetlands, where appropriate.

10.1.5 The appropriate plan approval agency shall require that plans and design reports be sealed by a qualified design professional that the plans have been designed in accordance with approved sediment and stormwater ordinances, regulations, standards and criteria. The appropriate plan approval agency may waive this requirement on a case by case basis.

10.1.6 Additional information necessary for a complete project review may be required by the appropriate plan approval agency as deemed appropriate. This additional information may include items such as public sewers, water lines, septic fields, wells, etc.

10.2 Specific requirements for the erosion and sediment control portion of the sediment and stormwater management plan approval process include, but are not limited to, the following items. The appropriate plan approval agency may modify the following items for a specific project or type of project. Modification for a specific type of project will require the concurrence of the Department before that modification may be applied and that modification shall be subject to public review and comment prior to adoption.

10.2.1 All plans shall include details of temporary and permanent stabilization measures including placement of the following statement on all plans submitted for approval. Following soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within 14 calendar days as to the surface of all perimeter sediment controls, topsoil stockpiles, and all other disturbed or graded areas on the project site.

These requirements do not apply to those areas which are shown on the plan and are currently being used for material storage, or for those areas on which actual earth moving activities are currently being performed.

10.2.2 All plans shall be consistent with the standards and specifications contained in the Delaware Erosion and Sediment Control Handbook, and approved supplements. The supplements shall be subject to public review and comment prior to their incorporation in the Erosion and Sediment Control Handbook.

10.2.3 A sequence of construction shall be contained on all plans describing the relationship between the implementation and maintenance of sediment controls, including permanent and temporary stabilization and the various stages or phases of earth disturbance and construction. The sequence of construction shall, at a minimum, include the following activities:

10.2.3.1 Clearing and grubbing for those areas necessary for installation of perimeter controls;

10.2.3.2 Construction of perimeter controls;

10.2.3.3 Remaining clearing and grubbing;

10.2.3.4 Road grading;

10.2.3.5 Grading for the remainder of the site;

10.2.3.6 Utility installation and whether stormdrains will be used or blocked until after completion of construction;

10.2.3.7 Final grading, landscaping, or stabilization; and

10.2.3.8 Removal of sediment controls.

10.2.4 The plans shall contain a description of the predominant soil types on the site, as described by the appropriate soil survey information available through the local Conservation District.

10.2.5 Unless an exception is approved on a case by case basis or an exception is approved for a specific type of activity by the appropriate plan approval agency, not more than 20 acres may be cleared at any one time. Once grading is initiated in one 20 acre section, a second 20 acre section may have stumps, roots, brush, and organic material removed. This will necessitate the phasing of construction on sites in excess of 20 acres to minimize areas exposed of ground cover and reduce erosion rates. Grading of the second 20 acre section may not proceed until temporary or permanent stabilization of the first 20 acre section is accomplished.

10.3 Specific requirements for the permanent stormwater management portion of the sediment and stormwater management plan approval process include, but are not limited to, the following items. The appropriate plan approval agency may modify the following items for a specific project or type of project. Modification for a specific type of project will require the concurrence of the Department before the modification may be applied and the modification for a type of project shall be subject to public review and comment.

10.3.1 It is the overall goal of the Department to utilize stormwater management as a means to minimize water quantity and water quality impacts due to land disturbing activities and to mimic pre-development hydrology, to the maximum extent practicable, in regards to the rate, volume and duration of flow. These regulations will provide general design requirements that must be adhered to in the absence of Designated Watershed or Subwatershed specific criteria.

10.3.2 All hydrologic computations shall be accomplished using the methodologies from the most recent U.S.D.A. Natural Resources Conservation Service Technical Releases 20 or 55, or other methods as approved by the Department. The storm duration for computational purposes shall be the 24 hour rainfall event. For projects south of the Chesapeake and Delaware Canal, the Delmarva Unit Hydrograph shall be incorporated into the design procedure.

10.3.3 Stormwater management requirements for a specific project shall be based on the entire area to be developed, or if phased, the initial submittal shall control that area proposed in the initial phase and establish a procedure and obligation for total site control.

10.3.4 Water quantity control is an integral component of overall stormwater management. Control of peak discharges will, to some extent, prevent increases in flooding. The following design criteria for peak flow control is established for water quantity control purposes, unless a waiver is granted based on a case-by-case basis:

10.3.4.1 Projects in New Castle County that are located north of the Chesapeake and Delaware Canal shall not exceed the post-development peak discharge for the 2, 10, and 100 year frequency storm events at the pre-development peak discharge rates for the 2, 10, and 100 year frequency storm events.

10.3.4.2 Projects in New Castle County that are located south of the Chesapeake and Delaware Canal, Kent County, and Sussex County shall not exceed the post-development peak discharge for the 2 and 10 year frequency storm events at the pre-development peak discharge rates for the 2 and 10 year frequency storm events.

10.3.4.3 Watersheds, other than Designated Watersheds or Subwatersheds, that have well documented water quantity problems may have more stringent, or modified, design criteria that is responsive to the specific needs of that watershed. Modified criteria for that watershed must receive Departmental approval, and all projects reviewed and approved by the appropriate plan approval agency shall meet or exceed the modified criteria. Proposed modification of criteria for a watershed shall be subject to public review and comment prior to implementation.

10.3.4.4 In addition to the peak flow control design criteria contained in this Section, projects in the Mill Creek, Little Mill Creek, Red Clay Creek, White Clay Creek, Persimmon Creek and Shellpot Creek watersheds shall demonstrate successful management of any increase in stormwater runoff volume from pre-development land use conditions. Successful management of increased stormwater volume shall include but not be limited to; recharge, infiltration and re-use where soils and site conditions are applicable. For any increase in volume that cannot be recharged, infiltrated or re-used, volume management may be achieved by modifying the release rate for the increase in volume so as not to increase the flood elevation for all storms up to and including the 100 year return period.

10.3.5 Water quality control is also an integral component of stormwater management. Control of runoff from small, frequent rainfall events on-site will minimize further degradation of downstream water quality and habitat. The following design criteria are established for water quality protection unless a waiver or variance is granted on a case-by-case basis.

10.3.5.1 In general, the preferred option for water quality protection shall be those practices collectively referred to as "Green Technology BMP's". Other practices shall be considered only after preferred practices have been eliminated for engineering or hardship reasons as approved by the appropriate plan approval agency.

10.3.5.2 Water quality practices shall be designed to manage the rate and volume of flow from the 2.0" NRCS Type II rainfall event, up to a maximum of 1.0" of runoff.

10.3.5.3 Alternative stormwater quality practices may be acceptable to the Department and/ or the plan approval agency if the removal efficiency for suspended solids meets or exceeds 80% as demonstrated by scientifically independent evaluation and monitoring performance data.

10.3.5.4 The Department and/or the plan approval agency may require other acceptable stormwater quality practices if a receiving waterbody has been identified as impaired, or designated with a specific pollutant reduction target necessary to meet State of Delaware water quality regulations.

10.3.5.5 Water quality practices may also be acceptable to the Department and/or the plan approval agency if they are designed to reduce pollutant loading from a specific post-development source. The Department and/or the plan approval agency will determine if this criterion for water quality Best Management Practices is appropriate.

10.3.5.6 The Department will develop policy and maintain documentation related to the performance of water quality practices. The Department will also provide guidance for the design, appropriate use and required maintenance of water quality practices. These shall include structural and non-structural practices in addition to source reduction management strategies.

10.3.5.7 The Department and/or the plan approval agency will review the specific water quality practices proposed in a Sediment and Stormwater Management Plan, and review, approve or deny approval of the plan based on the criteria specified in Section E. of these regulations.

10.3.6 All ponds that are constructed for stormwater management shall be designed and constructed in accordance with the U.S.D.A. Soil Conservation Service Small Pond Code 378, dated September, 1990, as approved for use in Delaware.

10.3.7 Any pond utilized for water supply purposes, or for irrigation, must obtain approval from the Department for that use pursuant to Chapter 60.

10.3.8 Where ponds are the proposed method of control, the developer shall submit to the approving agency, when required, an analysis of the impacts of stormwater flows downstream in the watershed for the 100 year frequency storm event.

The analysis shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development, with and without the pond, on downstream dams, highways, structures, or natural points of constricted streamflows past which the timing effects would be considered negligible. The results of the analysis will determine the need to modify the pond design or to eliminate the pond requirement. Lacking a clearly defined downstream point of constriction, the downstream impacts shall be established, with the concurrence of the approving agency, downstream of a tributary of the following size:

10.3.8.1 The first downstream tributary whose drainage area equals or exceeds the contributing area to the pond; or

10.3.8.2 The first downstream tributary whose peak discharge exceeds the largest designed release rate of the pond.

10.3.9 Where existing wetlands are intended as a component of an overall stormwater management system, the following criteria shall be adhered to:

10.3.9.1 The only disturbance to the wetland, for the purposes of these regulations, shall be that disturbance caused by the stormwater management pond embankment placement and construction; or

10.3.9.2 The applicant can demonstrate that the intended or functional aspects of the stormwater management facility and wetlands are maintained or enhanced, or the construction in the wetland for stormwater management is the only reasonable alternative.

10.3.9.3 All other necessary State and federal permits can be obtained.

10.3.10 Designs shall be in accordance with standards developed or approved by the Department, which are subject to public review and comment.

10.3.11 Ease of maintenance must be considered as a site design component. Access to the stormwater management structure must be provided for in the design, and land area adjacent to the structure must be set aside for disposal of sediments removed from the structure when maintenance is performed. The land set aside for pond maintenance shall be sized as follows:

10.3.11.1 The set aside area shall accommodate at least 2% of the stormwater management basin volume to the elevation of the 2 year storage volume elevation;

10.3.11.2 The maximum depth of the set aside volume shall be one foot;

10.3.11.3 The slope of the set aside area shall not exceed 5%; and

10.3.11.4 The area and slope of the set aside area may be modified if an alternative area or method of disposal is approved by the appropriate plan approval agency.

10.3.12 A clear statement of defined maintenance responsibility shall be established during the plan review and approval process.

10.3.13 All ponds shall have a forebay or other design feature to act as a sediment trap. A reverse slope bench must be provided one foot above the normal pool elevation for safety purposes and all embankment ponds, having a normal pool, shall have a drain installed to facilitate maintenance.

10.3.14 The use of infiltration practices for the disposal of stormwater runoff is classified by the USEPA as an underground injection control practice, class V injection well. The appropriate plan approval agency shall forward a copy of all such approvals and the results of all construction inspections to the Department's Underground Injection Control program manager.

10.3.15 Infiltration practices have certain limitations on their use on certain sites. These limitations include the following items:

10.3.15.1 Areas draining to these practices must be stabilized and vegetative filters established prior to runoff entering the system. Infiltration practices shall not be used if a suspended solids filter system does not accompany the practice. If vegetation is the intended filter, there shall be, at least, a 20 foot length of vegetative filter prior to stormwater runoff entering the infiltration practice;

10.3.15.2 The bottom of the infiltration practice shall be at least three feet above the seasonal high water table, whether perched or regional, determined by direct piezometer measurements which can be demonstrated to be representative of the maximum height of the water table on an annual basis during years of normal precipitation, or by the depth in the soil at which mottling first occurs;

10.3.15.3 The infiltration practice shall be designed to completely drain of water within 48 hours.

10.3.15.4 Soils must have adequate permeability to allow water to infiltrate. Infiltration practices are limited to soils having an infiltration rate of at least 1.02 inches per hour.

Initial consideration will be based on a review of the appropriate soil survey, and the survey may serve as a basis for rejection. On-site soil borings and textural classifications must be accomplished to verify the actual site and seasonal high water table conditions when infiltration is to be utilized.

10.3.15.5 Infiltration practices greater than three feet deep shall be located at least 20 feet from basement walls;

10.3.15.6 Infiltration practices designed to handle runoff from impervious parking areas shall be a minimum of 150 feet from any public or private water supply well;

10.3.15.7 The design of an infiltration practice shall provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall; and

10.3.15.8 The slope of the bottom of the infiltration practice shall not exceed five percent. Also, the practice shall not be installed in fill material as piping along the fill/natural ground interface may cause slope failure.

10.3.15.9 Unless allowed on a specific project, infiltration practices will be used primarily for water quality enhancement only.

10.3.15.10 An infiltration practice shall not be installed on or atop a slope whose natural angle of incline exceeds 20%.

10.3.16 A regional approach to stormwater management is an acceptable alternative to site specific requirements. As a substitute control practice, regional stormwater management structures shall be required to meet the following items:

10.3.16.1 They shall have a contributory drainage area not in excess of 400 acres unless, on a case by case basis, a larger drainage area is approved by the appropriate plan approval agency;

10.3.16.2 They shall have a permanent pool of water and provide for 24 hour detention of the first inch of stormwater runoff from the entire upstream watershed; and

10.3.16.3 All other necessary approvals have been obtained that could be cause for site rejection.

10.3.17 The pre-development peak discharge rate shall be computed assuming that all land uses in the site to be developed are in good hydrologic condition.

8 DE Reg. 1172 (2/01/05)

10 DE Reg. 735 (10/01/06)

11.0 Standard Plan Criteria

11.1 Approval under this section involves submission of a standard plan by a land owner, developer, or agent to the appropriate plan approval agency. The minimum criteria for the standard plan will be developed by the Department, and may be expanded upon by the appropriate plan approval agency. The standard plan will contain standard conditions for erosion and sediment control that must be implemented on sites where a detailed plan is not required. The appropriate plan approval agency shall approve or deny standard plan requests within 14 calendar days of receipt.

11.2 The inclusion of an activity into the standard plan classification does not relinquish that activity from the requirements of Chapter 40. Rather, the standard plan precludes that activity from the necessity of a detailed plan review for each individual project.

11.3 Approval of a standard plan does not relieve the applicant from the conditions that are a part of the standard plan approval regarding the implementation of control practices as required by the standard plan. Failure to implement control practices pursuant to conditions included in the general permit standard plan may necessitate appropriate enforcement action as provided in Chapter 40 and these regulations.

11.4 Those activities eligible for standard plans include the following, when the stormwater management requirements have been waived in accordance with Section 3 of these Regulations:

11.4.1 Individual detached residential home or agricultural structure construction where the disturbed area for construction will be less than one acre in size. Two or more contiguous lots being developed concurrently by the same land developer will not be eligible for the standard plan.

11.4.2 Highway shoulder and side swale maintenance.

11.4.3 The repair, maintenance, and installation of above and underground utilities.

11.4.4 Minor Commercial, Institutional, and industrial projects where the total disturbed area will be less than one acre.

11.4.5 Modification or reconstruction of a tax ditch by a tax ditch organization when that tax ditches not intended to serve new development, and which will not increase water quantity or adversely impact water quality, or change points of discharge so as to adversely affect the waters of the State.

11.5 The appropriate plan approval agency may place more restrictive conditions upon the standard plan approval including the requirement for detailed plans for any standard plan category. The imposition of more specific requirements for categories of projects shall be approved by the Department, and shall be subject to public review and comment prior to their imposition.

8 DE Reg. 1172 (2/01/05)

12.0 Certified Construction Reviewer Requirements

12.1 Projects reviewed and approved by the Department for sediment control and stormwater management, in general, shall have a certified construction reviewer when the disturbed area of the project is in excess of 50 acres. In addition any project, regardless of its size, may be required by the Department, or the appropriate plan approval agency, to have a certified construction reviewer on a case by case basis.

12.2 The Department or the appropriate inspection agency may require that any project, already under construction, have on site a certified construction reviewer if, on that project, significant sediment control or stormwater management problems necessitate more frequent inspections.

12.3 The certified construction reviewer shall function under the direction of a registered professional engineer licensed to practice engineering in the State of Delaware.

12.4 Individuals designated as certified construction reviewers shall attend and pass a Departmental sponsored or approved construction review training course. The course content will contain, at a minimum, information regarding the following items:

12.4.1 Basic hydrology and hydraulics;

12.4.2 Soils information including texture, limitations, erodibility, and classifications;

12.4.3 Types of vegetation, growing times, and suitability;

12.4.4 Erosion, sediment control, and stormwater management practices;

12.4.5 Inspection and problem referral procedures;

12.4.6 Aspects of State law, regulations, local ordinances, and approval procedures: and

12.4.7 Sediment and stormwater management plan content.

12.5 The time frame for certification shall not exceed five years unless extended by the Department.

12.6 The responsibility of the certified construction reviewer will be to ensure the adequacy of construction pursuant to the approved sediment and stormwater management plan.

12.7 The certified construction reviewer shall be responsible for the following items:

12.7.1 Provision of a construction review of active construction sites on at least a weekly basis;

12.7.2 Within five calendar days, informing the person engaged in the land disturbing activity, and the contractor, by a written construction review report of any violations of the approved plan or inadequacies of the plan. The plan approval agency shall be informed, if the approved plan is inadequate, within five working days. In addition, the appropriate construction review agency shall receive copies of all construction review reports; and

12.7.3 Referral of the project through the delegated inspection agency to the Department for appropriate enforcement action if the person engaged in the land disturbing activity fails to address the items contained in the written construction review report. Verbal notice shall be made to the Department within two working days and written notice shall be provided to the Department within five working days.

12.8 If the Secretary or his designee determines that a certified construction reviewer is not providing adequate site control or is not referring problem situations to the Department, the Secretary or his designee may suspend or revoke the certification of the construction reviewer.

12.9 In any situation where a certified construction reviewer's approval is being suspended or revoked, an opportunity for hearing before the Secretary or his designee shall be provided. During any suspension or revocation, the certified construction reviewer shall not be allowed to provide construction reviews pursuant to these regulations. The minimum time of suspension or revocation shall be 6 months.

13.0 Contractor Certification Program

13.1 The Department shall require certification of responsible personnel for any foreman or superintendent who is in charge of on-site clearing and land disturbing activities for sediment and stormwater control associated with a construction project. Responsible personnel are not required on any project involving silvaculture or fewer than four residential homes. Responsible personnel shall obtain certification by completing a Department sponsored or approved training program. Enrollment of existing and future responsible personnel is the responsibility of employers. Response to a Department notice of training and certification in accordance with the provisions of item 3 of this section shall serve as an application for training. The Department shall notify employers of responsible personnel as to the date and location of training programs for attendance by responsible personnel and other interested persons.

13.2 After July 1, 1991, any applicant seeking sediment and stormwater plan approval shall certify to the appropriate plan approval agency that all responsible personnel involved in the construction project will have a certificate of attendance at a Departmental sponsored or approved training course for the control of sediment and stormwater before initiation of any land disturbing activity. The certificate of

attendance shall be valid until the Department notifies the individual or announces in local newspapers that recertification is required due to a change in course content.

13.3 After July 1, 1991, employers of responsible personnel may receive interim certification for responsible personnel during the period before attendance at a Departmental sponsored or approved training course by submitting an enrollment form to the Department. Interim certification shall be valid until the scheduled date of attendance for training of responsible personnel. These enrollment forms are available from the Department and the Conservation Districts.

14.0 Construction Review and Enforcement Requirements

14.1 The land developer shall request, at least 24 hours ahead of time, that the appropriate inspection agency approve work completed at the stages of construction outlined in the sequence of construction contained on the approved plans. Any portion of the work which does not comply will be promptly corrected by the developer after written notice by the appropriate inspection agency. The notice shall set forth the nature of corrections required and the time frame within which corrections must be made.

14.2 The land developer shall notify the appropriate inspection agency before initiation of construction and upon project completion when a final inspection will be conducted to ensure compliance with the approved sediment and stormwater management plan.

14.3 The responsible inspection agency shall, for inspection purposes, do all of the following items:

14.3.1 Ensure that the approved sediment and stormwater management plans are on the project site and are complied with;

14.3.2 Ensure that every active site is inspected for compliance with the approved plan on a regular basis;

14.3.3 Prepare and leave on site, or forward to the contractor, a written report after every inspection that describes:

14.3.3.1 The date and location of the site inspection;

14.3.3.2 Whether the approved plan has been properly implemented and maintained;

14.3.3.3 Approved plan or practice deficiencies; and

14.3.3.4 The action taken.

14.3.4 Notification of on-site personnel or the owner/developer in writing when violations are observed, describing the:

14.3.4.1 Nature of the violation;

14.3.4.2 Required corrective action; and

14.3.4.3 Time period for violation correction.

14.4 The Department may investigate complaints or refer any complaint received to the local inspection agency if the activity is located in a jurisdiction that has received delegation of sediment and stormwater management inspection. In conjunction with a referral, the Department may also initiate an on-site investigation after notification of the local inspection agency in order to properly evaluate the complaint. The Department shall take enforcement action when appropriate, and notify the local inspection agency in a timely manner of any enforcement actions taken.

14.5 The Department, at its discretion and upon notification to either the owner, developer, or contractor, may visit any site to determine the adequacy of sediment and stormwater management practices. In the event that the Department conducts site inspections, the appropriate inspection agency shall be notified prior to the initiation of any enforcement action. The appropriate inspection agency shall establish a time frame to obtain site compliance. This notification shall, in no way limit the right to the Department to take action subsequent to any provision of these regulations or Chapter. Formal procedures for interaction between the Department and the appropriate inspection agency on site inspection and referral will be developed on an individual basis.

14.6 The appropriate plan approval agency may require a revision to the approved plans as necessary due to differing site conditions. The appropriate plan approval agency shall establish guidelines to facilitate the processing of revised plans where field conditions necessitate plan modification. Where changes to the approved plan are necessary those changes shall be in accordance to the following:

14.6.1 Major changes to approved sediment and stormwater management plans, such as the addition or deletion of a sediment basin, shall be submitted by the owner/developer to the appropriate plan approval agency for review and approval.

14.6.2 Minor changes to sediment and stormwater management plans may be made in the field if approved by the construction reviewer and documented in the field review report. The appropriate inspection agency shall develop a list of allowable field modifications for use by the construction reviewer.

14.7 Stormwater management construction shall have inspections accomplished at the following stages:

14.7.1 Infiltration practices shall be inspected at the commencement, during, and upon completion of construction;

14.7.2 All ponds shall be inspected at the following stages:

14.7.2.1 Upon completion of excavation to sub-foundation and where required, installation of structural supports or reinforcement for structures, including, but not limited to;

14.7.2.1.1 Core trenches for structural embankments,

14.7.2.1.2 Inlet-outlet structures and anti-seep structures, watertight connectors on pipes, and

14.7.2.1.3 Trenches for enclosed storm drainage facilities.

14.7.2.2 During placement of structural fill, concrete, and installation of piping and catch basins;

14.7.2.3 During backfill of foundations and trenches;

14.7.2.4 During embankment construction; and

14.7.2.5 Upon completion of final grading and establishment of permanent vegetation.

14.8 The agency responsible for construction review may, in addition to local enforcement options, refer a site violation to the Department for additional enforcement action.

14.9 Referral of a site violation to the Department may initiate a Departmental construction review of the site to verify site conditions. That construction review may result in the following actions:

14.9.1 Notification through appropriate means to the person engaged in a land disturbing activity and the contractor to comply with the approved plan within a specified time frame; and

14.9.2 Notification of plan inadequacy, with a time frame for the person engaged in a land disturbing activity to submit a revised sediment and stormwater plan to the appropriate plan approval agency and to receive its approval with respect thereto.

The Department shall notify the local inspection agency in a timely manner of what enforcement action is taken on the site.

14.10 Failure of the person engaged in the land disturbing activity or the contractor to comply with Departmental requirements may result in the following actions in addition to other penalties as provided in Chapter 40.

14.10.1 The Department shall have the power to issue a cease and desist order to any person violating any provision of Chapter 40 and these regulations by ordering such person to cease and desist from any site work activity other than those actions necessary to achieve compliance with any administrative order.

14.10.2 The Department may request that the appropriate plan approval agency refrain from issuing any further building or grading permits to the person having outstanding violations until those violations have been remedied.

15.0 Maintenance Requirements

15.1 For erosion and sediment control, all practices shall be maintained in accordance with requirements specified in the Delaware Sediment and Erosion Control Handbook dated 1989 or as directed by the construction reviewer.

15.2 Prior to the issuance of any building or grading permit for which stormwater management is required, the responsible plan approval agency shall require the applicant or owner to execute an

inspection and maintenance agreement binding on all subsequent owners of land served by the private stormwater management facility. Such agreement shall provide for access to the facility at reasonable times for regular inspection by an inspection agency and for an assessment of property owners to ensure that the stormwater management structure is maintained in proper design working condition.

15.3 The Department encourages, and will provide technical assistance to, any Conservation District or local jurisdiction who chooses to assume the maintenance responsibility for stormwater management structures on, at least, residential lands. Public maintenance provides a reasonable assurance that maintenance will be accomplished on a regular basis.

15.4 The owner or person responsible shall perform or cause to be performed preventive maintenance of all completed stormwater management practices to ensure proper functioning. The responsible inspection agency shall ensure preventive maintenance through inspection of all stormwater management practices. The inspections shall occur at least once each year.

15.5 Inspection reports shall be maintained by the responsible inspection agency on all detention and retention structures and those inspection reports shall include the following items:

15.5.1 The date of inspection;

15.5.2 The name of the inspector;

15.5.3 The condition of:

15.5.3.1 Vegetation,

15.5.3.2 Fences,

15.5.3.3 Spillways,

15.5.3.4 Embankments,

15.5.3.5 Reservoir area,

15.5.3.6 Outlet channels,

15.5.3.7 Underground drainage,

15.5.3.8 Sediment load, or

15.5.3.9 Other items which could effect the proper function of the structure.

15.5.4 Description of needed maintenance.

15.6 Responsible inspection agencies shall provide procedures to ensure that deficiencies indicated by inspections are rectified. The procedures shall include the following:

15.6.1 Notification to the person responsible for maintenance of deficiencies including a time frame for repairs;

15.6.2 Subsequent inspection to ensure completion of repairs; and

15.6.3 Effective enforcement procedures or procedures to refer projects to the Department if repairs are not undertaken or are not done properly.

16.0 Penalties

16.1 Any person who violates any rule, order, condition imposed in an approved plan or other provision of these regulations shall be fined not less than $200 or more than $2,000 for each offense. Each day that the violation continues shall constitute a separate offense. The Justice of the Peace Courts shall have jurisdiction of offenses brought under this subsection.

16.2 Any person who intentionally, knowingly, and after written notice to comply, violates or refuses to comply with any notice issued pursuant to these regulations shall be fined not less than $500 or more than $10,000 for each offense. Each day the violation continues shall constitute a separate offense. The Superior Court shall have jurisdiction of offenses brought under this subsection.

17.0 Hearings

The conduct of all hearings conducted pursuant to these regulations shall be in accordance with the relevant provisions of 7 **Del.C.** Ch. 60.

18.0 Severability

If any section, subsection, sentence, clause, phrase, or portion of these regulations are for any reason held invalid or unconstitutional by any court or competent jurisdiction, such provision and such holding shall not affect the validity of the remaining portions of these regulations.

7 DE Reg. 1147 (3/1/04)

Appendix E-8. Endangered Species

Endangered Species Act
DE Code Title 7, Part I, Chapter 6
Source: http://delcode.delaware.gov/title7/c006/index.shtml, accessed June 1, 2012.

§ 601. Importation of endangered species or hides, parts or articles made therefrom.

Notwithstanding any other provision of this title, the importation, transportation, possession or sale of any endangered species of fish or wildlife, or hides or other parts thereof, or the sale or possession with intent to sell any article made in whole or in part from the skin, hide or other parts of any endangered species of fish or wildlife is prohibited, except under license or permit from the Division of Fish and Wildlife. For the purposes of this section, endangered species shall mean those species of fish and wildlife designated by the Division of Fish and Wildlife as seriously threatened with extinction. Such a list shall in any event include, but not be limited to, endangered species as so designated by the Secretary of the Interior.

7 Del. C. 1953, § 601; 58 Del. Laws, c. 65.;

§ 602. Sale of skins, bodies or animals of certain species prohibited.

No part of the skin or body, whether raw or manufactured, of the following species of wild animals or the animal itself may be sold or offered for sale by any individual, firm, corporation, association or partnership within the State: All endangered species as designated by the United States Department of the Interior; leopard (panthera pardus); snow leopard (uncia uncia); clouded leopard (neofelis nebulosa); tiger (panthera tigris); cheetah (acinonyx jubatus); alligators, crocodiles or caiman; vicuna (vicugna vicugna); red wolf (canis niger); polar bear (thalarctos maritimus); and harp seals (phoca groenlandica).

7 Del. C. 1953, § 602; 58 Del. Laws, c. 65; 58 Del. Laws, c. 252, § 1.;

§ 603. Enforcement.

Any officer or agent authorized by the Secretary of the Department of Natural Resources and Environmental Control or any officer or agent authorized by the Director of the Division of Fish and Wildlife, or any police officer of the State, or any police officer of any municipality within the State, has authority to execute any warrant in search for and seizure of any goods, merchandise or wildlife sold or offered for sale in violation of this chapter, or any property or item used in connection with a violation of this chapter; such goods, merchandise, wildlife or property shall be held pending proceedings in any court of proper jurisdiction. Upon conviction, such seized goods, merchandise or wildlife shall be forfeited and, upon forfeiture, either offered to a recognized institution for scientific or educational purposes, or destroyed.

7 Del. C. 1953, § 603; 58 Del. Laws, c. 65.;

§ 604. Permits for importation of certain fish or wildlife.

The Director of the Division of Fish and Wildlife may permit, under such terms and conditions as he or she may prescribe, the importation of any species or subspecies of fish or wildlife listed in this chapter for zoological, educational, and scientific purposes and for the propagation of such fish or wildlife in captivity for the preservation of a species, unless such importation is prohibited by any federal law or regulation.

7 Del. C. 1953, § 604; 58 Del. Laws, c. 65; 70 Del. Laws, c. 186, § 1.;

§ 605. Penalty.

Whoever violates this chapter shall be guilty of a class A environmental misdemeanor for each offense.

70 Del. Laws, c. 275, § 42.;

List of Endangered Species of Delaware

Division of Fish and Wildlife, Department of Natural Resources and Environmental Control
Source: http://www.dnrec.delaware.gov/fw/NHESP/information/Pages/Endangered.aspx, accessed June 1, 2012.

(Effective March 1, 2011)

Birds

- Brown Creeper[BR] (Certhia americana)
- Bald Eagle (Haliaeetus leucocephalus)
- Pied-billed Grebe[BR] (Podilymbus podiceps)
- Northern Harrier[BR] (Circus cyaneus)
- Cooper's Hawk[BR] (Accipiter cooperii)
- Black-Crowned Night Heron (Nycticorax nycticorax)
- Yellow-Crowned Night Heron (Nyctanassa violacea)
- Northern Parula[BR] (Parula americana)
- Piping Plover[T](Charadrius melodus)
- Short-eared Owl[BR] (Asio flammeus)
- American Oystercatcher (Haematopus palliatus)
- Black Rail (Laterallus jamaicensis)
- Upland Sandpiper (Bartramia longicauda)
- Loggerhead Shrike (Lanius ludovicianus)
- Black Skimmer (Rynchops niger)
- Henslow's Sparrow (Ammodramus henslowii)
- Common Tern[BR] (Sterna hirundo)
- Forster's Tern[BR] (Sterna forsteri)
- Least Tern (Sterna antillarum)
- Cerulean Warbler (Dendroica cerulea)
- Hooded Warbler[BR] (Wilsonia citrina)
- Swainson's Warbler (Limnothlypis swainsonii)
- Red-headed Woodpecker (Melanerpes erythrocephalus)
- Sedge Wren (Cistothorus platensis)

Reptiles

- Leatherback Sea Turtle[E] (Dermochelys coriacea)
- Atlantic Ridley Sea Turtle[E] (Lepidochelys kempii)
- Green Sea Turtle[T] (Chelonia mydas)
- Loggerhead Sea Turtle[T] (Caretta caretta)
- Bog Turtle[T] (Clemmys muhlenbergii)
- Corn Snake (Elaphe guttata guttata)

Amphibians

- Eastern Tiger Salamander (Ambystoma tigrinum tigrinum)

- Barking Treefrog (Hyla gratiosa)

Mammals

- Delmarva Fox Squirrel [E] (Sciurus niger cinereus)

Fish

- Atlantic Sturgeon (Acipenser oxyrhynchus)

Mollusks

- Yellow Lampmussel (Lampsilis cariosa)
- Eastern Lampmussel (Lampsilis radiata)
- Dwarf Wedgemussel[E] (Alasmidonta heterodon)
- Eastern Pondmussel (Ligumia nasuta)
- Brook Floater (Alasmidonta varicosa)
- Tidewater Mucket (Leptodea ochracea)

Insects

- Little White Tiger Beetle (Cicindela lepida)
- White Tiger Beetle (Cicindela dorsalis)
- Seth Forest Scavenger Beetle (Hydrochus sp.)
- Frosted Elfin (Incisalia irus)
- Bethany Firefly (Photuris bethaniensis)
- Hessel's Hairstreak (Mitoura hesseli)
- King's Hairstreak (Satyrium kingi)
- Rare Skipper (Problema bulenta)
- Mulberry Wing (Poanes massasoit chermocki)

BR - Breeding population only

T - Federally listed Threatened Species

E - Federally listed Endangered Species

Appendix E-9. Division of Fish and Wildlife Regulations

Division of Fish and Wildlife, Department of Natural Resources and Environmental Control
Source: http://regulations.delaware.gov/AdminCode/title7/3000/3900%20Wildlife/3900.shtml#TopOfPage, accessed June 1, 2012.

3900 Wildlife

1.0 Definitions

For purposes of Regulations 1.0 through 22.0, the following words and phrases shall have the meaning ascribed to them, unless the context clearly indicates otherwise:

"Administered by the Division" shall mean owned, leased or licensed by the Division.

"Antlered Deer" shall mean any deer with one or more antlers three inches long or longer, measured from the base of the antler where it joins the skull to the tip of the antler following any curve of the antler.

"Antlerless Deer" shall mean any deer that has no antlers or antlers less than three inches in length.

"Bait" shall mean any nontoxic food material, compound or mixture of ingredients which wildlife is able to consume.

"Baited Field" shall include any farm field, woodland, marsh, water body or other tract of land where minerals, grain, fruit, crop or other nontoxic compounds have been placed to attract wildlife to be hunted.

"Black Powder" shall mean a manufacturer's approved muzzleloading propellant.

"Deer" shall mean white-tailed deer (*Odocoileus virginianus*) and/or Sika deer (*Cervus nippon*).

"Director" shall mean the Director or Acting Director of the Division.

"Division" shall mean the Division of Fish and Wildlife of the Department.

"Established Blind" shall mean a structure or pit constructed for the purpose of hunting migratory waterfowl by a landowner on his or her property or by another person with the permission of the landowner or the landowner's duly authorized agent.

"Established Road" shall mean a road maintained for vehicular use by the Division and designated for such use by the Division on current wildlife area maps.

"Liberated Game" shall mean cottontail rabbits and game birds, including bobwhite quail, mallard duck, chukar and pheasant released pursuant to § 568 of Title 7.

“Loaded Muzzle-Loading Rifle” shall mean the powder and ball, bullet or shot is loaded in the bore. A muzzle-loading rifle shall not be considered loaded if the cap, primer, or priming powder (in a flintlock) is removed and:

The striking mechanism used to ignite the cap, primer or priming powder is removed or rendered inoperable; or

The rifle is enclosed in a case.

“Lure” shall mean any mixture of ingredients, element or compound that attract wildlife, but the wildlife is unlikely to consume.

“Longbow” shall mean a straight limb, reflex, recurve or compound bow. All crossbows or variations thereof and mechanical holding and releasing devices are expressly excluded from the definition.

“Nongame Wildlife” shall mean any native wildlife, including rare and endangered species, which are not commonly trapped, killed, captured or consumed, either for sport or profit.

“Possession” shall mean either actual or constructive possession of or any control over the object referred to.

“Quality Buck” shall mean an antlered deer with an outside antler spread of at least 15 inches. This measurement is taken across the outside of the main beams at their widest point; this measurement’s path must be perpendicular to the center line of the skull and parallel to the top of the skull plate.

“Refuge” shall mean an area of land, whether in public or private ownership, designated by the Department as a refuge. Land shall only be designated with the permission of the landowner and if such designation is thought to be in the best interest of the conservation of wildlife. Refuges shall normally be closed at all times to all forms of hunting, except as permitted by the Director in writing for wildlife management purposes.

“Roadway” shall mean any road, lane or street, including associated right-of-ways, maintained by this State or any political subdivision of this State.

“Season” shall mean that period of time during which a designated species of wildlife may be lawfully hunted or a designated species of fish may be lawfully fished.

“Vehicle” shall include any means in or by which someone travels or something is carried or conveyed or a means of conveyance or transport, whether or not propelled by its own power.

“Wildlife” shall mean any member of the animal kingdom, including without limitation, any amphibian, arthropod, bird, mammal or reptile.

3 DE Reg. 289 (8/1/99)
3 DE Reg. 1738 (6/1/00)
11 DE Reg. 334 (09/01/07)

14 DE Reg. 52 (07/01/10)
15 DE Reg. 1505 (04/01/12)

2.0 Method of Take

(Penalty Section 7 **Del.C.** §103(d)**)**

2.1 General.

Unless otherwise provided by law or regulation of the Department, it shall be unlawful to hunt any protected wildlife with any weapon or firearm other than a longbow or shotgun (10 gauge or smaller), except that:

2.1.1 Crossbows may be used during all deer seasons;

2.1.2 A muzzle-loading rifle with a barrel length of at least twenty inches and loaded with black powder may be used to hunt deer during muzzleloader and shotgun deer seasons;

2.1.3 A .22 caliber rimfire pistol may be used to hunt raccoons and opossums and to take wildlife lawfully confined in a trap;

2.1.4 A hook, spear or gig may be used to take frogs; and

2.1.5 Snapping turtles may be taken by hand or by using a spear, gig, fyke net or turtle trap. Turtle traps can have only one throat or funneling device.

2.1.6 A single shot an antique or authentic reproduction black powder Sharps rifle of 45 to 60 caliber shall be lawful for use during shotgun deer seasons using paper patched bullets.

2.1.7 No person shall place in the field any set or unset equipment associated with the trapping of game animals until the opening day of any state approved trapping season.

2.1.8 Any person who sets or makes use of any trap, snare or other approved wildlife capture device during any lawful trapping season, shall remove all trapping equipment by the last day of the approved trapping season.

2.2 Archery and Crossbow.

2.2.1 General. No person shall use or have in his or her possession, while hunting, any: poison arrow, arrow with and explosive tip, or any longbow with a minimum pull less than 35 pounds.

2.2.2 Crossbows used for deer hunting must have a minimum pull weight of 125 pounds, be manufactured after 1980, and have a mechanical safety. Crossbows may be equipped with a scope.

2.2.2.1 It shall be unlawful to transport a crossbow on or within any vehicle while the crossbow is in the cocked position.

2.3 Hunting from Boats.

2.3.1 Distance from Blinds. During the season for the hunting of migratory waterfowl, it shall be unlawful for any person to hunt from a boat of any kind that is within 1500 feet of an established blind, except that:

2.3.1.1 Any person may use a boat to tend lawfully set traps for fur-bearing wildlife;

2.3.1.2 Any person may retrieve crippled waterfowl by the use of a boat in accordance with federal regulations;

2.3.1.3 Any person may use a boat for transportation to and from an established blind lawfully used by such person;

2.3.1.4 Any person may hunt from a boat that is firmly secured and enclosed in an established blind.

2.3.2 Notwithstanding the provisions of subsection 2.2.1 of this section, any person may hunt migratory waterfowl within 1500 feet of an established blind, from a boat, with permission of the blind owner.

2.3.3 Gunning Rigs.

2.3.3.1 During the season for hunting migratory waterfowl, it shall be unlawful for any person to hunt within 900 feet of the shoreline (high tide line) of the Delaware River and Bay, between the Appoquinimink River and the Smyrna River, without written permission of the closest adjoining landowner(s).

2.3.3.2 During the season for hunting migratory waterfowl, it shall be unlawful for any person to hunt within 1500 feet of the shoreline (high tide line) of the Delaware River and Bay, between the Smyrna River and the Murderkill River, without written permission of the closest adjoining landowner(s).

2.3.4 Tender Boats. It shall be unlawful for tender boats servicing gunning (layout) rigs to be further than 1500 feet from the rig or to conduct any activity, except to pick up downed birds or service the rig.

2.3.5 During the season for hunting migratory waterfowl, it shall be unlawful for any person to hunt from a boat, or a floating or fixed blind in the Little River in areas bounded on both sides by land administered by the Division, except as permitted in writing by the Director.

2.4 Leghold Traps.

2.4.1 It shall be unlawful for any person to set a leghold trap at any time in this State, except from December 1 through March 10 (March 20 on embanked meadows) in New Castle County and December 15 through March 15 in Kent and Sussex counties.

2.4.2 Notwithstanding subsection 2.4.1 of this section, it shall be lawful to trap raccoons with leghold traps in New Castle County or Kent County from the southerly boundary of New Castle County Route 380 and east and southeast of the center line of U.S. Route No. 13, thence following said center line of U.S. Route No. 13 to the point where U.S. Route No. 13 forms a junction with U.S. Route No. 113 and

thence along the center line of U.S. Route No. 113 to a line dividing Kent County from Sussex County during any time of the year, except on Sundays. Notwithstanding the foregoing, this subsection shall not apply to lands in Kent County lying east of the center line of Rt. 113, north of the Sussex County line and south of the St. Jones River.

2.4.3 It shall be unlawful for any person to set long-spring traps, “Stop-Loss” traps or jump traps larger than No. 1½ or coil-spring traps larger than No. 1 in any location, except:

2.4.3.1 In any marsh ordinarily subject to the rise and fall of the tide;

2.4.3.2 In a diked marsh that was formerly tidal;

2.4.3.3 Below the mean high tide line in a river ordinarily subject to the rise and fall of the tide;

2.4.3.4 On an island surrounded by tidal marsh or diked marsh that was formerly tidal; or

2.3.4.5 In the areas described in subsection 2.4.2 of this section.

The term “diked marsh” shall not include millponds or any stream running into a millpond.

2.4.4 In addition to the areas listed in subsection 2.4.3 of this section, traps described in said subsection may be set for river otter and/or beavers in tax ditches, millponds and streams leading into such ponds only by underwater sets.

2.4.5 It shall be unlawful for any person to set or make use of long-spring traps, “Stop-Loss” traps or jump traps larger than No. 1½ or coil-spring traps larger than No. 1 without first permanently attaching a metallic tag on each trap, bearing:

2.4.5.1 The words “Trapping License, Delaware”, the number of the trapping license issued to the owner of the traps and the year of issuance; or

2.4.5.2 The owner's name and address.

2.4.6 It shall be unlawful for any person to set a long-spring trap, “Stop-Loss” trap, jump trap No. 1½ or smaller or a coil-spring trap No. 1 or smaller in any location in this State, except in the areas described in subsections 2.4.3 and 2.4.4 of this section and in the following locations:

2.4.6.1 A ditch;

2.4.6.2 A stream; or

2.4.6.3 On land not subject to cultivation of crops due to a normally marshy condition.

2.4.7 For the purposes of subsection 2.4.6 of this section, the term “ditch” shall mean a long, narrow channel dug into the earth as a trough for drainage or irrigation of the soil that normally contains flowing water.

2.4.8 For the purposes of subsection 2.4.6 of this section, the term “normally marshy condition” shall mean land with one or more of the following associated plant groupings growing upon it: cordgrass, sedges, rushes, cattails, threesquare or phragmites.

2.4.9 When information is furnished to a Fish and Wildlife Agent from the owner, tenant or sharecropper of any land that any species of wildlife is detrimental to crops, property or other interests on land on which he or she resides or controls, upon investigation, that Fish and Wildlife Agent may issue a permit to such person or his or her agent for the use of leghold traps to control said species of wildlife. Said permit may be issued at any time of the year.

2.4.10 The setting of each trap in violation of this section shall be a separate offense.

2.5 Gray Squirrel.

Hunting gray squirrels with a .17 through .22 caliber rimfire or pellet firearm with a rifled barrel, or muzzle-loading rifle not larger than .36 caliber is permitted south of the Chesapeake and Delaware Canal.

2.6 Muskrats.

It shall be unlawful for any person to shoot muskrats at any time, except with written permission of the Director.

2.7 Otters.

Each otter trapped in Delaware must be tagged by an authorized representative of the Division. Each otter sold in Delaware or shipped out of the State must be tagged in accordance with the requirements of the Convention on International Trade in Endangered Species.

2.8 Red Fox.

2.8.1 Red foxes may be killed in accordance with §788 of Title 7 with the following: longbow and crossbow, shotgun, rimfire rifle or centerfire rifle up to .25 caliber, revolvers and single shot pistols or a muzzle-loading rifle.

2.8.2 Notwithstanding subsection 2.8.1 of this section, during any deer firearms season, it shall be unlawful to hunt red fox with any firearm that is not also legal for deer hunting.

2.8.3 Notwithstanding subsection 2.8.1 of this section, it shall be unlawful to kill a red fox that is being pursued by dogs.

2.9 Snapping Turtles

2.9.1 Turtle traps must have either an escape hole below water measuring a minimum of 7.5” in all directions or floats inserted inside the trap or attached to the trap or be set in such a way so that the trap provides sufficient breathing space for all captured turtles at all times.

2.9.2 Each trap shall be marked with a metallic tag bearing the trapper's name and address. The tag shall be attached to the trap in a manner that allows it to remain visible, at all times.

2.9.3 All turtle traps must be lifted and emptied of catch at least once every 24 hours.

2.9.4 An annual permit must be obtained from the Division in order to trap snapping turtles. This permit is free.

3 DE Reg. 289 (8/1/99)
6 DE Reg. 536 (10/1/02)
11 DE Reg. 334 (09/01/07)
14 DE Reg. 52 (07/01/10)
15 DE Reg. 1505 (04/01/12)

3.0 Federal Laws and Regulations Adopted

(Penalty Section 7 **Del.C.** §103(d))

3.1 Federal Laws.

It shall be unlawful for any person to hunt, buy, sell or possess any protected wildlife or part thereof, except in such manner and numbers as may be prescribed by the following federal laws and regulations promulgated thereunder: Airborne Hunting Act (16 USC § 742j-l et seq.), Eagle Act (16 USC § 668 et seq.), Endangered Species Act (16 USC 1531 et seq.), Lacey Act (16 USC § 3371 et seq.), Marine Mammal Protection Act (16 USC § 1361 et seq.), and the Migratory Bird Treaty Act (16 USC § 703 et seq.). Notwithstanding the foregoing, the federal laws and regulations shall be superseded by more stringent restrictions prescribed by State law or regulation of the Department.

3.2 Sea Ducks.

Scoters, eiders and old squaw ducks may be taken during their special season not less than 800 yards seaward from the Delaware Bay shore beginning at an east/west line between Port Mahon and the Elbow Cross Navigation Light south to the Atlantic Ocean or in the Atlantic Ocean.

3.3 Non-toxic Shot.

3.3.1 Required Usage. Non-toxic shot, as defined by federal regulations, shall be required for hunting waterfowl, rails, snipe, and moorhens in Delaware. It shall be unlawful for any person to possess shells loaded with lead shot while hunting waterfowl, rails, snipe, and moorhens.

3.3.2 Maximum Shot Size. It shall be unlawful for any person to hunt, except for deer, in Delaware with any size non-toxic shot (as defined by federal regulations) pellet(s) larger than size T (.20 inches in diameter).

3.4 Special Mallard Release Areas.

The Division may issue permits to allow the taking of captive-reared mallards during the established waterfowl season under applicable federal regulations. Permits shall only be issued to persons who: control at least 100 acres of land on which there is suitable waterfowl habitat; agree to follow a management plan and federal regulations; and maintain a log of guests and birds harvested. Failure to follow the management plan or a violation of State or federal laws may result in the revocation of a Special Mallard Release Area Permit. Waterfowl may only be hunted on Special Mallard Release Areas from one-half hour after sunrise to one hour before sunset.

3.5 Mute Swans *(Cygnus olor)*

3.5.1 Mute swans shall be considered an exotic, invasive species that is not subject to state protection. Mute swans may only be taken during legal waterfowl hunting seasons and shooting hours. The method of take for mute swans is restricted to shotguns no larger than 10 gauge and with non-toxic ammunition no larger than size T.

3.5.2 It shall be unlawful to possess, buy, sell, barter, trade, or transfer any live mute swan or their eggs to or from another person unless permitted by the Director of the Division of Fish and Wildlife.

3.5.3 It shall be unlawful to release any mute swan into the wild.

3.6 Special Shotgun Season for Young and Disabled Hunters

3.6.1 Waterfowl may be hunted on a special days established annually by the Division for disabled (non-ambulatory) hunters using a wheelchair for mobility and hunters 10 years of age or older but less than 16 years of age (10-15 years inclusive). Hunters 13-15 years of age must have completed an approved course in hunter training and possess a Delaware Resident or Non-Resident Junior Hunting License. Young hunters must be accompanied by a licensed non-hunting adult who is 21 years of age or older. Young hunters must be of sufficient size, physical strength and emotional maturity to safely handle a shotgun.

3 DE Reg. 289 (8/1/99)
6 DE Reg. 536 (10/1/02)
12 DE Reg. 496 (10/01/08)
14 DE Reg. 52 (07/01/10)

4.0 Seasons

(Penalty Section 7 **Del.C.** §103(d))

4.1 Season Dates.

Hunting and trapping season dates will be published each year in an annual publication entitled "Delaware Hunting and Trapping Guide."

4.2 General.

It shall be unlawful for any person to hunt those species of wildlife for which a season is designated at any time other than during that season.

4.3 Protected Wildlife.

4.3.1 Unless otherwise provided by law or regulation of the Department, it shall be unlawful for any person to hunt any species of protected wildlife.

4.3.2 It shall be unlawful for any person to sell, transport or possess any species of protected wildlife, except when:

4.3.2.1 Otherwise provided by law or regulation of the Department; or

4.3.2.2 The wildlife was lawfully taken outside of this State in accordance with the laws or regulations of the state or nation where the wildlife was taken.

4.4 Beaver.

4.4.1 Unless otherwise provided by law or regulation of the Department, it shall be unlawful for any person to hunt or trap beaver during any period of the year, however, from December 1 through March 20, landowners (or their agents) may take up to eight beavers from their property without a permit, provided the beavers are causing crop or property damage.

4.4.2 Beaver hides and the meat of lawfully taken beaver harvested anywhere within or outside of Delaware may be sold.

4.5 Bullfrogs.

4.5.1 Season. Bullfrogs may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of bullfrogs: from May 1 through September 30.

4.5.2 Limit. It shall be unlawful for any person to take more than twenty-four (24) bullfrogs in any one day.

4.5.3 License. A hunting or fishing license is required to take bullfrogs.

4.6 Crows.

It shall be unlawful for any person to hunt common crows during any period of the year, except Thursdays, Fridays and Saturdays between and including the fourth Thursday of June and the last Saturday of March, unless said person holds a valid depredation permit. The hunting of common crows is restricted only by the provisions of federal regulations pertaining to the taking of common crows. Crows may be taken without a permit when committing damage or about to commit damage.

4.7 Gray Squirrel.

4.7.1 Season. Gray squirrel may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of gray squirrel: from September 15 (September 14, if September 15 is a Sunday) through the first Saturday in February. Squirrel hunting shall be unlawful during the November deer firearms season. When squirrel season overlaps with a firearms deer season, squirrel may be hunted when hunter orange is displayed in accordance with § 718 of Title 7.

4.7.2 Limit. It shall be unlawful for any person to take more than six gray squirrels in any one day.

4.8 Opossum.

The opossum may only be hunted or trapped during the lawful season to hunt or trap raccoons.

4.9 Pheasant.

4.9.1 Season. Male pheasant may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of pheasant: from the Monday that immediately precedes Thanksgiving through the first Saturday in February, provided that during a deer firearms season hunter orange is displayed in accordance with §718 of Title 7.

4.9.2 Female Pheasant. It shall be unlawful for any person to hunt or possess any female pheasant at any time, except as permitted on game preserves, by licensed game breeders or as otherwise permitted by law.

4.9.3 Male Pheasant Limit. It shall be unlawful for any person to hunt or possess more than two (2) male pheasants in any one day during the pheasant season, except as permitted by law.

4.9.4 Scientific or Propagating Purposes. It shall be unlawful for any person to possess pheasants for scientific and propagating purposes without a valid permit from the Director.

4.9.5 Game Preserves. Nothing in this regulation shall be construed so as to limit the number or sex of pheasants that may be harvested by any one person on licensed game preserves.

4.10 Quail.

4.10.1 Season. Bobwhite quail may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of bobwhite quail: from the Monday that immediately precedes Thanksgiving through the first Saturday of January, provided that during a deer firearms season hunter orange is displayed in accordance with § 718 of Title 7.

4.10.2 Limit. It shall be unlawful for any person to take more than six (6) quail in any one day.

4.11 Rabbit.

4.11.1 Season. Rabbits may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of rabbits: from the Monday that immediately precedes Thanksgiving through the last day of February or the last Saturday of February if February ends on a Sunday provided that during a deer firearms season hunter orange is displayed in accordance with § 718 of Title 7.

4.11.2 Limit. It shall be unlawful for any person to take more than four (4) rabbits in any one day.

4.12 Raccoon.

4.12.1 Trapping Season. Raccoon may be trapped in accordance with the statutes and regulations of the State of Delaware governing the trapping of raccoon: from December 1 through March 10 (March 20 on embanked meadows) in New Castle County; and from December 15 through March 15 in Kent and Sussex counties. The season is open throughout the year on private land, except on Sundays, in eastern New Castle and Kent counties pursuant to § 786 of Title 7 and Section 4(b) of WR-2.

4.12.2 Hunting Season. Raccoon may be hunted in accordance with the statutes and regulations of the State of Delaware governing the hunting of raccoon: from September 1 (September 2, if September 1 is a Sunday) through October 31 for chase only whereby it shall be unlawful to kill raccoon and opossum; from November 1 through the last day of February; and from March 1 through March 31 for chase only whereby it shall be unlawful to kill raccoon and opossum. The season is open throughout the year on private land in eastern New Castle and Kent counties, except on Sundays, pursuant to § 786 of Title 7.

4.12.3 Notwithstanding subsection 4.3.2 of this section, it shall be unlawful for any person to hunt raccoon or opossum during any period when it is lawful to hunt deer with a firearm, except that it shall be lawful to hunt raccoon from 7:00 p.m. until midnight during the December and January firearm deer seasons.

4.13 Red Fox.

4.13.1 Harvest Season. Red fox may be killed in accordance with the statutes and regulations of the State of Delaware governing the hunting of red fox: from November 1 through the last day of February, excluding Sundays. Notwithstanding the foregoing, red foxes may be killed in accordance with Section 8 of WR-2 and § 788 of Title 7.

4.14 Ruffed Grouse. It shall be unlawful for any person to hunt for ruffed grouse during any period of the year.

4.15 Snapping Turtles.

4.15.1 Season. It shall be unlawful for any person to hunt for snapping turtles during any period of the year, except between and including June 15 and May 15.

4.15.2 Size. It shall be unlawful for any person to sell, offer for sale or kill any snapping turtle with a straight-line carapace (top shell) length of less than eleven inches, measured on the curvature. This straight-line measurement is taken from the nuchal scute directly behind the turtle's head to the base of the notch where the two most posterior scutes meet over the tail.

4.16 Terrapin.

4.16.1 Season. It shall be unlawful for any person to hunt for diamondback terrapin during any period of the year, except between and including September 1 and November 15.

4.16.2 Limit. It shall be unlawful for any person to take more than four (4) diamondback terrapin in any one day.

4.17 Muskrats

4.17.1 7 Day Season Extension. The Department may extend the muskrat trapping season 7 days if the Department determines that the statewide muskrat population can sustain additional harvest and the average mean temperature for February was below 32^0F and the total February snowfall exceeded 12 inches as determined by the National Weather Service station at Wilmington, Delaware.

4.17.2 14 Day Season Extension. The Department may extend the muskrat trapping season 14 days if the Department determines that the statewide muskrat population can sustain additional harvest and the average mean temperature for February was below 28^0F and the total February snowfall exceeded 24 inches as determined by the National Weather Service station at Wilmington, Delaware.

3 DE Reg. 289 (8/1/99)
3 DE Reg. 1738 (6/1/00)
6 DE Reg. 536 (10/1/02)
8 DE Reg. 352 (8/1/04)
11 DE Reg. 334 (09/01/07)
13 DE Reg. 941 (01/01/10)
14 DE Reg. 52 (07/01/10)
15 DE Reg. 1505 (04/01/12)

5.0 Wild Turkeys

(Penalty Section 7 **Del.C.** §103(d))

5.1 Possession of Wild Turkey Prohibited; Exceptions.

It shall be unlawful for any person, other than authorized representatives of the Division, to release or possess *Meleagris gallopavo* (wild turkey) in Delaware without a permit from the Division. The prohibition to possess and/or release *Meleagris gallopavo* shall include both birds taken from the wild and birds bred in captivity.

5.2 Instruction Requirement.

It shall be unlawful for any person to hunt wild turkeys in Delaware before passing a Division approved course of instruction in turkey hunting. In addition to official Delaware Division of Fish and Wildlife sponsored courses, official NRA Wild Turkey Hunting Clinics, official NWF Turkey Hunting Courses and out-of-state Turkey Hunting Courses (minimum of 4 hours) officially sponsored and sanctioned by other state or provincial Hunter Education Programs shall be recognized as being Division approved courses of instruction in turkey hunting. This includes Division approved internet courses.

5.3 Method of Take.

5.3.1 It shall be unlawful for any person to use any firearm to hunt wild turkeys, except a 10, 12, 16, or 20 gauge shotgun loaded with size 4, 5, or 6 shot or a longbow, compound bow or crossbow with a broadhead arrow, 7/8 inches in minimum width. Notwithstanding the foregoing, 7 or 7 1/2 shot may be used in shotguns if it is part of a duplex or triplex load that also contains 4, 5 or 6 shot.

5.3.2 It shall be unlawful for any person to use bait or dogs to hunt wild turkeys.

5.3.3 It shall be unlawful for any person to “drive” wild turkeys.

5.3.4 It shall be unlawful for any person to shoot any wild turkey that is in a roost tree.

5.3.5 It shall be unlawful for any person to hunt wild turkeys unless said person is wearing camouflage clothing.

5.3.6 It shall be unlawful for any person to hunt wild turkeys if said person is wearing any garment with the colors white, red, or blue.

5.3.7 It shall be unlawful for any person to hunt wild turkeys and use artificial turkey decoys of either sex that are wholly or partially made from any part of a turkey that was formerly alive.

5.3.8 It shall be unlawful for any person to hunt wild turkeys using an electronic calling device.

5.4 Season and Limit.

5.4.1 The Division may establish a season for hunting bearded wild turkeys. The Division will determine the season length and bag limit. It shall be unlawful for any person to hunt wild turkey, except as permitted by the written authorization of the Division. Proof of course completion referenced in 5.2 of this section shall serve as written authorization for private land hunters. Public land hunters must have an annual permit from the Division.

5.4.2 It shall be unlawful for any person to hunt wild turkeys, except from one-half hour before sunrise to 1:00 p.m.

5.4.3 It shall be unlawful for any person to not check a wild turkey at an authorized checking station by 2:30 p.m. on the day of kill.

5.4.4 It shall be unlawful for any person to take or attempt to take more than one bearded wild turkey per season.

5.5 Special Season for Young and Disabled Hunters

5.5.1 Turkeys may be hunted on private land and selected public land on the Saturday prior to the opening of the regular spring turkey hunting season by disabled (non-ambulatory) hunters using a wheelchair for mobility, and hunters 10 years of age or older but less than 16 years of age (10-15 years inclusive). Hunters 13-15 years of age must have completed an approved course in hunter training as well as a Division approved turkey hunter safety class and possess a Delaware Resident or Non-Resident Junior Hunting License. Young hunters must be accompanied by a licensed non-hunting adult who is 21

years of age or older who has also completed a Delaware approved turkey hunter safety class. Young hunters must be of sufficient size, physical strength and emotional maturity to safely handle a shotgun.

3 DE Reg. 289 (8/1/99)
11 DE Reg. 334 (09/01/07)
12 DE Reg. 496 (10/01/08)
15 DE Reg. 1505 (04/01/12)

6.0 Game Preserves

(Penalty Section 7 **Del.C.** §103(d))

It shall be unlawful for any person to hunt liberated game on licensed game preserves from April 1 through October 14.

3 DE Reg. 289 (8/1/99)

3 DE Reg. 1738 (6/1/00)

7.0 Deer

(Penalty Section 7 **Del.C.** §103(d))

7.1 Limit.

7.1.1 Unless otherwise provided by law or regulation of the Department, it shall be unlawful for any person to:

7.1.1.1 Kill or take or attempt to kill or take more than four antlerless deer in any license year;

7.1.1.2 Kill or take four antlerless deer in any license year without at least two of the four deer being female deer; or

7.1.1.3 Possess or transport an antlered deer that was unlawfully killed.

7.1.1.4 Possess or transport an antlerless deer that was unlawfully killed.

7.1.1.5 Kill any antlered deer without first purchasing a Delaware Resident Combination Hunter's Choice Deer tag and Quality Buck Deer Tag, a Delaware Non Resident Antlered Deer Tag, or a Non-Resident Quality Buck Deer Tag except that persons exempt from purchasing a hunting license shall be entitled to take one Hunter's Choice deer at no cost.

7.1.1.6 No hunter may harvest more than two antlered deer during a license year between July 1st. and June 30th of the next calendar year.

7.1.2 For the purposes of this section, a person "driving deer" and not in possession of any weapon or firearm shall not be treated as if they are hunting deer, provided they are assisting lawful hunters.

7.1.3 It shall be unlawful for any person to purchase, sell, expose for sale, transport or possess with the intent to sell, any deer or any part of such deer at any time, except that hides from deer lawfully killed and checked may be sold. This subsection shall not apply to venison approved for sale by the United States Department of Agriculture and imported into Delaware.

7.1.4 Notwithstanding subsection 7.1.1 of this section, a person may purchase Antlerless Deer Tags for $10 each to kill or take additional antlerless deer during the open season. Hunters may take additional antlerless deer on Antlerless Deer Damage Tags at no cost.

7.1.5 Notwithstanding subsection 7.1.1 of this section, a person may use one Quality Buck tag to take an antlered deer with a minimum outside antler spread of fifteen inches, provided the tag is valid for the season in which it is used. Hunters exempt from the requirement to purchase a hunting license must purchase a Quality Buck tag in order to take a second antlered deer in any one license year.

7.2 Tagging and Designated Checking Stations.

7.2.1 Attaching Tags. Each licensed person who hunts and kills a deer shall, immediately after the killing and before removing the deer from the location of the killing, attach an approved tag to the deer and record in ink the date of harvest on the tag. An approved tag shall mean an Anterless Deer Tag or Doe Tag received with the hunting license, a Delaware Resident Quality Buck Deer Tag, a Delaware Resident Hunter's Choice Deer Tag, a Delaware Non Resident Quality Buck Deer Tag, a Delaware Non Resident Antlered Deer Tag, an Antlerless Deer Damage Tag, or an Antlerless Tag purchased in addition to the hunting license tags. Any unlicensed person not required to secure a license shall make and attach a tag to the deer that contains the person's name, address and reason for not having a valid Delaware hunting license.

7.2.2 Retention of Tag. The tag required by subsection 7.2.1 of this section shall remain attached to the deer until the deer is processed for consumption.

7.2.3 Registering Deer. Each person who hunts and kills a deer shall, within 24 hours of killing said deer, register their deer by phone or over the internet through systems authorized by the Division. After registering a deer, hunters will be given a deer registration number. This number must be recorded in ink on the approved tags listed in subsection 7.2.1 of this section. It shall be unlawful to knowingly enter incorrect information when registering a deer.

7.2.4 Dressing. It shall be unlawful for any person to remove from any deer any part thereof, except those internal organs known as the viscera, or cut the meat thereof into parts, until such deer has been registered using the phone or internet system authorized by the Division.

7.2.5 Deer Registration Number. The Deer Registration number provided by the automated phone/internet system must remain with the head and/or carcass until the mount is picked up from the taxidermist or the meat is processed and stored as food.

7.3 Method of Take.

7.3.1 Shotgun. It shall be unlawful for any person to hunt deer during the shotgun season using a shotgun of a caliber smaller than 20 gauge, or have in his or her possession any shell loaded with shot smaller than what is commonly known as “buckshot.”

7.3.2 Archery and Crossbow Seasons. It shall be unlawful for any person to hunt deer during the archery season or crossbow season and have in his or her possession any weapon or firearm other than a knife, a longbow or crossbow and sharpened broadhead arrows having minimum arrowhead width of 7/8 of an inch.

7.3.3 Muzzle-loading Pistols. A single shot muzzle-loading pistol of .42 caliber or larger using a minimum powder charge of 40 grains may be used to provide the coupe-de-grace on deer during the primitive firearm season.

7.3.4 Refuge in Water. It shall be unlawful for any person to shoot, kill or wound or attempt to shoot, kill or wound any deer that is taking refuge in or swimming through the waters of any stream, pond, lake or tidal waters.

7.3.5 Dogs. It shall be unlawful for any person to make use of a dog for hunting during the shotgun or muzzleloader seasons for deer (in each county), except as permitted in the hunting of migratory waterfowl from an established blind or for hunting dove, quail, raccoon or rabbit on properties closed to deer hunting with firearms during December and January.

7.4 Illegal Hunting Methods; Baiting.

It shall be unlawful for any person to set, lay or use any trap, snare, net, or pitfall or make use of any artificial light, or other contrivance or device, for the purpose of hunting deer. This subsection does not preclude the use of bait for the purpose of attracting deer in order to hunt them on private land.

7.5 Seasons.

7.5.1 Shotgun Seasons. Deer may be hunted with shotgun in accordance with the statutes and regulations of the State of Delaware governing the hunting of deer: from the Friday in November that precedes Thanksgiving by thirteen (13) days through the second Saturday succeeding said Friday; and from the Saturday that precedes the third Monday in January through the following Saturday in January.

7.5.2 Archery Seasons. Deer may be hunted with longbow in accordance with statutes and regulations of the State of Delaware governing the hunting of deer: from September 1 (September 2, if September 1 is a Sunday) through the last day of January, provided hunter orange is displayed in accordance with § 718 of Title 7 when it also lawful to hunt deer with a gun.

7.5.3 Muzzleloader Seasons. Deer may be hunted with muzzle-loading rifles in accordance with the statutes and regulations of the State of Delaware governing the hunting of deer: from the Friday that precedes the second Monday in October through the second Saturday that succeeds the Friday opening day; and from the Monday that follows the close of the January shotgun season through the next Saturday.

7.5.4 Special Antlerless Season. Antlerless deer may be hunted with a shotgun in accordance with the statutes and regulations of the State of Delaware governing the hunting of deer during all Fridays, Saturdays and Mondays in October except for during the October Muzzleloader season and the last Monday prior to the opening Friday of the October Muzzleloader season. Notwithstanding the foregoing, antlered deer may be taken with archery equipment that is legal during this October shotgun season. Antlerless deer may be hunted with shotgun in accordance with the statutes and regulations of the State of Delaware governing the hunting of deer: from the second Saturday in December through the third Saturday in December.

7.5.5 Crossbow Seasons. Deer may be hunted with crossbows in accordance with statutes and regulations of the State of Delaware governing the hunting of deer: from September 1 (September 2, if September 1 is a Sunday) through the last day of January, provided hunter orange is displayed in accordance with 718 of Title 7 when it also lawful to hunt deer with a gun.

7.5.6 Special Shotgun Season for Young and Disabled Hunters. Deer may be hunted on the first Saturday of November by disabled (non-ambulatory) hunters using a wheelchair for mobility, and hunters 10 years of age or older but less than 16 years of age (10 to 15 inclusive). Hunters 13-15 years of age must have completed an approved course in hunter training and possess a Delaware Resident or Non-Resident Junior Hunting License. Young hunters must be accompanied by a licensed non-hunting adult who is 21 years of age or older. Young hunters must be of sufficient size, physical strength and emotional maturity to safely handle a shotgun.

7.6 Carcass Importation Ban.

7.6.1 Importation. It shall be unlawful to import or possess any carcass or part of a carcass of any member of the family Cervidae (deer) originating from a state or Canadian province, country or any portion of the aforementioned jurisdictions thereof as determined by the Division, in which Chronic Wasting Disease has been found in free-ranging or captive Cervids. Notwithstanding the foregoing, the following parts may be imported into the state:

7.6.1.1 Boned-out meat that is cut and wrapped;

7.6.1.2 Quarters or other portions of meat with no part of the spinal column or skull attached;

7.6.1.3 Hides or capes with no skull attached;

7.6.1.4 Clean (no meat or tissue attached) skull plates with antlers attached;

7.6.1.5 Antlers (with no meat or tissue attached);

7.6.1.6 Upper canine teeth (buglers, whistlers, or ivories); and

7.6.1.7 Finished taxidermy products.

7.6.2 Carcass Notification. Any person who imports into Delaware any deer carcass or parts described in subsection 7.6.1 of this section and is notified that the animal has tested positive for Chronic Wasting

Disease must report the test results to the department within 72 hours of receiving the notification. In order to facilitate the proper disposal of any infected material, the department may take into possession any imported carcass or carcass part of an animal if the animal has tested positive for Chronic Wasting Disease.

3 DE Reg. 289 (8/1/99)
6 DE Reg. 536 (10/1/02)
8 DE Reg. 352 (8/1/04)
11 DE Reg. 334 (09/01/07)
12 DE Reg. 496 (10/01/08)
14 DE Reg. 52 (07/01/10)
15 DE Reg. 1505 (04/01/12)

8.0 General Rules and Regulations Governing Land and Waters Administered by the Division

8.1 Motorized Vehicles.

8.1.1 General. It shall be unlawful for any person to drive or operate a motorized vehicle upon any lands administered by the Division, except on established roads or as otherwise authorized by the Director.

8.1.2 Noise. It shall be unlawful for any person to drive or operate a motorized vehicle upon any lands administered by the Division, unless such vehicle is equipped with a muffler in good working order and in constant operation to prevent excessive or unusual noise.

8.1.3 Speed Limit. It shall be unlawful for any person to drive or operate a vehicle in excess of twenty (20) miles per hour when on lands administered by the Division, unless otherwise authorized by the Director.

8.1.4 Unlicensed Vehicles. It shall be unlawful for any person to drive or operate any motorized vehicle upon any lands administered by the Division, unless said vehicle is licensed for use upon public highways and roadways or the driver or operator of said vehicle has been issued a permit from the Division.

8.1.5 Parking.

8.1.5.1 It shall be unlawful for any person to park any vehicle on lands administered by the Division in such a manner as to obstruct the use of a boat ramp, roadway or trail. Any vehicle parked in such manner shall be subject to removal, and the owner of said vehicle shall bear all costs involved with such removal.

8.1.5.2 Unless otherwise authorized by the Director, it shall be unlawful for any person to park and leave unattended any vehicle or trailer in any Division parking lot, unless said lot is lawfully being used for direct access to lands or waters administered by the Division.

8.1.5.3 Unless otherwise authorized by the Director, it shall be unlawful for any person to leave any vehicle on lands administered by the Division for a period exceeding 24 hours.

8.2 Conditions of Use.

8.2.1 Trespass. It shall be unlawful for any person to enter upon lands or waters administered by the Division when those lands or waters have been closed by the Division to: protect public safety; protect Department property; or manage wildlife. Persons shall adhere to special entry restrictions as listed on official area maps signed by the Division Director.

8.2.2 Hours of Entry. It shall be unlawful for any person to be present upon lands or waters administered by the Division between sunset and sunrise, unless such person is lawfully hunting or fishing or has been authorized by written permission of the Director.

8.2.3 Camping. It shall be unlawful for any person to camp on lands administered by the Division, except conservation oriented groups may, with written permission of the Director, camp in areas specified in such permit.

8.2.4 Swimming. It shall be unlawful for any person to swim in waters administered by the Division, except by written permission of the Director.

8.2.5 Dumping.

8.2.5.1 It shall be unlawful for any person to place, dump, deposit, throw or leave any garbage, refuse or similar debris within or upon any lands or waters administered by the Division, except in receptacles provided for such purpose;

8.2.5.2 It shall be unlawful for any person to bring any trash, refuse or similar material onto lands administered by the Division for the purpose of disposing such in Division receptacles.

8.2.5.3 Unless otherwise authorized by the Director, it shall be unlawful for any person to deposit any material, structure, debris or other objects on lands or waters administered by the Division.

8.2.6 Destruction of State Property.

8.2.6.1 It shall be unlawful for any person to deface, damage, remove or alter any structures, buildings, natural-land features, or other property or equipment belonging to the Division.

8.2.6.2 Unless authorized by the Division for management, research or educational purposes, it shall be unlawful for any person to cut, injure or remove trees, shrubs, wildflowers, ferns, mosses or other plants from lands administered by the Division.

8.2.6.3 It shall be unlawful for any person to erect or use any portable or permanent deer stand that involves the use of nails or screws placed in a tree.

8.2.6.4 Unless otherwise authorized by the Director, it shall be unlawful for any person to kindle, build, maintain or use a fire on lands administered by the Division.

8.2.7 Collection of Wildlife.

8.2.7.1 Collection and removal of any wildlife species from a State Wildlife Area is prohibited unless otherwise provided by statute, regulation or authorized by the Division Director.

8.2.8 Fishing.

8.2.8.1 It shall be unlawful to fish in any Division managed ponds except in accordance with conditions set forth on area maps and/or signs.

8.3 Hunting and Firearms.

8.3.1 Hunting.

8.3.1.1 It shall be unlawful for any person to hunt on lands administered by the Division, except as permitted by the Director in writing and specified on current wildlife area maps distributed by the Division.

8.3.1.2 A daily permit must be obtained before hunting waterfowl at Augustine, Cedar Swamp, Little Creek, Woodland Beach, Ted Harvey, Prime Hook and Assawoman wildlife areas. Permits may be obtained on-site from an authorized agent of the Division and must be returned upon leaving the area. The Director may specify the hours of a permit's effectiveness and determine the conditions of its issuance.

8.3.2 Waterfowl.

8.3.2.1 It shall be unlawful for any person to hunt waterfowl on areas administered by the Division, except from State built blinds, or other blinds authorized by the Division, or by written permission of the Director.

8.3.2.2 It shall be unlawful for any person to enter tidal and/or impounded areas administered by the Division during the waterfowl season, except for access as authorized by paragraph (1) of this subsection.

8.3.3 Trapping. It shall be unlawful for any person to trap or attempt to trap on areas administered by the Division, except for: persons holding a valid contract with the Division to do so; authorized agents of the Division who are conducting authorized wildlife management practices; or scientific purposes as specifically authorized in writing by the Director.

8.3.4 Firearms on Division Areas.

8.3.4.1 It shall be unlawful for any person to possess a firearm on lands or waters administered by the Division from March 1 through August 31, except as authorized by the Director in writing.

8.3.4.2 It shall be unlawful for any person to possess a rifled firearm of any description at any time on those lands bordering the Chesapeake and Delaware Canal and licensed to the Department by the Government of the United States for wildlife management purposes, except that muzzleloaders and shotguns with rifle barrels may be used during deer seasons when it is lawful to use those firearms.

8.3.4.3 It shall be unlawful for any person to discharge any firearm on lands or waters administered by the Division on Sunday, except in areas designated by the Director or with a permit from the Director.

8.3.4.4 It shall be unlawful for any person to discharge any firearm on lands or waters administered by the Division for any purpose, including target shooting, other than to hunt during an open season, under conditions approved by the Director and specified on the current wildlife area map.

8.3.4.5 It shall be unlawful to possess, consume or be under the influence of alcoholic beverages, liquors or drugs while hunting or in the possession of firearms when on lands administered by the Division.

8.3.5 Dikes. It shall be unlawful for any person to be in possession of any firearm on any dike administered by the Division, unless such person is temporarily crossing a dike at a ninety degree angle or traversing a dike to reach a Division authorized deer stand location during a deer firearms hunting season.

8.3.6 Deer Hunting By Driving. It shall be unlawful for residents to participate in deer drives, except where authorized on current wildlife area maps between the hours of 9:00 a.m. and 3:00 p.m. No more than six (6) resident hunters may participate in driving deer at any one time. Nonresidents may not participate in deer drives at any time. Nonresidents are restricted to hunting deer from stationary locations. Nonresidents may not possess a loaded firearm during the deer season, except to hunt from a stationary location or to retrieve a deer that they wound.

8.4 Horses and Bicycles. It shall be unlawful to ride horses or bicycles on, or allow horses to use, any lands or waters administered by the Division, except on established roads or trails that have been designated by the Division for such purposes on current wildlife area maps.

8.5 Concessions, Posters and Solicitations.

8.5.1 It shall be unlawful for any person to erect, post or distribute any placard, sign, notice, poster, billboard or handbill on lands or waters administered by the Division without written authorization of the Director.

8.5.2 It shall be unlawful for any person to engage in the vending of merchandise, food or services on lands or waters administered by the Division without written authorization of the Director.

8.5.3 It shall be unlawful for any person to do any form of solicitation for money or goods on any lands or waters administered by the Division without written authorization of the Director.

8.6 Firewood. It shall be unlawful for any person to remove firewood from lands administered by the Division without a permit from the Division, except when special firewood areas are designated by the Director in writing.

8.7 Dog Training.

8.7.1 General. It shall be unlawful for any person to train a dog on lands or waters administered by the Division, except:

8.7.1.1 During open hunting seasons for the game that the dog is being trained to hunt;

8.7.1.2 Within a dog training area established by the Division; and

8.7.1.3 As permitted by the Director in writing on current wildlife area maps.

8.7.2 C&D Canal Summit Area. It shall be unlawful for any person to enter the dog training area west of the Summit Bridge (Rt. 896), designated on the current wildlife area map of the C&D Canal Wildlife Area, for any purpose other than to train dogs or hunt for deer during the shotgun deer seasons. It shall be unlawful for any person to fish, operate a model or full size boat, ride horses or bicycles, or conduct any other activity on the area.

8.8 Geocaching

8.8.1 It shall be unlawful to place caches or letterboxes on Division of Fish and Wildlife property without a permit from the Division. Permits may be obtained by submitting a completed permit application to the appropriate Fish and Wildlife Regional Office. The proposed caching location will be specified in the application. The Regional Fish and Wildlife Manager will review and approve or deny the permit request. A permit will be valid for a maximum of one year from the date of issue at which time the geocache or letterbox must be removed or re-permitted. The permitted time frame will be determined by the area manager and be based on the local wildlife species present and the management activities planned for the area. The area manager will be provided the location of the cache or letterbox and may remove it at his or her discretion, with notice to the permit holder, should circumstances warrant. Online geocache and letterbox descriptions, such as those on geocaching.com or letterboxing.org must include information about access during hunting seasons and provide a link to Delaware Division of Fish and Wildlife Hunting Information.Geocache and letterbox contents must be suitable for all ages. Food, alcohol, tobacco, weapons or other dangerous items, prescription or illegal drugs and adult items are prohibited. From September 1st. through February 15th. of each year and during the spring turkey hunting season, the placement of or searching for geocaches and letterboxes may only occur on Sundays from sunrise to sunset. During the remainder of the year, geocaching and letterbox activities may occur 7 days per week from sunrise to sunset.

3 DE Reg. 289 (8/1/99)
11 DE Reg. 334 (09/01/07)
12 DE Reg. 496 (10/01/08)
15 DE Reg. 1505 (04/01/12)

9.0 Wildlife Theft Prevention Fund.

(Penalty Section 7 **Del.C.** §103(d))

9.1 Schedule of Rewards.

9.1.1 The Division shall pay up to $1000 for information leading to the arrest and conviction of any person found guilty of:

9.1.1.1 Commercialization of wildlife; or

9.1.1.2 Killing an endangered species or a species classified as a threatened species in accordance with the Endangered Species Act of 1973, as amended.

9.1.2 The Division shall pay up to $500 for information leading to the arrest and conviction of any person found guilty of:

9.1.2.1 Illegally hunting black ducks, canvasbacks, Canada geese or turkeys;

9.1.2.2 Poisoning wildlife;

9.1.2.3 Gross over-limits of wildlife;

9.1.2.4 Illegally hunting waterfowl or deer on State game refuges;

9.1.2.5 Hunting or trapping out of season;

9.1.2.6 Illegally hunting at night;

9.1.2.7 Hunting during license revocation; or

9.1.2.8 Possessing, tending or setting killer traps with a jaw spread in excess of 5 inches.

9.1.3 The Division shall pay up to $100 for information leading to the arrest and conviction of any person found guilty of illegally taking or wounding wildlife with a rifle.

9.1.4 The confidentiality of informants and their payments shall be maintained by administrative procedures. Peace officers, Department employees or members of their immediate families are not eligible for rewards.

3 DE Reg. 289 (8/1/99)

10.0 Nuisance Game Animals

(Penalty Section 7 **Del.C.** §103(d))

10.1 Incorporated Cities or Towns. Within the limits of residential or commercial areas of incorporated cities or towns, or within residential or commercial structures, the following game animals may be controlled (killed) without a permit when they are causing damage: gray squirrel, raccoon and opossum. Methods used to control said animals must be consistent with the laws of this State and the regulations of the Department and only live traps may be used (without a depredation permit) outside of established trapping seasons.

10.2 Pest Control Operators. The Division may designate licensed pest control operators as cooperators to control nuisance wild animals. Said cooperators must agree to follow guidelines for control as determined by the Division and notify potential clients of their fees.

3 DE Reg. 289 (8/1/99)

11.0 Shoreline Refuges of the Delaware River and Bay

(Penalty Section 7 **Del.C.** §103(d))

11.1 State Wildlife Area Protection for Intertidal Areas.

Any land located between the high tide line and the low tide line, between the Smyrna River and the St. Jones River and adjoining the Delaware River and Bay is hereby designated a State wildlife area and subject to the rules and regulations pertaining thereto, provided the adjoining landowners to said lands agree to their designation and agree to co-sign complaints concerning violations.

11.2 Exemptions.

Woodland Beach, Pickering Beach, and Kitts Hummock shall be exempt from this regulation. This regulation shall not affect surf fishing vehicles in areas where such vehicles are permitted or other uses of intertidal areas authorized by permit from the Division.

3 DE Reg. 289 (8/1/99)

12.0 Waterfowl Refuge

(Penalty Section 7 **Del.C.** §103(d))

It shall be unlawful for any person to hunt waterfowl in that part of Drawer Creek west of U.S. Route 13 to where the tributaries of the creek meet routes 428 and 429.

3 DE Reg. 289 (8/1/99)

13.0 Wildlife Rehabilitation Permits

(Penalty Section 7 **Del.C.** §103(d))

13.1 Permit from Division; Exemption.

13.1.1 It shall be unlawful for any person to hold native wildlife in captivity for the purpose of rehabilitation without a permit from the Division and any other permits required by the U.S. Fish and Wildlife Service.

13.1.2 Licensed veterinarians are exempt from the permitting requirements of this regulation when rendering treatment to injured wildlife and provisions are made to return any recovered animals to the wild or transfer them to a permitted rehabilitator for further care. Licensed veterinarians may only hold wildlife for as long as veterinary care is required.

13.2 Training, Housing and Veterinary Care; Inspections.

13.2.1 Permit holders must conform to the training, housing, release and veterinary care standards as written in the document “Minimum Standards for Wildlife Rehabilitation” published by the National Wildlife Rehabilitators Association and the International Wildlife Rehabilitation Council. Permit holders must also abide by the rules and policies set forth in the “State of Delaware Wildlife Rehabilitation Rules and Policies” document. Failure to abide by both of these documents may result in revocation of the rehabilitation permit. Animals held under rehabilitation permits must be released to the wild according to policies set forth in the document “State of Delaware Wildlife Rehabilitation Rules and Policies” or euthanized, if release is not feasible, unless the Division under §555 of Title 7 authorizes possession for scientific propagation or educational purposes. For federally listed endangered species and migratory birds an extension must be granted by the migratory bird permit office of the United State Fish and Wildlife Service, and the Division for each individual case. Rehabilitators must not release sick animals into the wild.

13.2.2 Rehabilitation facilities must be available for inspection by Division employees during normal business hours. Normal business hours shall mean Monday through Friday, except those days designated as holidays, during the hours in which the staff of the Division is scheduled to work. Violations of compliance with the Minimum Standards or the Rules and Policies noted in 13.2.1 will result in a written warning or immediate revocation of the rehabilitation permit depending on the violation. Persons receiving a warning will have their facility re-inspected. Failure to address the problem(s) in a timely manner will result in permit revocation. Upon permit revocation, all animals will be removed from the facility and either placed with another rehabilitator, released into the wild, placed with an educational facility, or humanly euthanized.

13.3 Rabies Vector Species

13.3.1 It shall be unlawful for any person to attempt rehabilitation of a rabies vector species without having proof of current pre-exposure immunization against the rabies virus. No permitted rehabilitator shall knowingly expose other non-immunized persons to a rabies vector species. For the purpose of the Delaware Wildlife Rehabilitator Permit, rabies vector species are defined as bats, raccoons, skunks, foxes, coyotes and woodchucks.

13.3.2 All rehabilitated rabies vector species must be released in the county of origin and the Division must be notified of the release location in the rehabilitator's annual report to the Division. It shall be unlawful for rehabilitated rabies vector species to be released on State Wildlife Management Areas without the consent of the Division Director.

3 DE Reg. 289 (8/1/99)
11 DE Reg. 334 (09/01/07)

14.0 Falconry

(Penalty Section 7 **Del.C.** §103(d))

14.1 Federal Regulations Adopted.

It shall be unlawful for any person to practice the sport of falconry, except in such a manner as prescribed by regulations promulgated under provisions of 50 CFR (Code of Federal Regulations) §§ 21.28, 21.29 and 21.30. Such regulations are hereby made part of the regulations of the Department as prescribed in § 725 of Title 7. Notwithstanding the foregoing, the federal regulations governing falconry shall be superseded by more stringent restrictions prescribed by law or regulation of the Department.

14.2 Permits.

14.2.1 Residents wishing to practice falconry shall apply to the Division for a falconry permit. To be issued a falconry permit, the person shall successfully pass a written test and have their facilities and equipment inspected as prescribed by the federal regulations.

14.2.2 Nonresidents must purchase a nonresident hunting license and be properly permitted to practice falconry in the state in which he or she resides.

14.2.3 Falconry permits shall be effective, unless revoked, for a period of up to three years and coincide with the license period for the hunting license. The Division shall participate in any joint state/federal permit system available.

14.2.4 The issuance of Apprentice Class permits shall be limited to persons 15 years of age or older.

14.3 Taking of Raptors.

14.3.1 It shall be unlawful for any person to take any birds of prey from the wild without a permit from the Division. The Director shall establish a limit on the number of raptors which may be taken each year and appear before the Council on Game and Fish to receive input on such limit before its adoption.

14.3.2 In 2000, and each year thereafter until changed, the Division may issue up to twelve (12) permits for the taking of twelve (12) birds of prey from the wild in Delaware, except that no more than three (3) permits shall be issued for the taking of three (3) nestling red-tailed hawks or three (3) nestling great horned owls, or any combination thereof. Nonresident falconers may apply for available permits to take nestling raptors, provided the state in which the nonresident resides allows Delaware residents the reciprocal opportunity to remove nestling raptors.

14.3.3 The taking of nestling (eyas) birds shall be limited to red-tailed hawks and great horned owls on Thursdays, Fridays and Saturdays from March 18 through June 30.

14.3.4 The season for the taking of passage birds shall be from September 1 through January 12. Nonresident falconers may apply to obtain any available permits to take passage raptors in Delaware, provided the state in which the nonresident resides has a reciprocal arrangement that permits Delaware residents to take passage raptors.

14.3.5 It shall be unlawful to remove raptors from private property without the express consent of the landowner. It shall also be unlawful for any person to remove raptors from State parks, State forests, State wildlife areas, State owned wetland mitigation sites, national wildlife refuges, nature preserves,

natural areas, and county or local parks without the advance approval of the agency administering the property. The permit to remove a raptor from the wild must be in possession of the falconer when attempting to capture a raptor. Apprentice falconers must be under the direct supervision of their sponsor or a Master or General class falconer when removing raptors from the wild.

14.3.6 Raptors taken from the wild in Delaware may not be sold or bartered.

14.4 Hunting. Falconry shall be a legal method of take for all game birds and game animals in Delaware. The hunting season for resident game shall be from September 1 through February 28. A permit holder whose raptor accidentally kills wildlife during a closed season for such wildlife shall leave the dead wildlife where it lies, except the raptor may feed upon the wildlife before leaving the site of the kill, provided that the wildlife shall not be reduced to possession by the falconer and the falconer shall cease hunting with the raptor that makes the accidental kill for the remainder of the day.

14.5 Marking. Any raptor possessed under a Delaware falconry permit must be banded with a permanent, non-reusable numbered band issued by the U.S. Fish and Wildlife Service or the Division. Captive reared raptors may be marked with either a permanent, non-reusable numbered band or, if sold, a numbered seamless band. Markers shall be removed from birds that die or are intentionally released into the wild and must be forwarded to the Division within ten days along with a report that documents the fate of the bird.

14.6 Release. Raptors, including hybrid raptors, which are not indigenous to Delaware shall not be permanently released into the wild. Raptors released in Delaware must be released within the appropriate season in which that species naturally occurs within the State.

3 DE Reg. 289 (8/1/99)
3 DE Reg. 1738 (6/1/00)
6 DE Reg. 536 (10/1/02)

15.0 Collection or Sale of Native Wildlife

(Penalty Section 7 **Del.C.** §103(d))

15.1 Commercial Collection.

15.1.1 Unless otherwise provided by law or regulation of the Department, it shall be unlawful for any person to collect, possess, import, cause to be imported, export, cause to be exported, buy, sell or offer for sale any native wildlife species or any part thereof for commercial purposes without a permit from the Director. The permit shall limit the terms and conditions for collecting or possessing said wildlife within the State.

15.1.2 Notwithstanding subsection 15.1.1 of this section, native wildlife species may be possessed, imported, sold or offered for sale for commercial purposes without a permit from the Director if there is written documentation to confirm that said wildlife was legally taken in and transported from another state.

15.2 Collection and Possession of Reptiles and Amphibians.

15.2.1 Unless otherwise provided by law or regulation of the Department, it shall be unlawful for any person to remove from the wild or possess any native reptile or amphibian species, their eggs or parts without a permit from the Director.

15.2.2 Notwithstanding subsection 15.1.1 of this section, one individual of each of the following species or subspecies of reptiles and amphibians, may be collected and possessed without a permit.

Reptiles
Lizard, Northern Fence (*Sceloporus undulatus hyacinthinus*)
Racer, Northern Black (*Coluber constrictor constrictor*)
Skink, Five-lined (*Eumeces fasciatus*)
Snake, Black Rat (*Elaphe obsoleta obsoleta*)
Snake, Eastern Garter (*Thamnophis sirtalis sirtalis*)
Snake, Eastern Hognose (*Heterodon platirhinos*)
Snake, Eastern Worm (*Carphophis amoenus amoenus*)
Snake, Northern Water (*Nerodia sipedon sipedon*)
Snake, Ringneck (*Diadophis punctatus*)
Terrapin, Diamondback (*Malaclemys terrapin*)
Turtle, Common Musk (*Sternotherus odoratus*)
Turtle, Eastern Box (*Terrapene carolina carolina*)
Turtle, Eastern Mud (*Kinosternon subrubrum subrubrum*)
Turtle, Painted (*Chrysemys picta*)
Turtle, Redbelly (*Pseudemys rubriventris*)
Turtle, Snapping (*Chelydra serpentina*)

Amphibians
Bullfrog (*Rana catesbeiana*)
Frog, Green (*Rana clamitans melanota*)
Frog, New Jersey Chorus (*Pseudacris triseriata kalmi*)
Frog, Northern Cricket (*Acris crepitans crepitans*)
Frog, Pickerel (*Rana palustris*)
Frog, Southern Leopard (*Rana utricularia*)
Frog, Wood (Rana sylvatica)
Newt, Red-spotted (*Notophthalmus viridescens viridescens*)
Peeper, Northern Spring (*Pseudacris crucifer crucifer*)
Salamander, Northern Dusky(*Desmognathus fuscus fuscus*)
Salamander, Northern Two-lined (*Eurycea bislineata*)
Salamander, Redback (*Plethodon cinereus*)
Spadefoot, Eastern (*Scaphiopus holbrookii holbrookii*)
Toad, American (*Bufo americanus*)
Treefrog, Gray (*Hyla versicolor and Hyla chrysoscelis*)

15.2.3 It shall be unlawful to remove any reptile or amphibian from the wild and later release said reptile or amphibian back to the wild if it has been held in captivity for more than thirty (30) days.

15.2.4 Notwithstanding subsection 15.1.1 of this section, native reptiles and amphibians taken from the wild and lawfully possessed prior to August 15, 1999, may continue to be held in captivity, provided that written notification of the numbers and species being held is given to the Division prior to December 15, 1999.

15.3 Captive Breeding.

15.3.1 It shall be unlawful for any person to breed in captivity any native wildlife species without a permit from the Director. Said permit shall limit the terms and conditions for captive breeding of said wildlife.

15.3.2 It shall be unlawful for any person to release captive-bred species into the wild. A signed bill of sale shall accompany any captive-bred species that are sold.

15.3.3 This section shall not apply to accredited zoos or to raptors regulated by federal and State falconry or raptor propagation regulations.

15.4 Sale or Possession of CITES Listed Species.

It shall be unlawful for any person to sell or possess bear gall bladder, or other viscera from any species of bear, or any part of other species listed as prohibited by the Convention on International Trade in Endangered Species (CITES). The possession of any part of a bear must be in conformance with CITES.

3 DE Reg. 289 (8/1/99)
3 DE Reg. 1738 (6/1/00)
6 DE Reg. 536 (10/1/02)
15 DE Reg. 1505 (04/01/12)

16.0 Endangered Species.

(Penalty Section 7 **Del.C.** §103(d))

16.1 Importation, Transportation and Possession.

16.1.1 Pursuant to §601 of Title 7, the importation, transportation, possession or sale of any endangered species of fish or wildlife, or hides or other parts thereof, or the sale or possession with intent to sell any article made in whole or in part from the skin, hide or other parts of endangered species of fish or wildlife is prohibited, except under license or permit from the Division.

16.2 Designation of Species by Division.

16.2.1 Pursuant to §601 of Title 7, the Division may designate species of fish and wildlife that are seriously threatened with extinction as endangered species. The Division will review the state list of

endangered species and add species suggested by the public that have sufficient documentation for listing.

16.2.2 For the purposes of this section, the phrase “seriously threatened with extinction” shall mean that the species satisfies one or more of the following criteria:

16.2.2.1 Appears on the federal list of endangered species;

16.2.2.2 Ranked as “globally rare” (G1, G2, or G3), which means 100 or fewer populations worldwide; or

16.2.2.3 Is rare within the mid-Atlantic coastal plain.

16.2.3 Based upon the criteria prescribed by subsection 16.2.2 of this section, the following species are declared endangered in this State and are afforded the protection provided by § 601 of Title 7:

Amphibians
Salamander, Eastern Tiger (*Ambystoma tigrinum* tigrinum)
Treefrog, Barking (*Hyla gratiosa*)

Birds
Creeper, Brown [BR] (*Certhia americana*)
Eagle, Bald (*Haliaeetus leucocephalus*)
Grebe, Pied-billed[BR] (*Podilymbus podiceps*)
Harrier, Northern[BR] (*Circus cyaneus*)
Hawk, Cooper’s[BR] (*Accipiter cooperii*)
Heron, Black-Crowned Night- (*Nycticorax nycticorax*)
Heron, Yellow-Crowned Night- (*Nyctanassa violacea*)
Parula, Northern[BR] (Parula americana)
Plover, Piping (*Charadrius melodus*)
Owl, Short-eared[BR] (*Asio flammeus*)
Oystercatcher, American (*Haematopus palliatus*)
Rail, Black (*Laterallus jamaicensis*)
Sandpiper, Upland (*Bartramia longicauda*)
Shrike, Loggerhead (*Lanius ludovicianus*)
Skimmer, Black (*Rynchops niger*)
Sparrow, Henslow's (*Ammodramus henslowii*)
Tern, Common[BR] (*Sterna hirundo*)
Tern, Forster’s[BR] (*Sterna forsteri*)
Tern, Least (*Sterna antillarum*)
Warbler, Cerulean (*Dendroica cerulea*)
Warbler, Hooded [BR] (*Wilsonia citrina*)
Warbler, Swainson’s (*Limnothlypis swainsonii*)
Woodpecker, Red-headed (*Melanerpes erythrocephalus*)
Wren, Sedge (*Cistothorus platensis*)

[BR] Breeding population only

Fish
Sturgeon, Atlantic (*Acipenser oxyrhynchus*)

Insects
Beetle, Little White Tiger (*Cicindela lepida*)
Beetle, White Tiger (*Cicindela dorsalis)*
Beetle, Seth Forest Scavenger (*Hydrochus sp.*)
Elfin, Frosted (*Incisalia irus*)
Firefly, Bethany (*Photuris bethaniensis*)
Hairstreak, Hessel's (*Mitoura hesseli*)
Hairstreak, King's (*Satyrium kingi*)
Skipper, Rare (*Problema bulenta)*
Wing, Mulberry (*Poanes massasoit chermocki*)

Mammals
Squirrel, Delmarva Fox (*Sciurus niger cinereus*)

Mollusks
Lampmussel, Yellow *(Lampsilis cariosa*)
Lampmussel, Eastern (*Lampsilis radiata*)
Wedgemussel, Dwarf (*Alasmidonta heterodon*)
Pondmussel, Eastern (*Ligumia nasuta*)
Floater, Brook (*Alasmidonta varicosa*)
Mucket, Tidewater (*Leptodea ochracea*)

Reptiles
Sea Turtle, Leatherback (*Dermochelys coriacea*)
Sea Turtle, Atlantic Ridley (*Lepidochelys kempii)*
Sea Turtle, Green (*Chelonia mydas*)
Sea Turtle, Loggerhead (*Caretta caretta*)
Turtle, Bog (*Clemmys muhlenbergii*)
Snake, Corn (*Elaphe guttata guttata*)

16.3 Federally Listed Species.

16.3.1 Pursuant to the Endangered Species Act of 1973 (16 USC §§ 1531-1543), as amended, the Secretary of the Interior must publish in the Federal Register a list of all fish and wildlife species determined by him or her or the Secretary of Commerce to be endangered species. The federal list of endangered species is hereby adopted and all species listed thereon are hereby declared to be endangered species in the State as prescribed in §601 of Title 7.

16.3.2 It shall be unlawful for any person to collect, possess or sell any species of fish or wildlife listed as endangered or threatened pursuant to the Endangered Species Act of 1973, as amended, without the appropriate federal permits.

3 DE Reg. 1738 (6/1/00)
6 DE Reg. 536 (10/01/02)

17.0 Species of Special Concern

(Penalty Section 7 **Del.C.** §103(d))

17.1 List of Species

The following species or groups of species shall be considered Species of Special Concern for the purpose of qualifying for federal funds for wildlife restoration: Endangered species as designated by state or federal regulations; species designated by WR-16, Section 2, colonial nesting birds; shorebirds; wading birds; neotropical migrant birds; beach nesting birds; bald and golden eagles; peregrine falcons; other raptors, grassland nesting birds; birds of early successional habitat; bobwhite quail; wild turkey; freshwater mussels; bats; nutria; and overly abundant species such as deer, beavers, southern nesting Canada geese, and red fox.

6 DE Reg. 536 (10/1/02)

18.0 Wanton Waste

Penalty Section 7 **Del.C.** §103(d))

18.1 Retrieval and Possession of Game Animals. A person wounding or killing a game animal shall make a reasonable effort to retrieve the wounded or dead game animal. The retrieved game animal shall be retained in the individual's possession until any of the following occurs:

18.1.1 The game animal is processed for consumption, consumed or utilized for its fur value.

18.1.2 The game animal is transported to the individual's residence, to a taxidermist, or to a place of commercial processing.

18.1.3 The game animal is utilized for scientific, educational or research purposes.

18.2 Any use of a game animal as not described in items 18.1.1 - 18.1.3 above will be deemed wanton waste.

11 DE Reg. 334 (09/01/07)

19.0 (Reserved)

20.0 Game Bird Releases

(Penalty Section 7 **Del.C.** §103(d))

20.1 Permit for releasing game birds

20.1.1 All persons possessing or releasing 25 or fewer domestically raised quail, chukar partridge, Hungarian partridge and pheasants into the wild must obtain a permit from the Division. This permit is free.

20.2 Banding Released Game Birds.

20.2.1 All domestically raised quail, chukar partridge, Hungarian partridge and pheasants must be leg banded with a Division approved band before being released into the wild. Person herein must report the number of birds banded, the type of bird released (quail, chukar partridge, Hungarian partridge or pheasant) and the release date and location.

12 DE Reg. 496 (10/01/08)

21.0 Guide License

(Penalty Section 7 **Del.C.** §103(d))

21.1 Persons required to obtain a Delaware Guide License

21.1.1 All individuals receiving monetary or in-kind compensation for providing personal guide services to hunters are required to have a Delaware Guide License.

21.2 Age Requirement

21.2.1 Persons acquiring a guide license, must be 18 years of age or older

21.3 Fish and Wildlife Violations

21.3.1 Persons acquiring a guide license must not have been convicted for violations of any wildlife or fisheries statutes or regulations within the last three years prior to applying for a Delaware Guide License.

21.4 Reporting

21.4.1 All persons possessing a Delaware Guide License are required to complete and submit an annual report to the Division within seven days after the close of the season to include the following information which must be readily available for inspection by enforcement officers: full name of each hunter, address of each hunter in the party, hunting license number for each hunter, date, number and species of each animal harvested, location of hunts and the name and license number of the guide.

21.5 Record Retention

21.5.1 The guide shall retain all hunting field records for a period of three years.

21.6 General Hunting License

21.6.1 A resident or non resident hunting license is not required for persons holding a valid Delaware Guide License.

21.6.2 A nonresident shall be exempt from the guide licensing requirement of this section only while guiding hunters for snow geese (light geese), provided:

21.6.2.1 The nonresident is properly licensed to guide in another state or Canadian province which extends the same exemption to Delaware residents;

21.6.2.2 The nonresident guide purchases a Delaware migratory waterfowl stamp and obtains a Delaware H.I.P. permit.

21.6.2.3 The nonresident resides in another state or Canadian province which extends the same exemption to Delaware residents.

12 DE Reg. 496 (10/01/08)
14 DE Reg. 52 (07/01/10)

22.0 Hunter and Trapper License Exempt Number

(Penalty Section 7 **Del.C.** §103(d))

Hunters and trappers who are exempt from purchasing a license to hunt or trap in Delaware are required to obtain an annual Hunter and Trapper License Exempt Number from the Division. This number must be carried by the hunter or trappers while engaged in hunting and trapping activities.

12 DE Reg. 496 (10/01/08)
14 DE Reg. 52 (07/01/10)
15 DE Reg. 1505 (04/01/12)

Appendix E-10. Environmental Protection Act

Environmental Protection Act
DE Code Title 7, Part VII, Chapter 60 (Environmental Control)
Source: http://delcode.delaware.gov/title7/c060/index.shtml, accessed June 1, 2012.

Subchapter I. General Provisions

§ 6001. Findings, policy and purpose.

(a) Findings. -- The General Assembly hereby makes the following findings concerning the development, utilization and control of the land, water, underwater and air resources of the State:

(1) The development, utilization and control of the land, water, underwater and air resources of the State are vital to the people in order to assure adequate supplies for domestic, industrial, power, agricultural, recreational and other beneficial uses;

(2) The development and utilization of the land, water, underwater and air resources must be regulated to ensure that the land, water, underwater and air resources of the State are employed for beneficial uses and not wasted;

(3) The regulation of the development and utilization of the land, water, underwater and air resources of the State is essential to protect beneficial uses and to assure adequate resources for the future;

(4) The land, water, underwater and air resources of the State must be protected and conserved to assure continued availability for public recreational purposes and for the conservation of wildlife and aquatic life;

(5) The land, water, underwater and air resources of the State must be protected from pollution in the interest of the health and safety of the public;

(6) The land, water, underwater and air resources of the State can best be utilized, conserved and protected if utilization thereof is restricted to beneficial uses and controlled by a state agency responsible for proper development and utilization of the land, water, underwater and air resources of the State;

(7) Planning for the development and utilization of the land, water, underwater and air resources is essential in view of population growth and the expanding economic activity within the State.

(b) Policy. -- In view of the rapid growth of population, agriculture, industry and other economic activities, the land, water and air resources of the State must be protected, conserved and controlled to assure their reasonable and beneficial use in the interest of the people of the State. Therefore, it is the policy of this State that:

(1) The development, utilization and control of all the land, water, underwater and air resources shall be directed to make the maximum contribution to the public benefit; and

(2) The State, in the exercise of its sovereign power, acting through the Department should control the development and use of the land, water, underwater and air resources of the State so as to effectuate full utilization, conservation and protection of the water and air resources of the State.

(c) Purpose. -- It is the purpose of this chapter to effectuate state policy by providing for:

(1) A program for the management of the land, water, underwater and air resources of the State so directed as to make the maximum contribution to the interests of the people of this State;

(2) A program for the control of pollution of the land, water, underwater and air resources of the State to protect the public health, safety and welfare;

(3) A program for the protection and conservation of the land, water, underwater and air resources of the State, for public recreational purposes, and for the conservation of wildlife and aquatic life;

(4) A program for conducting and fostering research and development in order to encourage maximum utilization of the land, water, underwater and air resources of the State;

(5) A program for cooperating with federal, interstate, state, local governmental agencies and utilities in the development and utilization of land, water, underwater and air resources;

(6) A program for improved solid waste storage, collection, transportation, processing and disposal by providing that such activities may henceforth be conducted only in an environmentally acceptable manner pursuant to a permit obtained from the Department.

7 Del. C. 1953, § 6001; 59 Del. Laws, c. 212, § 1.;

Subchapter II. Powers and Duties of Secretary and Department

§ 6002. Definitions.

The following words and phrases shall have the meaning ascribed to them in this chapter unless the context clearly indicates otherwise:

(1) "Activity" means construction, or operation, or use of any facility, property, or device.

(2) "Air contaminant" means particulate matter, dust, fumes, gas, mist, smoke or vapor or any combination thereof, exclusive of uncombined water.

(3) "Air pollution" means the presence in the outdoor atmosphere of 1 or more air contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant or animal life or to property, or which unreasonably interferes with the enjoyment of life and property within the jurisdiction of this State, excluding all aspects of employer-employee relationships as to health and safety hazards.

(4) "At cost" means the expense to the government to conduct tests and analyses. No added service fee, or other fees and charges, may be included in this cost.

(5) "Board" means the Environmental Appeals Board.

(6) "Boat docking facility" shall mean a place where vessels may be secured to a fixed or floating structure or to the shoreline or shoreline structure.

(7) "Borrow pit" means any excavation into the subsurface for the purpose of extraction of earth products with the exception of excavation for utility or road construction, agricultural or highway drainage, or dredging operations under the jurisdiction of the U.S. Army Corps of Engineers.

(8) "Categorical pretreatment standard" means a pretreatment standard which applies to industrial users in a specific industrial subcategory.

(9) "Commercial landfill" means a waste disposal facility available for use by the general public and which accepts waste for disposal for profit.

(10) "Debris disposal area" means an excavation, pit or depression into which land clearing debris, along with small amounts of construction or demolition waste incidental to construction, has been placed and which is not a permitted or approved waste management facility.

(11) "Dedicated pumpout facility" means a semi-permanent connection made to a vessel for the purpose of removing sewage from the vessel on a continuous basis or automatic intermittent basis to an approved disposal facility.

(12) "Delineation" shall mean the process of defining and/or mapping a boundary that approximates the areas that contribute water to a particular water source used as a public water supply.

(13) "Department" means the Department of Natural Resources and Environmental Control.

(14) "Direct vessel sewage pumpout connection" shall mean a semipermanent connection made to a vessel for the purpose of removing vessel sewage from the vessel holding tank or head on a continuous or automatic intermittent basis to an approved sewage disposal facility.

(15) "Discharge or indirect discharge" means the discharge or the introduction of pollutants from any nondomestic source into a POTW.

(16) "Domestic wastewater" means the liquid and water-borne human and/or household type waste derived from residential, industrial, institutional or commercial sources.

(17) "Dump station" means a type of pumpout facility that receives vessel sewage from portable marine sanitation devices and delivers that sewage to an approved sewage disposal facility.

(18) "Earth products" means any solid material, aggregate or substance of commercial value, whether consolidated or loose, found in natural deposits on or in the earth, including, but not limited to clay, silt, diatomaceous earth, sand, gravel, stone, metallic ores, shale and soil.

(19) "Environmental release" means any spillage, leakage, emission, discharge or delivery into the air or waters or on or into the lands of this State of any sewage of 10,000 gallons or more oil, industrial waste, liquid waste, hydrocarbon chemical, hazardous substance, hazardous waste, restricted chemical material, vessel discharge, air contaminant, pollutant, regulated biological substance or other wastes reportable pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 [42 U.S.C. § 9601 et seq.], as amended, or regulations enacted pursuant to § 6028 of this title.

(20) "Excellent ground-water recharge potential area" shall mean any area where soils and sedimentary deposits of the most coarse grained nature have the best ability to transmit water vertically through the unsaturated zone to the water table as mapped by the methods described in the Delaware Geological Survey Open File Report No. 34, "Methodology For Mapping Ground-Water Recharge Areas in Delaware's Coastal Plain" (August 1991), and as depicted on a series of maps prepared by the Delaware Geological Survey. An excellent ground-water recharge potential area shall constitute a critical area as defined under Chapter 92 of Title 29.

(21) "Garbage" shall mean any putrescible solid and semisolid animal and/or vegetable wastes resulting from the production, handling, preparation, cooking, serving or consumption of food or food materials.

(22) "Graywater" means galley, bath and shower water.

(23) "Ground water" means any water naturally found under the surface of the earth.

(24) "Hydrocarbon chemical" means any compound composed of carbon and hydrogen.

(25) "Incinerator," "incinerator structure or facility," and "waste incinerator" include any structure or facility operated for the combustion (oxidation) of solid waste, even if the by-products of the operation include useful products such as steam and electricity. "Incinerator" shall not include:

a. Crematoriums;

b. The disposal of the bodies of animals through incineration;

c. The burning of poultry waste or poultry manure at the same site where the waste or manure was generated, which shall include the burning of poultry waste or poultry manure generated upon an adjacent farm;

d. The disposal of all materials used in the discovery, development, and manufacture of veterinary products, medicines and vaccines; or

e. The disposition of mortalities from poultry operations in facilities approved by the Delaware Department of Natural Resources and Environmental Control which comply with United States Department of Agricultural Natural Resources Conservation Service Interim Conservation Practice Standard Incinerator 769 or any successor standard.

(26) "Industrial user" means a source of indirect discharge. The term "industrial user" shall include, but not be limited to, the original source of the indirect discharge as well as the owners or operators of any

intervening connections, other than those owned or operated by the receiving POTW, which convey the indirect discharge to the POTW.

(27) "Industrial waste" means any water-borne liquid, gaseous, solid or other waste substance or a combination thereof resulting from any process of industry, manufacturing, trade or business, or from the development of any agricultural or natural resource.

(28) "Liquid waste" means any industrial waste or sewage or other wastes or any combination thereof which may potentially alter the chemical, physical or biological integrity of water from its natural state.

(29) "Liquid waste hauler" means any person who engages in the removal of liquid wastes from septic tanks, cesspools, seepage pits, holding tanks or other such devices and conveys such liquid waste to a location removed from the point of acceptance.

(30) "Liquid waste treatment plant operator" means any person who has direct responsibility for the operation of a liquid waste treatment plant.

(31) "Live-aboard vessel" shall mean:

a. A vessel used principally as a residence;

b. A vessel used as a place of business, professional or other commercial enterprise and, if used as a means of transportation, said transportation use is a secondary or subsidiary use; this definition shall not include commercial fishing boats which do not fall under paragraph (31)a. of this section; or

c. Any other floating structure used for the purposes stated under paragraph (31)a. or b. of this section.

(32) "Marinas" are those facilities adjacent to the water which provide for mooring, berthing, or storage of boats, and which include any or all of the related ancillary structures and functions of marinas, such as docks, piers, boat storage areas, boat ramps, anchorages, breakwaters, channels, moorings, basins, boat repair services, boat sales, sales of supplies which are normally associated with boating such as fuel, bait and tackle, boat rentals and parking areas for users of the marina.

(33) "Marine Sanitation Device (MSD)" includes any equipment on board a vessel which is designed to receive, retain, treat or discharge sewage, and any process to treat such sewage. Marine sanitation devices are classified as:

a. "Type I marine sanitation device" means a device that produces an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 milliliters and no visible floating solids.

b. "Type II marine sanitation device" means a device that produces an effluent having a fecal coliform bacteria count of not greater than 200 per 100 milliliters and suspended solids not greater than 150 milligrams per liter.

c. "Type III marine sanitation device" means a device that is certified to a no-discharge standard. Type III devices include recirculating and incinerating MSDs and holding tanks.

(34) "Oil" means oil of any kind and in any form, including but not limited to, petroleum products, sludge, oil refuse, oil mixed with other wastes and all other liquid hydrocarbons regardless of specific gravity.

(35) "Open dump" means any facility or site where solid waste is disposed which is not a sanitary landfill and which is not a facility for disposal for hazardous waste.

(36) "Other wastes" means garbage, refuse, decayed wood, sawdust, shavings, bark, sand, lime cinders, ashes, offal, oil, tar, dye-stuffs, acids, chemicals and all discarded substances other than sewage or industrial wastes.

(37) "Persons" means any individual, trust, firm, joint stock company, federal agency, partnership, corporation (including a government corporation), association, state, municipality, commission, political subdivision of a state or any interstate body.

(38) "Pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, hydrocarbons, oil, and product chemicals, and industrial, municipal and agricultural waste discharged into water.

(39) "POTW pretreatment program" means a program administered by a POTW for the purpose of enforcing pretreatment standards in accordance with the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq. and regulations promulgated thereunder.

(40) "Pretreatment standard" means any pollutant discharge limit promulgated by the Administrator of the United States Environmental Protection Agency in accordance with § 307(b) and (c) of the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1317(b) and (c), or by the Secretary, which applies to industrial users.

(41) "Public drinking water system" shall mean a community, noncommunity or non-transient non-community water system which provides piped water to the public for human consumption. The system must have at least 15 service connections or regularly serve at least 25 individuals daily for at least 60 days.

(42) "Publicly owned treatment works" or "POTW" means either:

a. A treatment works which is owned by a city, town, county, district or other public body created by or pursuant to the laws of the State; or

b. Any such public body which has jurisdiction over the discharges to such treatment works.

(43) "Pumpout facility" means a mechanical device which is temporarily connected to a vessel for the purpose of removing sewage from a vessel to an approved sewage disposal facility.

(44) "Refuse" means any putrescible or nonputrescible solid waste, except human excreta, but including garbage, rubbish, ashes, street cleanings, dead animals, offal and solid agricultural, commercial,

industrial, hazardous and institutional wastes and construction wastes resulting from the operation of a contractor.

(45) "Restricted chemical material" means:

a. Any halogenated hydrocarbon chemical (aliphatic or aromatic) including but not limited to trichloroethane, tetrachloroethylene, methylene chloride, halogenated benzenes and carbon tetrachloride; or

b. Any aromatic hydrocarbon chemical including, but not limited to, benzene, toluene and naphthalene; or

c. Any halogenated phenol derivative in which a hydroxide group and 2 or more halogen atoms are substituted onto aromatic carbons of a benzene ring including, but not limited to, trichlorophenol and pentachlorophenol; or

d. Similar materials including but not limited to acrolein, acrylonitrile or benzidene.

(46) "Rubbish" means any nonputrescible solid waste, excluding ashes, such as cardboard, paper, plastic, metal or glass food containers, rags, waste metal, yard clippings, small pieces of wood, excelsior, rubber, leather, crockery and other waste materials.

(47) "Sanitary landfill" means a facility for the disposal of solid waste which meets the criteria promulgated under § 6010(g)(1) of this title.

(48) "Secretary" means the Secretary of the Department of Natural Resources and Environmental Control or the Secretary's duly authorized designee.

(49) "Sewage" means water-carried human or animal wastes from septic tanks, water closets, residences, buildings, industrial establishments, or other places, together with such ground water infiltration, subsurface water, admixtures of industrial wastes or other wastes as may be present.

(50) "Sewage system" means any part of a wastewater disposal system including, but not limited to, all toilets, urinals, piping, drains, sewers, septic tanks, distribution boxes, absorption fields, seepage pits, cesspools and dry wells.

(51) "Sewage system cleanser" means: (i) Any solid or liquid material intended or used primarily for the purpose of cleaning, treating or unclogging any part of a sewage system, or (ii) any solid or liquid material intended or used primarily for the purpose of continuously or automatically deodorizing or disinfecting any part of a sewage system including, but not limited to, solid cakes or devices placed in plumbing fixtures. Excluded from this definition are products intended or used primarily in the manual surface cleaning, scouring, treating, deodorizing or disinfecting, of common plumbing fixtures.

(52) "Slip" means a place where a boat may be secured to a fixed or floating structure, including, but not limited to a dock, pier, mooring or anchorage. Slips may be wet (in the water) or dry (in a rack or other device on land).

(53) "Solid waste" means any garbage, refuse, refuse-derived fuel, demolition and construction waste wood, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including solid, liquid, semisolid or contained gaseous material resulting from industrial, commercial, mining and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under this chapter, as amended, or source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954 [42 U.S.C. § 2011 et seq.], as amended. By-products of a uniform and known composition produced as a result of a production process are not solid wastes when incinerated onsite. All incinerators under state permit as of March 1, 2000, and renewal permit applications for these incinerators shall not come under the provisions of this section and § 6003 of this title.

(54) "Source water" shall mean any aquifer or surface water body from which water is taken either periodically or continuously by a public drinking water system for drinking or food-processing purposes.

(55) "Source water assessment" shall mean the identification and evaluation of the sources of water within the State that are used by public drinking water systems in an effort to determine the susceptibility of those sources to contamination.

(56) "Source water assessment area" shall mean the delineated area which contributes water to a public water supply system. This is called a wellhead protection area for a well and a watershed or basin for a surface water intake. A source water assessment area shall constitute a critical area as defined under Chapter 92 of Title 29.

(57) "Source water assessment plan" shall mean the October 1999 U.S. EPA-approved plan for evaluating the sources of public drinking water in Delaware for their vulnerability and susceptibility to contamination.

(58) "Source Water Protection Citizens Technical Advisory Committee" shall mean a group to advise the Secretary of the Department of Natural Resources and Environmental Control, including, but not limited to, representatives of the following organizations or municipalities: DNREC, Department of Health and Social Services, Department of Agriculture, the Delaware Nature Society, the Delaware Public Health Association, the American Association of Retired Persons, the United States Geological Survey, the Christina River Conservancy, the Water Resources Agency of the University of Delaware, the Council of Farm Organizations, the Delaware Rural Water Association, the League of Women Voters, the Friends of Herring Creek, the Civic League of New Castle County, the Delaware Geological Survey, the Committee of 100, the City of Dover, the City of Lewes, the New Castle County Department of Land Use, Kent County Levy Court, Sussex County Council, the League of Local Governments, the Sussex County Association of Towns, the Homebuilders Association of Delaware, the Commercial Industrial Realty Council, and the Delaware Association of Professional Engineers; and public water suppliers.

(59) "Surface water" means water occurring generally on the surface of the earth.

(60) "Treatment works" means any device and system used in the storage, treatment, recycling and reclamation of municipal sewage, or industrial wastes of a liquid nature, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, outfall sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances, extensions, improvements, remodeling, additions and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities and improvements to exclude or minimize inflow and infiltration.

(61) "Variance" means a permitted deviation from an established rule or regulation, or plan, or standard or procedure.

(62) "Vessel" shall mean and include every description of watercraft, boat, houseboat or other form of artificial contrivance used, or capable of being used, whether or not capable of self-propulsion, for navigation on the waters of the State.

(63) "Vessel discharge" includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying or dumping.

(64) "Vessel sewage" shall mean human body wastes and wastes from toilets and other receptacles intended to receive or retain human body wastes.

(65) "Vessel sewage pumpout station" shall mean a mechanical device which is temporarily connected to a vessel for the purpose of removing vessel sewage from its holding tank or head to an approved sewage disposal facility.

(66) "Water facility" means any well, dam, reservoir, surface water intake or waterway obstruction.

(67) "Water pollution" means the human-made or human-induced alteration of the chemical, physical, biological or radiological integrity of water.

(68) "Water supply system" means all plants, systems, facilities or properties used or useful, or having the present capacity for future use, in connection with the supply or distribution of water, and any integral part thereof, including water distribution systems, mains, laterals, pumping stations, stand pipes, filtration plants, purification plants, hydrants, meters, valves and equipment, appurtenances and all properties, rights, easements and franchises relating thereto and deemed necessary or convenient by the authority for the operation thereof. Except as otherwise provided in this chapter, the term "water supply system" shall not mean a dam, reservoir, surface water intake, water obstruction or well.

(69) "Water utility" shall mean any person or entity operating within this State any water service, system, plant or equipment for public use.

(70) "Water well contractor" means any person engaged in the business of contracting for the construction of water wells and/or installation of pumping equipment in or for wells.

(71) "Well" means any excavation that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed when the intended use of such excavation is for the location, testing, acquisition or artificial recharge of underground water, and where the depth is greater than the diameter or width.

(72) "Wellhead protection area" shall mean the surface and subsurface area surrounding a water well or wellfield supplying a public water system through which contaminants are likely to reach such a well or wellfield. A Wellhead Protection Area shall constitute a critical area as defined under Chapter 92 of Title 29.

(73) "Wellhead protection plan" shall mean the March 1990 U.S. EPA-approved plan for protecting the quality of drinking water derived from public water supply wells in Delaware.

7 Del. C. 1953, § 6002; 59 Del. Laws, c. 212, § 1; 61 Del. Laws, c. 315, § 1; 62 Del. Laws, c. 412, §§ 1, 2; 62 Del. Laws, c. 414, § 3; 63 Del. Laws, c. 248, § 1; 64 Del. Laws, c. 146, § 4; 64 Del. Laws, c. 370, § 1; 64 Del. Laws, c. 479, §§ 4, 5; 65 Del. Laws, c. 144, § 1; 66 Del. Laws, c. 275, § 1; 67 Del. Laws, c. 353, § 2; 68 Del. Laws, c. 124, § 3; 68 Del. Laws, c. 137, §§ 1, 2; 68 Del. Laws, c. 403, §§ 1, 2; 69 Del. Laws, c. 302, § 6; 70 Del. Laws, c. 186, § 1; 71 Del. Laws, c. 418, § 1; 72 Del. Laws, c. 289, §§ 1, 6, 7; 73 Del. Laws, c. 67, § 1; 73 Del. Laws, c. 117, § 1.;

§ 6003. Permit -- Required.

(a) No person shall, without first having obtained a permit from the Secretary, undertake any activity:

(1) In a way which may cause or contribute to the discharge of an air contaminant; or

(2) In a way which may cause or contribute to discharge of a pollutant into any surface or ground water; or

(3) In a way which may cause or contribute to withdrawal of ground water or surface water or both; or

(4) In a way which may cause or contribute to the collection, transportation, storage, processing or disposal of solid wastes, regardless of the geographic origin or source of such solid wastes; or

(5) To construct, maintain or operate a pipeline system including any appurtenances such as a storage tank or pump station; or

(6) To construct any water facility; or

(7) To plan or construct any highway corridor which may cause or contribute to the discharge of an air contaminant or discharge of pollutants into any surface or ground water.

(b) No person shall, without first having obtained a permit from the Secretary, construct, install, replace, modify or use any equipment or device or other article:

(1) Which may cause or contribute to the discharge of an air contaminant; or

(2) Which may cause or contribute to the discharge of a pollutant into any surface or ground water; or

(3) Which is intended to prevent or control the emission of air contaminants into the atmosphere or pollutants into surface or ground waters; or

(4) Which is intended to withdraw ground water or surface water for treatment and supply; or

(5) For disposal of solid waste.

(c) The Secretary shall grant or deny a permit required by subsection (a) or (b) of this section in accordance with duly promulgated regulations and:

(1) No permit may be granted unless the county or municipality having jurisdiction has first approved the activity by zoning procedures provided by law; and

(2) No permit may be granted to any incinerator unless:

a. The property on which the incinerator is or would be located is within an area which is zoned for heavy industrial activity and shall be subject to such process rules, regulations or ordinances as the county, municipality or other government entity shall require by law, such as a conditional use, so that conditions may be applied regarding the health, safety and welfare of the citizens within the jurisdiction; and

b. Every point on the property boundary line of the property on which the incinerator is or would be located is:

1. At least 3 miles from every point on the property boundary line of any residence;

2. At least 3 miles from every point on the property boundary line of any residential community; and

3. At least 3 miles from every point on the property boundary line of any church, school, park, or hospital.

(d) A county which requests authority to administer a system for granting or denying a septic tank permit, and which satisfies the Secretary that it has the capability, including but not limited to regulations and enforcement authority, may be authorized by the Secretary, for a term stated, to administer such a system for him or her within that county. In the event of such authorization, an applicant for a septic tank permit in that county shall not be bound by subsections (a) and (b) of this section.

(e) The Secretary may, after public hearings, publish a list of activities which do not require a permit.

(f) The Secretary may establish fees for permits issued pursuant to this section with the concurrence and approval of the General Assembly. The Secretary shall annually prepare a schedule of fees for permits issued pursuant to this section and submit the same as part of the Department's annual operating budget proposal.

(g) No county, municipality or other governmental entity shall issue any building, placement, storage or occupancy permit or license until the property owner has obtained from the Department any necessary permits for underground discharge of wastewater and withdrawal of groundwater.

(h) The Secretary may reduce the amount of any fee charged for any permit or license issued pursuant to the provisions of this title for particular types of permits or classes or categories of permittees.

(i) No county, municipality or other governmental entity shall issue any building, placement, storage or occupancy permit or license to any person intending to operate an incinerator unless:

(1) The property on which the incinerator is or would be located is within an area which is zoned for heavy industrial activity and shall be subject to such process rules, regulations or ordinances as the county, municipality or other government entity shall require by law, such as a conditional use, so that conditions may be applied regarding the health, safety and welfare of the citizens within the jurisdiction; and

(2) Every point on the property boundary line of the property on which the incinerator is or would be located is:

a. At least 3 miles from every point on the property boundary line of any residence;

b. At least 3 miles from every point on the property boundary line of any residential community; and

c. At least 3 miles from every point on the property boundary line of any church, school, park or hospital.

7 Del. C. 1953, § 6003; 59 Del. Laws, c. 212, § 1; 65 Del. Laws, c. 344, § 1; 68 Del. Laws, c. 86, § 3; 68 Del. Laws, c. 89; 68 Del. Laws, c. 348, § 1; 70 Del. Laws, c. 186, § 1; 72 Del. Laws, c. 289, §§ 2-5.;

§ 6004. Permit -- Application; hearing.

(a) Any person desiring to obtain a permit required by § 6003 of this title or a variance or an application to establish a redemption center or a certificate of public convenience and necessity required by subchapter V of this chapter shall submit an application therefor in such form and accompanied by such plans, specifications and other information as required by applicable statute or regulation.

(b) Except as otherwise provided in subsection (c) of this section, upon receipt of an application in proper form, the Secretary shall advertise in a newspaper of general circulation in the county in which the activity is proposed and in a daily newspaper of general circulation throughout the State:

(1) The fact that the application has been received;

(2) A brief description of the nature of the application; and

(3) The place at which a copy of the application may be inspected.

The Secretary shall hold a public hearing on an application, if he or she receives a meritorious request for a hearing within a reasonable time as stated in the advertisement. A public hearing may be held on any application if the Secretary deems it to be in the best interest of the State to do so. Such notice shall also be sent by mail to any person who has requested such notification from the Department by providing the name and mailing address. The reasonable time stated shall be 15 days, unless federal law requires a longer time, in which case the longer time shall be stated. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasoned statement of the permit's probable impact. The applicant shall be responsible for the cost of any such advertisements and notices made by the Department as required by this section, not to exceed $500.

(c) The advertisement and notice requirements set forth in subsection (b) of this section may not apply to a permit application received by the Department whenever the subject matter of said application relates to the following:

(1) Air quality control permit applications for open burning, or for the construction or operation of emission control equipment on an existing gasoline dispensing facility, a delivery vessel or a dry cleaning facility;

(2) Water quality control permit applications for a sewage system for 3 or fewer families, a municipal or publicly owned or operated sewage collection system that does not have a pump or lift station, or, a commercial septic system that is used to treat and dispose of 500 gallons or less per day of domestic wastewater only;

(3) Water well construction permit applications for any well from which the Department determines that the withdrawal under normal operations will not exceed 1,000,000 gallons per day.

The Secretary may act without public notice on any permit application that is specified in this subsection.

(d) Advertisements required under subsection (b) of this section may be placed by persons desiring to obtain a permit under § 6003 of this title, provided the advertisement meets the requirements contained in subsection (b) of this section and any additional requirements as may be specified by the Department.

7 Del. C. 1953, § 6004; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 1; 61 Del. Laws, c. 503, § 3; 64 Del. Laws, c. 146, §§ 1-3; 64 Del. Laws, c. 472, § 1; 68 Del. Laws, c. 124, § 4; 70 Del. Laws, c. 53, § 1; 70 Del. Laws, c. 186, § 1; 73 Del. Laws, c. 117, § 2; 78 Del. Laws, c. 185, § 1.;

§ 6005. Enforcement; civil and administrative penalties; expenses.

(a) The Secretary shall enforce this chapter.

(b) Whoever violates this chapter or any rule or regulation duly promulgated thereunder, or any condition of a permit issued pursuant to § 6003 of this title, or any order of the Secretary, shall be punishable as follows:

(1) If the violation has been completed, by a civil penalty imposed by Superior Court of not less than $1,000 nor more than $10,000 for each completed violation. Each day of continued violation shall be considered as a separate violation. The Superior Court shall have jurisdiction of a violation in which a civil penalty is sought. If the violation has been completed and there is a substantial likelihood that it will reoccur, the Secretary may also seek a permanent or preliminary injunction or temporary restraining order in the Court of Chancery.

(2) If the violation is continuing, the Secretary may seek a monetary penalty as provided in paragraph (b)(1) of this section. If the violation is continuing or is threatening to begin, the Secretary may also seek a temporary restraining order or permanent injunction in the Court of Chancery. In his or her discretion, the Secretary may endeavor by conciliation to obtain compliance with all requirements of this chapter. Conciliation shall be giving written notice to the responsible party:

a. Specifying the complaint;

b. Proposing a reasonable time for its correction;

c. Advising that a hearing on the complaint may be had if requested by a date stated in the notice; and

d. Notifying that a proposed correction date will be ordered unless a hearing is requested.

If no hearing is requested on or before the date stated in the notice, the Secretary may order that the correction be fully implemented by the proposed date or may, on his or her own initiative, convene a hearing, in which the Secretary shall publicly hear and consider any relevant submission from the responsible party as provided in § 6006 of this title.

(3) In his or her discretion, the Secretary may impose an administrative penalty of not more than $10,000 for each day of violation. Prior to assessment of an administrative penalty, written notice of the Secretary's proposal to impose such penalty shall be given to the violator, and the violator shall have 30 days from receipt of said notice to request a public hearing. Any public hearing, if requested, right of appeal and judicial appeal shall be conducted pursuant to §§ 6006-6009 of this title. Assessment of an administrative penalty shall be determined by the nature, circumstances, extent and gravity of the violation, or violations, ability of violator to pay, any prior history of such violations, the degree of culpability, economic benefit or savings (if any) resulting from the violation and such other matters as justice may require. Simultaneous violations of more than 1 pollutant or air contaminant parameter or of any other limitation or standard imposed under this chapter shall be treated as a single violation for each day. In the event of nonpayment of the administrative penalty after all legal appeals have been exhausted, a civil action may be brought by the Secretary in Superior Court for collection of the administrative penalty, including interest, attorneys' fees and costs, and the validity, amount and appropriateness of such administrative penalty shall not be subject to review.

(c)(1) Whenever the Secretary determines that any person has violated this chapter, or a rule, or regulation, or condition of a permit issued pursuant to § 6003 of this title, or an order of the Secretary, said person shall be liable for all expenses incurred by the Department:

a. In abating the violation; or

b. Controlling a pollution incident related to the violation; or

c. Cleanup and restoration of the environment; or

d. The costs incurred by the Department in recovering such expenses.

Such expenses shall include, but not be limited to, the costs of investigation, legal fees and assistance, public hearings, materials, equipment, human resources, contractual assistance and appropriate salary and overtime pay for all state employees involved in the effort notwithstanding merit system laws, regulations or rules to the contrary. The Secretary shall submit a detailed billing of expenses to the liable person.

(2) In the event the liable person desires to challenge the detailed billing submitted by the Secretary, such person shall, within 20 days of receipt of the detailed billing request an administrative hearing before the Secretary. Testimony at the administrative hearing shall be under oath and shall be restricted to issues relating to:

a. The finding of violation; and

b. The billing of expenses submitted by the Secretary.

A verbatim transcript of testimony at the hearing shall be prepared and shall, along with the exhibits and other documents introduced by the Secretary or other party, constitute the record. The Secretary shall make findings of fact based on the record, and enter an order which shall contain reasons supporting the decision. An appeal of the decision of the Secretary may be perfected to Superior Court within 30 days of the decision of the Secretary. In lieu of holding an administrative hearing on the detailed billing, or in the event a liable person fails or refuses to pay any of the expenses listed in the detailed billing, the Secretary may seek to compel payment through the initiation of a civil action in any court of competent jurisdiction within the State of Delaware. This subsection shall not be affected by the appeal provisions of § 6008 of this title.

(d) Any expenses or 75 percent of civil or administrative penalties collected by the Department under this section are hereby appropriated to the Department to carry out the purposes of this chapter; however any expenditure or transfer must be approved by the Director of the Office of Management and Budget and the Controller General. The Department shall submit quarterly reports on the progress of the expenditures and/or projects. All expenditures must be recommended by the Department and approved by the Secretary. All penalty funds will be deposited in the Penalty Fund Account. All of the penalty fund expenditures made by the Department of Natural Resources and Environmental Control shall be reported annually to the Joint Finance Committee in the Department's annual budget presentation. Included in this presentation shall be an explanation of the process used to select the recipients of penalty fund money.

(e) Penalties or fines created by this section may be tripled with respect to any person or entity that was designated a chronic violator pursuant to § 7904 of this title at the time that the act leading to the penalty or fine occurred.

7 Del. C. 1953, § 6005; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, §§ 2, 3; 66 Del. Laws, c. 163, §§ 1, 2; 70 Del. Laws, c. 186, § 1; 73 Del. Laws, c. 318, § 2; 74 Del. Laws, c. 37, § 1; 74 Del. Laws, c. 203, § 1; 75 Del. Laws, c. 88, § 21(4); 75 Del. Laws, c. 357, § 1; 78 Del. Laws, c. 177, § 18.;

§ 6006. Public hearings.

Any public hearing held by the Secretary concerning any regulation or plan, permit application, alleged violation or variance request shall be conducted as follows:

(1) For any hearing on an application for a permit or an alleged violation or variance request, notification shall be served upon the applicant or alleged violator as summonses are served or by registered or certified mail not less than 20 days before the time of said hearing. Not less than 20 days' notice shall also be published in a newspaper of general circulation in the county in which the activity is proposed or the alleged violation has occurred and in a daily newspaper of general circulation throughout the State.

(2) For a hearing on a regulation or plan proposed for adoption, notification shall be published in a newspaper of general circulation in each county and in a newspaper of general circulation in the State. Such notification shall include:

a. A brief description of the regulation or plan;

b. Time and place of hearing; and

c. Time and place where copies of the proposed regulation may be obtained and a copy of the plan is available for public scrutiny.

Such notice shall also be sent to any persons who have requested such notification from the Department by providing the name and mailing address.

(3) The permit applicant or the alleged violator or party requesting a variance may appear personally or by counsel at the hearing and produce any competent evidence in his or her behalf. The Secretary or his or her duly authorized designee may administer oaths, examine witnesses and issue, in the name of the department, notices of hearings or subpoenas requiring the testimony of witnesses and production of books, records or other documents relevant to any matter involved in such hearing; and subpoenas shall also be issued at the request of the applicant or alleged violator or party requesting a variance. In case of contumacy or refusal to obey a notice of hearing or subpoena under this section, the Superior Court in the county in which the hearing is held shall have jurisdiction upon application of the Secretary, to issue an order requiring such person to appear and testify or produce evidence as the case may require.

(4) A record from which a verbatim transcript can be prepared shall be made of all hearings and shall, also with the exhibits and other documents introduced by the Secretary or other party, constitute the

record. The expense of preparing any transcript shall be borne by the person requesting it. The Secretary shall make findings of fact based on the record. The Secretary shall then enter an order that will best further the purpose of this chapter, and the order shall include reasons. The Secretary shall promptly give written notice to the persons affected by such order.

(5) The Secretary may establish a fee schedule for applications and hearings, and may collect from the applicant or from a violator finally adjudged guilty, the necessary expenses of the Department for conducting the hearing, or a reasonable fee for processing an application, or both. Any fees collected under this chapter are hereby appropriated to the Department to carry out the purposes of this chapter. The Secretary shall report through the annual budget process the receipt, proposed use and disbursement of these funds.

7 Del. C. 1953, § 6006; 59 Del. Laws, c. 212, § 1; 63 Del. Laws, c. 322, § 105(a); 64 Del. Laws, c. 62, § 1; 68 Del. Laws, c. 148, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6007. Establishment of Environmental Appeals Board.

(a) There is hereby created an Environmental Appeals Board which shall consist of 7 Delaware residents, appointed by the Governor with the advice and consent of the Senate. The Chairperson shall be appointed by the Governor and serve at the Governor's pleasure. Each county shall be represented by 2 members. Registered members of either major political party shall not exceed the other major political party by more than 1. The term of each member appointed shall be 3 years. Vacancies in Board membership shall be filled by the Governor for the remainder of the unexpired term.

(b) The Board is a quasi-judicial review board which is constituted in order to hear appeals of decisions of the Secretary. The Board or its designee may issue subpoenas by certified mail for witnesses or evidence, administer oaths to witnesses and conduct prehearing conferences for the simplification of issues by consent, for the disposal of procedural requests or disputes and to regulate and expedite the course of the hearing.

(c) A simple majority of the Board shall constitute a quorum. A simple majority of those members of the Board present shall be required to override the decision of the Secretary. The Board shall schedule, but not necessarily conduct, a hearing within 30 days following the receipt of the appeal. In any event, the Board shall conduct, but not necessarily complete, the hearing within 180 days following the receipt of the appeal unless the parties agree otherwise. The Board may verbally announce the decision at the conclusion of the hearing. A written decision shall be mailed to the parties by certified mail within 90 days after the completion of the hearing. If the Board fails to conduct the hearing or to issue the written opinion as required, the decision of the Secretary shall be a final decision for the purposes of appeal.

(d) Any member of the Board with a personal or private financial interest in the outcome of an appeal before the Board shall disqualify himself or herself from any consideration of that matter and shall inform the Chairperson who shall note such interest on the record of the hearing.

(e) Each Board member shall be compensated for such reasonable expenses as travel and meals for each meeting and hearing attended.

(f) The Environmental Appeals Board shall adopt such rules and regulations as are necessary to provide procedures to implement the terms of §§ 6007-6009 of this title, which shall apply to appeals to the Environmental Appeals Board. Prior to adopting any such rules and regulations, the Board shall designate a day, time and place for a public hearing on such proposed rules or for any amendments to existing or proposed rules and regulations. The Board shall give 20 days' notice of such hearing by publication in a newspaper of general circulation in the State and shall make copies of such proposed regulations available to the public upon request. The public hearing on such regulations shall be consistent with the provisions of Chapter 101 of Title 29.

(g) In any appeal to the Board there shall be required a reasonable fee, as established by the General Assembly, to cover such costs as are incurred during the appeal. The fees charged by the Environmental Appeals Board shall be deposited in a special account in the name of the Environmental Appeals Board and shall be used solely for the costs and expenses of that Board in holding its hearings and proceedings.

7 Del. C. 1953, § 6007; 59 Del. Laws, c. 212, § 1; 60 Del. Laws, c. 201, § 1; 68 Del. Laws, c. 86, § 4; 68 Del. Laws, c. 148, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6008. Appeals to Board.

(a) Any person whose interest is substantially affected by any action of the Secretary may appeal to the Environmental Appeals Board within 20 days after receipt of the Secretary's decision or publication of the decision. The Board shall conduct a public hearing for all appeals in accordance with Chapter 101 of Title 29. Deliberations of the Board may be conducted in executive session. Each member who votes shall indicate the nature of his or her vote in the written decision.

(b) Whenever a final decision of the Secretary concerning any case decision, including but not limited to any permit or enforcement action is appealed, the Board shall hold a public hearing in accordance with Chapter 101 of Title 29. The record before the Board shall include the entire record before the Secretary. All parties to the appeal may appear personally or by counsel at the hearing and may produce any competent evidence in their behalf. The Board may exclude any evidence which is plainly irrelevant, immaterial, insubstantial, cumulative or unduly repetitive, and may limit unduly repetitive proof, rebuttal and cross-examination. The burden of proof is upon the appellant to show that the Secretary's decision is not supported by the evidence on the record before the Board. The Board may affirm, reverse or remand with instructions any appeal of a case decision of the Secretary.

(c) Appeals of regulations shall be on the record before the Secretary. The Board may hear new evidence if it is relevant to or clarifies those issues in the record before the Secretary. The Board may exclude any new evidence which is plainly irrelevant, immaterial, insubstantial, cumulative or unduly repetitive. Regulations will be presumed valid, and the burden will be upon the appellant to show that the regulations are arbitrary and capricious, or adopted without a reasonable basis in the record. The Board shall take due account of the Secretary's experience and specialized competence and of the purposes of

this chapter in making its determination. The board may affirm, reverse or remand any appeal of regulations promulgated by the Secretary.

(d) The decision of the Board shall be signed by all members who were present at the hearing.

(e) There shall be no appeal of a decision by the Secretary to deny a permit on any matter involving state-owned land including subaqueous lands, except an appeal shall lie on the sole ground that the decision was discriminatory in that the applicant, whose circumstances are like and similar to those of other applicants, was not afforded like and similar treatment.

(f) No appeal shall operate to stay automatically any action of the Secretary, but upon application, and for good cause, the Secretary or the Court of Chancery may stay the action pending disposition of the appeal.

(g) At any time after the appeal to the Board, the parties may, by stipulation, proceed directly to Superior Court, in which case the Court may affirm, reverse or remand the Secretary's decision based on the record before the Secretary and the Board and whatever other evidence the parties may submit by stipulation. The standard of review for such an appeal shall be governed by subsections (b) and (c) of this section.

(h) In those circumstances in which the Board concludes that an immediate and expedited review of a decision of the Secretary is appropriate or necessary, the Board may hold a public hearing on the appeal at the earliest possible time and issue a decision on such appeal. In such a case, the notice requirements of this section and Chapter 101 of Title 29 do not apply, and the Board shall give advance notice of the hearing only to the extent reasonably possible.

7 Del. C. 1953, § 6008; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 4; 67 Del. Laws, c. 377, § 1; 68 Del. Laws, c. 148, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6009. Appeal from the Board's decision.

(a) Any person or persons, jointly or severally, or any taxpayer, or any officer, department, board or bureau of the State, aggrieved by any decision of the Board, may appeal to the Superior Court in and for the county in which the activity in question is wholly or principally located by filing a petition, duly verified, setting forth that such decision is illegal, in whole or in part, specifying the grounds of the illegality. Any such appeal shall be perfected within 30 days of the receipt of the written opinion of the Board.

(b) The Court may affirm, reverse or modify the Board's decision. The Board's findings of fact shall not be set aside unless the Court determines that the records contain no substantial evidence that would reasonably support the findings. If the Court finds that additional evidence should be taken, the Court may remand the case to the Board for completion of the record.

(c) No appeal shall operate to stay automatically any action of the Secretary, but upon application, and for good cause, the Board or the Court of Chancery may stay the action pending disposition of the appeal.

7 Del. C. 1953, § 6009; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, §§ 5, 6; 68 Del. Laws, c. 148, § 1.;

§ 6010. Rules and regulations; plans.

(a) The Secretary may adopt, amend, modify or repeal rules or regulations, or plans, after public hearing, to effectuate the policy and purposes of this chapter. No such rule or regulation shall extend, modify or conflict with any law of this State or the reasonable implications thereof.

(b) The Secretary shall formulate, amend, adopt and implement, after a public hearing, a statewide comprehensive water plan for the immediate and long-range development and use of the water resources of the State.

(c) The Secretary may formulate, amend, adopt and implement, after public hearing, a statewide air resources management plan to achieve the purpose of this chapter and comply with applicable federal laws and regulations. Any implementation plan in effect at the time of enactment of this chapter shall continue to be in effect unless amended or repealed by the Secretary.

(d) The Secretary may formulate, amend, adopt and implement, after public hearing, a statewide water pollution management plan to achieve the purposes of this chapter and comply with applicable federal laws and regulations. Any implementation plan in effect at the time of the enactment of this chapter shall continue to be in effect unless amended or repealed by the Secretary.

(e) The Secretary shall formulate, amend, develop and implement, after public hearing, a State solid waste plan in accordance with the requirements of subtitle D of the Resource Conservation and Recovery Act of 1976 (P.L. 94-580) as amended [42 U.S.C. § 6941 et seq.], and any regulations thereunder, hereafter referred to as RCRA: Provided, however, that such plan shall be formulated in coordination with the Delaware Solid Waste Authority and shall include provisions of the statewide solid waste management plan adopted by the Delaware Solid Waste Authority pursuant to § 6403(j) of this title which reflect the applicable functions and activities of the Delaware Solid Waste Authority under Chapter 64 of this title.

(f) The Secretary:

(1) Shall approve the allocation and use of water in the State on the basis of equitable apportionment;

(2) Shall approve all new plans and designs of all impounding water facilities by any state, county, municipal, public or private water user within the State pursuant to subchapter V of this chapter; and

(3) May require reports from all Delaware water users as to a description of their water facilities, and past and present records of water use.

(g)(1) The Secretary, after notice and public hearing, shall promulgate regulations containing criteria for determining which facilities shall be classified as sanitary landfills and which shall be classified as open dumps within the meaning of this chapter. At a minimum such criteria shall provide that a facility may be classified as a sanitary landfill and not an open dump only if there is no reasonable probability of adverse effects on health or the environment from disposal of solid waste at such facility. Such regulations may provide for the classification of the types of sanitary landfills.

(2) On the date as determined under paragraph (g)(3) of this section below, the open dumping of solid waste or hazardous waste and the establishment of new open dumps is prohibited and all solid waste, including solid waste originating in other states but not including hazardous waste, shall be utilized for resource recovery or disposed of in sanitary landfills, within the meaning of this chapter, or otherwise disposed of in an environmentally sound manner, except in the case of any practice or disposal of solid waste under a timetable or schedule for compliance established under paragraph (g)(5) of this section below.

(3) Except as provided in paragraphs (g)(4) and (5) of this section below, the prohibition contained in paragraph (g)(2) of this section above shall take effect on the date of promulgation of regulations containing criteria under paragraph (g)(1) of this section or on the date of approval of the state solid waste plan under § 4007 of RCRA [42 U.S.C. § 6947], whichever is later.

(4) To assist in the formulation of the state solid waste plan, the Secretary, utilizing the criteria adopted pursuant to paragraph (g)(1) of this section above, shall develop and publish an inventory of all disposal facilities or sites in Delaware which are open dumps within the meaning of this chapter. With respect to any active disposal facilities or sites the Secretary shall coordinate the development of the inventory with the Delaware Solid Waste Authority. Prior to publication of the inventory the Secretary shall provide written notice of the proposed open dump designation to the owner and operator of the disposal facility or site which notice shall contain a detailed statement of deficiencies under the criteria adopted pursuant to paragraph (g)(1) of this section above. Upon receipt of notification the owner or operator shall, within 30 days, be entitled to request a public hearing before the Secretary pursuant to § 6006 of this title to challenge the designation; otherwise, the designation shall become a final decision of the Secretary. With 60 days of publication of the open dump inventory, the owner or operator of a disposal facility or site may apply to the Secretary for a timetable or schedule for compliance or closure under paragraph (g)(5) of this section below. During the pendency of any such application and prior to final action and disposition thereon the prohibition set forth in paragraph (g)(3) of this section above shall not apply with respect to that site. Upon application by the owner or operator, a site or facility may be removed from the open dump inventory after a determination by the Secretary that the basis upon which the site was designated as an open dump no longer exists. Any such application to remove a site or facility from the inventory shall be advertised in accordance with § 6004(b) of this title.

(5) All existing disposal facilities or sites for solid waste which are open dumps listed in the inventory under paragraph (g)(4) of this section shall comply with such measures as may be required by the Secretary, consistent with the requirements of RCRA [42 U.S.C. § 6901 et seq.], for closure or upgrading. The Secretary shall establish a timetable or schedule for compliance for such practice or disposal of solid

waste which specifies a schedule of remedial measures, including an enforceable sequence of actions or operations, leading to compliance with the prohibition on open dumping of solid waste within a reasonable time (not to exceed 5 years) from the date of publication of criteria under paragraph (g)(1) of this section.

(h)(1) Subject to subsection (f) of this section, the Secretary shall establish procedures for the issuance of water allocation permits which shall be granted concurrently with any license or permit to construct, extend or operate an irrigation well or surface water intake on any farm or farmland in the State. A water allocation permit issued pursuant to this subsection shall reserve the right of the person to whom the permit is issued to utilize up to 20 acre-inches per year, but not more than 10 acre-inches per month.

(2) For the purposes of this subsection:

a. An "acre-inch" of water is the amount of water required to cover 1 acre of land to a depth of 1 inch and is equal in volume to 27,154 gallons of water.

b. An "irrigation well" is an agricultural well which is used exclusively for the watering of lands or crops other than household lawns and gardens.

(i) The Secretary shall waive the requirements of § 6004(b) of this title for irrigation wells if:

(1) The permit application is submitted between and April 1 and October 1, inclusive;

(2) The permit application is to replace an existing irrigation well;

(3) The existing well has a valid allocation permit; and

(4) The replacement well will not exceed allocation permitted amounts.

(j) An emergency circumstance is deemed to exist if a well will replace an existing well and if the Department of Agriculture and/or the Department of Natural Resources and Environmental Control determines that the lack of water or delay in obtaining water poses an immediate and significant danger to the health or welfare of persons or their property, or if 1 or both of the Departments have determined that other exceptional circumstances exist. Verbal approval must be given for the installation of a well if an emergency circumstance exists, provided that:

(1) Within 72 hours after the verbal issuance of a permit number under emergency circumstances, the applicant submits to the Department a well permit application and well completion report, which must include the permit number.

(2) All wells constructed under emergency circumstances must be constructed in conformance with all applicable regulations and officially established policies.

(k) If an emergency circumstance exists when State offices are closed, a well may be constructed, providing that it replaces an existing well and that the Department is notified verbally on the first

working day following such action. A well permit application, including the well permit number, the appropriate application fee, and a well completion report must be submitted within 72 hours after notification.

(l) The following persons shall serve on an advisory committee that oversees the agriculture irrigation well procedures:

(1) The Secretary of Agriculture, or the Secretary's designee;

(2) The Secretary of the Department of Natural Resources and Environmental Control, or the Secretary's designee;

(3) One person to represent the Delaware Farm Bureau;

(4) One person to represent the Fruit and Vegetable Growers Association of Delaware;

(5) One person who is an irrigation dealer;

(6) One person who is a commercial irrigation well driller;

(7) One person from the University of Delaware Water Resources Agency; and

(8) One person from the Delaware Geological Survey.

The Secretary of Agriculture and the Secretary of the Department of Natural Resources and Environmental Control shall determine that the committee members meet the above descriptions. The Secretary of Agriculture, or the Secretary's designee, shall serve as the chairperson of the advisory oversight committee.

7 Del. C. 1953, § 6010; 59 Del. Laws, c. 212, § 1; 60 Del. Laws, c. 288, § 2; 63 Del. Laws, c. 248, §§ 2-4; 67 Del. Laws, c. 344, § 4; 68 Del. Laws, c. 124, § 5; 73 Del. Laws, c. 191, § 1; 78 Del. Laws, c. 185, § 2.;

§ 6011. Variance.

(a) The Secretary may, upon application of a person (except an application concerning (1) a source of water or a sewerage facility for 3 or fewer families or (2) open burning, on which the Secretary may act without public notification), grant a variance to that person from any rule or regulation promulgated pursuant to this chapter after following the notice and hearing procedure set forth in § 6004 of this title.

(b) The variance may be granted if the Secretary finds that:

(1) Good faith efforts have been made to comply with this chapter;

(2) The person applying is unable to comply with this chapter because the necessary technology or other alternative methods of control are not available or have not been available for a sufficient period of time or the financial cost of compliance by using available technology is disproportionately high with respect to the benefits which continued operation would bestow on the lives, health, safety and welfare

of the occupants of this State and the effects of the variance would not substantially and adversely affect the policy and purposes of this chapter;

(3) Any available alternative operating procedure or interim control measures are being or will be used to reduce the impact of such source on the lives, health, safety and/or welfare of the occupants of this State; and

(4) The continued operation of such source is necessary to national security or to the lives, health, safety or welfare of the occupants of this State.

(c) The Secretary shall publish his or her decision, except a decision involving (1) a source of water or a sewerage facility for 3 or fewer families or (2) open burning, and the nature of the variance, if granted, and the conditions under which it was granted. The variance may be made effective immediately upon publication.

(d) Any party may appeal a decision of the Secretary on a variance request to the Environmental Appeals Board under § 6008 of this title within 15 days after the Secretary publishes his or her decision.

(e) No variance can be in effect longer than 1 year but may be renewed after another hearing pursuant to this section.

(f) The granting of a variance shall not in any way limit any right to proceed against the holder for any violation of the variance. This chapter, or any rule, or regulation, which is not incorporated in the variance provisions, shall remain in full effect.

(g) Notwithstanding other provisions of this section, the Secretary is not authorized to approve requests for fundamentally different factor variances from categorical pretreatment standards promulgated by the Administrator of the United States Environmental Protection Agency pursuant to § 307(b) or (c) of the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1317(b) or (c). The Secretary is authorized to accept and review such variance requests, and, upon review, deny such request or recommend that the Administrator of the United States Environmental Protection Agency approve such a variance request.

7 Del. C. 1953, § 6011; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, §§ 8, 9; 62 Del. Laws, c. 414, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6012. Temporary emergency variances.

(a) Notwithstanding § 6011 of this title, other than subsection (g) of that section, the Secretary may grant a variance to any rules or regulations promulgated pursuant to this chapter, for a period not to exceed 60 days. The request for a temporary emergency variance shall be submitted in writing, setting forth the reasons for the request.

(b) A temporary emergency variance may be granted only after a finding of fact by the Secretary that:

(1) Severe hardship would be caused by the time period involved in obtaining variances pursuant to § 6011 of this title;

(2) The emergency was of such an unforeseeable nature so as to preclude, because of time limitations, an application under § 6011 of this title;

(3) The conditions set forth in § 6011(b)(1)-(4) of this title are satisfied.

(c) Temporary emergency variances granted pursuant to this section may not be extended more than once.

(d) The granting of any temporary emergency variance shall be published within 5 days of the granting of said variance.

7 Del. C. 1953, § 6012; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 10; 62 Del. Laws, c. 414, § 2.;

§ 6013. Criminal penalties.

(a) Any person who wilfully or negligently:

(1) Violates § 6003 of this title, or violates any condition or limitation included in a permit issued pursuant to § 6003 of this title, or any variance condition or limitation, or any rule or regulation, or any order of the Secretary; or

(2) Violates any requirements of a statute or regulation respecting monitoring, recording and reporting of a pollutant or air contaminant discharge; or

(3) Violates a pretreatment standard or toxic effluent standard with respect to introductions of pollutants into publicly owned treatment works

shall be punished by a fine of not less than $2,500 nor more than $25,000 for each day of such violation.

(b) Any person who intentionally, knowingly, or recklessly:

(1) Makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained under this chapter, or under any permit, rule, regulation or order issued under this chapter; or

(2) Who falsifies, tampers with or renders inaccurate any monitoring device or method required to be maintained under this chapter,

shall upon conviction be punished by a fine of not less than $500 nor more than $10,000 or by imprisonment for not more than 6 months, or both.

(c) Any person who intentionally or knowingly:

(1) Violates § 6003 of this title, or violates any condition or limitation included in a permit issued pursuant to § 6003 of this title, or any variance condition or limitation, or any rule or regulation, or any order of the Secretary; or

(2) Violates any requirements of a statute or regulation respecting monitoring, recording and reporting of a pollutant or air contaminant discharge; or

(3) Violates a pretreatment standard or toxic effluent standard with respect to introductions of pollutants into publicly owned treatment works,

and who causes serious physical injury to another person or serious harm to the environment as one result of such conduct, shall be guilty of a class D felony and shall, upon conviction, be sentenced in compliance with the sentencing guidelines established for class D felonies in § 4205 of Title 11.

(d) Any person:

(1) Who intentionally or knowingly makes any false statement, representation or certification in any application, record, report, plan or other document filed or required to be maintained under this chapter, or under any permit, rule, regulation or order issued under this chapter; or

(2) Who falsifies, tampers with or intentionally or knowingly causes to be rendered inaccurate any monitoring device or method required to be maintained under this chapter,

and who causes serious physical injury to another person or serious harm to the environment as 1 result of such conduct, shall be guilty of a class D felony and shall, upon conviction, be sentenced in compliance with the sentencing guidelines established for class D felonies in § 4205 of Title 11.

(e) Any officer of any corporation, manager of any limited liability company, or general partner of any limited partnership conducting business in the State who intentionally or knowingly authorizes or directs said business entity or its employees or agents to:

(1) Falsify or conceal any material fact required to be disclosed to the Department;

(2) Destroy, conceal or alter any records that the corporation is required by this title, the Department's regulations, or an order of the Department to maintain; or

(3) Commit any act in violation of this title or rules promulgated by the Department;

shall upon conviction be punished by a fine of not less than $500 nor more than $10,000 or by imprisonment for not more than 6 months, or both. If an act described in this subsection causes serious physical injury to another person or serious harm to the environment as one result of such an act, the officer, manager or general partner committing the act shall be guilty of a class D felony and shall, upon conviction be sentenced in compliance with the sentencing guidelines established for class D felonies in § 4205 of Title 11. Nothing in this subsection shall be read to establish any additional elements for conviction of the criminal offenses described in subsections (a) through (d) of this section.

(f) Each day of violation with respect to acts or omissions described in this section shall be considered as a separate violation.

(g) The Superior Court shall have exclusive jurisdiction over prosecutions brought pursuant to subsections (a)-(e) of this section. Prosecutions pursuant to subsection (h) of this section may be brought in the jurisdiction of the Courts of the Justices of the Peace.

(h) Whoever violates this chapter, or any rule or regulation promulgated thereunder, or any rule or regulation in effect as of July 26, 1974, or any permit condition, or any order of the Secretary, shall:

(1) For the first conviction, be fined not less than $100 nor more than $500 for each day of violation;

(2) For a subsequent conviction for the same offense within a 10-year period, be fined not less than $500 nor more than $1,500 for each day of violation; and

(3) In addition to the penalties provided in paragraphs (h)(1) and (h)(2) of this section, if the offense involves the failure to acquire a permit as required under this chapter, the offender shall be assessed the cost of the permit, plus a 25 percent surcharge, in addition to the fine.

(i) Any person prosecuted pursuant to subsection (h) of this section shall not be prosecuted for the same offense under subsections (a)-(e) of this section.

(j) The terms "intentionally," "knowingly," "recklessly," "negligently," and "serious physical injury," as used in this section, shall have the meanings assigned to them by Chapter 2 of Title 11.

(k) The term "serious harm to the environment" shall mean damage to the air, water or soil which has or will, beyond a reasonable doubt, cause serious physical injury to any persons working at the facility in question or persons within the State.

(l) It is an affirmative defense to a prosecution that the specific conduct charged was freely and knowingly consented to by the person endangered and that the danger and conduct charged were reasonably foreseeable hazards of:

(1) An occupation, a business or a profession; or

(2) Medical treatment or medical or scientific experimentation conducted by professionally approved methods and such other person had been made aware of the risks involved prior to giving consent.

The defendant may establish an affirmative defense under this subsection by a preponderence of the evidence. The provisions of this subsection are subject to the restrictions enumerated at § 453 of Title 11.

(m) All general defenses affirmative defenses, and bars to prosecution that may apply with respect to other criminal offenses may apply under this section.

7 Del. C. 1953, § 6013; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, §§ 11-13; 69 Del. Laws, c. 366, § 1; 71 Del. Laws, c. 140, § 1; 74 Del. Laws, c. 170, §§ 2, 3; 75 Del. Laws, c. 275, §§ 1-5; 76 Del. Laws, c. 403, §§ 2, 3.;

§ 6014. Regulatory and compliance information, facility performance and public information.

(a) The Department shall develop an Environmental Information System that will include general information about facilities and sites under the Department's regulatory jurisdiction as defined by Chapters 40, 60, 62, 63, 66, 70, 72, 74, 77, 78, and 91 of this title and Chapter 63 of Title 16. The Environmental Information System shall include information on all such facilities and sites related to permitting requirements, emissions and discharge monitoring and reporting data, compliance inspections, violations and enforcement actions. The System shall provide the public with information that indicates when a facility has been inspected, what violations are detected, when the facility comes into compliance, and any enforcement action that results from violations at the facility.

(b) The Secretary shall create or contract with a third party to create a central unified notification system to notify the public in a timely manner of environmental releases. That system shall be designed in a such a manner as to ensure the notification, within 12 hours after the Department is informed of an environmental release, of:

(1) The State Representative and State Senator in whose district the release occurred;

(2) Any community or civic group the majority of whose membership lives within 5 miles of the reporting facility that has identified itself to the Department as an entity wishing to receive notice pursuant to this subsection; and

(3) Any individual who lives within 5 miles of the reporting facility and who has identified himself or herself to the Department as a person wishing to receive notice pursuant to this subsection.

(c) The facility from which an environmental release has occurred shall pay to the Department the cost of the Department's notification under subsection (b) of this section. Such cost shall include a prorated share of the annual fixed costs incurred by the Department for the maintenance of the notification system created pursuant to subsection (b) of this section, and a prorated share of the initial development costs of the notification system to be equally distributed over the first 5 years of the system's existence, both to be determined in the sole discretion of the Department. The facility shall make payment under this subsection within 30 days of receiving written notice of the amount of payment due. Failure to make payment pursuant to this subsection in a timely fashion shall constitute a violation punishable under § 6005 of this title. For purposes of this section facility shall mean any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly owned treatment works), wastewater treatment plant, pit, pond, lagoon, impoundment, landfill, storage container, or any site or area where an environmental release has occurred.

(d) Any records, reports or information obtained pursuant to this chapter and any permits, permit applications and related documentation shall be available to the public for inspection and copying;

provided, that upon a showing satisfactory to the Secretary by any person that such records, reports, permits, permit applications, documentation or information, or any part thereof (other than effluent data) would, if made public, divulge methods or processes entitled to protection as trade secrets of such person, the Secretary shall consider, treat and protect such record, report or information, or part thereof, as confidential; provided further, however:

(1) That any such record, report or information accorded confidential treatment may be disclosed or transmitted to other officers, employees or authorized representatives of this State or of the United States concerned with carrying out this chapter or when relevant in any proceeding to effectuate the purpose of this chapter; and

(2) That any report environmental release, air contaminant or water pollutant emissions may be made available to the public as reported and as correlated with any applicable emission standards or limitations.

7 Del. C. 1953, § 6014; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 14; 70 Del. Laws, c. 186, § 1; 73 Del. Laws, c. 117, § 4.;

§ 6015. Interference with Department personnel.

No person shall obstruct, hinder, delay or interfere with, by force or otherwise, the performance by Department personnel of any duty under this chapter, or any rule or regulation or order or permit or decision promulgated or issued thereunder.

7 Del. C. 1953, § 6015; 59 Del. Laws, c. 212, § 1.;

§ 6016. Departmental investigations; witnesses; oaths; attendance.

In furtherance of the policy and purposes of this chapter, the Secretary may make or cause to be made any investigation or study which is, in his or her opinion, necessary for the purpose of enforcing this chapter. For such purposes the investigative officer designated by the Secretary may subpoena witnesses and the production of documents and compel their testimony. Testimony received at a Departmental investigation shall be under oath and open to the public. Findings of these investigations or studies shall be made public.

7 Del. C. 1953, § 6016; 59 Del. Laws, c. 212, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6017. Sealing noncomplying equipment.

(a) The Department may seal, after consultation with the Attorney General, any source required to have a permit which is installed, altered, used or operated without such a permit or which is in violation of a cease and desist order.

(b) If the equipment is sealed, no person shall tamper with or remove the seal from any equipment so sealed. Violation of this provision shall make the violator upon conviction liable to punishment as provided in § 6005 of this title.

(c) A seal may be removed from equipment only upon receipt of written authorization from the Department. The Department shall order removal of the seal after the reason(s) which caused the sealing has been corrected.

7 Del. C. 1953, § 6017; 59 Del. Laws, c. 212, § 1.;

§ 6018. Cease and desist order.

The Secretary shall have the power to issue an order to any person violating any rule, regulation or order or permit condition or provision of this chapter to cease and desist from such violation; provided, that any cease and desist order issued pursuant to this section shall expire (1) after 30 days of its issuance, or (2) upon withdrawal of said order by the Secretary, or (3) when the order is suspended by an injunction, whichever occurs first.

7 Del. C. 1953, § 6018; 59 Del. Laws, c. 212, § 1.;

§ 6019. Voluntary compliance.

Nothing in this chapter shall prevent the Department from making efforts to obtain voluntary compliance by way of warning, notice or other educational means; this section does not, however, require that such voluntary methods be used before proceeding by way of compulsory enforcement.

7 Del. C. 1953, § 6019; 59 Del. Laws, c. 212, § 1.;

§ 6020. Liberal construction.

This chapter, being necessary for the welfare of the State and its inhabitants, shall be liberally construed in order to preserve the land, air and water resources of the State.

7 Del. C. 1953, § 6020; 59 Del. Laws, c. 212, § 1.;

§ 6021. Federal aid; other funds.

The Department may cooperate with and receive moneys from the federal government, any state or local government or any industry or other source. Such moneys received are appropriated and made available for the study and preservation of land, water and air resources.

7 Del. C. 1953, § 6021; 59 Del. Laws, c. 212, § 1.;

§ 6022. Temporary limits and procedures for hazardous operations.

Where no rule or regulation has been promulgated which sets specific limits for the use, emission or discharge, or operating procedure for hazardous operations, the Secretary may set temporary limits or operating procedure; provided, that the temporary limits or orders shall not be effective for more than 6 months unless adopted into permanent rules and regulations within that period. The affected parties shall be given a hearing before the Department within 30 days, if requested, on any action taken under this section.

7 Del. C. 1953, § 6022; 59 Del. Laws, c. 212, § 1.;

§ 6023. Licensing of water well contractors, pump installer contractors, drillers, drivers, pump installers, septic tank installers, liquid waste treatment plant operators and liquid waste haulers.

(a) No person shall:

(1) Engage in the drilling, boring, coring, driving, digging, construction, installation, removal or repair of a water well or water test well; or

(2) Install, maintain or repair pumping equipment in or from a well without a license issued by the Department, except (i) as, or under the supervision of, a licensed plumber, or (ii) an agricultural well on land owned or leased by the person installing, maintaining or repairing the pumping equipment. For the purpose of this paragraph "agricultural well" shall mean a well used for irrigation of crops, for the watering of livestock or poultry, for aquaculture uses, or for other on-farm purposes where the water is not to be used for human consumption or to service a residential dwelling.

(b) No person shall engaged in the construction, repair, installation or replacement of a septic tank system or any part thereof except as or under the supervision of a licensed septic tank installer.

(c) No person shall operate any liquid waste treatment system without a duly licensed liquid waste treatment plant operator.

(d) No person shall haul, convey or transport any liquid waste in any container without a license issued by the Department.

(e) Any person requiring a license for any activity specified in subsections (a)-(d) of this section shall file an application with the Secretary in such form and accompanied by such information as the Secretary may require by regulation.

(f) The Secretary shall have the exclusive power to grant or deny any license required under subsections (a), (b), (c) and (d) of this section. The Secretary shall adopt regulations setting forth requirements, including an acceptable performance or an examination for obtaining and retaining any such license.

7 Del. C. 1953, § 6023; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 15; 60 Del. Laws, c. 288, § 3; 64 Del. Laws, c. 472, § 2; 71 Del. Laws, c. 187, § 1.;

§ 6024. Right of entry.

The Secretary, or the Secretary's duly authorized designee, in regulating water pollution, air pollution, solid waste disposal or any other matter over which he or she has jurisdiction pursuant to this chapter, may enter, at reasonable times, upon any private or public property for the purpose of determining whether a violation exists of a statute or regulation enforceable by him or her, upon given verbal notice, and after presenting official identification to the owner, occupant, custodian or agent of said property.

7 Del. C. 1953, § 6024; 59 Del. Laws, c. 212, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6025. Solid waste.

(a) The Secretary shall have exclusive authority to effectuate the purposes of this chapter concerning solid waste, set forth in § 6001(c)(6) of this title notwithstanding any authority heretofore conferred upon or exercised by any other state agency, but any regulations heretofore duly adopted by any other state agency shall remain in effect and be enforceable by the Secretary unless repealed, amended or modified by the Secretary. Chapter 64 of this title shall not be interpreted to be in conflict with either the purposes of this chapter concerning solid waste as set forth in § 6001(c)(6) of this title, or any regulation promulgated thereunder.

(b) No person shall cause or contribute to the disposal or discharge of solid waste anywhere in the State including any surface or ground water, except:

(1) Through municipal or private solid waste collection systems which have received a permit from the Department; or

(2) In solid waste disposal facilities which have received a permit from the Department; or

(3) In containers specially provided for solid waste collection by any state or municipal agency or private or public group, organization, agency or company which has received a permit from the Department.

(c) Any person charged with violation of subsection (b) of this section, upon conviction, shall be fined not less than $500 nor more than $1500 for each violation and there shall be no suspension of the fine. Each day of continued violation or part thereof shall be considered as a separate offense. The court shall, in addition to levying the fine, order the person convicted to remove or cause to be removed any improperly disposed solid waste. In addition to the fine, the sentencing judge may order community service directed to the removal of solid waste illegally disposed of in the State, and may order restitution for costs incurred in remediation of the solid waste illegally disposed of in the State. The Courts of the Justices of the Peace shall have jurisdiction of offenses under this section.

(d) In the event a motor vehicle is used during or in aid of the disposal or discharge of solid waste in violation of subsection (b) of this section, and the identity of the offender is not otherwise apparent, there shall be a rebuttable presumption that the registered owner of the motor vehicle caused or contributed to such disposal or discharge. The rebuttable presumption set forth in this section shall not apply to operators of buses carrying 9 or more persons.

(e) Any person, who causes or contributes to the disposal or discharge of solid waste anywhere in the State including any surface or ground water, except:

(1) Through municipal or private solid waste collection systems which have received a permit from the Department; or

(2) In solid waste disposal facilities which have received a permit from the Department; or

(3) In containers specially provided for solid waste collection by any state or municipal agency or private or public group, organization, agency or company which has received a permit from the Department,

shall be civilly liable to the owner or person in possession of the real property upon which the solid waste is disposed or discharged, for any property damage sustained, for costs incurred by the owner or person in possession for clean up and proper disposal of the solid waste, and for reasonable attorneys' fees. This cause of action is in addition to any other causes of action, rights and/or remedies the owner or person in possession may have.

7 Del. C. 1953, § 6025; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, §§ 16, 17; 60 Del. Laws, c. 288, § 4; 76 Del. Laws, c. 403, §§ 4-7.;

§ 6026. License fees.

(a)(1) The Secretary may establish fees, subject to approval by the General Assembly, for granting any license to any percolation tester, system designer, site evaluator, system inspector, well water contractor, pump installer contractor, well driver, well driller, pump installer, septic tank system installer, liquid waste hauler and liquid waste treatment plant operator.

(2) Notwithstanding any other provisions of law to the contrary, the General Assembly hereby authorizes and approves the following schedule of license fees to be imposed by the Department effective July 1, 2003: Percolation Tester, $40 annual fee; System Designer, $40 annual fee; Site Evaluator, $40 annual fee; System Inspector, $40 annual fee; Septic Tank System Installer, $40 annual fee; and Liquid Waste Hauler; $40 annual fee.

(3) Any fees collected under this subsection are hereby appropriated to the Department to carry out the purposes of this chapter.

(b) The Secretary may establish fees for conveyance of oil and hazardous substance through pipeline after holding public hearings on such a fee schedule.

(c) Any fee collected under this subsection is hereby appropriated to the Department to carry out the purposes of this chapter.

7 Del. C. 1953, § 6026; 59 Del. Laws, c. 212, § 1; 60 Del. Laws, c. 288, § 5; 64 Del. Laws, c. 472, § 3; 74 Del. Laws, c. 139, § 1.;

§ 6027. Change of authority.

The word "Secretary" shall be substituted wherever the words "Water and Air Resources Commission" or "Commission" appear in the Delaware Code and any authority vested in the "Water and Air Resources Commission" or "Commission" is hereby delegated to the Secretary without qualification.

7 Del. C. 1953, § 6027; 59 Del. Laws, c. 212, § 1.;

§ 6028. Report of discharge of pollutant or air contaminant.

(a) Any person who causes or contributes to an environmental release or to the discharge of an air contaminant into the air, or a pollutant, including petroleum substances, into surface water, groundwater or on land, or disposal of solid waste in excess of any reportable quantity specified under either regulations implementing § 102 of the Federal Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended [42 U.S.C. § 9602], § 311 of the Clean Water Act of 1980, as amended [33 U.S.C. § 1321], or Department regulations, whichever restriction is most stringent, shall report such an incident to the Department as soon as the person has knowledge of said environmental release or discharge and activating their emergency site plan if appropriate unless circumstances exist which make such notification impossible. Such initial notification shall be made in person or by telephone to a number specifically assigned by the Department for this purpose and shall include, to the maximum extent practicable, the following information:

(1) The facility name and location of release;

(2) The chemical name or identity of any substance involved in the release;

(3) An indication of whether the substance is an extremely hazardous substance;

(4) An estimate of the quantity of any such substance that was released into the environment;

(5) The time and duration of the release;

(6) The medium or media into which the release occurred;

(7) Any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals;

(8) Proper precautions to take as a result of the release, including evacuation (unless such information is readily available to the community emergency coordination pursuant to the emergency plan);

(9) The names and telephone number of the person or persons to be contacted for further information; and

(10) Such other information as the Department may require.

This information shall be made available to the public by posting on the Department's internet web site no later than 1 business day after the release is reported. Discharges in compliance with a validly issued state permit or in compliance with other state and federal regulations are exempt from the reporting requirement.

(b) The Department shall adopt regulations revising the list, referred to in subsection (a) of this section, of pollutants environmental releases or air contaminants and their reportable quantities which are to be reported to the Department.

(c) The reporting requirements under this section are in addition to and not in lieu of, any other discharge reporting requirements found in any other state, federal, county or local government permits, regulations or ordinances.

(d) At the Department's discretion, the Department may require said person to file a written report with the Department describing in detail the facts and circumstances of the discharge and measures proposed to prevent such discharge from occurring in the future.

(e) Discharges of an air contaminant or pollutant (including petroleum substances) that are wholly contained within a building are exempt from the reporting requirements.

(f) Any person who violates this section or any rule or regulation duly promulgated hereunder shall be punishable in accordance with the enforcement provisions of this chapter.

7 Del. C. 1953, § 6028; 59 Del. Laws, c. 212, § 1; 59 Del. Laws, c. 537, § 18; 65 Del. Laws, c. 507, § 1; 66 Del. Laws, c. 221, § 1; 67 Del. Laws, c. 288, § 1; 73 Del. Laws, c. 117, § 3.;

§ 6029. Limitations on scope of chapter.

This chapter shall not apply to or change the existing law in respect to:

(1) The landowner's right to place a dam across a gully on his or her property or across a stream that originates on that landowner's property where provision is made for continued established average minimum flow occurring for 7 consecutive days within the lowest flow year of record; or

(2) The right to build and maintain a dam or construct a pond and divert water from any stream on any stream having a minimum flow of not more than 1/2 million gallons of water per day, and utilize up to 360 acre inches of the impounded water per year so long as such action does not affect the established average minimum flow in the stream below the dam at any time; or

(3) Ponds not larger than 60,000 square feet constructed for purposes of conservation, recreation, propagation and protection of fish and wildlife, watering of stock or fire protection.

7 Del. C. 1953, § 6029; 59 Del. Laws, c. 212, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6030. Approval of water use.

No increase in the amount of water used shall be made by a user without prior approval of the Department.

7 Del. C. 1953, § 6030; 59 Del. Laws, c. 212, § 1.;

§ 6031. Obligation of recipients of water allocations.

(a) The Secretary shall, when the use of water pursuant to an allocation granted under § 6010(f) of this title causes the depletion or exhaustion of an existing use of water, require as a condition of such allocation that the recipient of such allocation take 1 or more of the following actions:

(1) To provide free of charge to the affected person a complete water supply connection to a water supply distribution system and to provide water to the affected person for a term of 3 years in an amount not to exceed 100,000 gallons per year. Water used by the affected person which exceeds 100,000 gallons per year shall be paid for by the affected person on a quarterly basis at the rates established by the Public Service Commission as applicable to the supply of public water in the area in question; and/or

(2) To provide free of charge to the affected person an alternative source of water supply at least equal in quality and quantity to that existing at the time of the granting of the allocation.

(b) The Secretary shall, when an allocation granted pursuant to § 6010(f) of this title causes the depletion or exhaustion of an existing use of water, require as a condition of such allocation that the person receiving such allocation provide free of charge to the affected person an interim water supply which is adequate to meet such person's need. The Secretary shall determine the level of interim water supply sufficient to meet the needs of the affected person and shall further determine the dates on which the interim water supply will commence and terminate.

(c) The Secretary shall, upon receipt of a verified petition setting forth factual allegations that an allocation granted pursuant to § 6010(f) of this title caused the depletion or exhaustion of petitioner's existing use of water, schedule and conduct a hearing to consider the petition. Prior to a hearing under this subsection the Secretary shall give at least 20 days' notification of the date of the hearing to the petitioner and the person granted the allocation. The petitioner or the person granted the allocation may appear personally or by counsel at the hearing and produce any competent evidence. The Secretary or the Secretary's designee may administer oaths, examine witnesses and issue in the name of the Department subpoenae when requested by a petitioner or a person granted an allocation. A verbatim transcript of testimony at the hearing shall be prepared and shall, along with the exhibits and other documents introduced into evidence, constitute the record. The Secretary or the Secretary's designee shall make findings of fact based on the record and issue an order to effectuate such findings and further the purposes of this subsection. Any person whose interest is substantially affected by any order of the Secretary may appeal to the Environmental Appeals Board as provided in § 6008 of this title.

61 Del. Laws, c. 123, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6032. Licensing of site evaluators, percolation testers and on-site system designers and contractors.

(a) No person shall conduct percolation tests or soil evaluations or design, inspect or install on-site wastewater treatment and disposal systems without first having obtained a license from the Secretary. As a prerequisite of licensing, the Secretary may require the person to demonstrate familiarity with test procedures and applicable regulations, and to sign a statement under penalty of perjury that he or she will abide by all statutes and regulations governing the design, inspection and installation of on-site wastewater treatment and disposal systems. In addition, the Secretary may require each licensee or class of licensees to show proof of surety to cover liability for such risks and in such amounts as the Secretary may establish by regulation after public notice in accordance with § 6006 of this title.

(b) Any license by the Secretary shall be for a fixed term not to exceed 3 years and shall be renewable upon application.

(c) The Secretary shall adopt such other regulations after public notice and hearing in accordance with § 6006 of this title as necessary to accomplish the purposes of this title.

(d) The license requirements shall not apply in a county which has been delegated authority to issue septic tank permits pursuant to § 6003(d) of this title.

61 Del. Laws, c. 264, § 1; 65 Del. Laws, c. 361, § 1; 70 Del. Laws, c. 186, § 1; 74 Del. Laws, c. 139, § 2.;

§ 6033. Pretreatment program.

(a) The Secretary shall develop, implement and enforce, and may amend, modify and repeal, a state pretreatment program in compliance with the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq. and regulations promulgated thereunder. In addition to any other authority which the Secretary may exercise for this purpose under this chapter or other chapters of this Code, the Secretary may:

(1) Require any POTW to develop, submit for approval to the Secretary, administer and enforce a POTW pretreatment program;

(2) Review, approve and deny requests for approval of POTW pretreatment programs submitted by a POTW to the Secretary;

(3) Require any POTW, whether or not such POTW is required to develop and enforce a POTW pretreatment program, to develop, submit for approval to the Secretary and enforce specific limits on or prohibitions against discharges of pollutants by industrial users of such POTW to prevent interference with such POTW;

(4) Incorporate conditions into new or existing permits issued to POTWs, such as, but not limited to, compliance schedules, modification clauses, the elements of an approved pretreatment program and specific limits on or prohibitions against discharges by industrial users into such POTW;

(5) Review, approve and deny requests from POTWs required to develop POTW programs to modify categorical pretreatment standards to reflect removals achieved by such POTW;

(6) Require any POTW or industrial user to submit reports, monitor activities and maintain records to assure compliance with this section and regulations hereunder;

(7) Require compliance by industrial users with pretreatment standards, and discharge limits and prohibitions;

(8) Adopt, amend, modify or repeal rules or regulations to effectuate this section and comply with federal laws and regulations respecting pretreatment. Such rules and regulations shall be adopted, after public hearing, in accordance with § 6010 of this title; provided, however, that the Secretary may

incorporate into state regulations without a public hearing a categorical pretreatment standard which has previously been promulgated by regulation by the Administrator of the United States Environmental Protection Agency. Prior to incorporating any such categorical pretreatment standard without a public hearing, the Secretary shall comply with §§ 10115, 10116 and 10118 of Title 29.

(b) The Secretary may seek any relief authorized by this chapter against any industrial user even if a POTW has acted or will act to seek such relief.

62 Del. Laws, c. 414, § 4.;

§ 6034. Sewage system cleansers and additives.

(a) No person shall distribute, sell, offer or expose for sale in this State any sewage system cleanser or additive containing any restricted chemical materials in excess of 1 part per hundred by weight. The penalty for an initial violation of this subsection shall be a formal written warning by the Secretary for the first offense; and for any subsequent violation a fine of $500 shall be imposed.

(b) No person shall use, introduce or apply, or cause any other person to use, introduce or apply in any sewage system, surface waters or groundwaters in this State any sewage system cleanser or additive containing any restricted chemical material or any combination thereof, in excess of 1 part per hundred. The penalty for violating this subsection shall be a fine of $100 for the first offense and $1,000 for each subsequent offense.

(c) No person shall serve water, or a product containing water, to the public from a well ordered closed due to the presence of restricted chemical materials. The penalty for each such violation shall be a fine of not less than $1,000 nor more than $10,000. Any subsequent violation of this subsection by a violator shall result in the closing of the facility until a new and safe source of water is found and is operative in the facility.

(d) The Courts of the Justices of the Peace shall have jurisdiction over offenses under this section.

(e) The Secretary, with assistance from the Division of Public Health, shall:

(1) Conduct a public education program by utilizing mass-media instruments within 90 days of July 17, 1984;

(2) Thereafter, conduct random spot checks in appropriate business concerns to insure that no restricted chemical materials are on sale; and

(3) Take appropriate enforcement action for violations of the sale or use of restricted chemical materials as provided in subsections (a) and (b) of this section.

64 Del. Laws, c. 370, § 2.;

§ 6035. Vessel sewage discharge.

(a) Marina owners/operators for marinas that are located in whole or in part on tidal waters of the State, and that provide dockage for vessels with a portable toilet or toilets or Type III marine sanitation device or devices (MSD), shall provide convenient access, as determined by the Department, to an approved, fully operable and well maintained pumpout facility or facilities and/or dump station or stations for the removal of sewage from said vessels to a Department approved sewage disposal system.

(b)(1) Owners/operators may agree to pool resources for a single pumpout dump station with Departmental approval based on criteria of number and class of vessels, marina locations, cost per pumpout use, and ultimate method of sewage treatment and disposal (i.e. septic system or waste water treatment facility).

(2) The owner/operator of any boat docking facility that is located in whole or in part on tidal waters of the State, and that provides dockage for a live-aboard vessel or vessels with a Type III marine sanitation device or devices, shall install and maintain at all times, in a fully operable condition, an approved dedicated pumpout facility at each live-aboard vessel slip for the purpose of removing sewage from the live-abroad vessel on a continuous or automatic, intermittent basis to a Department approved sewage disposal system.

(3) Any discharge, by any means, of untreated or inadequately treated vessel sewage into or upon the waters of any marina, boat docking facility or tidal water of the State is prohibited.

(4) All vessels while on waters of the State shall comply with 33 U.S.C. § 1322, as amended February 4, 1987.

(5) The Secretary shall have authority to adopt reasonable rules and regulations to implement this section.

66 Del. Laws, c. 275, § 2; 68 Del. Laws, c. 137, § 3; 68 Del. Laws, c. 403, §§ 3-6.;

§ 6036. Projects of state significance.

The Department shall adopt objective standards and criteria to identify "projects of state significance" which standards and criteria shall be used by the Department in evaluating projects in the State requiring the review or approval of the Department. The process to be followed by the Department in the adoption of said objective standards and criteria shall include the following:

(1) In making the determination of whether any proposed project is a project of state significance, the Department shall consider, without limitation, the following factors:

a. Environmental impact, including, without limitation, probable air, land and water pollution likely to be generated by the proposed use under normal operating conditions and as the result of mechanical malfunction and human error; likely destruction of wetlands and flora and fauna; impact and effect of site preparation and facility operations on land erosion, drainage of the area in question, especially as it relates to flood control, and the quality and quantity of surface and ground water resources, such as the

use of water for processing, cooling, effluent removal and other purposes; and the likelihood of generation of glare, heat, noise, vibration, radiation, electromagnetic interference and obnoxious odors.

b. Economic effect, including, without limitation, the number of jobs created and the income which will be generated by the wages and salaries of these jobs in relation to the amount of land required, and the amount of tax revenues potentially accruing to state and local government.

c. Effect on neighboring land uses including, without limitation, effect on public access to all state surface waters, effect on recreational areas and effect on adjacent residential and agricultural areas.

(2) The Secretary shall further elaborate on the definition of "heavy industry" in accordance with § 7005(c) of this title. The Secretary shall delineate "heavy industry of state significance" as part of this process, which shall be a subcategory of projects of state significance. Heavy industry uses of any kind, including heavy industry of state significance, not in operation on June 28, 1971, shall be prohibited in the coastal zone and no permits may be issued therefor.

(3) All agencies of state government shall assist the Department in developing objective standards and criteria to identify projects of state significance and shall provide such information as the Department requests. The Department shall develop regulations specifying the objective standards and criteria which are to be used to identify projects of state significance and shall make such regulations available for public review no later than 9 months after the effective date of this legislation. The Department shall hold a public hearing on said regulations and shall announce such hearing by publication in a newspaper of general circulation in each county of the State. The Department shall adopt regulations specifying the objective standards and criteria for identifying projects of state significance, with exception of heavy industry of state significance, no later than 13 months after the effective date of this legislation. The Department shall submit to the State Coastal Zone Industrial Control Board standards and criteria for identifying heavy industry of state significance for adoption no later than 11 months after the effective date of this legislation. The State Coastal Zone Industrial Control Board shall adopt said standards and criteria no later than 13 months after the effective date of this legislation.

67 Del. Laws, c. 253, § 2.;

§ 6037. Obligation of persons who contaminate drinking water supplies.

(a)(1) The Secretary shall develop and publish the necessary forms to be used by any person who believes his or her drinking water supply has been contaminated to petition for an alternative water supply, said petition will include, at a minimum, the following:

a. Well information including a valid DNREC well permit number, or other certified documentation as to how and when the well or other water intake was constructed; and

b. The contaminant and its concentration in the form of a signed analytical report from a certified drinking water laboratory which identifies the sample, the contaminant, its concentration and the analytical method detection limit; and

c. The date the sample was collected, the name of the person collecting the sample, a description of the sample container, and the preservation techniques used, if any.

(2) The form shall be notarized and certified as being true and factual by the petitioner. Failure to provide all relevant information, or providing false information, will be grounds to reject a petition.

(b) Upon the Secretary's receipt of a certified petition that sets forth allegations that a discharge of a substance into a drinking water supply has affected a petitioner's use of an existing drinking supply well or other drinking water intake through any activity, the Secretary shall notify all potentially responsible parties who shall be given 30 days in which to either respond to the petition, propose remedial action or request a hearing on the merits of the petition.

(c) After evaluating all available information in his or her possession, the Secretary will issue an order either verifying or rejecting the contentions contained in the petition. The Secretary's decision to verify the petition and grant relief must be based on findings of fact contained in the certified petition and other scientifically conclusive evidence in his or her possession, which at a minimum establishes that:

(1) A state or federal drinking water standard has been exceeded; and

(2) A source, due to its nature, proximity, and hydrogeologic connection to the affected water supply is the likely cause of the contamination provided that the activity does not contain a valid state or federal permit with which the permittee has fully complied and provided that the permit did not anticipate the contamination of the drinking water supply.

(d) Upon verification of a petition as set forth in subsection (c) of this section, the Secretary shall require that if any activity results in the contamination of an existing drinking water supply by contaminants other than bacteria, viruses, nitrate or pesticides, which have been applied according to the manufacturer's instructions, then the person(s) who is responsible for the contamination shall complete 1 of the following activities which is deemed to be the most cost effective:

(1) Provide at no cost to each person who has had his or her existing drinking water supply contaminated, the installation of an alternative water supply of at least equal quantity and quality to said person's water supply that existed on the date the water supply was contaminated; or

(2) Provide at no cost to each person who has had his or her existing drinking water supply contaminated, a complete water supply connection to a water supply distribution system, and provide water to said person for a term of up to 3 years in an amount not to exceed 100,000 gallons per year. Said 3-year term shall commence on the first day water is supplied to said person by the person who contaminated the drinking water supply. Water used by said person that exceeds 100,000 gallons per year shall be paid by said person at a rate that is established by the appropriate rate setting body taking into consideration the rate charged for the supply of public water in the water supply area before it was contaminated, or the rate charged in a similar area; or

(3) Provide at no cost the treatment system necessary to maintain the water supply as an adequate drinking water supply and provide the costs of operation and maintenance of the system for a period of 3 years.

(e) In addition to the provisions of subsection (d) of this section, the Secretary may require that the person who has caused the contamination of a person's drinking water supply by contaminates other than bacteria, viruses, nitrate or pesticides, shall provide at no cost to each person who has had his or her drinking water supply contaminated an interim water supply that is of a quality and quantity to meet said person's needs as shall be determined by the Secretary on a case-by-case basis. In addition, the Secretary shall determine the dates on which the interim water supply shall commence and be terminated.

(f) Any affected party may appeal a decision by the Secretary concerning a replacement water supply petition to the Environmental Appeals Board in accordance with § 6008 of this title.

(g) Any hearing that may be conducted pursuant to the provisions of this section shall be done according to procedures as set forth in § 6006 of this title.

(h) For the purposes of this section, "contamination" means the human alteration of the chemical, physical, biological or radiological integrity of water which violates federal or state drinking water standards.

67 Del. Laws, c. 406, § 1; 70 Del. Laws, c. 186, § 1.;

§ 6037B. Recreational water.

(a) The Secretary shall provide for the sanitary control of natural swimming and bathing places.

(b) The Secretary shall consult with the Director of the Division of Public Health prior to making any recommendations on swimming or bathing conditions that pose a significant risk to the public health.

69 Del. Laws, c. 302, § 8.;

§ 6038. Borrow pits.

(a) The Secretary shall develop, implement and enforce, and may amend, modify and repeal, after notice and public hearing, a program to protect the waters of the State from adverse environmental impacts relating to the operation of borrow pits. In addition to any other authority which the Secretary may exercise for the purpose under this chapter or other chapters of the Delaware Code, the Secretary may:

(1) Require borrow pit owners/operators to obtain operating permits from the Department of Natural Resources and Environmental Control;

(2) Require reclamation of abandoned pits by owners/operators;

(3) Require borrow pit owners/operators to secure the borrow pit premises from illegal dumping, disposal of wastes or vandalism; and

(4) Adopt, amend, modify or repeal rules or regulations to effectuate this section.

(b) Fees may be collected or charged for permits to be issued under this section in an amount determined by the issuing authority, which fee shall not exceed the sum of $80 per disturbed acre, per year, per project.

(c) The Secretary may delegate all or part of the program to any county having rules or regulations governing borrow pits which, upon a finding by the Secretary, are at least equivalent to state requirements.

67 Del. Laws, c. 353, § 1.;

§ 6039. Debris disposal area remediation.

(a) The Secretary may develop, implement and administer a program for the identification, investigation, assessment, mitigation and remediation of debris disposal areas created as part of the construction of residential or subdivision developments. Any person who caused or contributed to the creation or use of a debris disposal area on or after December 8, 1988, shall be subject to enforcement for illegal disposal and may be required by order from the Department to remove and properly dispose of such material. The Department is authorized to develop policies, procedures and guidelines and may establish, amend, modify and repeal, after notice and public hearing, such regulations as may be necessary to effectuate the purposes of this section. The Department may establish an application fee not to exceed $250 for homeowners to participate in the remediation program. The money generated by this application fee shall be placed in the "Debris Disposal Area Remediation Account." This account shall only be used to offset costs of this program. Homeowners who wish to excavate and remove buried debris from their own residential property or homeowners who have already excavated and removed buried debris from their own residential property are eligible for reimbursement of the cost of remediation up to a maximum reimbursement of $10,000, provided that:

(1) The cost was incurred on or after December 8, 1988;

(2) The disposal areas were created as part of the construction of residential or subdivision developments in accordance with this section; and

(3) Satisfactory documentation of the work and expenses incurred are provided.

(b) The Department shall report the findings from the study and the evaluation and make recommendations to the Governor and the General Assembly no later than March 15, 1999.

(c) There shall be established within the Department an account to be known as the "Debris Disposal Area Remediation Account." All funds made available to the Department in accordance with the provisions of subsection (b) of this section shall be placed in the Debris Disposal Area Remediation

Account to be used by the Department or its agents to carry out the purposes of this section. The Department may establish presumptive remedies to address the remediation of debris disposal areas. These funds shall be used for the purpose of identifying, investigating, assessing, mitigating or remediating debris disposal areas and associated effects as determined by the Department. Notwithstanding any other provision to the contrary, up to $7,500 per site may also be used to cover any secondary damage that may occur to existing structures or property as the result of the remediation, which, if applicable, shall be in addition to the maximum reimbursement amount established in subsection (a) of this section.

(d) The Department may use funds from the Debris Disposal Area Remediation Account to identify, investigate, assess, mitigate or remediate any debris disposal area constructed, used or filled subsequent to December 8, 1988, if the party responsible for the area does not respond as required to any order issued by the Secretary, and if such site presents an imminent threat to human health, safety or the environment as determined by the Department. In addition to the assessment of any penalty as provided in § 6005(a) and (b) of this title, any person who fails to comply with any order issued by the Secretary to identify, investigate, assess, mitigate or remediate any debris disposal area may be liable for all costs incurred by the Department to do so as provided in § 6005 (c) of this title.

(e) Except to the extent provided herein, no provision contained in this section shall relieve any party from compliance with or liability under any other environmental statute, including, but not limited to, Chapters 60, 62, 63, 66, 74 and 77 of Title 7.

71 Del. Laws, c. 418, § 2; 72 Del. Laws, c. 318, §§ 1, 2; 73 Del. Laws, c. 212, § 1.;

§ 6040. Requirement for scrap tire piles; enforcement.

(a) The following definitions shall apply to this section:

(1) "Operator" means any person or entity who has or had a contractual or other responsibility for security, maintenance, sales or operations of a scrap tire pile or of any real property on which a scrap tire pile is located, at any time after July 20, 1999; provided that this definition does not include a person or entity whose only ownership interest is as a mortgagee.

(2) "Owner" means any person or entity who has or had legal or equitable ownership interest in a scrap tire pile, or in any real property on which a scrap tire pile is located, at any time after July 20, 1999.

(3) "Scrap tire" means:

a. A tire that is no longer prudent or practical for vehicular use; or

b. A tire that has not been used on a vehicle for more than 6 months after the last date it was used on a vehicle.

(4) "Scrap tire pile" means an accumulation of 100 or more scrap tires, whether or not they are lying 1 upon another, that:

a. Has been accumulated or located in the same general vicinity, or accumulated or located on a parcel of real property; and

b. Is not enclosed by a building.

(5) "Tire" means a covering fitting around the rim of a vehicular wheel to absorb shocks, usually of reinforced rubber or a rubberized compound, and pressurized with air or by a pneumatic inner tube, and typically weighing approximately 25 pounds. Included in this meaning is any substantial portion of such covering, and any weight tires including truck tires.

(b) The Secretary shall, after notice and public hearing, promulgate regulations to establish standards for storage of scrap tires. Such standards shall include:

(1) A limit on the number of scrap tires that may be stored at any given location;

(2) A limit on the length of time that scrap tires may be stored at a given location;

(3) Appropriate mosquito control methods to be employed at scrap tire piles; and

(4) Proper methods for managing scrap tire piles.

72 Del. Laws, c. 205, § 1; 75 Del. Laws, c. 346, §§ 1-6.;

§ 6041. Scrap Tire Management Fund.

(a) There shall be established in the State Treasury and in the accounting system of the State a special fund to be known as the Scrap Tire Management Fund ("the Fund").

(b) The following moneys shall be deposited into the Fund:

(1) All fees collected by the State pursuant to § 2910 of Title 30;

(2) The State Treasurer shall credit to the Scrap Tire Management Fund such amount of interest as determined by this paragraph upon such Fund. On the last day of each month, the State Treasurer shall credit the Fund with interest on the average balance in the Fund for the preceding month. The interest to be paid to the Fund shall be that proportionate share, during such preceding month, of interest to the State as the Fund's and the State's average balance is to the total State's average balance; and

(3) Any other money appropriated or transferred to the account by the General Assembly.

(c) Money in the Fund may be used by the Secretary only to carry out the purposes of this section, including but not limited to the following activities.

(1) Conducting a comprehensive inventory of scrap tire piles in the State.

(2) Developing and implementing a scrap tire pile registration program.

(3) Implementing a program to clean up the scrap tire piles in existence in Delaware on June 30, 2006.

(4) Providing for state matching funds for the cleanup of scrap tire piles that have been registered in accordance with the scrap tire pile registration program referenced in paragraph (c)(2) of this section. For each registered scrap tire pile, the Fund shall cover 90% of the cost of cleaning up the pile. The owner and operator shall pay 10% of the cost of cleaning up the pile, unless they satisfactorily demonstrate the inability to pay that cost.

(5) Paying the total cost of cleaning up scrap tire piles located on abandoned properties and on estate properties where the inheritors do not register the scrap tire piles in accordance with the scrap tire pile registration program referenced in paragraph (c)(2) of this section. For such abandoned and estate properties, the Department shall place liens on the properties in order to recoup the entire cleanup cost upon sale of the properties.

(6) Payment to the Division of Revenue for the costs of administering § 2910 of Title 30.

(d) No greater than 15% of the moneys deposited into the Fund shall be used for administering this section without approval of the Joint Finance Committee.

(e) Prior to January 1, 2009, the Department shall prepare and submit to the Governor and the General Assembly a joint report on the progress made toward cleaning up the scrap tire piles in the State. Such report shall include recommendations for extension, modification, or termination of the Scrap Tire Management Fund and § 2910 of Title 30.

74 Del. Laws, c. 203, § 2; 75 Del. Laws, c. 88, § 21(4); 75 Del. Laws, c. 346, § 7.;

§ 6042. Civil and administrative penalties; Community Environmental Project Fund.

(a) There is hereby established a Community Environmental Project Fund, referred to herein as the "Fund." The Fund shall be held as a separate account within the Department and may be invested by the State Treasurer in securities consistent with investment policies established by the Cash Management Policy Board.

(b) The Fund shall consist of 25 percent of all civil or administrative penalties collected by the Department pursuant to § 4015, § 6005, § 6617, § 7011, § 7214, § 7906, § 9109, or § 9111 of this title. Twenty-five percent of such civil and administrative penalties are hereby appropriated to the Fund, subject to the requirements of this section.

(c) Moneys shall be expended from the Fund only for Community Environmental Projects, referred to herein as "Projects." As used herein the term "Community Environmental Project" means a project that is undertaken for the purpose of effecting pollution elimination, minimization, or abatement, or improving conditions within the environment so as to eliminate or minimize risks to human health, or enhancement of natural resources for the purposes of improving indigenous habitats or the recreational opportunities of the citizens of the Delaware. The Secretary may, by regulation, provide for further definition of such Projects.

(d) The Secretary, after consultation with the Community Involvement Advisory Council, shall give priority to Community Environmental Projects which benefit communities that are most impacted by specific infraction(s) or violation(s). Specifically, the Secretary, at his or her discretion, shall determine whether a proposed Project is located within the watershed or airshed adversely affected by a violation or infraction as part of the evaluation process. The Secretary shall ensure that records identify the location of each civil or administrative penalty. No provision of this section shall be construed to require the Department to expend funds from the Fund in the absence of a suitable Project within the community where the violation or infraction occurred. The Secretary may also determine that the requirements of this subsection cannot practicably be met with respect to expenditures from the Fund associated with a penalty from a facility or location because such amount is insufficient or too large to be an appropriate expenditure. The expenditure of funds required under this subsection may be waived by the Secretary, with the concurrence of the Director of the Office of Management and Budget and Comptroller General.

(e) In the event that the requirements of this section conflict with applicable federal or State of Delaware requirements pertaining to the establishment and collection of penalties or other assessments by the Department, such requirements shall take precedence over the conflicting requirements of this section.

(f) The Department shall submit quarterly reports on the progress of the expenditures and/or projects conducted with the Community Environmental Project Fund to the Governor and members of the General Assembly. All of the expenditures made by or on behalf of the Fund, together with an explanation the process utilized for selecting and prioritizing Projects, shall be reported annually to the Joint Finance Committee in the Department's budget presentation.

74 Del. Laws, c. 203, § 2; 70 Del. Laws, c. 186, § 1; 75 Del. Laws, c. 88, § 21(4); 75 Del. Laws, c. 346, § 7; 78 Del. Laws, c. 193, § 1.;

Subchapter II-A. Regional Greenhouse Gas Initiative and CO2 Emission Trading Program

§ 6043. Findings, purpose, and definitions.

(a) Findings. -- The General Assembly hereby makes the following findings concerning the development, utilization and control of the air resources of the State related to impacts of carbon dioxide (CO2) emissions:

(1) There is growing scientific consensus that the increased anthropogenic emissions of greenhouse gases are enhancing the natural greenhouse effect and causing changes in the Earth's climate.

(2) Climate change poses serious potential risks to human health and terrestrial and aquatic ecosystems globally, regionally and in the State.

(3) CO2 is an air contaminant as defined in § 6002 of this title.

(4) It is in the interest of the State to protect human health and terrestrial and aquatic ecosystems by taking actions to stabilize and to limit the CO2 contributions from the State.

(5) A CO2 reduction program focusing on fossil fuel-fired electricity generation, and the development of a CO2 allowance trading program, will create a strong incentive for the creation and deployment of more efficient fuel-burning technologies, renewable resources and end-use efficiency resources, which will lead to lower dependence on imported fossil fuels.

(6) Given the absence of federal action to protect the nation, a number of states, including Delaware, are taking actions regionally to reduce power sector CO2 emissions.

(7) The State of Delaware is a signatory state to the Regional Greenhouse Gas Initiative ("RGGI"), a cooperative effort on the part of mid-Atlantic and northeastern states to curtail CO2 emissions from power plants.

(8) The Memorandum of Understanding ("MOU") signed by the Governors of participating RGGI states requires each participating state to promulgate regulations to establish a cap-and-trade program for CO2 with the goal of stabilizing CO2 emissions at current levels through 2015 and reducing by 10 percent such emissions by 2019.

(9) The MOU sets an initial emissions cap of 7,559,787 short tons of CO2 for Delaware and further requires a minimum of 25 percent of Delaware's allocation of CO2 allowances under the cap-and-trade program to be used for public benefit purposes. The cap and Delaware's allocation may be adjusted in the future.

(10) Implementation of a CO2 reduction program on a large scale, such as regionally, or nationally, is important so as to maximize our efficient use of energy and our contribution to lowering CO2 emissions while minimizing impacts on electric system reliability and unnecessary costs to Delaware power consumers. Further, costs of the CO2 cap and trade program are anticipated to be less burdensome if the program is implemented, to the extent possible and practicable, on a regional level.

(11) Pursuant to Senate Concurrent Resolution 28 of the 144th General Assembly, a stakeholder workgroup was convened to study the RGGI MOU, analyze the actions of other RGGI states, and consider and recommend the best course of action for Delaware, noting particularly the quantity of CO2 allowances to be auctioned and the potential for the use of any revenue to further the goals of the Sustainable Energy Utility or such other goals the workgroup considered consistent with the RGGI MOU.

(b) Definitions. -- For purposes of this chapter, the following terms shall have the meaning set out herein.

(1) "CO2 allowance" shall mean a limited authorization to emit up to 1 ton of CO2.

(2) "Public benefit purpose" shall mean purposes including the promotion of energy efficiency, the mitigation of electricity ratepayer impacts attributable to RGGI, the promotion of distributed renewable or non-carbon-emitting energy technologies, the stimulation and reward of investment in the

development of innovative carbon emissions abatement technologies with significant carbon reduction potential, and funding of the administration of the Program established by this chapter.

(3) "Regional Greenhouse Gas Initiative" or "RGGI" shall the mean Regional Greenhouse Gas Initiative as established by the MOU signed by Delaware and other states calling for the development of a program to reduce CO2 emissions from energy generating facilities utilizing fossil fuels.

76 Del. Laws, c. 262, § 1.;

§ 6044. Regional Greenhouse Gas Initiative.

(a) The General Assembly explicitly authorizes and sanctions the prior and ongoing participation of the Secretary of the Department of Natural Resources and Environmental Control, and the Chair of the Public Service Commission, and their duly authorized representatives, as part of their official duties, to implement and participate in the Regional Greenhouse Gas Initiative (RGGI).

(b) Representatives of the RGGI states have formed a nonprofit corporation called "RGGI Inc." to assist in the development of the regional program for reducing CO2 emissions. The General Assembly explicitly authorizes and sanctions the prior and ongoing participation in RGGI Inc. by the Secretary of the Department of Natural Resources and Environmental Control, and the Chair of the Public Service Commission, and their duly authorized representatives, as part of their official duties. The State may contract with RGGI Inc, pay dues to RGGI Inc, and transfer funds to RGGI Inc. to facilitate implementation of the RGGI program.

(c) The Secretary of the Department of Natural Resources and Environmental Control is herein authorized to promulgate regulations to implement the RGGI cap and trade program consistent with the RGGI Memorandum of Understanding, as amended.

(d) No person that is required by regulation to hold CO2 allowances shall operate in Delaware unless it holds CO2 allowances as required by the regulations implementing the RGGI Program.

(e) The Secretary shall enforce the provisions of this subchapter.

76 Del. Laws, c. 262, § 1.;

§ 6045. Auction of allowances.

(a) The Secretary of the Department of Natural Resources and Environmental Control is hereby authorized to establish, implement and manage an auction program to sell CO2 allowances into a market based trading program consistent with the RGGI Memorandum of Understanding (MOU) and this statute. The Secretary shall make every effort to participate in a regional allowance auction with other RGGI states but may conduct a Delaware-only auction if such individual auction is found to be in the best interests of Delaware electric ratepayers, as determined by the Secretary, and after consultation with the Delaware Public Service Commission.

(b) The Secretary need not establish, implement or manage the elements of the allowance auction program by regulation. However, the Secretary shall publish the elements of the auction program in the Delaware Register of Regulations no less than 60 days prior to Delaware's participation in its first auction. The Secretary may modify the auction program as the Secretary deems necessary, but substantive modifications shall also be published in the Delaware Register of Regulations.

(c) Any auction of Delaware CO2 allowances shall be conducted in accordance with accepted auction practices and principles and shall seek to maximize the efficacy of the RGGI program, minimize program costs to consumers and provide a liquid, transparent market for CO2 allowances.

(d) Beginning with 2009 CO2 allowances, the Secretary shall auction 60% of allowances available to Delaware and allocate 40% to generators in proportion to their average annual emissions from 2000-2002. The percentage of allowances auctioned by the Secretary shall increase by 8% per year, such that 100% of Delaware's allowances for 2014 shall be auctioned.

76 Del. Laws, c. 262, § 1.;

§ 6046. Auction revenue.

(a) All proceeds associated with the auction of CO2 allowances shall be directed to public benefit purposes as defined herein.

(b) The Secretary shall hold any and all auction proceeds in an interest bearing account with all interest directed to the account to carry out the purposes set forth herein.

(c) The Secretary shall direct auction proceeds to the following uses:

(1) Sixty-five percent of the CO2 allowance proceeds shall be directed to the Sustainable Energy Utility (SEU), established in § 8059 of Title 29. The SEU shall apply these funds to further the goals and activities of the SEU including, but not limited to, the promotion of energy conservation, energy efficiency, renewable energy, and energy financing pursuant to § 8059(j)(3) of Title 29.

(2) A total of 15% of the CO2 allowance proceeds shall be directed to low-income consumers, of which 10% shall be directed to the federally funded and state administered Weatherization Assistance Program (WAP), and up to 5% shall be directed to the federally funded and state administered fuel assistance (Low Income Home Energy Assistance Program or LIHEAP) programs. Participants in the LIHEAP program funded pursuant to this section shall also participate in the WAP program within 2 years of receiving assistance through LIHEAP, subject to funding availability. These programs are administered by the Office of Community Services, which is located within the Division for State Service Centers, and Delaware Department of Health and Social Services.

(3) Percentage allocations of funds to the SEU and low-income consumers may be reviewed and adjusted annually by a committee comprised of the Secretary of the Department of Natural Resources and Environmental Control (DNREC), who shall serve as committee chair, the Chair of the Board of the SEU, and the program managers of the state WAP and LIHEAP.

(4) Ten percent of CO2 allowance proceeds shall be directed to Greenhouse Gas Reduction Projects, selected by the Secretary following a periodic competitive proposal process. The Secretary shall utilize an advisory body composed of electric generators, environmental advocates, legislators and such others as the Secretary may find useful in developing guidelines for the proposal process and in soliciting and ranking of projects. Projects must result in quantifiable and verifiable reductions in Greenhouse gas emissions in Delaware not otherwise required by federal or state law and not receiving funding from any other state sources.

(5) The Secretary shall use up to 10% of CO2 allowance proceeds as detailed in subsection (d) of this section. Expenses for running the RGGI program shall be met first, prior to distribution of funds as outlined above.

(d) The Secretary of DNREC shall use annual auction proceeds to implement the cap-and-trade program, monitor emissions, allowances and offsets, and pay any expenses associated with the program including, but not limited to, expenses related to auctioning and tracking of allowances. This may include contracting with RGGI Inc., paying of dues to RGGI Inc., or transferring funds to RGGI Inc. should DNREC determine it appropriate for RGGI Inc. to undertake any action related to implementation of the program. Any auction proceeds directed to the Secretary of DNREC may also be used to fund climate change activities designed to reduce greenhouse gas emissions from all sectors of Delaware's economy and to maintain a public information program to educate Delawareans about the impacts of climate change on Delaware, and for any administrative costs associated with support of the SEU not otherwise provided for under § 8059 of Title 29.

76 Del. Laws, c. 262, § 1.;

§ 6047. Federal preemption.

Should a national cap and trade program essentially equivalent to the requirements of Regional Greenhouse Gas Initiative (RGGI) be promulgated by the federal government, Delaware may transition into the federal program and suspend or amend its regulations accordingly, provided that any unspent funds remaining with the Sustainable Energy Utility or Department of Natural Resources and Environmental Control following cessation or suspension of the RGGI program shall be used in accordance with their initial purpose. Delaware's program shall not be abandoned until the national program is fully implemented and Delaware's regulations are amended to transition to the national program.

76 Del. Laws, c. 262, § 1.;

Subchapter III. Solid Waste Recycling

§ 6051. Findings; intent.

In furtherance of the determination long established in § 6450 of this title that "the reduction of solid waste disposal and recovery of usable materials from solid waste are matters of extreme importance in minimizing the environmental impact of solid waste disposal through landfilling" and that it "is in the

public interest to develop a comprehensive statewide system of recycling and resource recovery which maximizes the quantity of solid waste materials which can be recovered, reused or converted to beneficial use" the General Assembly hereby makes the following findings and declares the following intent with respect to the establishment of this subchapter. In order to establish a comprehensive statewide system of recycling, wherein recycling is maximized and the necessary economies of scale are realized, every residence and business must have access to recycling programs that are both convenient and cost effective. It is the intent of the General Assembly, in full recognition that the establishment of a comprehensive statewide recycling program has long been sought, that said program shall be accomplished by modification of the existing beverage container law and the establishment of universal recycling inclusive of the prescribed recycling programs, requirements and goals that follow. As such, liberal interpretation in favor of accomplishing the stated goals and objectives shall be exercised.

77 Del. Laws, c. 275, § 1.;

§ 6052. Definitions.

Notwithstanding any definitions in Chapter 60 or 64 of this title to the contrary, the following words and phrases shall have the meaning ascribed to them in this subchapter unless the context clearly indicates otherwise.

(1) "Authority" means the Delaware Solid Waste Authority.

(2) "Beverage" means any mineral waters (but not including naturally sparkling mineral waters), soda waters or any other carbonated beverage not containing alcohol that is commonly known as a "soft drink" and any beer, ale or other malt beverage containing alcohol.

(3) "Beverage container" means any airtight nonaluminous container containing less than 2 quarts of a beverage under pressure of carbonation.

(4) "Dealer" means any person who engages in the sale of beverages in beverage containers to a consumer and shall include groups of retailers or retail chains.

(5) "Multi-family" means 3 or more attached structures, such as condominiums or apartments, generally intended for occupancy by individuals or families and where centralized community trash disposal and collection services are typically provided.

(6) "Municipal solid waste" means wastes such as durable goods, nondurable goods, containers and packaging, food scraps, organic yard waste and miscellaneous inorganic waste from residential (i.e. household), commercial, institutional and industrial sources such as appliances, automobile tires, old newspapers, clothing, disposal tableware, office and classroom paper, wood pallets, and cafeteria wastes. Municipal solid waste does not include solid wastes from other sources such as construction and demolition debris, auto bodies, municipal sludges, combustion ash and industrial process wastes.

(7) "On-premises sales" means sales transactions in which beverages are purchased by a consumer for immediate consumption within the area under the control of the dealer.

(8) "Organic yard waste" means plant material resulting from lawn maintenance and other horticultural gardening and landscaping activities and includes grass, leaves, prunings, brush, shrubs, garden material, Christmas trees and tree limbs up to 4 inches in diameter.

(9) "Recyclable material" or "recyclables" means any material or group of materials that can be collected and sold or used for recycling.

(10) "Recycling" means the process by which solid wastes are separated for use as raw materials, products or replacement of products, including the reuse of organic yard waste, but does not include the incineration of materials for energy.

(11) "Residential waste" means the solid waste generated in occupied single-family and multi-family structures. Also referred to as "household waste".

(12) "Single stream" means a system in which all fibers (including but not limited to paper, cardboard, etc.) and containers (including but not limited to plastic, glass and metal) are commingled for collection into 1 container instead of being sorted into separate commodities and multiple containers.

(13) "Single-family" means either a detached structure (i.e. a house) surrounded by open space or attached structures, such as town or row homes, generally intended for occupancy by a family and where individual trash collection services are typically provided for each structure.

(14) "Source-separated" means recyclable materials, including single stream recyclables, are segregated at the point of generation and kept apart from the waste stream by the generator thereof for the purpose of collection and recycling.

61 Del. Laws, c. 503, § 1; 63 Del. Laws, c. 385, § 1; 67 Del. Laws, c. 341, § 1; 71 Del. Laws, c. 74, § 2; 77 Del. Laws, c. 275, § 1.;

§ 6053. Universal recycling.

The goal of universal recycling is to create an economy of scale wherein a dramatic increase in Delaware's diversion of recyclables occurs in the most cost effective manner achievable while simultaneously creating job opportunities and significantly reducing Delaware's rate of waste disposal.

Universal recycling shall be implemented in accordance with the following provisions:

(1) Effective no later than September 15, 2011, the Authority shall cease providing curbside recycling services, including yard waste collection, and all persons providing solid waste collection services in the State shall also provide:

a. Single-stream curbside recycling collection services to all of their Delaware single-family residential customers, including delivery of a container for the purpose of storage and collection of recyclables that is adequately sized for the customers use such that recycling is encouraged and disposal of recyclables is discouraged; and the recyclables collection service shall be provided at a frequency of not less than once every other week.

b. Source-separated recycling collection services to dealers who provide on-premise sales, including delivery of a recyclables container that is adequately sized for the premise being served and a frequency of recyclables collection that shall preclude the recycling containers from overflowing and otherwise causing a nuisance.

c. All single-family residential and on-premise sales customers with a single charge for the collection of waste and recyclables on their "waste services" bill that is inclusive of the combined waste and recycling collection service costs. Local governments that do not presently bill separately for the costs of waste collection are exempt from this requirement.

d. Notification to all customers that the single-stream recycling service will be provided and instructions on participation prior to September 15, 2011.

(2) Effective no later than January 1, 2013, all persons providing solid waste collection services in the State shall provide:

a. Single-stream recycling collection services to all of their Delaware multi-family residential customers, including providing the multi-family complex with an appropriately sized and centrally located recyclables collection container or containers for the complex being served and ideally in the same proximity as the complex's waste disposal containers. Local governments may require multi-family complex owners to provide their own recyclable collection containers consistent with local requirements.

b. Notification to the multi-family complex management that the single-stream recycling service, including instructions on participation, will be provided.

c. A frequency of recyclables collection that shall preclude the recycling containers from overflowing and otherwise causing a nuisance.

d. Written justification to the Department for not providing multi-family recycling collection services where the physical constraints of the site prevent the placement of both trash and recycling containers. Exclusion from multi-family recycling is subject to Department review and approval.

(3) Owners of multi-family complexes must, at least once per calendar year, provide residents with instructions on participating in the complex's recycling program.

(4) The Recycling Public Advisory Council shall issue a report to the Governor and the General Assembly no later than November 1, 2012, with recommendations regarding the implementation of universal recycling in the commercial sector. It is the express requirement of this legislation that universal recycling be adopted by the commercial sector and that all commercial businesses actively participate in a comprehensive recycling program no later than January 1, 2014.

(5) Persons who choose to transport and deliver the solid waste and recyclables they generated on their own property for proper disposal or to a recycling facility of their choice respectively shall not be affected by this subchapter and may continue in this practice.

(6) Nothing shall impair the ownership of recyclable materials by the generator unless and until such materials are placed at curbside or similar location for collection and recycling, and nothing in this chapter shall be construed to prevent any person from collecting, transporting, processing, and marketing recyclable materials in competition with other persons in the same business, including the Authority, provided that the requirements of this subchapter are satisfied.

(7) Persons engaging in the collection, transportation, processing, or marketing of source separated recyclable materials shall conduct such activities in a manner that the source separated recyclable materials enter the marketplace and are otherwise not disposed via a landfill or by incineration.

77 Del. Laws, c. 275, § 1.;

§ 6054. Delaware Recycling Fund.

(a) There shall be established in the State Treasury and in the accounting system of the State a special fund to be known as the Delaware Recycling Fund ("the Fund").

(b) The following revenue shall be deposited into the Fund:

(1) As specified in § 2912 of Title 30, the recycling fee on the sale of beverage containers;

(2) On the last day of each month, the State Treasurer shall credit the Fund with interest on the average balance in the Fund for the preceding month. The interest to be paid to the Fund shall be that proportionate share, during such preceding month, of interest to the State as the Fund's and the State's average balance is to the total State's average balance;

(3) Any other revenue appropriated or transferred to the account by the General Assembly; and

(4) Repayment of low interest loans.

(c) The Fund shall be used by the Secretary for the exclusive purpose of funding specific activities designed to enhance the State's recycling rate and the diversion of recyclables that would otherwise be land disposed. The Fund may be expended only:

(1) To fund the Recycling Grants and Low Interest Loan Program referenced in § 6055 of this title. Annual funding for the Recycling Grants and Low Interest Loan Program shall be dependent on revenue generated by the Fund;

(2) To pay the limited and reasonable cost of the Department and the Recycling Public Advisory Council to study, evaluate and report on the status and potential for recycling various components of the solid waste stream, with emphasis on those aspects of municipal solid waste and commercial waste necessary to achieve the diversion goals established in § 6056 of this title;

(3) To pay the Department's limited and reasonable costs for administering this subchapter. No greater than 10% of the revenue deposited into the Fund shall be used by the Department for administering this subchapter without approval of the Joint Finance Committee and shall include but not be limited to:

promoting the Recycling Grants and Low Interest Loan Program, universal recycling, zero waste principles, development of reporting requirements and related recycling initiatives; and

(4) To pay the Division of Revenue for the costs of administering § 2912 of Title 30.

(d) The Department shall commence the Recycling Grants and Low Interest Loan Program in calendar year 2011 and offer the Program at least annually thereafter until 2014.

(e) The revenue from the Fund and its disbursement via the Recycling Grants and Low Interest Loan Program shall be subject to audit and the recipient of any such funding shall agree to the audit and cooperate with the auditor as a condition of receiving funding.

(f) No expenditures shall be made from the Fund for any grants or loans pursuant to § 6055 of this title without the approval by the Controller General and Director of the Office of Management and Budget of a plan for revenues and expenditures for the period between December 1, 2010, and September 15, 2011.

77 Del. Laws, c. 275, § 1.;

§ 6055. Recycling Grants and Low Interest Loan Program.

(a) There is hereby established a competitive Recycling Grants and Low Interest Loan Program (the "Program") to assist persons engaged in the business of collecting, transporting, processing, or marketing recyclable materials with the implementation of:

(1) Source-separated recyclables collection and processing programs with emphasis on start-up costs for residential single-stream recyclables collection; and

(2) Start-up costs for initiatives which result in the recycling of solid waste materials which would otherwise be land disposed, with emphasis on commercial waste.

The Program shall be administered by the Department, and monies from the Program shall be paid based on approved grant and loan requests. The Department shall be entitled to disburse grant and loan monies for the documented costs of implementing the collection or processing of recyclable materials. The Department shall be entitled to adopt guidelines and procedures for administering the Program and determining eligibility for receipt of funding pursuant to § 6054 of this title. Such procedures shall include provisions for repayment of loans to the Department and may include a rebate program for costs based on, including but not limited to, a prorated share of household customers in a recycling program that may have been in existence prior to creation of this law. The Department shall solicit the commentary of the grant eligible stakeholders during development of the grant guidelines and procedures. The Program shall be funded by monies made available under the provisions of § 6054 of this title.

(b) The Recycling Public Advisory Council, after the receipt of comments by grant and loan eligible stakeholders, shall make recommendations annually to the Department regarding the programmatic

priorities for awarding Program funds under this subchapter. The Recycling Public Advisory Council shall provide recommendations regarding the categories and priorities for grants and loans that reflect an informed and representative view of the most urgent and important areas where grant funding will provide the most benefit to the State balancing current needs with those of future generations.

(c) The Department shall review all grant and loan applications and award grants and loans taking into consideration the Recycling Public Advisory Council recommendations. In those cases where the Department's funding decisions differ significantly from the Recycling Public Advisory Council recommendations, the Department shall report to the Recycling Public Advisory Council the justification for such differences.

(d) Any person providing solid waste collection services that is a recipient of a grant or low interest loan from the Delaware Recycling Fund shall not, as a result of implementation of universal recycling, increase rates charged for solid waste collection between such time as they make application for the grant until March 15, 2013.

77 Del. Laws, c. 275, § 1.;

§ 6056. Adopting diversion goals and reporting requirements [Effective Dec. 1, 2010]

It is the intent of the General Assembly that implementation of the requirements of this subchapter reduce the amount of nonhazardous solid waste currently deposited in landfills in this State by maximizing the recovery of recyclable materials. In order to do so, it will be necessary for the State to embrace the Zero Waste Principles of designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not incinerate or bury them. In that spirit, the following Interim Waste Diversion Goals are established with the understanding that as more data and information regarding the implementation of universal recycling become available, the goals leading up to January 1, 2020 may be modified by the Department as circumstances dictate; however, the January 1, 2020, goals may not be modified without the approval of the General Assembly:

Table 1. Interim Zero Waste Diversion Goals(1)		
Date by which goal is to be achieved	Solid Waste Diverted from disposal	Municipal Solid Waste Diverted from disposal
January 1, 2015	72%	50%
January 1, 2020	85%	60%
(1) By weight		

(1) In order to effectively measure the diversion rates being achieved, all persons, including persons who collect, process or market recyclables, with the exception of those specified in § 6053(5) of this title, must report to the Department on a calendar year basis, no later than February 15 of the following year, the type and quantity of recyclables managed, the method of recycling collection used (single or multiple streams), and the location of the recycling facilities used pursuant to reporting guidance developed by the Department and the Recycling Public Advisory Council. Said reporting guidance shall be developed pursuant to the solicitation of stakeholders responsible for reporting, shall take into account the need for confidentiality of the information reported and shall be finalized no later than December 1, 2010. The first recycling report shall cover calendar year 2011 and shall be due no later than February 15, 2012.

(2) In order to ensure that the waste diversion goals specified in Table 1 of this section above are achieved by the dates specified, the Department, in cooperation with the Recycling Public Advisory Council [RPAC], shall assess progress and recommend to the Governor and General Assembly any additional mechanisms necessary including but not limited to: which waste streams must be diverted from disposal; the parties responsible for ensuring the identified waste streams are diverted from disposal; the date by which the diverted waste streams must be diverted from disposal; implementation of Pay As You Throw; Extended Producer Responsibility; incentive based recycling; waste bans and related requirements. Such assessment shall be completed, inclusive of any draft legislation determined necessary, and submitted to the General Assembly no later than November 1, 2014, as part of the RPAC annual report.

77 Del. Laws, c. 275, § 1.;

§ 6057. Beverage containers -- Findings, intent, prohibitions.

(a) The General Assembly hereby finds that beverage containers are a valuable recyclable material and a major source of nondegradable litter in this State and that the collection and disposal of this litter and solid waste constitutes a great financial burden for the citizens of this State; and that, in addition to this unnecessary expenditure of tax moneys, such litter unreasonably interferes with the enjoyment of life and property by our citizens; and that the practice of littering and disposal of a recyclable material is not compatible with previously adopted policies of the State in regard to proper use and protection of our natural resources.

(b) It is the intent of the General Assembly to increase recycling significantly, inclusive of beverage containers, thereby conserving valuable natural resources, removing the blight of litter on the landscape of the State caused by the disposal of beverage containers and other packaging, and reduce the increasing costs of litter collection and disposal.

(c) Prohibitions. -- No beverage shall be sold or offered for sale in this State:

(1) In containers connected to each other with plastic rings or similar devices which are not classified by the Department as biodegradable, photodegradable or recyclable.

(2) In a beverage container which is not recyclable or refillable.

61 Del. Laws, c. 503, § 1; 64 Del. Laws, c. 57, § 1; 67 Del. Laws, c. 341, § 2; 77 Del. Laws, c. 275, § 1.;

§ 6058. Establishment, composition and responsibility of the Recycling Public Advisory Council.

(a) There is hereby established a Recycling Public Advisory Council (the "Council"). The Council shall be composed of 16 members who shall be appointed by the Governor as follows:

(1) One member from the Department;

(2) One member from the Authority;

(3) One member representing county governments, with such member being recommended by the Delaware Association of Counties;

(4) One member representing municipal governments, with such member being recommended by the Delaware League of Local Governments;

(5) One member representing the recycling industry;

(6) One member representing the waste hauling industry;

(7) Two members, 1 representing the soft drink industry and 1 representing the alcohol beverage industry, representing the beverage industry;

(8) One member representing the Delaware State Chamber of Commerce;

(9) One member representing the Delaware restaurant industry; and

(10) Five members representing community-based or public-interest groups.

(11) One member representing the Delaware Food Industry Council.

(b) Members of the Council, except for those appointed pursuant to paragraphs (a)(1) and (2) of this section above, shall serve for terms up to 3 years and may not serve more than 2 consecutive terms but may again serve after 1 year off of the Council. Members shall be appointed for staggered terms so that no more than 5 appointments shall expire in any 1 calendar year. Members may be reimbursed for travel to and from meetings. The Governor shall appoint a Chairman from among the 16 members. Actions of the Council shall be approved by a majority vote of the Council. At least 9 members of the Council shall constitute a quorum. The Council may adopt bylaws as it deems appropriate to serve the purposes of this subchapter.

(c) The Recycling Public Advisory Council shall:

(1) Advise the Department and the Authority on all aspects of recycling;

(2) Advise the Department in developing criteria for the Recycling Grants and Low Interest Loan Program and selection of applications as well as provide an annual assessment of the revenue needed to satisfy the grant requirements;

(3) Maintain, in conjunction with the Department and the Authority, a methodology for measuring recycling rates;

(4) Provide advice and recommendations regarding the recycling outreach and education programs conducted by the Authority and/or the Department;

(5) Report to the Governor and the General Assembly annually by November 1 of each year on the status of recycling activities in Delaware. Said report shall include, but not be limited to the following:

a. Status of attainment of the recycling goals specified in § 6056 of this title;

b. An accounting of the recycling grants and loan program and any recommendations for future funding of the grants and loan program;

c. An assessment of the activities of both the Department and the Authority in achieving the recycling goals specified in § 6056 of this title;

d. An objective, auditable accounting of recycling rates for total solid waste, municipal solid waste, and residential solid waste;

e. Such other recommendations as the Council shall deem appropriate; and

f. Use the definitions of "recycling" and "municipal solid waste" as stated by the United States Environmental Protection Agency in its document EPA530-R-97-011 dated September 1997. The Council shall be able to adopt changes to these definitions.

(d) The Department, in concert with the Authority and the Council, shall:

(1) Monitor the State's recycling initiatives and measure Delaware's achievements toward attainment of the recycling goals specified in § 6056 of this title;

(2) Design and implement public educational efforts aimed at increasing public awareness of recycling opportunities;

(3) Provide technical assistance to local entities to assist them in increasing their recycling rates; and

(4) Provide administrative support to the Council.

77 Del. Laws, c. 275, § 1.;

§ 6059. Enforcement, civil and administrative penalties.

(a) Whoever violates this subchapter, or any rule or regulation promulgated there under, or any order of the Secretary, shall:

(1) For the first conviction, be fined not less than $100 nor more than $500 for each day of violation;

(2) For each subsequent conviction for the same offense within a 10-year period, be fined not less than $500 nor more than $1,500 for each day of violation;

(3) In the Secretary's discretion, the Secretary may endeavor by conciliation to obtain compliance with all requirements of this subchapter. Conciliation shall be giving written notice to the responsible party:

a. Specifying the complaint;

b. Proposing a reasonable time for its correction;

c. Advising that a hearing on the complaint may be had if requested by a date stated in the notice; and

d. Notifying that a proposed correction date will be ordered unless a hearing is requested.

If no hearing is requested on or before the date stated in the notice, the Secretary may order that the correction be fully implemented by the proposed date or may, on the Secretary's own initiative, convene a hearing, in which the Secretary shall publicly hear and consider any relevant submission from the responsible party as provided in § 6006 of this title.

(b) Any person whose interest is substantially affected by any action of the Secretary may appeal to the Environmental Appeals Board, in accordance with § 6008 of this title.

61 Del. Laws, c. 503, § 1; 68 Del. Laws, c. 146, § 1; 70 Del. Laws, c. 186, § 1; 77 Del. Laws, c. 275, § 1.;

Subchapter IV. Ocean Dumping

§ 6070. Title.

This subchapter shall be known as the "Solid Waste Dumping Elimination Act."

67 Del. Laws, c. 135, § 1; 68 Del. Laws, c. 121, § 1.;

§ 6071. Purpose.

The General Assembly finds that historically millions of tons of solid wastes have been disposed of in the ocean and waters of the State, that these wastes are not land disposed in recognition of the threat posed by the presence of contaminants, by the lack of knowledge or appreciation of the harm such wastes can cause to the marine environment, or that it is cheaper to dispose of such wastes in the ocean or other waters of the State. Therefore, it is the intent of the General Assembly to prohibit the disposal of solid wastes in the ocean and other waters of the State.

67 Del. Laws, c. 135, § 1; 68 Del. Laws, c. 121, § 1.;

§ 6072. Definitions.

The following words and phrases shall have the meanings ascribed to them in this subchapter unless the context clearly indicates otherwise:

(1) "Inland bays" shall mean the Rehoboth Bay, Indian River Bay, Indian River and Little Assawoman Bay.

(2) "Waters of exceptional recreational or ecological significance" shall mean waters designated by the State which are important, unique or sensitive from a recreational and/or ecological perspective, but which may or may not have excellent water quality. Such waters shall normally have regional significance with respect to recreational use (fishing, swimming and boating), or have significant or widespread riverine, riparian or wetland natural areas.

68 Del. Laws, c. 121, § 1.;

§ 6073. Prevention.

The provisions of any other law, rule or regulation to the contrary notwithstanding, all disposal of solid wastes into the ocean waters of the State, the Delaware Bay, the inland bays and waters of exceptional recreational or ecological significance is hereby prohibited.

67 Del. Laws, c. 135, § 1; 68 Del. Laws, c. 121, § 1.;

§ 6074. Penalties.

(a) Whoever negligently violates § 6073 of this title shall be fined not less than $2,500 nor more than $25,000 per day of violation, or be imprisoned for not more than 1 year, or both. If a conviction of a person is for a violation committed after a prior conviction of such person under this section, punishment shall be by a fine of not less than $5,000 nor more than $50,000 per day of violation, or by imprisonment of not more than 2 years, or both.

(b) Whoever knowingly violates § 6073 of this title shall be fined not less than $5,000 nor more than $50,000 per day of violation, or be imprisoned for no more than 3 years, or both. If a conviction of a person is for a violation committed after a prior conviction of such person under this section, punishment shall be by a fine of not less than $10,000 nor more than $100,000 per day of violation, or by imprisonment of not more than 6 years, or both.

(c) The Superior Court shall have jurisdiction over violations of § 6073 of this title.

(d) There shall be no suspension of any fines required under the provisions of this section.

67 Del. Laws, c. 135, § 1; 68 Del. Laws, c. 121, § 1.;

Subchapter V. Water Utilities

§ 6075. Nonutility wells and permits for nonutility wells within a service territory served by a water utility under a certificate of public convenience and necessity.

(a) The Department may not withhold a permit for a potable water well within the service territory served by a water utility under a certificate of public convenience and necessity, or require an applicant for a potable water well permit in an area served by a water utility to utilize the services of the utility, unless:

(1) The Delaware Geological Survey or the Department of Health and Social Services certifies that the ground water supply is inadequate or unsuitable for the intended use for which the permit is being sought;

(2) The water utility demonstrates to the satisfaction of the Department that it can provide service of equal or better quality at lower cost; or

(3) The permit applicant is a resident of a municipality, a county water district authority, or a recorded development where public water is available.

(b) Notwithstanding paragraphs (a)(2) and (3) of this section, following the issuance of a certificate of public convenience and necessity to a water utility, the Department shall not withhold a potable water well permit from any person seeking to construct or extend a well on a farm, farmland or the lands of any existing mobile home community, or an addition, modification or extension of that mobile home community, which as of April 11, 2000, self-supplied potable water under existing permits in an area served by a water utility, nor shall it require that the person utilize the services of the utility. However, this subsection shall not authorize or require the issuance of a potable well permit that would enable a person or entity to act as a water utility without a duly issued certificate of public convenience and necessity.

(c) Notwithstanding any other provision of this section, following the issuance of a certificate of public convenience and necessity to a water utility, the Department shall not withhold a nonpotable water well permit from any person seeking to construct or extend a nonpotable water well in an area serviced by a water utility, subject to the provisions of subsection (d) of this section.

(d) Following the issuance of a nonpotable water well permit in an area for which a certificate of public convenience and necessity has been issued, the Secretary shall send a copy of the permit, with conditions, to the water utility providing water to that area. This notification requirement shall not apply to permits issued for monitor, observation, recovery and dewatering wells. All nonpotable water well permits issued in such an area shall include the following conditions:

(1) Water taken from the well is not to be used for human consumption;

(2) The well shall not, at anytime, be interconnected with any portion of any building's plumbing and/or any water utility's service connection;

(3) Representatives of the Secretary and the water utility that services the certificated area may inspect the well at any reasonable time to insure that there are not interconnections; and

(4) That the permit is subject to revocation upon any violation of its permit conditions, and upon revocation, the Secretary shall order that the well will be abandoned.

(e) The Secretary may enforce this section under § 6005 of this title. Violations of this section may be sanctioned under the provisions of §§ 6005 and 6013 of this title.

72 Del. Laws, c. 402, § 2.;

§ 6076. Transfer of jurisdiction for certificates of public convenience and necessity for water utilities to the Public Service Commission.

On and after July 1, 2001, the Department and Secretary shall no longer have jurisdiction to issue certificates of public convenience and necessity to water utilities. On such date, the jurisdiction to issue certificates of public convenience and necessity shall be vested in the Public Service Commission. On such date, the Public Service Commission shall also be vested with the jurisdiction, to the extent described in Chapter 1 of Title 26, to issue, suspend and revoke certificates issued to water utilities. The process of reviewing requests for certificates, however, shall include coordination and cooperation by the Commission with the Department of Natural Resources and Environmental Control and the Division of Public Health.

72 Del. Laws, c. 402, § 3.;

§§ 6077-6080. Issuance of certificate; limitations; powers of the Public Service Commission with respect to water utilites; public hearings; rules for conduct; application fee.

Repealed by 72 Del. Laws, c. 402, § 1, effective July 1, 2001.

Subchapter VI. Source Water Protection

§ 6081. Reporting on source water protection.

(a) The Secretary shall prepare, periodically, a report to the Governor and General Assembly, beginning in 2003, of the potential threats, including contaminants currently not regulated, to public drinking water systems. The report shall identify actions that the Secretary proposes to control these threats.

(b) The Secretary shall periodically prepare a report to the respective counties and municipalities, beginning in 2003, that denotes the availability of source water assessments completed by the Department. The Secretary shall also report on the status of the Ground-Water Recharge Potential Mapping Project.

73 Del. Laws, c. 67, § 2; 70 Del. Laws, c. 186, § 1.;

§ 6082. Adoption of source water assessment, wellhead protection, and excellent ground-water recharge potential areas by counties and municipalities.

(a) By December 31, 2004, the Department shall develop a guidance manual, in conjunction with and with the substantial concurrence of the Source Water Protection Citizens Technical Advisory Committee,

for desirable land uses within source water assessment areas that promote the long-term protection of public drinking water supplies, consistent with "Shaping Delaware's Future: Managing Growth in 21st Century Delaware, Strategies for State Policies and Spending" (December 1999).

(b) The counties and municipalities with populations of 2,000 persons or more, with the assistance of the Department, shall adopt as part of the update and implementation of the 2007 Comprehensive Land Use Plans, the overlay maps delineating, as critical areas, source water assessment, wellhead protection and excellent ground-water recharge potential areas. Furthermore, the counties and municipalities shall adopt, by December 31, 2007, regulations governing the use of land within those critical areas designed to protect those critical areas from activities and substances that may harm water quality and subtract from overall water quantity.

(c) Municipalities with populations of less than 2,000 persons, with the assistance of the Department, may adopt by ordinance the overlay maps delineating, as critical areas, source water assessment, wellhead protection, and excellent ground-water recharge potential areas. Furthermore, the ordinance shall include regulations governing the use of land within those critical areas designed to protect those critical areas from activities and substances that may harm water quality and subtract from overall water quantity. Counties and municipalities of more than 2,000 persons that have previously adopted ordinances that include the Department's overlay maps and regulations that protect public water supplies and are consistent with minimum standards identified in the guidance manual shall be exempt from the provisions of this subsection.

(d) The Department shall make source water assessment areas available to the public as they are completed, with all systems to be completed by 2003.

(e) The Department may, when based on sound science and factual information, revise and update the overlay maps of source water assessment areas.

(f) Counties and municipalities with populations of 2,000 persons or more shall update their overlay maps in accordance with changes made by the Department with respect to source water assessment, wellhead protection and excellent ground-water recharge potential areas.

(g) Municipalities with populations of less than 2,000 persons may update their overlay maps in accordance with changes made by the Department with respect to source water assessment, wellhead protection, and excellent ground-water recharge potential areas.

73 Del. Laws, c. 67, § 2; 70 Del. Laws, c. 186, § 1.;

§ 6083. Adoption of source water assessment, wellhead protection and excellent ground-water recharge potential areas by the Governor's Cabinet Committee on State Planning Issues.

The Department shall make source water assessment, wellhead protection and excellent ground-water recharge potential area delineations available for maps developed as part of "Shaping Delaware's Future: Managing Growth in 21st Century Delaware, Strategies for State Policies and Spending" (December 1999)

73 Del. Laws, c. 67, § 2; 70 Del. Laws, c. 186, § 1.;

§ 6084. Source Water Protection Citizen and Technical Advisory Committee.

The Secretary shall consult a citizen and technical advisory committee, as established by the Delaware Source Water Assessment Plan, on matters related to the implementation of the Source Water Assessment Plan and the requirements of this statute.

73 Del. Laws, c. 67, § 2; 70 Del. Laws, c. 186, § 1.;

Subchapter VII. Labeling of Plastic Products

§ 6090. Findings; intent.

(a) The General Assembly finds that:

(1) Recycling of waste materials is preferable to incinerating or landfilling those materials because recycling conserves valuable resources, saves energy in the manufacturing process and extends the life of disposal facilities;

(2) Increased recycling is necessary in Delaware to meet the EPA's national goal of a 25% reduction of the solid waste stream;

(3) Plastics have been shown to be recyclable;

(4) One of the barriers to increased recycling of plastics is the necessity of keeping the various types of plastic separate, based on the resin from which they are made; and

(5) The Society of the Plastics Industry, Inc., has devised a coding system that can be used to label plastic containers so as to identify the type of resin from which they are made.

(b) It is the intent of the General Assembly to facilitate the recycling of plastic containers by requiring that these containers be labeled according to resin type.

68 Del. Laws, c. 174, § 1.;

§ 6091. Definitions.

As used in this subchapter, unless otherwise indicated:

(1) "Container" means a "rigid plastic container" or a "plastic bottle" as those terms are defined in this section.

(2) "Department" means the Department of Natural Resources and Environmental Control.

(3) "Label" means a molded, imprinted or raised symbol on or near the bottom of a rigid plastic container or plastic bottle.

(4) "Person" means any individual, trust, firm, joint stock company, federal agency, partnership, corporation (including a government corporation), association, state, municipality, commission, political subdivision of a state or any interstate body.

(5) "Plastic" means any material made of polymeric organic compounds and additives that can be shaped by flow.

(6) "Plastic bottle" means a plastic container intended for single use that has a neck that is smaller than the body of the container; accepts a screw-type cap, snap cap or other closure; and has a capacity of 16 fluid ounces or more, but less than 5 gallons.

(7) "Rigid plastic container" means any formed or molded container, other than a bottle, intended for single use, composed predominantly of plastic resin and having a relatively inflexible finite shape or form with a capacity of 8 ounces or more but less than 5 gallons.

(8) "Secretary" means the Secretary of the Department of Natural Resources and Environmental Control.

68 Del. Laws, c. 174, § 1.;

§ 6092. Labeling.

(a) On or after July 1, 1992, no person shall distribute, sell or offer for sale in this State any plastic bottle or rigid plastic container unless such container is labeled with a code identifying the appropriate resin type used to produce the structure of the container. The code shall consist of a number placed within 3 triangulated arrows and a letter placed below the triangle of arrows. The triangulated arrows shall be equilateral, formed by 3 arrows with the apex of each point of the triangle at the midpoint of each arrow, rounded with a short radius. The pointer (arrowhead) of each arrow shall be at the midpoint of each side of the triangle with a short gap separating the pointer from the base of the adjacent arrow. The triangle, formed by the 3 arrows curved at their midpoints, shall depict a clockwise path around the code number. The numbers and letters used shall be as follows:

1 = PETE (polyethylene threphthalate)

2 = HDPE (high density polyethylene)

3 = V (vinyl)

4 = LDPE (low density polyethylene)

5 = PP (polypropylene)

6 = PS (polystyrene)

7 = Other

(b) The Department shall maintain a list of the label codes provided in subsection (a) of this section and shall provide a copy of the list to any person upon request.

(c) The provisions of this section and any rules or regulations adopted hereunder shall be interpreted to conform with nationwide plastics industry standards.

68 Del. Laws, c. 174, § 1.;

§ 6093. Penalty; enforcement.

(a) Any person who violates this subchapter or any rule or regulation duly promulgated thereunder or any order of the Secretary issued pursuant to this subchapter shall be punishable as follows:

(1) If a violation has been completed, by a civil penalty imposed by the Justice of the Peace Court of not less than $250 nor more than $1,000 for each completed violation. The Secretary may also seek a permanent or preliminary injunction or temporary restraining order in the Court of Chancery.

(2) If a violation is continuing, the Secretary may seek a monetary penalty as provided in paragraph (a)(1) of this section. If a violation is continuing or is threatened, the Secretary may also seek a temporary restraining order or permanent injunction in the Court of Chancery.

(b) The Secretary shall have the authority to enforce this subchapter.

68 Del. Laws, c. 174, § 1.;

Subchapter VIII. Clean Air Act Title V Operating Permit Program

§ 6095. Applicability.

This subchapter shall apply to all sources required to obtain a Title V Operating Permit pursuant to the federal Clean Air Act Amendments of 1990. Such sources shall include, but not be limited to, the following:

(1) Sulfuric acid plants; municipal incinerators; fossil-fuel burners; petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels; petroleum refineries; sulfur recovery plants; chemical process plants;

(2) For pollutants other than radionuclides, any stationary source or group of stationary sources located within a contiguous area and under common control or common ownership consistent with the requirements of 40 C.F.R. Part 70, that emits or has the potential to emit, in the aggregate, 10 tons per year (tpy) or more of any hazardous air pollutant which has been listed pursuant to Title I, § 112(b) of the Clean Air Act Amendments of 1990, Public Law 101-549, 25 tpy or more of any combination of such hazardous air pollutants, or such lesser quantity as the Department may establish by regulation;

(3) A source that directly emits or has the potential to emit, 100 tpy or more of any air pollutant, including any major source of fugitive emissions of any such pollutant, as the Department may establish by regulation;

(4) For ozone nonattainment areas, sources with the potential to emit 100 tpy or more of volatile organic compounds or oxides of nitrogen in areas classified as "marginal" or "moderate," 50 tpy or more

in areas classified as "serious," 25 tpy or more in areas classified as "severe," and sources subject to the requirements for preconstruction review; except that the references in this paragraph to 100, 50, and 25 tpy of nitrogen oxides shall not apply with respect to any source for which the Department has made a finding, pursuant to regulations, that requirements under this section do not apply;

(5) For areas within the northeast transport region, sources with the potential to emit 50 tpy or more of volatile organic compounds; or

(6) Any other sources designated by the Department or mandated for designation by the United States Environmental Protection Agency.

69 Del. Laws, c. 121, § 1.;

§ 6096. Title V account.

The Secretary shall establish a separate account entitled the "Clean Air Act Title V Operating Permit Program Account," hereinafter the "Account." All fees collected under this subchapter shall be deposited into this account and utilized solely to cover all direct and indirect costs required to support the Title V Operating Permit Program, hereinafter "Program." Any civil or administrative penalties or costs recovered as a result of a violation of a Title V permit shall be used to further the goals and purposes of the Department to promote clean air for the citizens of Delaware.

69 Del. Laws, c. 121, § 1.;

§ 6097. Fees.

(a) The Department shall collect an annual fee from sources that are required to obtain a Title V Operating Permit pursuant to the Title V Program and from sources who voluntarily limit their potential to emit to below Title V applicability thresholds as set forth in § 6095 of this title (i.e., a synthetic minor facility). The annual fees shall be utilized solely to pay for all direct and indirect costs required to develop, administer and implement the Program.

(b) The fee schedule must result in the collection and retention of revenues sufficient to cover the permit program costs. These costs include, but are not limited to, the costs of the following activities, as they relate to the operating permit program for stationary sources: preparing generally applicable regulations or guidance documents regarding the permit program or its implementation or enforcement; reviewing and acting on any application for a permit, permit revision or permit renewal, including the development of an applicable requirement as part of the processing of a permit or permit revision or renewal; general administrative costs of implementing the permit program, including the supporting and tracking of data; implementing and enforcing the terms of any Title V Operating Permit (not including any court costs or other costs associated with an enforcement action), including adequate resources to determine which sources are subject to the program; emissions and ambient monitoring; modeling; preparing inventories and tracking emissions; and supporting the ombudsman established pursuant to the Small Business Stationary Source Technical and Environmental Compliance Program

("SBTCP") to assist sources covered by the SBTCP in determining and meeting their obligations under the Title V Operating Permit Program.

(c) The Department shall collect annual fees, payable annually or in quarterly installments, during calendar years 2012, 2013, and 2014, from each source that is required to pay the annual fee as set forth in subsection (a) of this section. The annual fee for each subject source will be determined by the sum of 2 component fees: a base fee and a user fee. For sources that are identified in the 2008 Delaware Point Source Emission Inventory of Estimated Actual Air Contaminants or sources that have applied for a Title V Operating Permit or synthetic minor facility permit by December 31, 2011, the base fee and the user fee shall be calculated as set forth in subsections (d) and (e) of this section. For all other sources the base fee and user fee shall be calculated as set forth in subsection (f) of this section.

(d) The base fee relates to services that are common to all sources subject to the program. These services include activities such as permit issuance and renewals; stationary source regulation development; ambient monitoring; emission inventory; control strategy development; and development, administration and implementation of 2 additional programs: the Small Business Stationary Source Technical and Environmental Compliance Program and a portion of the accidental release prevention program.

In calendar years 2010 and 2011 the Department will place each subject source into 1 of the following 11 categories:

Category A Greater than 6,000 hours $243,000

Category B from 5,001 to 6,000 hours $ 95,000

Category C from 4,001 to 5,000 hours $ 82,000

Category D from 3,001 to 4,000 hours $ 71,000

Category E from 2,001 to 3,000 hours $ 50,000

Category F from 1,501 to 2,000 hours $ 37,000

Category G from 1,001 to 1,500 hours $ 25,000

Category H from 667 to 1,000 hours $ 16,000

Category I from 334 to 666 hours $ 8,000

Category J from 0 to 333 hours $ 5,000

Category K New sources that have

applied for a permit by

December 31, 2008 $ 6,000

In calendar years 2012, 2013, and 2014 the Department will place each subject source into 1 of the following 11 categories:

Category A Greater than 6,000 hours will pay $ 243,000

Category B from 5,001 to 6,000 hours will pay $ 95,000

Category C from 4,001 to 5,000 hours will pay $ 82,000

Category D from 3,001 to 4,000 hours will pay $ 71,000

Category E from 2,001 to 3,000 hours will pay $ 50,000

Category F from 1,501 to 2,000 hours will pay $ 37,000

Category G from 1,001 to 1,500 hours will pay $ 25,000

Category H from 667 to 1,000 hours will pay $ 16,000

Category I from 334 to 666 hours will pay $ 8,000

Category J from 0 to 333 hours will pay $ 5,000

Category K New sources that have applied for

a permit after January 1, 2011 will

pay $ 6,000.

Determination shall be based upon the most recent 5 year's data of engineering, compliance, and enforcement hours expended for each facility. The Department will continue to track the actual hours spent processing Title V permits and performing other related services under the Title V program. This information may be used in the evaluations of the Title V program associated with the expiration of this statute on December 31, 2014

(e) The user fee relates to activities not identified in subsection (d) of this section for the Program, such as: development, administration and implementation of a compliance and enforcement program; implementation and enforcement of the terms of any Title V Operating Permit or synthetic minor permit; permit revisions or amendments, including the development of an applicable requirement as part of the processing of the permit issuance, revision or amendment; the supporting and tracking of data; modeling; and adequate resources to determine which sources are subject to the Program. Such fees shall be based on the emissions of each air contaminant, in whole tons and in the aggregate, excluding carbon monoxide (CO) and particulate matter less than 2.5 microns (PM2.5), as listed in the 2008 Delaware Point Source Emission Inventory of Estimated Actual Air Contaminants.

In calendar years 2010 and 2011 the Department will place each subject source into 1 of the following 10 categories:

Category 1 Greater than 6,500 tons $175,000

Category 2 from 2,001 to 6,500 tons $125,000

Category 3 from 1,001 to 2,000 tons $ 50,000

Category 4 from 501 to 1,000 tons $ 30,000

Category 5 from 201 to 500 tons $ 14,000

Category 6 from 101 to 200 tons $ 6,000

Category 7 from 51 to 100 tons $ 4,500

Category 8 from 26 to 50 tons $ 3,000

Category 9 from 0 to 25 tons $ 2,000

Category 10 New sources that

have applied for a per-

mit by December 31,

2008 $ 3,000.

In calendar years 2012, 2013, and 2014 the Department will place each subject source into 1 of the following 9 categories:

Category 1 Greater than 2,000 tons will pay $175,000

Category 2 from 1,001 to 2,000 tons will pay $ 50,000

Category 3 from 501 to 1,000 tons will pay $ 30,000

Category 4 from 201 to 500 tons will pay $ 14,000

Category 5 from 101 to 200 tons will pay $ 6,000

Category 6 from 51 to 100 tons will pay $ 4,500

Category 7 from 26 to 50 tons will pay $ 3,000

Category 8 from 0 to 25 tons will pay $ 2,000

Category 9 New sources that have applied

for a permit after January 1,

2011 will pay $ 3,000.

(f) Sources not included in the 2008 Delaware Point Source Emission Inventory of Estimated Actual Regulated Air Contaminants or sources that have not applied for a Title V Operating Permit or synthetic minor facility permit by December 31, 2011, shall be assessed a base fee that is consistent with the categories and amounts specified in subsection (d) of this section. The estimated hours on which the base fee assessment is calculated shall include an evaluation of specific regulatory applicability to the source. This shall include, but is not limited to, the following: new source review; new source performance standards; toxic requirements, to include maximum achievable control technology and National Emission Standards for Hazardous Air Pollutants; and continuous emission monitoring requirements. Such sources shall also be assessed a user fee based upon allowable emissions specified in its permit that is consistent with the categories and amounts specified in subsection (e) of this section.

(g) These fees may be increased on an annual basis by no more than the Federal Consumer Price Index for the previous calendar year. Any increases in fees are subject to review and approval by the committee established pursuant to § 6098 of this title. After December 31, 2014, no fees shall be collected pursuant to this section unless authorized by a further act of the General Assembly. The Department shall consult with the Title V Operating Permit Program Advisory Committee prior to any proposed increase to the complement of full-time equivalent employees funded in whole or in part by the Program.

(h) Annual fees must be paid in full by the end of each calendar year 2012, 2013 and 2014. Any delinquent subject source shall be subject to a 2% compounding monthly interest rate for each month overdue. Subject sources delinquent for more than one year may be subject to permit cancellation.

(i) In determining the amount of tons of actual emissions, the Department shall not be required to include any amount of air contaminant emitted by any source in excess of 4,000 tons per year of that air contaminant. The determination of common control or common ownership shall be consistent with the requirements of 40 C.F.R. Part 70.

(j) Any funds collected under this section shall be deposited in the account as described in § 6096 of this title, shall be interest earning, and shall be used solely to develop, administer and implement the Program. The Secretary shall cause an audit of the fiscal affairs to be made annually and shall furnish a copy of such audit report together with such additional information or data with respect to the affairs as the Secretary may deem desirable to the Title V Operating Permit Program Advisory Committee.

(k) The Department will continue to track for each source the actual hours spent processing Title V permits and performing other related services under the Title V program and shall, as part of the annual fee assessment, provide each source with the number of said hours expended during the preceding year. The Division of Air Quality will develop, by May 1 of each year, the overall program costs, the fees collected, current staffing levels, program accomplishments, and each subject source's total hours for the preceding calendar year in report form and present this report at an annual meeting with the Title V Operating Permit Program Advisory Committee. The Division of Air Quality shall publish a notice announcing the availability of the report in a paper of general circulation throughout the State.

Additionally, the Division shall mail a copy of said notice to the personnel on the Division of Air Quality's mailing lists.

(l) The Program shall be reviewed by an independent third party, to be approved by the committee established pursuant to § 6099 of this title. This review shall not be funded from the fees collected under the Program.

69 Del. Laws, c. 121, § 1; 70 Del. Laws, c. 8, §§ 1, 2; 70 Del. Laws, c. 186, § 1; 72 Del. Laws, c. 214, § 1; 73 Del. Laws, c. 318, § 1; 73 Del. Laws, c. 381, § 1; 75 Del. Laws, c. 172, §§ 1-5; 76 Del. Laws, c. 73, § 1; 76 Del. Laws, c. 312, § 1-7; 77 Del. Laws, c. 430, §§ 54, 55; 78 Del. Laws, c. 110, §§ 1-15.;

§ 6098. Permit shield.

Except for sources required to have a permit before construction or modification under the applicable requirements of this subchapter, if an applicant has submitted a timely and complete application for a permit required by this title (including renewals), but final action has not been taken on such application, the source's failure to have a permit shall not be a violation of this subchapter, unless the delay in final action was due to the failure of the applicant to timely submit information required or requested to process the application.

72 Del. Laws, c. 214, § 3.;

§ 6099. Title V Operating Permit Program Advisory Committee.

There shall be established a "Title V Operating Permit Program Advisory Committee," hereinafter referred to as "Committee." The Committee members shall be appointed by the Governor and shall include, but not be limited to, the Secretary of the Department of Natural Resources and Environmental Control, or the Secretary's duly appointed designee; the Director of the Division of Air Quality, or the Director's duly appointed designee; 2 members who will represent stationary sources; 1 to be a member of the Chemical Industry Council; a member of the Delaware State Chamber of Commerce; a member representing a public utility; 2 members of a nationally affiliated or state environmental advocacy group; and the chairpersons of the House and the Senate Natural Resource Committees. The Secretary of the Department of Natural Resources and Environmental Control shall serve as the Chair of this Committee. The Committee shall provide the Governor and the General Assembly with a report on or before February 1 of each year, for the previous calendar year, identifying the amounts and sources of fees collected pursuant to § 6097 of this title, the expenditures made by the Department to implement the Program, information regarding the performance of the Program, whether the fees collected by § 6097 of this title are adequate to ensure the effective implementation of the Program, and recommendations to remedy or improve any deficiencies or elements of the Program.

69 Del. Laws, c. 121, § 1; 70 Del. Laws, c. 8, § 3; 70 Del. Laws, c. 186, § 1; 72 Del. Laws, c. 214, §§ 2, 4; 73 Del. Laws, c. 381, § 2; 76 Del. Laws, c. 312, § 8; 77 Del. Laws, c. 430, § 56; 78 Del. Laws, c. 110, § 16.;

Subchapter IX. Recycling and Waste Reduction

§ 6099A. At-store recycling program [Effective Dec. 1, 2009, until Dec. 2, 2014; but see subsection (i) of this section]

(a) For purposes of this subchapter, the following definitions shall apply:

(1) "Manufacturer" means the producer of a plastic carryout bag sold to a store.

(2) "Plastic carryout bag" means a plastic carryout bag provided by a store to a customer at the point of sale.

(3) "Reusable bag" means either of the following:

a. A bag made of cloth or other fabric that has handles and is designed and manufactured to be used repeatedly.

b. A durable plastic bag with handles that is at least 2.25 mils thick and is designed and manufactured to be used repeatedly.

(4) "Store" means a retail establishment, excluding a restaurant, engaged in the business of selling or exchanging goods and/or services for cash, barter or any form of consideration on the assumption that the purchaser of such goods and/or services has acquired the goods and/or services for ultimate consumption or use and not resale that provides plastic carryout bags to its customers in conjunction with the sale of such goods and/or services and that meets either of the following requirements:

a. Has at least 7,000 square feet of retail sales space, or

b. Has 3 or more stores or retail locations, each having at least 3,000 square feet of retail sales space, in the State.

(b) The store shall establish an at-store recycling program pursuant to this section that permits a customer of the store to return clean plastic carryout bags to the store.

(c) A retail establishment that does not meet the definition of a store, as defined herein, and that provides plastic carryout bags to customers at the point of sale may adopt a similar at-store recycling program, as specified in this section.

(d) An at-store recycling program provided by a store shall include all of the following:

(1) By August 1, 2010, all plastic carryout bags provided by the store to a customer shall have printed or displayed on the bag, in a manner conspicuously visible to a consumer, the words "PLEASE RETURN THIS BAG TO A PARTICIPATING STORE FOR RECYCLING", or a similar message encouraging the reuse or recycling of plastic carryout bags.

(2) A plastic carryout bag collection bin shall be placed at each store and shall be visible, easily accessible to the consumer, and clearly marked that the collection bin is available for the purpose of collecting and recycling plastic carryout bags.

(3) All plastic carryout bags collected by the store shall be collected and recycled in a manner consistent with the intent of this section. In no instance shall a store permit collected plastic carryout bags to be disposed of or to further any act other than the recycling of such bags.

(4) The store shall maintain records describing the collection and recycling of plastic carryout bags collected by such store and shall make the records available to the Department of Natural Resources and Environmental Control (DNREC), upon request, to demonstrate compliance with this section.

(5) The store shall make reusable bags available to customers within the store, which bags may be purchased by such customer and used in lieu of using a plastic carryout bag or paper bag. This subsection is not applicable to a retail establishment specified pursuant to subsection (c) of this section above.

(e) The manufacturer of a plastic carryout bag shall provide educational materials to all stores required to comply with this section to encourage the reduction, reuse, and recycling of plastic carryout bags and the stores shall place such materials in a conspicuous location, visible to the customers of such store.

(f)(1) Unless expressly authorized by this section, a county, city, or other public agency shall not adopt, implement, or enforce an ordinance, resolution, regulation, or rule to do any of the following:

a. Require a store that is in compliance with this section to collect, transport, or recycle plastic carryout bags.

b. Impose a plastic carryout bag fee upon a store that is in compliance with this section.

c. Impose auditing or reporting requirements upon a store that are in addition to those set forth in paragraph (d)(4) of this section.

(2) This section does not prohibit the adoption, implementation, or enforcement of any county, city or other local ordinance, resolution, regulation, or rule governing curbside or drop off recycling programs operated by, or pursuant to a contract with, a county, city, or other public agency, including any action relating to fees for these programs.

(3) This section does not affect any contract, franchise, permit, license, or other arrangement regarding the collection or recycling of solid waste or household hazardous waste.

(g)(1) A violation of this section, with such determination thereof being made by DNREC, shall result in civil liability or administrative penalty in an amount up to $500 for the first violation, up to $1,000 for the second violation, and up to $2,000 for the third, and each subsequent, violation.

(2) Any civil penalties collected in accordance with paragraph (g)(1) of this section shall be paid to DNREC. The penalties collected pursuant to this section by DNREC shall be expended by DNREC, upon appropriation by the General Assembly, to assist in funding enforcement and furtherance of the intent of this section.

(h) This subchapter shall become effective on December 1, 2009.

(i) This section shall remain in effect through and including December 1, 2014, unless later-enacted legislation extends such date.

77 Del. Laws, c. 198, § 1.;

Appendix E-11. Land Use and Zoning Restrictions – New Castle County, Kent County, Public Lands, and State Parks

New Castle County

DE Code Title 9, Part II, Chapter 26 (Zoning)

Source: http://delcode.delaware.gov/title9/c026/index.shtml, accessed June 1, 2012.

Subchapter I. General Provisions

§ 2601. Power of County Council; area subject to regulation.

(a) The County Council may, in accordance with the conditions and procedure specified in this subchapter, regulate the location, height, bulk and size of buildings and other structures, the percentage of lot which may be occupied, the size of yards, courts and other open spaces, the density and distribution of population, the location and uses of buildings and structures for trade, industry, residence, recreation, public activities or other purposes and the uses of land for trade, industry, residence, recreation, public activities, water supply conservation, soil conservation or other similar purposes, in any portion or portions of New Castle County which lie outside of incorporated municipalities; provided however, that no such regulation or regulations promulgated pursuant to Chapter 30 of this title shall apply to any lands, buildings or other structures proposed to be used by or for any nonprofit corporation organized under the laws of this State and engaged at the time of such proposal in the operation in this State of 1 or more acute general hospital facilities for the purpose of such or similar operations, or to any lands, buildings or other structures of such corporation devoted to such operations. The territory lying within incorporated municipalities shall be included upon request made by the governing body or authority thereof.

(b) Notwithstanding subsection (a) of this section, no such regulation or regulations shall apply to any land, building, greenhouse or other structure proposed to be devoted to any agricultural use or which is devoted at the time of such proposal to agricultural use or to any land, building, greenhouse or other structure owned by a cooperative agricultural associations or a corporation which is or is proposed to be devoted to agricultural use. For the purposes of this subsection, any land, building, greenhouse or structure shall be deemed to be devoted to agricultural use if:

(1) The land, building, greenhouse or structure is assessed pursuant to § 8335 of this title;

(2) The land, building, greenhouse or structure is within an Agricultural Preservation District pursuant to Chapter 9 of Title 3;

(3) The person who owns, leases or otherwise controls the land, building, greenhouse or structure is required to implement a nutrient management plan or agricultural waste management plan for the same and the land, building, greenhouse or structure itself is devoted to or used in the production for sale of plants and animals useful to man, including but not limited to:

a. Forages and sod crops;

b. Grains and feed crops;

c. Dairy animals and dairy products;

d. Poultry and poultry products;

e. Livestock, including beef cattle, sheep, swine, horses, ponies, mules or goats, including the breeding and grazing of any or all of such animals;

f. Bees and apiary products;

g. Fish, hydroponic and aquacultural products;

h. Fur animals; and

i. Trees and forest products;

(4) The land, building, greenhouse or structure is devoted to and meets the requirements and qualifications for payments or other compensation pursuant to a soil conservation program under an agreement with an agency of the federal government;

(5) The land, building or structure is a farm market or roadside stand provided:

a. The products offered for sale are grown or produced on the subject farm or lands in agriculture production associated with such farm operation; or

b. The products are grown or produced on a local regional farm, and such farm market or roadside stand shall comply with the following provisions:

1. All buildings, structures and associated canopies shall comply with the building height setback requirements established by the local jurisdiction within its zoning ordinances. All construction shall conform to applicable building codes and building permit requirements as enacted by the local jurisdiction;

2. Off street customer parking shall be provided in accordance with the provisions of the zoning ordinance of the local jurisdiction provided that at least 1 parking space shall be provided for each 100 square feet of floor area of the establishment. The area of 1 parking space shall be equivalent to a standard parking stall of 9/' x 18/';

3. If a new vehicular entrance is proposed to support a farm market or roadside stand, an entrance permit shall be obtained from the Delaware Department of Transportation prior to the start of construction; and

4. Signage shall comply with signage provisions and permitting requirements established by the local jurisdiction within its zoning ordinances; and

(6) The land, building or structure is used for an agritourism activity, and such land, building or structure complies with the following provisions:

a. All buildings, structures and associated canopies shall comply with the building height setback requirements established by the local jurisdiction within its zoning ordinances. The construction of buildings or structures to be used by the participants of any agritourism activity shall conform to applicable building codes and building permit requirements enacted by the local jurisdiction;

b. If a new vehicular entrance is necessary to support an agritourism activity, an entrance permit shall be obtained from the Delaware Department of Transportation prior to the start of construction; and

c. Any signage shall comply with signage provisions and permitting requirements established by the local jurisdiction, as well as any applicable signage regulations adopted by the Department of Transportation.

(c) Notwithstanding subsection (a) of this section, no such regulation or regulations shall apply to the agricultural uses of conducting hayrides, horseback riding, guided tours, barn parties and petting zoos.

48 Del. Laws, c. 321, § 1; 9 Del. C. 1953, § 2601; 55 Del. Laws, c. 85, § 18A; 60 Del. Laws, c. 661, § 1; 66 Del. Laws, c. 207, § 1; 71 Del. Laws, c. 401, § 15; 74 Del. Laws, c. 144, § 1; 75 Del. Laws, c. 244, §§ 1, 2; 76 Del. Laws, c. 409, § 2; 78 Del. Laws, c. 143, §§ 1-3.;

§ 2602. Zoning plan and regulations.

(a) For any or all of the purposes specified in § 2601 of this title the County Council may divide the territory of New Castle County into districts or zones of such number, shape, or area as it may determine, and within such districts, or any of them, may regulate the erection, construction, reconstruction, alteration, and uses of buildings and structures and the uses of land.

(b) All such regulations shall be uniform for each class or kind of buildings throughout any district, but the regulations in 1 district may differ from those in other districts.

48 Del. Laws, c. 321, § 2; 9 Del. C. 1953, § 2602; 55 Del. Laws, c. 85, §§ 18A, 18C; 71 Del. Laws, c. 401, § 15.;

§ 2603. Purposes of regulations.

(a) Regulations adopted by the County Council, pursuant to the provisions of this subchapter, shall be in accordance with a comprehensive development plan adopted pursuant to this title, and shall be designated and adopted for the purpose of promoting the health, safety, morals, convenience, order, prosperity or welfare of the present and future inhabitants of this State, including, among other things, the lessening of congestion in the streets or roads or reducing the waste of excessive amounts of roads, securing safety from fire and other dangers, providing adequate light and air, preventing on the 1 hand excessive concentration of population and on the other hand excessive and wasteful scattering of population or settlement, promoting such distribution of population and such classification of land uses and distribution of land development and utilization as will tend to facilitate and provide adequate

provisions for public requirements, transportation, water flowage, water supply, drainage, sanitation, educational opportunities, recreation, soil fertility, food supply, protection of the tax base, securing economy in governmental expenditures, fostering the State's agricultural and other industries, and the protection of both urban and nonurban development.

(b) The regulations shall be made with reasonable consideration, among other things, of the character of the particular district involved, its peculiar suitability for particular uses, the conservation of property values and natural resources and the general and appropriate trend and character of land, building and population development.

48 Del. Laws, c. 321, § 3; 9 Del. C. 1953, § 2603; 55 Del. Laws, c. 85, § 18A; 66 Del. Laws, Sp. Sess., c. 199, § 1; 66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, § 1; 71 Del. Laws, c. 401, § 15.;

§ 2604. Assistance from and cooperation with other agencies.

The Department of Land Use shall make use of the expert advice and information which may be furnished by appropriate state, federal, or other officials, departments and agencies. All officials, departments, and agencies within the State having information, maps, and data pertinent to county zoning shall make the same available for the use of the Department of Land Use, as well as furnish such other technical assistance and advice as they may have available for such purpose.

48 Del. Laws, c. 321, § 5; 9 Del. C. 1953, § 2605; 55 Del. Laws, c. 85, § 18B; 71 Del. Laws, c. 401, § 85.;

§ 2605. Department's powers in conduct of public hearing.

At any public hearing held pursuant to this subchapter, the Department of Land Use may summon witnesses, administer oaths and compel the giving of testimony.

48 Del. Laws, c. 321, § 6; 9 Del. C. 1953, § 2609; 55 Del. Laws, c. 85, § 18B; 66 Del. Laws, c. 207, § 1; 71 Del. Laws, c. 401, § 85.;

§ 2606. Adoption by county government of zoning plan and regulations; public hearing and notice; consultative hearings; resubmission to Department of Planning.

Repealed by 71 Del. Laws, c. 401, § 86, effective July 13, 1998.

§ 2607. Changes in zoning district, plan or regulations; procedure.

(a) The County Council may, from time to time, make amendments, supplements, changes, modifications (herein called "changes"), in accordance with a comprehensive development plan adopted pursuant to Chapter 13 of this title, with respect to the number, shape, boundary or area of any district or districts, or any regulation of, or within, such district or districts, or any other provision of any zoning regulation or regulations, but no such changes shall be made or become effective until the same shall have been proposed by or be first submitted to the Department of Land Use.

(b) With respect to any proposed changes, the Department of Land Use shall hold at least 1 public hearing, notice of which hearing shall be published at least 7 days before the date of the hearing in a newspaper of general circulation in the County. The notice shall contain the time and place of hearing, and shall specify the nature of the proposed change in a general way and shall specify the place and times at which the text and map relating to the proposed change may be examined.

(c) Unless such Department of Land Use shall have transmitted its report upon the proposed changes within 45 days after the submission thereof to it, the County Council shall be free to proceed to the adoption of the changes without further awaiting the receipt of the report of the Department of Land Use. In any event, the County Council shall not be bound by the report of the Department of Land Use. Before finally adopting any such changes, the County Council shall hold a public hearing thereon, at least 15 days notice of the time and place of which shall be given by at least 1 publication in a newspaper of general circulation in the County.

48 Del. Laws, c. 321, § 8; 9 Del. C. 1953, § 2611; 50 Del. Laws, c. 118, § 1; 55 Del. Laws, c. 85, §§ 18A, 18B; 66 Del. Laws, Sp. Sess., c. 199, § 2; 66 Del. Laws, c. 201, § 1; 71 Del. Laws, c. 401, §§ 15, 85.;

§ 2608. Zoning coordination and integration; committees and rules of Department of Land Use.

(a) The New Castle County Department of Land Use may cooperate with other planning and zoning commissions within New Castle County and within other counties and states, and with the planning, zoning, legislative and administrative authorities of incorporated or unincorporated municipalities, either within or without such County, with a view to coordinating and integrating the zoning of the County with the planning and zoning of other counties or of municipalities.

(b) The Department of Land Use may appoint committees and adopt such rules for the conduct of its business as it deems proper to effect such cooperation or to more expeditiously and effectively perform its functions.

48 Del. Laws, c. 321, § 9; 9 Del. C. 1953, § 2612; 55 Del. Laws, c. 85, § 18B; 71 Del. Laws, c. 401, § 85.;

§ 2609. Violations of regulations or subchapter; enforcement, remedies and penalties.

(a) No person shall erect, construct, reconstruct, alter, maintain or use any building or structure or use any land in violation of any regulation in or of any provision of, any zoning regulation, or any change thereof, enacted or adopted by the County Council under the authority of this subchapter.

(b) Whoever violates any such regulation, provision or change of this subchapter, shall be fined not more than $100, or imprisoned not more than 10 days, or both.

(c) Each and every day during which such illegal erection, construction, reconstruction, alteration, maintenance or use continues shall be deemed a separate offense.

(d) In case any building or structure is or is proposed to be erected, constructed, reconstructed, altered, maintained or used, or any land is or is proposed to be used, in violation of this subchapter or of any

regulation or provision of any regulation, or change thereof, enacted or adopted by the County Council under the authority granted by this subchapter, the County Council, the attorney thereof, or any owner or occupier of real estate within the district or within an adjoining district in which such building, structure or land is situated, may, in addition to other remedies provided by law, institute injunction, mandamus, abatement or any other appropriate action or actions, proceeding or proceedings to prevent, enjoin, abate or remove such unlawful erection, construction, reconstruction, alteration, maintenance or use.

48 Del. Laws, c. 321, § 13; 9 Del. C. 1953, § 2619; 54 Del. Laws, c. 222; 55 Del. Laws, c. 85, § 18A; 66 Del. Laws, c. 207, § 1; 71 Del. Laws, c. 401, § 15.;

§ 2610. Nonconforming uses of land or buildings.

(a) The lawful use of a building or structure, or the lawful use of any land, as existing and lawful at the time of the enactment of a zoning regulation, or in the case of a change of regulations, then at the time of such change, may, except as hereinafter provided, be continued although such use does not conform with the provisions of such regulations or change, and such use may be extended throughout the same building, provided no structural alteration of such building is proposed or made for the purpose of such extension. County Council in any zoning regulations may permit the restoration, reconstruction, extension or substitution of nonconforming uses upon such terms and conditions as may be set forth in the zoning regulations.

(b) If the County acquires title to any property by reason of tax delinquency and such properties are not redeemed as provided by law, the future use of such property shall be in conformity with the then existing provisions of the zoning regulations of the County, or with any change of such regulations, equally applicable to other like properties within the district in which the property acquired by the County is located.

48 Del. Laws, c. 321, § 14; 9 Del. C. 1953, § 2620; 55 Del. Laws, c. 85, § 18A; 71 Del. Laws, c. 400, §§ 2.;

§ 2611. Conflict between zoning regulations and other laws.

Whenever any regulation made under authority of this subchapter requires a greater width or size of yards, courts or other open spaces, or requires a lower height of buildings or smaller number of stories, or requires a greater percentage of lot to be left unoccupied, or imposes other higher standards than are required in or under any other statute or local regulation, the regulations made under authority of this subchapter shall govern. Whenever any other statute or local regulation requires a greater width or size of yards, courts or other open spaces, or requires a lower height of buildings or a lesser number of stories, or requires a greater percentage of lot to be left unoccupied, or imposes other higher standards than are required by any regulations made under authority of this subchapter, such statute shall govern.

48 Del. Laws, c. 321, § 17; 9 Del. C. 1953, § 2623; 66 Del. Laws, c. 207, § 1.;

§ 2612. Residential facilities for persons with disabilities.

(a) For purposes of all county zoning ordinances a residential facility licensed or approved by a state agency serving 10 or fewer persons with disabilities on a 24-hour-per-day basis shall be construed to be a permitted single family residential use of such property.

(b) For the purposes of this section, the term "persons with disabilities" includes any persons with a handicap or disability as those terms are defined in the Delaware Fair Housing Act (Chapter 46 of Title 6).

(c) [Repealed]

62 Del. Laws, c. 390, § 1; 74 Del. Laws, c. 149, §§ 1, 2, 3.;

§ 2613. Notice to local school districts of residential zoning changes.

With respect to any proposed residential zoning change the County Council shall notify the local school district for the area at least 7 days prior to the initial hearing upon such residential zoning change.

66 Del. Laws, Sp. Sess., c. 195, § 1; 71 Del. Laws, c. 401, § 15.;

§ 2614. Changes in zoning.

(a) Unless the Department of Land Use recommends approval of a rezoning, the County Council shall not change the zoning for any parcel of land without the County Council approving such change in zoning by a concurrence of two thirds of all members elected to the County Council.

(b) Any rezoning which is approved subject to restrictions shall require a two-thirds vote of all members elected to the County Council to release, remove or change such restrictions, unless the Department of Land Use recommends approval of the release, removal or change of said restrictions, in which case a simple majority of all members elected to the County Council shall be required.

68 Del. Laws, c. 272, § 1; 69 Del. Laws, c. 27, § 1; 71 Del. Laws, c. 401, §§ 15, 85.;

§ 2615. Notice to property owners of zoning changes.

With respect to any proposed zoning change, unless the owner applies for the change or consents to the change, the county government shall notify the owner of the property and all adjacent property owners to the extent and in the manner the county by ordinance so provides as of June 28, 2000, mailed at least 7 days prior to the initial hearing upon such zoning change.

72 Del. Laws, c. 415 shall become effective for zoning changes initiated after enactment of this act.

72 Del. Laws, c. 415, § 1.;

§ 2616. Emergency Communication Systems.

(a) "Emergency communications equipment" includes, but is not limited to: repeater systems, 2-way radio communications, signal boosters, bi-directional amplifiers, radiating cable systems or internal antenna or any combination of the foregoing.

(b) "Emergency public safety personnel" includes firefighters, emergency medical services personnel, law-enforcement officers and other personnel routinely called upon to provide emergency assistance to members of the public in a wide variety of emergency situations, including but not limited to, fires, medical emergencies, crimes and terrorist attacks.

(c) "Newly constructed buildings" are defined as any structure of 25,000 square feet or more for which a building permit is issued commencing February 24, 2008. New construction shall not be construed as a renovation or modification of a building, or an expansion or addition to a building which is contiguous to an existing building for which a permanent certificate of occupancy was in effect by February 24, 2008. A structure shall be considered new construction even if it is physically connected to an existing structure exempt from the provisions of this section if it is not contiguous to the structure. "Contiguous structures" shall mean at least 2 structures that share a common wall or floor.

(d) The zoning ordinance and regulations adopted pursuant to this section shall provide that newly constructed buildings of 25,000 square feet of gross floor area or more shall be designed, constructed and/or equipped so that they meet the GAT (Grid Acceptance Test) at 95% compliance for 800 MHz public safety in-building communications coverage. The in-building coverage required under this section may occur naturally or may require in-building emergency communications equipment as defined in subsection (a) of this section.

(e) No issuing agency shall award a permanent certificate of occupancy unless a building affected under this section meets the GAT 95% coverage requirement. An issuing agency may issue a temporary certificate of occupancy for a period of 3 months if a reasonable effort has been made to meet the requirements under this section prior to the issuance of the temporary certificate of occupancy.

(f) The Delaware Department of Safety and Homeland Security (DSHS), or its designee, shall develop and promulgate rules and regulations for the implementation of the provisions in this section. The Secretary of DSHS shall form an advisory committee consisting of representatives of state agencies and private commercial and industrial building interests to develop the rules and regulations specified in this section. The advisory committee shall be comprised of no more than 16 members which shall consist at least of the following members:

(1) The Secretary of the Department of Safety and Homeland Security or the Secretary's designee;

(2) A representative of the Office of Facilities Management to be appointed by the Director of the Office of Management and Budget;

(3) A representative of the Delaware Volunteer Firefighter's Association;

(4) A representative from Emergency Medical Service;

(5) A representative from the Delaware State Police to be appointed by the Colonel of the State Police;

(6) A representative of the Police Chiefs Council to be appointed by the President of the Police Chiefs Council;

(7) A representative from the Delaware Department of Transportation [DelDOT] to be appointed by the Secretary of the DelDOT;

(8) A representative of the Delaware Department of Technology and Information to be appointed by the Chief Information Officer of the Delaware Department of Technology and Information;

(9) A representative from the Delaware Healthcare Association;

(10) A member of the Commercial Industrial Realty Council;

(11) Two members at-large to be appointed by the Governor of the State of Delaware.

The remaining members shall be appointed by the Governor and shall represent owners and developers of buildings greater than 100,000 square feet. The Advisory Committee shall expire upon completion and adoption of the rules and regulations under this section, but no later than February 28, 2009.

(g) The rules and regulations promulgated by the Department of Safety and Homeland Security shall not require any building to be certified for 95% in-building coverage until all 800 MHz communications towers within a county, under the Next Generation 800 MHz Project in effect at the time this section is enacted, are fully operational. If a building otherwise subject to the provisions of this section is temporarily exempt from certification under this section due to unfinished towers in a county, the design and construction of a building shall incorporate the means to later install any equipment necessary to meet the 95% GAT in-building coverage requirement. A building temporarily exempted under this subsection shall be certified within 6 months after all Next Generation 800 MHz communication towers are fully operational within a county. The Department of Safety and Homeland Security shall publish, and update, on its website, a map of the State showing those counties in which buildings subject to this chapter must comply with the requirements under this section.

(h) If a building, subject to the provisions of this section, has been certified as meeting the GAT 95% in-building coverage requirement, then persons and/or entities involved in the design, construction, ownership and maintenance of the building shall not be liable for any injury, death or damage that solely and directly results from the acts or omissions in its operation of the State of Delaware 800 MHz Emergency Communications system.

(i) Except as otherwise provided in this section, the following shall be an exception to the provisions of this section:

(1) Areas of a building, otherwise subject to the provisions of this Section, where electromagnetic interference (EMI's) will interfere with the efficient operation of equipment sensitive to EMI's; and,

(2) Any agricultural building not intended and not used for human occupancy, including but not limited to, commercial poultry houses, animal barns, etc.

(j) Buildings that would otherwise be subject to the provisions of this section shall be permanently exempt if a building permit is issued by February 28, 2009.

(k) When all towers associated or related to the Next Generation 800 MHz Project have been erected and are operational, subsection (g) of this section shall no longer be applicable and shall expire unless otherwise provided by a subsequent act of the General Assembly.

(l) The 95% GAT 800 MHz Emergency Communications in-building coverage standard shall be the standard applicable to the 800 MHz Emergency Communications System and any minor upgrades to the 800 MHz Emergency Communications System.

76 Del. Laws, c. 181, § 1; 70 Del. Laws, c. 186, § 1; 77 Del. Laws, c. 378, § 1.;

Subchapter II. The Quality of Life Act

§ 2651. Short title; intent and purpose.

(a) This subchapter shall be known and may be cited as the "Quality of Life Act of 1988." It is the purpose of this subchapter to utilize and strengthen the existing role, processes and powers of County Councils in the establishment and implementation of comprehensive planning programs to guide and control future development. It is the intent of this subchapter to encourage the most appropriate use of land, water and resources consistent with the public interest and to deal effectively with future problems that may result from the use and development of land within their jurisdictions. Through the process of comprehensive planning, it is intended that units of County Council can preserve, promote and improve the public health, safety, comfort, good order, appearance, convenience, law enforcement and fire prevention and general welfare; facilitate the adequate and efficient provision of transportation, water, sewage, schools, parks, recreational facilities, housing and other requirements and services; and conserve, develop, utilize and protect natural resources within their jurisdictions.

(b) It is also the intent of this subchapter to encourage and assure cooperation between and among municipalities, counties and the State and to encourage and assure coordination of planning and development activities of units of County Council, municipalities, regional agencies and state government in accord with applicable provisions of law. A growth management plan or policy plan that meets the standards and requirements of this subchapter shall be an acceptable comprehensive plan. The land use map or map series forming part of the comprehensive plan as required by this subchapter shall have the force of law, and no development, as defined in this subchapter, shall be permitted except in conformity with the land use map or map series and with county land development regulations enacted to implement the other elements of the adopted comprehensive plan. (66 Del. Laws, c. 207, § 1; 71 Del. Laws, c. 401, § 15.)

§ 2652. Definitions.

For the purposes of this subchapter:

(1) "Area" or "area of jurisdiction" means the total area qualifying under the provisions of this subchapter, being all unincorporated lands within a county.

(2) "Comprehensive plan" or "comprehensive development plan" shall mean, from and after the respective dates by which the counties must be in compliance with this subchapter, a plan that meets the requirements of this subchapter. Wherever in this subchapter land use regulations are required to be in accordance with the comprehensive plan, such requirements shall mean only that such regulations must be in conformity with the applicable maps or map series of the comprehensive plan. Whenever in this subchapter land use orders, permits or zoning district changes are required to be in accordance with the comprehensive plan, such requirements shall mean only that such orders, permits and changes must be in conformity with the map or map series of the comprehensive plan and county land use regulations enacted to implement the other elements of the adopted comprehensive plan.

(3) "Coordination" as used in this chapter means, in general terms, to act jointly, concurrently, and/or harmoniously toward a common end or purpose.

(4) "County" means New Castle.

(5) "Developer" means any person, including a governmental agency, undertaking any development as defined in this subchapter.

(6) "Development" means any construction or reconstruction of any new or existing commercial or residential building(s) or structure(s) upon lands which are not owned by the State or its agencies or its political subdivisions, or are not within the jurisdictional control of the State or its agencies or its political subdivisions.

(7) "Development order" means any order granting, denying or granting with conditions an application for a development permit.

(8) "Development permit" includes any building permit, zoning permit, subdivision approval, rezoning, certificate of occupancy, special exception, variance or any other official action of local government having the effect of permitting the development of land.

(9) "Governing body" means the chief governing body of County Council, however designated, or the combination of such bodies where joint utilization of the provision of this subchapter is accomplished as provided herein.

(10) "Governmental agency" means:

a. The United States or any department, commission, agency or other instrumentality thereof.

b. This State or any department, commission, agency or other instrumentality thereof.

c. Any local government, as defined in this section, or any department, commission, agency or other instrumentality thereof.

d. Any school board or other special district, authority or governmental entity.

(11) "Land" means the earth, water and air, above, below or on the surface, and includes any improvements or structures customarily regarded as land.

(12) "Land development regulation commission" means a commission designated by a County Council to develop and recommend, to the local governing body, land development regulations which implement the adopted comprehensive plan and to review land development regulations, or amendments thereto, for consistency with the adopted plan and to report to the governing body regarding its findings. The responsibilities of the land development regulation commission may be performed by the local planning agency.

(13) "Land development regulations" means ordinances enacted by governing bodies for the regulation of any aspect of development and includes any County Council zoning, rezoning, subdivision, building construction or sign regulations or any other regulations controlling the development of land.

(14) "Land use" means the development that has occurred on the land, the development that is proposed by a developer on the land or the use that is permitted or permissible on the land under an adopted comprehensive plan.

(15) "Local government" means any municipality.

(16) "Local planning agency" means the agency designated to prepare the comprehensive plan required by this subchapter.

(17) A "newspaper of general circulation" means a newspaper published at least on a weekly basis and printed in the language most commonly spoken in the area within which it circulates, but does not include a newspaper intended primarily for members of a particular professional or occupational group, a newspaper whose primary function is to carry legal notices or a newspaper that is given away primarily to distribute advertising.

(18) "Parcel of land" means any quantity of land capable of being described with such definiteness that its locations and boundaries may be established, which is designated by its owner or developer as land to be used or developed as a unit or which has been used or developed as a unit.

(19) "Person" means an individual, corporation, governmental agency, statutory trust, business trust, estate/trust, partnership, association, 2 or more persons having a joint or common interest or any other legal entity.

(20) "Public facilities" means major capital improvements over which the County has jurisdiction.

(21) "Public notice" or "due public notice" as used in connection with the phrase "public hearing," "hearing to be held after due public notice" or "public meeting" means publication of notice of the time, place and purpose of such hearing at least twice in a newspaper of general circulation in the area.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 2, 3; 71 Del. Laws, c. 401, § 15; 73 Del. Laws, c. 329, § 48.;

§ 2653. Scope of subchapter.

(a) The County shall have power and responsibility:

(1) To plan for their future development and growth.

(2) To adopt and amend comprehensive plans, or elements or portions thereof, to guide their future development and growth.

(3) To implement adopted or amended comprehensive plans by the adoption of appropriate land development regulations or elements thereof. In furtherance of the authority to adopt, amend and implement comprehensive plans or elements or portions thereof to guide and control future growth, counties are expressly granted the authority to develop and adopt regulations governing the transfer of development rights from identified residential and nonresidential districts, zones or parcels of land to residential and nonresidential districts, zones, parcels or areas designated to receive such development rights; provided that such receiving districts, zones or areas are within the same planning district as defined by the county. Such regulations may provide for the establishment of development right banking. Whenever a county exercises its authority to provide for the transfer of development rights it shall:

a. Comply with all requirements of this subchapter pertaining to the amendment of a comprehensive plan;

b. Provide for the transfer of development rights as an option to the use and development of the subject property according to the otherwise applicable zoning ordinance;

c. Limit designation of receiving areas to locations where the county has determined that growth should be encouraged and where a transfer of development rights would not result in the inability of either the existing or planned public facilities which serve the area to accommodate such growth; and

d. Demonstrate that the creation and regulation of both sending and receiving districts are otherwise consistent with promotion of the policies expressed by the comprehensive plan and statewide planning goals and objectives established pursuant to Chapter 91 of Title 29.

e. Consider appropriate incentives for the transfer of development rights, including bonuses for the use of transferred development rights and intergovernmental agreements with other counties or municipalities which would permit the transfer and use of development rights between counties and municipalities.

(4) To establish, support and maintain administrative instruments and procedures to carry out the provisions and purposes of this subchapter.

(b) Each County Council shall prepare a comprehensive plan of the type and in the manner set out in this subchapter or amend its existing comprehensive plan to conform to the requirements of this subchapter.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, § 4; 71 Del. Laws, c. 401, § 15; 72 Del. Laws, c. 122, §§ 1, 2.;

§ 2654. Areas under this subchapter.

A county shall exercise authority under this subchapter for the total unincorporated area under its jurisdiction.

66 Del. Laws, c. 207, § 1.;

§ 2655. Local planning agency.

(a) The governing body of each County Council shall designate and by ordinance establish a "local planning agency." The governing body may designate itself as the local planning agency pursuant to this subsection. The local planning agency shall prepare the comprehensive plan after meetings to be held after due public notice and shall make recommendations regarding the adoption of such plan or element or portion thereof. The agency may be a local planning commission, the Department of Land Use of the County Council or other instrumentality, including a countywide planning entity established by special act or council of local government officials, provided the composition of the council is fairly representative of all the governing bodies in the County.

(b) The governing body or bodies shall appropriate funds for salaries, fees and expenses necessary in the conduct of the work of the local planning agency and shall also establish a schedule of fees to be charged by the agency. To accomplish the purpose and activities authorized by this subchapter, the local planning agency, with the approval of the governing body or bodies and in accord with the fiscal practices thereof, may expend all sums so appropriated and other sums made available for use from fees, gifts, state or federal grants, state or federal loans and other sources; however, acceptance of loans must be approved by the governing bodies involved.

(c) The local planning agency shall have the general responsibility for the conduct of the comprehensive planning program. Specifically, the local planning agency shall:

(1) Be the agency responsible for the preparation of the comprehensive plan and shall make recommendations regarding the adoption of such plan or element or portion thereof consistent with existing county laws or regulations. During the preparation of the plan, and prior to any recommendation for adoption, the local planning agency shall hold at least 1 public hearing or public meeting on the proposed plan or element or portion thereof. The local planning agency may designate any agency, committee, department or person to prepare, revise, monitor and oversee the effectiveness

and status of the comprehensive plan or any element thereof. Prior to adoption of the proposed comprehensive plan, the governing body shall hold at least 1 public hearing, with due public notice, on the proposed plan or element thereof. Final recommendation of the adoption of such plan to the governing body shall be in accordance with existing county procedures, or absent such procedures, shall be the responsibility of the local planning agency.

(2) Review proposed land development regulations, land development codes or amendments thereto, and make recommendations to the governing body as to the consistency of the proposal with the adopted comprehensive plan.

(3) Perform any other functions, duties and responsibilities assigned to it by the governing body or special law.

66 Del. Laws, c. 207, § 1; 71 Del. Laws, c. 401, §§ 15, 85.;

§ 2656. Required and optional elements of comprehensive plan; studies and surveys.

(a) The comprehensive plan shall consist of materials in such descriptive form, either written or graphic, as may be appropriate to the prescription of principles, guidelines and standards for the orderly and balanced future economic, social, physical, environmental and fiscal development of the area.

(b) Coordination of the several elements of the local comprehensive plan shall be a major objective of the planning process.

(c) A capital improvements plan covering at least a 5-year period shall be developed in accordance with the adoption of, and be consistent with, the comprehensive plan. The capital improvements plan shall be designed to consider the need for and the location of public facilities in order to encourage the efficient utilization of such facilities and set forth:

(1) Principles for construction, extension or increase in capacity of public facilities, as well as principles for correcting existing public facility deficiencies, which are necessary to implement the comprehensive plan.

(2) Estimated public facility costs, including a delineation of when facilities will be needed, the general location of the facilities and projected revenue sources to fund the facilities.

(3) Standards to ensure the availability of public facilities and the adequacy of those facilities.

(4) To the extent provisions of the capital improvements plan anticipate State financial assistance, involvement or cooperation, such provisions shall be developed in conjunction with the state capital improvement plan and annual capital budget.

(d) The capital improvements plan shall be reviewed on an annual basis and modified as necessary. Corrections, updates and modifications concerning costs, revenue sources, acceptance of facilities pursuant to dedications which are consistent with the plan, or the date of construction of any facility enumerated in the capital improvements plan may be accomplished by ordinance and shall not be

deemed to be amendments to the local comprehensive plan. All proposed improvements to public facilities shall be consistent with the capital improvements plan.

(e) Coordination of the comprehensive plan with the comprehensive plans of municipalities within the County, adjacent counties and applicable state regulations and policy shall be an objective of the comprehensive planning process. To that end, in the preparation of a comprehensive plan or element thereof, and in the comprehensive plan or element as adopted, the planning agency shall include a specific policy statement or coordinated mapping element indicating the relationship of the proposed development of the area to the comprehensive plans of municipalities within the County, adjacent counties and applicable state regulations and policy as the case may require. Such policy statement or coordinated mapping element shall specifically identify the coordination process undertaken and the official action taken by affected municipalities regarding the county comprehensive plan. Such statement or element shall also set forth the procedures to be followed to ensure continuing coordination with municipalities, regional agencies and the State. In addition, the comprehensive plan shall provide for coordination with state agencies regarding land use and development policies and shall provide for review and consideration by the Cabinet Committee on State Planning Issues at such times as required by this subchapter.

(f) The comprehensive plan and its elements shall contain policy recommendations for the implementation of the plan and its elements.

(g) The comprehensive plan shall include:

(1) A future land use plan element designating proposed future general distribution, location and extent of the uses of land for such activities as residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities and other categories of the public and private uses of land. The plan shall include standards to be followed in the control and distribution of population densities and building and structure intensities. The proposed distribution, location and extent of the various categories of land use shall be shown on a land use map or map series which shall be supplemented by goals, policies and measurable objectives. Each land use category shall be defined in terms of the types of uses included and standards for the density or intensity of use. The future land use plan shall be based upon surveys, studies and data regarding the area, including the amount of land required to accommodate anticipated growth, the projected population of the area, the character of undeveloped land and the availability of public services. The future land use plan may designate areas for future planned development use involving combinations of types of uses for which special regulations may be necessary to ensure development in accord with the principles and standards of the comprehensive plan and this subchapter. The land use maps or map series shall generally identify and depict historic district boundaries and shall designate historically significant properties meriting protection. Population, demographic, environmental and economic data and projections used to determine present conditions, future land use and public facility requirements shall be developed in conjunction with the State and municipalities, and shall, as a minimum, consistent with projections officially adopted by the Delaware Population Consortium. The sources and assumptions used to develop such projections shall be clearly identified.

(2) A mobility element which is consistent with the approved Area-wide Transportation Plan and has been developed in conjunction with the Department of Transportation. The mobility element shall provide a balanced transportation system addressing the movement of people and goods while showing existing and proposed rights-of-way, sidewalks, bikeways, rail facilities, terminals and related facilities. The mobility element shall include recommendations for land use regulations that promote a range of sustainable transportation choices for future transportation needs. The mobility element shall be consistent with the State Implementation Plan (SIP) for air quality attainment.

(3) A water and sewer element correlated to principles and guidelines for future land use, indicating ways to provide for future potable water, and wastewater disposal for the area. County Council, in conjunction with the State, shall assess their current, as well as projected, water needs and sources. The element shall describe the problems and needs and the general facilities that will be required for solution of the problems and needs. The water and sewer element shall be developed in consultation with and reviewed by the Department of Natural Resources and Environmental Control. The water and sewer element shall include an assessment of fiscal considerations and shall be consistent with approved area-wide wastewater treatment Plans.

(4) A conservation element for the conservation, use and protection of natural resources in the area and which results in the identification of these resources. At a minimum, the element shall consist of such natural area classifications as wetlands, wood uplands, habitat areas, geological areas, hydrological areas, floodplains, aquifer recharge areas, ocean beaches, soils and slopes. The land use map or map series contained in the future land use element shall generally identify and depict natural areas classifications, such as those enumerated in this section. The land uses identified on said maps shall be consistent with applicable state laws and regulations. Identification and depiction of the above shall be based on the best topographic maps and other information available from state and federal agencies or other sources that the County deems appropriate. The conservation element shall also consider areas most suited for agricultural uses, silvacultural uses and watershed protection. The conservation element shall be developed in consultation with and reviewed by the Department of Agriculture and the Department of Natural Resources and Environmental Control.

(5) A recreation and open space element indicating a comprehensive system of public and private sites for recreation including, but not limited to, nature preserves, parks and playgrounds, parkways, water bodies including beaches and public access to beaches, open spaces and other recreational facilities. A county recreation and open space plan is acceptable in lieu of a recreation and open space element. The recreation and open space element shall be consistent with the comprehensive land use plan. The element shall be developed in consultation with and reviewed by the Department of Natural Resources and Environmental Control and shall reflect the State's open space preservation and outdoor recreation planning activities.

(6) A housing element that is consistent with county housing plans, standards and principles. Such housing plans shall be in accordance with state and federal rules and regulations and the housing plan or housing element of the comprehensive plan shall include the following:

a. The provision of housing for existing residents and the anticipated growth of the area.

b. The elimination of substandard dwelling conditions.

c. The structural and aesthetic improvement of existing housing.

d. The provision of adequate sites for future housing, including housing for low-income and moderate-income families, group home facilities and foster care facilities, with supporting infrastructure and public facilities.

e. Provision for relocation housing and identification of historically significant and other housing for purposes of conservation, rehabilitation or replacement.

f. The formulation of housing implementation programs.

g. Demonstrated coordination with the State Housing Authority including, but not limited to, guidelines to insure that sites for publicly assisted housing are located where adequate transportation opportunities, health and social services and other community services are available.

(7) An intergovernmental coordination element of the comprehensive plan shall demonstrate consideration of the particular effects of the plan, when adopted, upon the development of municipalities within the County, adjacent counties or on the applicable state regulations.

(8) A recommended community design element to assist in the achievement of the objectives of the comprehensive plan which may consist of design recommendations for land subdivision, neighborhood development, neighborhood redevelopment, design of open space locations and similar matters. To that end, such recommendations may be made available as aids and guides to developers in the future planning and development of land in the area.

(9) An historical preservation element which sets out plans and programs for those structures or lands in the area having historical, archaeological, architectural or similar significance. The historical preservation element shall be developed in consultation with and reviewed by the Division of Historical and Cultural Affairs of the Department of State.

(10) An economic development element setting forth principles and guidelines for the commercial and industrial development, if any, and the employment and personnel utilization within the area. The element may detail the type of commercial and industrial development sought while correlating the present and projected employment needs of the area to other elements of the plan and may set forth methods by which a balanced and stable economic base will be pursued. The economic development element shall include a general area redevelopment component consisting of plans, criteria and programs for community redevelopment, including reuse of housing sites, business sites, industrial sites, central business districts, public building sites, recreational facilities and other locations. The economic development element shall be developed in consultation with and reviewed by the Economic Development Office.

(h) The comprehensive plan may include such other elements as may be peculiar to and/or necessary for the area concerned and as are added by the governing body upon the recommendation of the local planning agency.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 270, §§ 5-15; 71 Del. Laws, c. 401, § 15; 74 Del. Laws, c. 186, § 3; 78 Del. Laws, c. 92, § 1.;

§ 2657. State responsibilities to local planning agencies.

(a) All elements of the comprehensive plan shall be based upon data appropriate to the element involved. State agencies shall provide to each county upon request existing data or information necessary to expedite the development and preparation of the comprehensive plan and elements of this section. Surveys and studies utilized in the preparation of the comprehensive plan shall not be deemed a part of the comprehensive plan unless adopted as a part of it. Copies of such studies, surveys and supporting documents shall be made available to public inspection, and shall be made available to the public upon payment of reasonable charges for reproduction. The County shall be relieved of any requirement to comply with the data and information requirements of this subchapter when the State is unable to supply the necessary data and information to implement that requirement, except when such data or information is currently available or readily accessible to the County within budgetary limitations.

(b) The State, through the Office of State Planning Coordination, shall provide to the County, for use in the comprehensive planning process, State land use and development goals and policies, state regulatory requirements, estimates of future state financial capabilities, the State Capital Improvements Budget and Plan, State facility location plans, estimates of existing quantity of natural resources, economic development strategies and any other information which might reasonably influence the county's future land use decisions. The State shall provide the County with long-range plans, performance standards, land development polices, facility siting criteria and infrastructure impact assessment standards (necessary to ensure the availability of public facilities and the adequacy of those facilities), so as to enable the county to prepare the plan elements required by § 2656 of this title and to clearly set forth the criteria the State will use to review such elements. The review by the Cabinet Committee on State Planning Issues shall be pursuant to § 9103 of Title 29. During preparation of the county comprehensive plan, the county and the State shall jointly establish guidelines for the location and arrangement of public facilities, such as public schools, health care facilities, public safety and correctional institutions, libraries and other public buildings. Such guidelines shall be used to coordinate between the various levels of government so as to ensure that public buildings and facilities are located in a manner which are consistent with state and county development goals.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 15, 16; 74 Del. Laws, c. 186, § 4; 78 Del. Laws, c. 92, § 2.;

§ 2658. Evaluation and appraisal of comprehensive plan.

(a) The comprehensive plan or amendments or revisions thereto shall be submitted to the Governor or designee at such time as the plan is made available for public review. The County shall provide sufficient copies for review by the Cabinet Committee on State Planning Issues. Within 30 days of plan submission, the Cabinet Committee on State Planning Issues shall conduct a public meeting, at which time the County shall make a presentation of the plan and its underlying goals and development policies. Following the public meeting the plan shall be subject to the state review and certification process set forth in § 9103 of Title 29.

(b) The State shall not be obligated to provide state financial assistance or infrastructure improvements to support land use or development actions by the County where the County's adopted comprehensive plan or portions thereof are determined to be substantially inconsistent with state development policies.

(c) The planning programs shall be a continuous and ongoing process. The local planning agency shall prepare a report on the progress of implementing the comprehensive plan, which shall be sent to the Office of State Planning Coordination each year after adoption of the comprehensive plan. The report shall be due annually no later than on each anniversary of the effective date of the most recently adopted comprehensive plan or plan update until January 1, 2012, and annually no later than July 1 each year thereafter starting on July 1, 2012. The Cabinet Committee shall forward the report to the Office of State Planning Coordination, which will evaluate it in the context of state goals, policies and strategies, and the plans of other jurisdictions. The Office of State Planning Coordination will integrate the information, land use trends, and changing conditions found in the county's report into the annual report of the Cabinet Committee, which is to be prepared as specified in § 9101(d) of Title 29. It is the intent of this subchapter that periodic updates on amendments to and the implementation of adopted comprehensive plans be communicated through the evaluation and appraisal reports to ascertain trends, monitor implementation and foster ongoing coordination.

(d) The report shall present an assessment and evaluation of the success or failure of the comprehensive plan or element or portion thereof, and shall contain appropriate statements (using words, maps, illustrations or other forms) related to:

(1) The major problems of development, physical deterioration and the location of land uses and the social and economic effects of such uses in the area.

(2) The condition of each element in the comprehensive plan at the time of adoption and at date of report.

(3) The comprehensive plan objectives as compared with actual results at date of report.

(4) The extent to which unanticipated and unforeseen problems and opportunities occurred between date of adoption and date of report.

(e) The report shall include reformulated objectives, policies and standards in the comprehensive plan or elements or portions thereof.

(f) The Cabinet Committee may prescribe a format and guidelines for the preparation of the County's report. Should the Cabinet Committee elect to do so, the Office of State Planning Coordination shall assist the Committee in the development and administration of such guidelines.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 15, 17-19; 73 Del. Laws, c. 186, § 1; 74 Del. Laws, c. 186, §§ 3-6; 78 Del. Laws, c. 92, §§ 3-6.;

§ 2659. Legal status of comprehensive plan.

(a) After a comprehensive plan or element or portion thereof has been adopted by County Council in conformity with this subchapter, the land use map or map series forming part of the comprehensive plan as required by this subchapter shall have the force of law, and no development, as defined in this subchapter, shall be permitted except in conformity with the land use map or map series and with land development regulations enacted to implement the other elements of the adopted comprehensive plan.

(b) Nothing in this subchapter shall serve to invalidate any comprehensive plan, land development regulation, land use, development, development order or development permit which presently exists or which hereafter validly comes into existence prior to the date when full compliance with this subchapter is required.

(c) Any application for a development permit filed or submitted prior to adoption or amendment under this subchapter of a comprehensive plan or element thereof shall be processed under the comprehensive plan, ordinances, standards and procedures existing at the time of such application. All subdivision or land development applications heretofore or hereafter filed or submitted to New Castle County that do not receive final approval from New Castle County government within 5 years from the date of application shall be subject to the environmental standards contained in Chapter 40, Articles 5 and 10, of the New Castle County Code, as may be amended, and the traffic impact standards contained in Chapter 40, Articles 5 and 11, of the New Castle County Code, as may be amended. This section shall not be construed to extend any time limitations pertaining to the expiration of subdivision or land development applications contained in the New Castle County Code.

(d) All development permits and development orders heretofore or hereafter validly issued or approved by County Council and not thereafter limited, rescinded or restricted shall automatically be incorporated into and become part of the present and all future comprehensive plans.

(e) In the event that any comprehensive plan or element required to comply with this subchapter shall be determined as failing to comply herewith, such failure shall not invalidate those elements of the plan which do comply with this subchapter, nor invalidate any previously issued development permit or order that was not specifically and timely challenged in the legal action in which such noncompliance was determined.

(f) The County Council may by ordinance provide for the sunsetting of any subdivision or land development plan approvals heretofore or hereafter approved by County Council. However, no such

plans shall be subject to sunsetting within the first 5 years of approval of such plans by County Council or the first 5 years after adoption of the County sunsetting ordinance, whichever is later.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, § 15; 71 Del. Laws, c. 400, §§ 3, 4; 71 Del. Laws, c. 401, §§ 15, 87; 73 Del. Laws, c. 33, § 1.;

§ 2660. County comprehensive plan.

(a) The County shall submit a final comprehensive plan for submission to the Cabinet Committee on State Planning Issues no later than 5 years after the adoption of the current plan; provided, however, that the County may request an extension of such date by forwarding a written request to the Cabinet Committee at least 90 days prior to the deadline. The basis for the request shall be clearly indicated. The decision whether to grant a request an extension, and the duration of such extension, shall be at the discretion of the Cabinet Committee. Upon completion of the comment period set forth in this subchapter, the County shall solicit public comment and adopt a comprehensive plan for zoning, subdivision and other land use decisions. Such plan shall be updated every 10 years thereafter.

(b) Once the County Council shall have in place said comprehensive plan, the County shall not be permitted to amend such plan without a simple majority of the entire membership thereof voting to do so.

(c) Within 1 year of the date of adoption of the county plan, the County shall initiate an implementation program regarding subdivision and development controls. The County shall report the status of the implementation program in the monitoring report as required by this subchapter. This report should include progress to date, problems, issues and opportunities.

(d) Subsequent amendments to the county comprehensive plan required by this chapter shall be submitted to the Cabinet Committee on State Planning Issues for review and certification pursuant to § 9103 of Title 29.

(e) Within 18 months of the date of adoption of the county comprehensive plan or revisions thereof, New Castle County shall amend its official zoning map or maps to rezone all lands in accordance with the uses and intensities of uses provided for in the future land use element for the County. In the event that the comprehensive plan includes provisions governing the rate of growth of particular planning districts or sub-areas of the County, the County's zoning district regulations shall be amended to reflect the timing elements of the comprehensive plan.

66 Del. Laws, c. 216, § 1; 70 Del. Laws, c. 270, §§ 15, 20, 21; 71 Del. Laws, c. 401, § 15; 73 Del. Laws, c. 186, § 2; 74 Del. Laws, c. 186, §§ 3, 7; 78 Del. Laws, c. 92, §§ 7, 8; 78 Del. Laws, c. 129, § 1.;

§ 2661. Information from state and local agencies and school districts.

(a) All subdivision plans approved by the County Council shall be filed with the Office of the Recorder of Deeds, and with such other state and local agencies as the County may by ordinance require.

(b) As part of its review of a rezoning or subdivision application, the County Council through its designated local planning agency shall request and review information from all state and local agencies and local school districts identified on a list prepared by the County and shall file as part of the record any written information provided by such state and local agencies or local school districts with respect to the rezoning or subdivision application. If the planning agency makes recommendations that are in conflict with the information supplied by state and local agencies or local school districts, it must explain its reasons for doing so in writing.

(c)(1) This section shall apply only to residential development. Prior to recording a major record subdivision plan, as defined by New Castle County, the applicant shall provide certification to the Department of Land Use from the Secretary of the Department of Education after consultation with the superintendent of the appropriate individual school district that the school district has adequate capacity for the proposed development. The Secretary shall respond to any request for certification or Voluntary School Assessments within 60 days' receipt of a completed request for such certification. That certification shall include the following information:

a. Existing classrooms and service levels based upon the Delaware Department of Education Delaware School Construction Manual, September 19, 1996, as may be amended or supplemented from time to time, or based upon other standards accepted as accurate by the Secretary of the Department of Education; and

b. Capacity calculations, which shall include the current student population, increased demand resulting from prior certifications from the Department of Education, and the increased demand that will result from the proposed development. The Department of Land Use shall within 20 days provide the Department of Education with all necessary information regarding the number and type of dwelling units proposed and other information which the Secretary may request.

This subsection shall apply to all new residential major subdivision plans submitted pursuant to the New Castle County Unified Development Code adopted December 31, 1997, as may be amended.

(2) Notwithstanding the foregoing provisions of this subsection, no certificate of adequate school capacity shall be required where either: (i) the residential development is restricted by recorded covenants to provide housing or shelter predominantly for individuals 55 years of age or older pursuant to the Federal Fair Housing Act [42 U.S.C. § 3601 et seq.]; (ii) the residential development is for low income housing, which, for purposes of this section, shall be defined to mean any housing financed by a loan or mortgage that is insured or held by the Secretary of HUD or the Delaware State Housing Authority or which is developed by a nonprofit corporation certified under § 501(c)(3) of the United States Internal Revenue Code [26 U.S.C. § 501(c)(3)]; or (iii) the applicant has pledged, in a writing recorded and running with the subject property, to pay a Voluntary School Assessment in an amount determined pursuant to § 103(c) of Title 14, for each lot for which the applicant would otherwise be required to obtain a certificate.

(3) Voluntary School Assessments will be calculated on a per unit basis as of the time of the issuance of the first building permit, and the assessment shall remain constant throughout the development of the

subdivision (and shall not be increased for any reason, including but not limited to any resubdivision); provided, however, that after 5 years the Voluntary School Assessment amount may be recalculated. Any Voluntary School Assessments paid under this subsection shall be paid to the Department of Education at the time that a certificate of occupancy is obtained for each unit, and shall be deposited by the Department into an interest-bearing account as set forth below. With the approval of the Secretary, after consultation with the superintendent of the affected school district, an applicant may receive a credit against voluntary assessments to be paid in an amount equal to the fair market value of any lands or properties set aside by the applicant and deeded to the school district for school uses. Any such lands shall not be used for nonschool purposes, other than as parkland or open space. All voluntary assessments paid shall be held in an interest-bearing account by the State for the school district in which the applicant's project is located until such time as the school district engages in construction activities that increase school capacity, at which time such assessments shall be released to the school district by the State in the amount of the Voluntary School Assessments paid into an interest-bearing account for such district. It is the intent of this section that lands or properties required to be conveyed by the applicant to New Castle County as a condition to subdivision approval shall not be eligible to be used for purposes of obtaining a credit against the voluntary school assessment notwithstanding the fact that such lands or properties may subsequently be conveyed by the county to a school district.

(4) To the extent New Castle County has adopted (or in the future attempts to adopt) any regulations or ordinances linking or tying residential development to school capacity, or otherwise restricting residential development in the absence of school capacity, such regulations and ordinances are hereby preempted and of no force and effect.

66 Del. Laws, Sp. Sess., c. 198, § 1; 70 Del. Laws, c. 270, § 15; 71 Del. Laws, c. 401, § 15; 72 Del. Laws, c. 237, § 1; 73 Del. Laws, c. 350, § 108; 74 Del. Laws, c. 308, § 151(a), (b).;

§ 2662. Highway capacity.

The County Council shall not approve any proposed change in the zoning classification for land (i.e., any "rezoning request") without first complying with the following procedures:

(1) As soon as possible, but in any event no later than June 30, 1988, the County Council, through its designated planning agency, shall establish an agreement with the Delaware Department of Transportation (DelDOT) to provide a procedure for analysis by DelDOT of the effects on traffic of each rezoning application.

(2) Each such agreement shall be approved by a resolution or ordinance, consistent with County procedures, and shall establish traffic level of service suitable to the County and DelDOT.

(3) The purpose of the agreement shall be to ensure that traffic analyses are conducted as part of the zoning reclassification process within the County.

(4) The agreement shall provide for the review of traffic impacts according to nationally recognized traffic criteria and shall, at a minimum, consider the effects of existing traffic, projected traffic growth in

areas surrounding a proposed zoning reclassification and the projected traffic generated by the proposed site development for which the zoning reclassification is sought.

66 Del. Laws, c. 217, § 1; 70 Del. Laws, c. 270, § 15; 71 Del. Laws, c. 401, § 15.;

New Castle County
DE Code Title 9, Part II, Chapter 30 (Subdivision and Land Development)
Source: http://delcode.delaware.gov/title9/c030/index.shtml, accessed June 1, 2012.

§ 3001. Definitions.

As used in this chapter, unless otherwise expressly stated:

(1) "Commission" means Regional Planning Commission of New Castle County in § 3003 of this title but shall mean the Department of Land Use in all other sections.

(2) "County" means New Castle County.

(3) "District" means Regional Planning District of New Castle County, which comprises all that portion of the County not included within the corporate limits of any city or town, unless any territory within such corporate limits is included upon request made by the governing body or authority of any such city or town.

(4) "Plan" means the map, plat, or other document verbally or graphically illustrating or describing a plan of subdivision or land development.

(5) "Recorder of Deeds" means Recorder of Deeds in and for New Castle County.

(6) "Regulations" means land subdivision regulations.

(7) "Structure" means any man-made object having an ascertainable stationary location on land or in water, whether or not affixed to the land.

(8) "Subdivide" means the subdivision of land as defined in paragraph (10) of this section, or any act directed toward the present or future subdivision of land.

(9) "Subdivider" means any person, or agent thereof, who undertakes the subdivision of land; or any successor to the rights of said person in said land.

(10) "Subdivision" means:

a. The division or redivision of a lot, tract, or parcel of land, by any means, including by means of a plan or plat or a description by metes and bounds, into 2 or more lots, tracts, parcels or other divisions of land, for the purpose, whether immediate or future, of lease, of the transfer of ownership or of building development, exempting, however, the division of land for agricultural purposes into parcels of more than 10 acres not involving any new streets or easements of access, divisions of property by testamentary or intestate provisions, or divisions of property upon court order;

b. The division or allocation of land for the opening, widening or extension of any street or streets, or the division or allocation of land as open spaces for common use by owners, occupants or leaseholders, or as easements for the extension and maintenance of public sewer, water supply, storm drainage or other public facilities.

9 Del. C. 1953, § 3001; 55 Del. Laws, c. 49; 60 Del. Laws, c. 468, § 3; 70 Del. Laws, c. 186, § 1; 71 Del. Laws, c. 401, § 89.;

§ 3002. Power to regulate.

In order to provide for the orderly growth and development of the County, to promote the health, safety, prosperity, and the general welfare of the present and future inhabitants of the County, to insure the conservation of property values and natural resources, including the protection of the County's agricultural lands, water resources, and industrial potential, and to afford adequate provisions for public utilities, water supply, drainage, sanitation, vehicular access, educational and recreational facilities, parkland and open space, among other and related activities, the Commission may regulate the subdivision of all land in the County not within the corporate limits of any city or town.

9 Del. C. 1953, § 3002; 55 Del. Laws, c. 49.;

§ 3003. Land subdivision regulations.

In order to carry out the provisions of this chapter, the Commission shall adopt and administer regulations in accordance with the following procedures:

(1) Within 1 year from May 4, 1965, the Commission shall propose regulations pursuant to the purposes specified in this chapter, and shall hold at least 1 public meeting, notice of which shall have been given by publication at least 15 days before said meeting in a newspaper of general circulation in the County. Copies of the proposed regulations shall be available to the public without charge at a place or places stated in said notice. Within 120 days after said meeting, the Commission may adopt the regulations as proposed or may make any amendment, change or addition thereto, except that prior to the adoption thereof the same procedures shall be followed;

(2) Prior to the adoption by the Commission of any subsequent amendment, change or addition to said regulations, the same procedures shall be followed;

(3) No regulation adopted by the Commission shall become effective unless and until approved by the County Council.

9 Del. C. 1953, § 3003; 55 Del. Laws, c. 49; 71 Del. Laws, c. 401, § 15.;

§ 3004. Content of land subdivision regulations.

Any regulations adopted and approved under this chapter shall include, but not be limited to, the following provisions:

(1) Varying procedures for insuring the processing of land subdivision plans, within a reasonable period of time, relative to the number of lots or parcels and the extent of improvements required;

(2) Procedures for insuring that the arrangement of the lots or parcels of land or improvements thereon shall conform to the existing zoning at the time of recordation and that streets, or rights-of-way,

bordering or within subdivided land shall be of such widths and grades and in such locations as may be deemed necessary to accommodate prospective traffic, that adequate easements or rights-of-way shall be provided for drainage and utilities, that reservations of areas designed for their use as public grounds shall be of suitable size and location for their designated uses, that sufficient and suitable monuments shall be required, that land which might constitute a menace to safety, health or general welfare shall be made safe for the purpose for which it is subdivided, and that adequate provision for water supply is made;

(3) Procedures for encouraging and promoting flexibility and ingenuity in the layout and design of subdivisions and land development, and for encouraging practices which are in accordance with contemporary and evolving principles of site planning and development.

9 Del. C. 1953, § 3004; 55 Del. Laws, c. 49.;

§ 3005. Issuance of building and occupancy permits.

Repealed by 75 Del. Laws, c. 85, § 4, effective June 30, 2005.

§ 3006. Selling before approval; penalty; civil suits.

(a) No street, sanitary sewer, storm sewer, water main, or other improvements shall be constructed, opened, or dedicated for public use or for the common use of occupants of buildings abutting thereon, and no part of any land which has been subdivided after the adoption of regulations under this chapter, shall be sold, transferred or conveyed, except pursuant to an approval received for the land subdivision in accordance with the regulations adopted under this chapter.

(b) Whoever violates subsection (a) of this section shall upon conviction thereof be fined not more than $200 or imprisoned not more than 30 days, or both. Each lot or parcel so transferred or sold and each improvement so constructed, opened or dedicated shall be deemed a separate violation, and each and every day during which such violation continues shall be deemed a separate violation. The Superior Court shall have exclusive jurisdiction of offenses under this section.

(c) The County Council, or any owner of real estate affected by such violation, may, in addition to utilizing other remedies provided by law, institute injunction, mandamus, abatement or other appropriate proceedings to prevent, enjoin, abate or otherwise correct such violation.

9 Del. C. 1953, § 3006; 55 Del. Laws, c. 49; 71 Del. Laws, c. 401, § 15.;

§ 3007. Recording unapproved plans; penalty.

(a) The Recorder of Deeds within the County shall not receive for filing any plan of land showing an arrangement of lots or parcels of lands, streets, easements or rights-of-way unless and until said plan shall have been submitted to, and approved by, the Commission and the County Council pursuant to the regulations adopted under this chapter, and until each such approval shall have been endorsed in

writing on said plan by the Chairperson or the Executive Director of the Commission and the County Council by the President.

(b) Any plan received by the Recorder of Deeds for filing or recording without the approval of the Commission and the County Council endorsed thereon, shall be null and void and without legal effect and shall upon application of the Commission or the County Council, to the Superior Court, be expunged from the records of the Recorder of Deeds.

(c) Whoever causes any plan to be filed or recorded contrary to the provisions of this chapter shall be fined not less than $100 and not more than $500. The Superior Court shall have exclusive original jurisdiction of offenses under this section.

9 Del. C. 1953, § 3007; 55 Del. Laws, c. 49; 60 Del. Laws, c. 468, § 4; 70 Del. Laws, c. 186, § 1; 71 Del. Laws, c. 401, § 15.;

§ 3008. Improvements private until dedicated.

The approval of a plan by the Commission and by the County Council shall, when recorded, be deemed and taken as acceptance of the intended dedication of the streets, grounds or other improvements appearing thereon to the public use by appropriate governmental body or agency. The approval of a plan shall not impose any duty or obligation upon the County Council or any other public agency to improve, repair, or maintain the streets, grounds or other improvements appearing on the plan. The Commission may adopt and the County Council may approve such regulations as are deemed advisable for the removal of snow from the streets appearing on the plan from the time the plan is recorded until the obligation to maintain such improvements is assumed either by a maintenance corporation or by an appropriate public agency.

9 Del. C. 1953, § 3008; 55 Del. Laws, c. 49; 70 Del. Laws, c. 255, § 1; 71 Del. Laws, c. 401, § 15.;

§ 3009. Approved plan to be recorded.

The subdivider shall, within 120 days after the approval of a plan, record such plan in the office of the Recorder of Deeds. If such plan is not recorded within said time, the approval shall expire.

9 Del. C. 1953, § 3009; 55 Del. Laws, c. 49.;

§ 3010. Schedule of fees.

The Commission shall establish a uniform schedule of fees to be paid by the subdivider and to be proportioned to the cost of processing a subdivision submitted for review and approval of the Commission. No schedule established by the Commission shall become effective unless and until approved by the County Council.

9 Del. C. 1953, § 3010; 55 Del. Laws, c. 49; 71 Del. Laws, c. 401, § 15.;

§ 3011. Effect of approved plan on official map.

After a plan has been approved and recorded as provided under this chapter, all public streets and public grounds on such plan shall be, and become, a part of the official map of the County without public hearing.

9 Del. C. 1953, § 3011; 55 Del. Laws, c. 49.;

§ 3012. Notice to local school districts of residential subdivision plans or changes in residential subdivision plans that increase density.

With respect to the initial approval of a residential subdivision plan or any change in a residential subdivision plan that increases residential density, the County Council shall notify the local school district for the area at least 7 days prior to any such approval process.

66 Del. Laws, Sp. Sess., c. 195, § 2; 71 Del. Laws, c. 401, § 15.;

§ 3013. Effect of open space acquisition.

Notwithstanding any other provisions of this chapter to the contrary, upon the acquisition by the county government of areas of land, whether by sheriff's sale or otherwise, previously shown as open space on the recorded plats of the county, such lands shall be deemed as dedicated and available for public use. Such acquisition shall not impose any duty or obligation upon the county government or other public agency to improve, repair or maintain the open space.

72 Del. Laws, 1st Sp. Sess., c. 258, § 118.;

Kent County
DE Code Title 9, Part III, Chapter 48 Regional Planning
Source: http://delcode.delaware.gov/title9/c048/index.shtml, accessed June 1, 2012.

§ 4801. Definitions.

As used in this chapter, unless the same shall be inconsistent with the context:

(1) "Commission" means "Regional Planning Commission of Kent County" created by this chapter.

(2) "Council" means "the Council of the Mayor and Council of Dover."

(3) "County Engineer" means "County Engineer of Kent County."

(4) "County government" means the county governing body of Kent County.

(5) "District" means "Regional Planning District of Kent County" created by this chapter.

(6) "Highway Department" means "State Department of Transportation of the State of Delaware."

(7) "Land development" means "any tract or parcel of land upon which is proposed the construction or erection of 1 or more commercial, industrial, multi-family, or mobile home park use."

(8) "Minor subdivision" means any subdivision of land that creates 5 or less, or no, parcels of land and if a parcel of land is created, either said created parcel is not on a new road, or said created parcel or parcels is on a private road approved pursuant to regulations adopted by the county government; and shall apply only to the creation of up to a 5 parcel minor subdivision and shall not apply to the creation of parcels in excess of a total of 5 off of the tract of land from which minor subdivision is sought. Original tract shall be deemed to be all tracts separately in existence upon effective date of this definition.

(9) "Recorder's office" means "Recorder of Deeds in and for Kent County."

(10) "Road" includes any "road," "street," "highway," "freeway," "parkway" or other public thoroughfare.

(11) "Subdivision" means division of any part, parcel or area of land by the owner or the owner's agent, into lots or parcels 2 or more in number for the purpose of conveyance, transfer, improvement or sale with or without appurtenant roads, streets, lanes, driveways and ways dedicated or intended to be dedicated to public use, or the use of purchasers or owners of lots fronting thereon. A subdivision includes:

a. Any division of a parcel of land having frontage on an existing improved street into 2 or more lots, 1 or more of which have frontage on the existing street;

b. Any development of a parcel of land which involves installation of streets and driveways whether or not dedicated and whether or not the parcel is divided for the purpose of immediate conveyance, transfer or sale;

c. Any resubdivision and, as appropriate, shall refer to the process of subdividing land or the land so subdivided.

9 Del. C. 1953, § 4801; 56 Del. Laws, c. 103, § 15; 56 Del. Laws, c. 241, §§ 5, 6; 60 Del. Laws, c. 503, § 22; 67 Del. Laws, c. 167, § 1; 69 Del. Laws, c. 410, § 1; 70 Del. Laws, c. 186, § 1.;

§ 4802. Regional Planning Commission and Regional Planning District; statement of purposes.

For the purpose of promoting health, safety, prosperity and general welfare, as well as for the purpose of securing coordinated plans for roads, airways, railways, public buildings, parks, playgrounds, civic centers, airports, commercial, industrial and residential developments, water supplies, sewers and sewage disposal, drainage and other improvements and utilities (excepting, however, privately owned public utilities engaged in furnishing light, heat, power, transportation or communication by telephone or by telegraph or otherwise, as to which the provisions of this chapter shall not apply) in that portion of Kent County which is not included within the corporate limits of any city or town, unless any territory within such corporate limits is included upon request made by the governing body of authority of any such city or town, and as well as for the purpose of preventing the unnecessary duplication of such improvements or utilities, a department known as the Regional Planning Commission of Kent County is created for the area to be known as the Regional Planning District of Kent County.

9 Del. C. 1953, § 4802; 56 Del. Laws, c. 103, § 15; 56 Del. Laws, c. 241, § 7.;

§ 4803. Regional Planning Commission.

The county government shall, by ordinance, establish a Regional Planning Commission and determine the membership, terms, qualifications and compensation of said Commission.

9 Del. C. 1953, § 4803; 56 Del. Laws, c. 103, § 15; 56 Del. Laws, c. 241, §§ 8, 9; 58 Del. Laws, c. 340, §§ 3, 4; 60 Del. Laws, c. 503, § 22; 66 Del. Laws, c. 323, § 1.;

§ 4804. Office space and equipment.

The Kent County government shall provide suitable and convenient office space for the use and occupancy of the Commission, and the county government shall furnish and supply all necessary equipment for the office.

9 Del. C. 1953, § 4804; 56 Del. Laws, c. 103, § 15; 58 Del. Laws, c. 340, § 5; 66 Del. Laws, c. 323, § 2.;

§ 4805. Secretary of Commission and other personnel.

(a) The Commission shall appoint a secretary who shall serve for such time, and perform such duties and receive such compensation as the Commission may prescribe. The secretary shall give bond if required by the Commission in such amount as the Commission may require.

(b) The Commission may appoint, discharge at pleasure and fix the compensation of such employees and staff or may contract for the services of such persons, firms, or corporations as from time to time, in

its judgment may be necessary to the exercise of its powers under this chapter; provided, however, that all actions of the Commission are subject to county government approval, and the county government may require any employee to give bond with surety approved by it in a sum to be fixed by the Commission.

9 Del. C. 1953, § 4805; 56 Del. Laws, c. 103, § 15; 70 Del. Laws, c. 186, § 1.;

§ 4806. Assistance to Commission by County and City of Dover.

The county government or council may, from time to time, upon request of the Commission and for the purpose of special surveys, assign or detail to the Commission any members of the administrative staffs or agencies of the county or city, or may direct any such staff or agency to make for the Commission special surveys or studies requested by the Commission.

9 Del. C. 1953, § 4806; 56 Del. Laws, c. 103, § 15.;

§ 4807. Master plan of District.

(a) The Commission shall prepare a master plan of the District showing existing and proposed roads included in or likely to be incorporated in the road system, together with the indication of their existing and proposed widths; existing and proposed county parks, playgrounds, parkways, and other recreation places; existing and proposed county airways, aviation fields and other county open places; existing and proposed sites for county buildings; and such other features as may come wholly or partially within county jurisdiction; and in addition, similar elements of the plan existing and proposed within city or town as have or are likely to bear an important relation to the above county features. Such master plan shall be a public record, but its purpose and effect shall be solely as an aid to the Commission in the performance of its duties.

(b) The Commission may, from time to time, amend, extend or add to the master plan.

(c) The master plan may cover areas within the corporate limits of any city or town in Kent County, to the extent that such areas shall be deemed, in the judgment of the Commission, to be related to the planning of the District. The master plan shall have no legal effect in such areas except as in pursuance of a request for the inclusion of such area within the District as provided in § 4802 of this title.

(d) The Commission shall encourage the cooperation of the cities and towns within Kent County in any matter concerning the master plan and, if requested, shall advise the governing body or authority of any city or town in Kent County with respect thereto.

9 Del. C. 1953, § 4807; 56 Del. Laws, c. 103, § 15.;

§ 4808. Road surveys.

The Commission may, in pursuance of the development and carrying out of its master plan, make from time to time surveys for the exact location of the lines of future roads, road relocations, road extensions, road widenings or narrowings in the District or any portion thereof, and make plats of the

areas thus surveyed, showing the Commission's recommendations for the exact locations of such future road lines.

9 Del. C. 1953, § 4808; 56 Del. Laws, c. 103, § 15.;

§ 4809. Official map of the District.

(a) There is established an official map of the District. The Commission shall be the maker and custodian of such map. The map shall show the location and lines of the roads within the District existing and established by law as public roads at the time of the preparation and setting up of the map by the Commission; and shall show the location of the lines of the roads on plats which shall have been approved by the Commission at or previous to that time.

(b) Whenever the Commission shall have adopted an official map or any amendment, extension or addition thereto, it shall submit the official map or such amendment, extension or addition thereto, to the county government for its approval and if the official map or amendment, extension or addition thereto shall pertain to the road system of or any road in Kent County, the official map or any amendment, extension or addition thereto shall also be submitted to the Department of Transportation for its approval and upon approval of the official map or such amendment, extension or addition thereto, the Commission shall cause the official map or such amendment, extension or addition thereto to be recorded in the Recorder's office within 15 days after such approval.

(c) The Commission may, from time to time, amend, extend, add to or remove from the official map all roads established or vacated by law.

(d) If the State Department of Transportation changes or amends existing roads or adds new roads which vary from the master plan as established pursuant to § 4807 of this title, the Commission shall have the right, after due notice in writing to the Department, to appeal such change or addition, to the State Highway Commissioners in an official meeting of which the public shall be given notice and which the public may attend. After receiving notice in writing of the appeal of the Regional Planning Commission, the State Highway Commissioners and their employees will refrain from execution of plans changing or adding roads in variance from the aforesaid master plan until the appeal has been heard and a written decision rendered by the said State Highway Commissioners. That decision may be summarily appealed to the Superior Court which shall have the power to enjoin further action by all parties until a determination is reached by that Court as to whether the promotion of the health, safety, prosperity and general welfare of the citizens of this State and of Kent County are better served by compliance with the aforesaid master plan or by granting the change or addition desired by the State Department of Transportation.

9 Del. C. 1953, § 4809; 56 Del. Laws, c. 103, § 15; 60 Del. Laws, c. 503, § 22.;

§ 4810. Subdivision plans; land development plans; road plats; submission to Commission; recording; fees; regulations.

(a) Plans depicting the location, proposed grades, and drainage of all roads intended to be dedicated by the owner thereof to the public use or for the use of owners of property abutting thereon or adjacent thereto, and plats of all subdivisions and land developments, within the limits of the District, shall be submitted to the Commission for its approval. No person shall record any plan showing any new or proposed road or any plat showing any new or proposed subdivision or land development, in any public office in Kent County, unless such plan or plat shall show thereon by endorsement its approval by the Commission; expressly provided, however, said endorsement of approval for minor subdivision shall be by administrative Commission staff pursuant to minor subdivision regulations which the county government is hereby authorized and directed to adopt. The Commission's approval of any road plan shall, when recorded, be deemed and taken as an acceptance of the intended dedication of the road appearing thereon, but shall not impose any duty upon the county government or upon the Department of Transportation respecting the maintenance or improvement thereof. Such road plan shall, when recorded, become a part of the official map. The county government may adopt such regulations as are deemed advisable for the removal of snow from the streets appearing on the plan from the time the plan is recorded until the obligation to maintain such improvements is assumed either by a maintenance corporation or by an appropriate public agency.

(b) No plat of land showing any new or proposed subdivision or land development within the District shall be received, filed, or recorded by the Recorder of Deeds in and for Kent County until the plat shall have been submitted to and approved by the Commission and such approvals endorsed in writing on the plat by the Director of Planning Services and the County Administrator. The filing or recording of a subdivision or land development plat without the approval of the Commission and/or without the endorsements of the Director of Planning Services and the County Administrator shall, upon application of the Commission or the county government to the Superior Court in and for Kent County, be expunged from the records maintained by the Recorder of Deeds.

(c) On the basis of the estimated cost of the services to be rendered by it in connection with the consideration of such plats and the work incident thereto, the Commission may fix the scale of fees to be paid to it and may from time to time amend such scale. In the case of each plat submitted to the Commission, the fee thus fixed shall be paid before the plat is approved or disapproved, but such fees shall not exceed the actual cost to the Commission of the services and shall be paid by the person requesting the Commission's approval.

(d) Every such plat shall be prepared upon cloth of such size and character, with such notations, information and markings, and accompanied by such data and information as the Commission may, by regulation prescribe, and shall have such permanent markers, boundary stones or stations as the Commission shall prescribe, which shall be shown and designated on the plat thereof. The Commission shall prescribe the procedure for the submission of such plats and action in respect thereto, which shall include certification by a registered engineer or land surveyor as to the proper location on the plat of the aforesaid boundary markers, boundary stones or stations.

9 Del. C. 1953, § 4810; 56 Del. Laws, c. 103, § 15; 56 Del. Laws, c. 241, §§ 10, 11; 60 Del. Laws, c. 503, § 22; 69 Del. Laws, c. 410, § 2; 70 Del. Laws, c. 255, § 2; 77 Del. Laws, c. 175, §§ 1, 2.;

§ 4811. Approval or disapproval of plat by Commission; hearing.

The Commission shall approve, approve with conditions, disapprove or table a plat within 45 days after acceptance by the Commission of the plat and all necessary supporting documentation; otherwise such plat shall be deemed to have been approved and a certificate to that effect shall be issued by the Commission upon demand. Such period may be extended by mutual agreement between the Commission and the applicant for the Commission's approval. The grounds of disapproval of any plat shall be stated upon the records of the Commission and a copy of such statement shall be furnished to the applicant. No plat shall be acted upon by the Commission without affording a hearing thereon, notice of the time and place of which shall be sent by registered mail to such applicant not less than 5 days before the date fixed therefor. However, in the application the applicant may waive the requirement of such hearing and notice. Any approval or disapproval, after its recordation by the Commission, may be appealed to the county government within 30 days. County government shall affirm or deny, in whole or in part, the decision of the Regional Planning Commission, or remand the matter to the Regional Planning Commission for further proceedings. However, a decision of the Regional Planning Commission may not be remanded to that Commission by the county government more than 1 time.

9 Del. C. 1953, § 4811; 56 Del. Laws, c. 103, § 15; 67 Del. Laws, c. 168, § 1; 70 Del. Laws, c. 186, § 1; 75 Del. Laws, c. 297, § 1.;

§ 4812. Recording unapproved plan; penalty for.

Any Recorder who receives for filing or recording any plan or map contrary to the provisions of this chapter shall be fined not less than $100 nor more than $500.

9 Del. C. 1953, § 4812; 56 Del. Laws, c. 103, § 15.;

§ 4813. Cooperation with other agencies.

(a) Upon the request of the county government or the Council or the Department of Transportation or the Department of Health and Social Services or any other state, county or municipal agency, board, department, commission or authority, the Commission shall, upon such terms as may mutually be agreed upon, prepare plans and supply information relating to any of the matters set forth in this chapter.

(b) In exercising the powers conferred by this chapter the Commission is empowered to act in conjunction and cooperation with representatives, agencies, or officers of the United States government, this State, any other state, or any county, city or town within or without this State.

9 Del. C. 1953, § 4813; 56 Del. Laws, c. 103, § 15; 60 Del. Laws, c. 503, § 22; 70 Del. Laws, c. 149, § 4.;

§ 4814. Entry upon land; access to records.

(a) In the performance of the functions and duties of the Commission any member thereof or any employee or agent thereof shall have the right to enter and go upon, at reasonable times (Sundays and holidays excluded) between the hours of 8:00 a.m. and 5:00 p.m. any lands in the District, either public or private, and to make surveys and to place and maintain necessary monuments and markers thereon, but such entry shall be made with due care and regard for the protection and preservation of property.

(b) In the performance of the functions and duties of the Commission, any member, employee or agent of the Commission shall have free access, without expense, to all state, county, municipal and other public records.

9 Del. C. 1953, § 4814; 56 Del. Laws, c. 103, § 15.;

§ 4815. Appropriation; authority to make.

The county government may annually appropriate a sum not exceeding $200,000 for the purpose of carrying out this chapter, to be paid as other county expenses out of moneys collected for taxes for county purposes.

9 Del. C. 1953, § 4815; 56 Del. Laws, c. 103, § 15; 60 Del. Laws, c. 233, § 1.;

§ 4816. Issuance of building and occupancy permits.

(a) No building permit shall be issued by the County for the erection of any building or for the construction of any improvement, utility or structure on any part of any land which is required to be submitted to the Commission as provided in § 4810 of this title after the adoption of regulations, and no street, right-of-way, sanitary sewer, storm sewer, water main, or other improvements in connection therewith shall be constructed, opened or dedicated for public use or travel, or for the common use of occupants of buildings abutting thereon, except pursuant to an approval received for the road, subdivision or land development plan in accordance with the provisions contained in this chapter.

(b) No occupancy permit shall be issued for such building, improvement, utility or structure, or land thereunder, except upon a determination of full compliance with the road, subdivision or land development plan approval.

(c) Except in instances in which the Department of Transportation has indicated authorization for temporary use of land set aside for future right-of-way needs, as provided in § 145 of Title 17, no building permit shall be issued by the County for the erection of any building or for the construction of any improvement, or structure on any part of any land which lies, or is located, within the lines of any land designated and set aside for future highway right-of-way needs as appears on the Department's Future Right-of-Way Map -- Final, except as hereinafter provided in subsection (d) of this section.

(d) A building permit, otherwise issuable except for subsection (c) of this section, shall be issued notwithstanding the provisions of subsection (c) of this section unless the Department, after being given written notice thereof by the Commission shall:

(1) Within 60 days of receipt of such notice, file with the Commission a declaration that:

a. The issuance of the permit will be detrimental to future highway planning and construction; and

b. That the land described in the permit application is needed for future highway purposes; and

(2) Within 180 days of the giving of such notice, institute condemnation proceedings under Chapter 61 of Title 10, to acquire all of the land described in said building permit application as may be located within said future highway right-of-way.

9 Del. C. 1953, § 4816; 56 Del. Laws, c. 103, § 15; 56 Del. Laws, c. 241, § 12; 57 Del. Laws, c. 754, §§ 5, 6; 60 Del. Laws, c. 503, § 22.;

§ 4817. Powers and duties of municipal corporations not affected.

Nothing contained in this chapter shall change, alter, affect, or modify the rights, powers and duties heretofore conferred upon any municipal corporation over, in or upon any lands lying outside of the corporate limits of municipal corporations.

9 Del. C. 1953, § 4817; 56 Del. Laws, c. 103, § 15.;

§ 4818. Appeals from county government decisions.

All decisions of the county government pursuant to applications made under this chapter are appealable to the Superior Court of Kent County; and when such appeal has been filed with the Prothonotary of Kent County, the Prothonotary shall give notice to the Clerk of the Peace of Kent County who shall transmit to the Prothonotary within 10 days the written decision of the county government, which decision shall set forth the legal and factual basis for the refusal of the county government to permit the recording of the plat in the manner requested.

9 Del. C. 1953, § 4818; 57 Del. Laws, c. 710.;

§ 4819. Notice to local school districts of residential subdivision plans or changes in residential subdivision plans that increase density.

With respect to the initial approval of a residential subdivision plan or any change in a residential subdivision plan that increases residential density, the county government shall notify the local school district for the area at least 7 days prior to any such approval process.

66 Del. Laws, Sp. Sess., c. 195, § 2.;

Kent County
DE Code Title 9, Part III, Chapter 49 (Zoning)
Source: http://delcode.delaware.gov/title9/c049/index.shtml, accessed June 1, 2012.

Subchapter I. General Provisions

§ 4901. Power of county government; area subject to regulation.

(a) The county government may, in accordance with the conditions and procedure specified in this subchapter, regulate the location, height, bulk and size of buildings and other structures, the percentage of lot which may be occupied, the size of yards, courts, and other open spaces, the density and distribution of population, the location and uses of buildings and structures for trade, industry, residence, recreation, public activities or other purposes, and the uses of land for trade, industry, residence, recreation, public activities, water supply conservation, soil conservation, or other similar purposes, in any portion or portions of Kent County which lie outside of incorporated municipalities, or incorporated municipalities without zoning provisions, notwithstanding any provisions of other titles or chapters of this Code to the contrary. Any real property proposed to be used for an agritourism activity as defined in this title shall be given an expedited review before the Levy Court.

(b) Notwithstanding subsection (a) of this section, no such regulation or regulations shall apply to any land, building, greenhouse or other structure proposed to be devoted to any agricultural use, or which is devoted at the time of such proposal to agricultural use, or to any land, building, greenhouse or other structure owned by a cooperative agricultural associations or a corporation which is or is proposed to be devoted to agricultural use. For the purposes of this subsection, any land, building, greenhouse or structure shall be deemed to be devoted to agricultural use if:

(1) The land, building, greenhouse or structure is assessed pursuant to § 8335 of this title;

(2) The land, building, greenhouse or structure is within an Agricultural Preservation District pursuant to Chapter 9 of Title 3;

(3) The person who owns, leases or otherwise controls the land, building, greenhouse or structure is required to implement a nutrient management plan or agricultural waste management plan for the same and the land, building, greenhouse or structure itself is devoted to or used in the production for sale of plants and animals useful to man, including but not limited to:

a. Forages and sod crops;

b. Grains and feed crops;

c. Dairy animals and dairy products;

d. Poultry and poultry products;

e. Livestock, including beef cattle, sheep, swine, horses, ponies, mules or goats, including the breeding and grazing of any or all of such animals;

f. Bees and apiary products;

g. Fish, hydroponic and aquacultural products;

h. Fur animals; and

i. Trees and forest products;

(4) The land, building, greenhouse or structure is devoted to and meets the requirements and qualifications for payments or other compensation pursuant to a soil conservation program under an agreement with an agency of the federal government; and

(5) The land, building or structure is a farm market or roadside stand provided:

a. The products offered for sale are grown or produced on the subject farm or lands in agriculture production associated with such farm operation; or

b. The products are grown or produced on a local regional farm, and such farm market or roadside stand shall comply with the following provisions:

1. All buildings, structures and associated canopies shall comply with the building height setback requirements established by the local jurisdiction within its zoning ordinances. All construction shall conform to applicable building codes and building permit requirements as enacted by the local jurisdiction;

2. Off street customer parking shall be provided in accordance with the provisions of the zoning ordinance of the local jurisdiction provided that at least 1 parking space shall be provided for each 100 square feet of floor area of the establishment. The area of 1 parking space shall be equivalent to a standard parking stall of 9/' x 18/';

3. If a new vehicular entrance is proposed to support a farm market or roadside stand, an entrance permit shall be obtained from the Delaware Department of Transportation prior to the start of construction; and

4. Signage shall comply with signage provisions and permitting requirements established by the local jurisdiction within its zoning ordinances.

(c) Notwithstanding subsection (a) of this section, no such regulation or regulations shall apply to the agricultural uses of conducting hayrides, horseback riding, guided tours, barn parties and petting zoos.

9 Del. C. 1953, § 4901; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, c. 207, § 1; 74 Del. Laws, c. 144, § 2; 75 Del. Laws, c. 244, §§ 3, 4; 76 Del. Laws, c. 409, § 3; 78 Del. Laws, c. 143, §§ 1-3.;

§ 4902. Zoning plan and regulations.

(a) For any or all of the purposes specified in § 4901 of this title the county government may divide the territory of Kent County into districts or zones of such number, shape, or area as it may determine, and

within such districts, or any of them, may regulate the erection, construction, reconstruction, alterations, and uses of buildings and structures and the uses of land.

(b) All such regulations shall be uniform for each class or kind of buildings throughout any district, but the regulations in 1 district may differ from those in other districts.

(c) The county government shall provide for the manner in which regulations shall be enforced and shall designate the administrator of the regulations. The administrator so designated shall have authority to act as such throughout the County.

9 Del. C. 1953, § 4902; 56 Del. Laws, c. 103, § 16.;

§ 4903. Purposes of regulations.

(a) Regulations adopted by the county government, pursuant to the provisions of this subchapter, shall be designated and adopted for the purpose of promoting the health, safety, morale, convenience, order, prosperity or welfare of the present and future inhabitants of this State, including, amongst other things, the lessening of congestion in the streets or roads or reducing the waste of excessive amounts of roads, securing safety from fire and other dangers, providing adequate light and air, preventing on the 1 hand excessive concentration of population and on the other hand excessive and wasteful scattering of population or settlement, promoting such distribution of population and such classification of land uses and distribution of land development and utilization as will tend to facilitate and provide adequate provisions for public requirements, transportation, water flowage, water supply, drainage, sanitation, educational opportunities, recreation, soil fertility, food supply, protection of the tax base, securing economy in governmental expenditures, fostering the State's agricultural and other industries, and the protection of both urban and nonurban development.

(b) The regulations shall be made with reasonable consideration, among other things, of the character of the particular district involved, its peculiar suitability for particular uses, the conservation of property values and natural resources and the general and appropriate trend and character of land, building and population development.

9 Del. C. 1953, § 4903; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, c. 207, § 1.;

§ 4904. Kent County Zoning Commission; consolidation with Regional Planning Commission.

(a) In order to avail itself of the powers conferred by this subchapter, the county government shall appoint a commission of 5 members which shall be known as the Kent County Zoning Commission. Each member shall be appointed for a term of 6 years except that a member appointed to fill a vacancy occurring for any reason other than expiration of term, shall be appointed for the unexpired term.

(b) Each member shall be a freeholder and resident of Kent County, 4 of whom shall live outside any incorporated city or town. No more than 3 of the members of the Commission shall be of the same political party. Originally 3 members shall be appointed for 3 years, and the remaining 2 for 6 years so that at any biennial election, no more than 3 members shall be up for appointment. Members of the

Regional Planning Commission otherwise qualified, shall be eligible for appointment to the Kent County Zoning Commission.

(c) Upon adoption of permanent zoning regulations by the county government, the Zoning Commission shall cease to exist and the members of the Zoning Commission shall become voting members of and shall serve out their terms on the Kent County Regional Planning Commission. Upon expiration of the said original terms, reappointment or appointment of new members shall be in accordance with the terms established for members of the Regional Planning Commission. Following consolidation with the Zoning Commission, the Kent County Regional Planning Commission shall henceforth exercise all of the powers and duties herein set forth for the Zoning Commission.

9 Del. C. 1953, § 4904; 56 Del. Laws, c. 103, § 16; 56 Del. Laws, c. 241, § 13; 58 Del. Laws, c. 340, § 1; 66 Del. Laws, c. 207, § 1.;

§ 4905. Assistance from and cooperation with other agencies.

The Zoning Commission shall make use of the expert advice and information which may be furnished by appropriate state, federal, or other officials, departments and agencies. All officials, departments, and agencies within the State having information, maps and data pertinent to county zoning shall make the same available for the use of the Zoning Commission, as well as furnish such other technical assistance and advice as they may have available for such purpose.

9 Del. C. 1953, § 4905; 56 Del. Laws, c. 103, § 16.;

§ 4906. Personnel and office facilities of Zoning Commission.

The Zoning Commission may employ such experts, trained personnel, and staff as the funds provided therefor may permit. The county government shall furnish the Zoning Commission with appropriate office space and other facilities. The county government may pay to the Regional Planning Commission of Kent County for salaries and other expenses of the Zoning Commission an amount based upon a proportionate use of personnel and facilities of the Regional Planning Commission by the Zoning Commission.

9 Del. C. 1953, § 4906; 56 Del. Laws, c. 103, § 16.;

§ 4907. Tentative zoning plan; preparation of by Commission.

The Zoning Commission shall make, as promptly as possible, for certification to the county government, a zoning plan or plans, including both the full text of the zoning regulation or regulations and the maps, and representing the recommendations of the Zoning Commission for the regulation by districts or zones of the location, height, bulk, and size of buildings and other structures, percentage of lot which may be occupied, the size of lots, courts, and other open spaces, the density and distribution of population, for the location and use of buildings and structures for trade, industry, residence, recreation, public activities or other purposes, and for the uses of land for trade, industry, recreation, public activities, soil conservation, water supply conservation or other similar purposes.

9 Del. C. 1953, § 4907; 56 Del. Laws, c. 103, § 16.;

§ 4908. Public hearing and notice.

When the efforts of the Commission shall have reached the stage of a tentative plan, the Commission shall hold at least 1 public hearing on each tentative plan to be separately submitted, notice of which hearing shall be published at least 15 days before the date of the hearing in a newspaper of general circulation in the County. The notice shall contain the time and place of hearing, and shall specify the place and times at which the tentative text and maps of the zoning regulations may be examined.

9 Del. C. 1953, § 4908; 56 Del. Laws, c. 103, § 16.;

§ 4909. Commission's powers in conduct of public hearing.

For the purpose of any public hearing under this subchapter, the Commission shall have the power to summon witnesses, administer oaths, and compel the giving of testimony.

9 Del. C. 1953, § 4909; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, c. 207, § 1.;

§ 4910. Adoption by county government of zoning plan and regulations; public hearing and notice; consultative hearings; resubmission to Commission.

(a) After receiving the certification of a zoning plan from the Zoning Commission and before the adoption of any zoning regulations, the county government shall hold a public hearing thereon, the time and place of which at least 30 days notice shall be given by 1 publication in a newspaper of general circulation in the County. Such notice shall state the place at which the text and maps as certified by the Zoning Commission may be examined.

(b) The county government may conduct consultative hearings to aid it in determining the desirability of contemplated or recommended regulations.

(c) No change in or departure from text or maps, as certified by the Zoning Commission, shall be made unless such change or departure shall first be submitted to the Zoning Commission for its approval or disapproval or suggestions. The Zoning Commission shall have 45 days from and after such submission within which to send its report to the county government, but the county government shall not be bound by the report.

9 Del. C. 1953, § 4910; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, Sp. Sess., c. 201, § 2.;

§ 4911. Changes in zoning district; plan or regulations; procedure.

(a) The county government may, from time to time, make amendments, supplements, changes or modifications (herein called "changes") with respect to the number, shape, boundary or area of any district or districts, or any regulation of, or within, such district or districts, or any other provision of any zoning regulation or regulations, but no such changes shall be made or become effective until the same shall have been proposed by or be first submitted to the Zoning Commission.

(b) With respect to any proposed changes, the Zoning Commission shall hold at least 1 public hearing, notice of which hearing shall be published at least 15 days before the date of the hearing in a newspaper of general circulation in the County. The notice shall contain the time and place of hearing, and shall specify the nature of the proposed change in a general way and shall specify the place and times at which the text and map relating to the proposed change may be examined.

(c) Unless the Zoning Commission shall have transmitted its report upon the proposed changes within 45 days after acceptance of a completed application including all supporting documentation, by the Commission, the county government shall be free to proceed to the adoption of the changes without further awaiting the receipt of the report of the Zoning Commission. In any event, the county government shall not be bound by the report of the Zoning Commission. Before finally adopting any such changes, the county government shall hold a public hearing thereon, at least 15 days notice of the time and place of which shall be given at least 1 publication in a newspaper of general circulation in the County.

9 Del. C. 1953, § 4911; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, Sp. Sess., c. 201, § 3; 67 Del. Laws, c. 166, § 1.;

§ 4912. Zoning coordination and integration.

The Zoning Commission may cooperate with other planning and zoning commissions within Kent County, and within other counties and states, and with the planning, zoning, legislative and administrative authorities of incorporated or unincorporated municipalities, either within or without such County, with a view to coordinating and integrating the zoning of the County with the planning and zoning of other counties or of municipalities. The Zoning Commission shall also have power to appoint such committee or committees, and adopt such rules for the conduct of its business, as it may deem proper to effect such cooperation or to more expeditiously and effectively perform its functions.

9 Del. C. 1953, § 4912; 56 Del. Laws, c. 103, § 16.;

§ 4913. Board of Adjustment.

The county government shall, by ordinance, establish a Board of Adjustment and determine the membership, terms, qualifications and compensation of said Board.

9 Del. C. 1953, § 4913; 56 Del. Laws, c. 103, § 16; 56 Del. Laws, c. 241, § 14; 66 Del. Laws, c. 321, § 1.;

§ 4914. Board of Adjustment -- Office and personnel.

The county government shall furnish the Board of Adjustment with necessary office space and other facilities. Subject to the approval of the county government, the Board may employ such secretarial and technical assistants as may be required to perform its functions properly.

9 Del. C. 1953, § 4914; 56 Del. Laws, c. 103, § 16.;

§ 4915. Board of Adjustment -- Rules governing organization, procedure and jurisdiction.

The county government shall provide and specify in its zoning or other regulations, general rules to govern the organization, procedure and jurisdiction of the Board of Adjustment, which rules shall not be inconsistent with this subchapter, and the Board of Adjustment may adopt supplemental rules of procedure not inconsistent with this subchapter or such general rules.

9 Del. C. 1953, § 4915; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, c. 207, § 1.;

§ 4916. Appeals to the Board of Adjustment -- Procedure.

(a) Appeals to the Board of Adjustment may be taken by any person refused a building permit, or from the decision of any administrative officer or agency based upon or made in the course of the administration or enforcement of the provisions of the zoning regulations. Appeals to the Board of Adjustment may be taken by any officer, department, board or bureau of the County affected by the grant or refusal of a building permit or by other decision of an administrative officer or agency based on or made in the course of the administration or enforcement of the provisions of the zoning regulations.

(b) The time within which such appeal must be made, and the effect, form, or other procedure relating thereto, shall be specified in the general rules provided by the county government to govern the procedure of the Board of Adjustment or in the supplemental rules of procedure adopted by the Board.

9 Del. C. 1953, § 4916; 56 Del. Laws, c. 103, § 16.;

§ 4917. Appeals to the Board of Adjustment -- Powers.

Upon appeals the Board of Adjustment shall have the following powers:

(1) To hear and decide appeals where it is alleged by the appellant that there is error in any order, requirement, decision or refusal made by an administrative official or agency based on or made in the enforcement of the zoning regulations;

(2) To hear and decide, in accordance with the provisions of any zoning regulations, requests for special exceptions or for interpretation of the map or for decisions upon other special questions upon which the Board is authorized by any zoning regulation to pass;

(3) Where by reason of exceptional narrowness, shallowness or shape of a specific piece of property at the time of the enactment of the regulations, or by reason of exceptional topographic conditions or other extraordinary and exceptional situation or condition of such piece of property, the strict application of any regulation adopted under this subchapter would result in peculiar and exceptional practical difficulties to, or exceptional and undue hardship upon, the owner of such property, to authorize, upon an appeal relating to such property, a variance from such strict application so as to relieve such difficulties or hardship; provided such relief may be granted without substantial detriment to the public good and without substantially impairing the intent and purpose of the zoning plan and zoning regulations.

9 Del. C. 1953, § 4917; 56 Del. Laws, c. 103, § 16; 66 Del. Laws, c. 207, § 1.;

§ 4918. Court review of decision of Board of Adjustment; proceedings.

(a) Any persons jointly or severally aggrieved by any decision of the Board of Adjustment or any taxpayer or any officer, department, board or bureau of the County may present to the Superior Court in and for Kent County, a petition duly verified, setting forth that such decision is illegal in whole or in part, specifying the grounds of the illegality. The petition shall be presented to the Court within 30 days after the filing of the decision in the office of the Board.

(b) Upon the presentation of the petition, the Court may allow a writ of certiorari, directed to the Board of Adjustment, to review the decision of the Board of Adjustment, and shall prescribe therein the time within which a return thereto must be made and served upon the petitioner's attorney, which shall not be less than 10 days and may be extended by the Court.

(c) The allowance of the writ shall not stay proceeding upon the decision appealed from, but the Court may, on application, on notice to the Board and on due cause shown, grant a restraining order.

(d) The Board of Adjustment shall not be required to return the original papers acted upon by it, but it shall be sufficient to return certified or sworn copies thereof, or of such portions thereof as may be called for by the writ. The return shall concisely set forth such other facts as may be pertinent and material to show the grounds of the decision appealed from and shall be verified.

(e) If, upon the hearing, it shall appear to the Court that testimony is necessary for the proper disposition of the matter, it may take evidence, or appoint a referee to take such evidence as it may direct and report the same to the Court with the referee's findings of fact and conclusions of law, which shall constitute a part of the proceedings upon which the determination of the Court shall be made.

(f) The Court may reverse or affirm, wholly or partly, or may modify the decision brought up for review.

(g) Costs shall not be allowed against the Board, unless it shall appear to the Court that it acted with gross negligence or in bad faith or with malice in making the decision appealed from.

9 Del. C. 1953, § 4918; 56 Del. Laws, c. 103, § 16; 70 Del. Laws, c. 186, § 1.;

§ 4919. Enforcement; remedies.

(a) The enforcement of any code or regulation adopted by the county government under the authority of this subchapter shall be as prescribed by the county government by ordinance.

(b) In case any building or structure is or is proposed to be erected, constructed, reconstructed, altered, maintained or used, or any land is or is proposed to be used, in violation of this subchapter or of any regulation or provision of any regulation or change thereof, enacted or adopted by the county government, the attorney thereof, or any owner of real estate within the district in which such building, structure or land is situated, may, in addition to other remedies provided by law, institute injunction, mandamus, abatement or any other appropriate action or actions, proceeding or proceedings to

prevent, enjoin, abate or remove such unlawful erection, construction, reconstruction, alteration, maintenance or use.

9 Del. C. 1953, § 4919; 56 Del. Laws, c. 103, § 16; 65 Del. Laws, c. 304, § 2; 66 Del. Laws, c. 207, § 1.;

§ 4920. Nonconforming uses of land or buildings.

(a) The lawful use of a building or structure, or the lawful use of any land, as existing and lawful at the time of the enactment of a zoning regulation, or in the case of a change of regulations, then at the time of such change, may, except as hereinafter provided, be continued although such use does not conform with the provisions of such regulations or change, and such use may be extended throughout the same building, provided no structural alteration of such building is proposed or made for the purpose of such extension. The county government in any zoning regulations may permit the restoration, reconstruction, extension or substitution of nonconforming uses upon such terms and conditions as may be set forth in the zoning regulations.

(b) If the County acquires title to any property by reason of tax delinquency and such properties are not redeemed as provided by law, the future use of such property shall be in conformity with the then existing provisions of the zoning regulations of the County, or with any change of such regulations, equally applicable to other like properties within the district in which the property acquired by the County is located.

9 Del. C. 1953, § 4920; 56 Del. Laws, c. 103, § 16.;

§ 4921. Appropriations.

The county government may appropriate out of the general county fund such moneys, otherwise unappropriated, as it may deem fit to finance the work of the Zoning Commission and of the Board of Adjustment, and may enforce the zoning regulations and restrictions which are adopted, and may accept grants of money and service for these purposes, and other purposes, in accordance with this chapter, from either private or public sources, state or federal.

9 Del. C. 1953, § 4921; 56 Del. Laws, c. 103, § 16; 58 Del. Laws, c. 340, § 2; 66 Del. Laws, c. 207, § 1.;

§ 4922. Conflict between zoning regulations and other laws.

(a) Whenever any regulations made under authority of this subchapter require a greater width or size of yards, courts or other open spaces, or require a lower height of buildings or smaller number of stories, or require a greater percentage of lot to be left unoccupied, or impose other higher standards than are required in or under any other statute or local regulations, the provisions of the regulations made under authority of this subchapter shall govern. Whenever the provisions of any other statute or local regulation require a greater width or size of yards, courts or other open spaces, or require a lower height of buildings or a lesser number of stories, or require a greater percentage of lot to be left unoccupied, or impose other higher standards than are required by any regulations made under authority of this subchapter, the provisions of such statute shall govern.

(b) Whenever any other statute shall derogate from this subchapter, unless it be a statute granting powers to the State Planning Office, this subchapter shall govern.

9 Del. C. 1953, § 4922; 56 Del. Laws, c. 103, § 16; 58 Del. Laws, c. 340, § 2; 66 Del. Laws, c. 207, § 1.;

§ 4923. Residential facilities for persons with disabilities.

(a) For purposes of all county zoning ordinances a residential facility licensed or approved by a state agency serving 10 or fewer persons with disabilities on a 24-hour-per-day basis shall be construed to be a permitted single family residential use of such property.

(b) For the purposes of this section, the term "persons with disabilities" includes any persons with a handicap or disability as those terms are defined in the Delaware Fair Housing Act (Chapter 46 of Title 6).

62 Del. Laws, c. 390, § 2; 74 Del. Laws, c. 149, §§ 4-6.;

§ 4924. Notice to local school districts of residential zoning changes.

With respect to any proposed residential zoning change, the county government shall notify the local school district for the area at least 7 days prior to the initial hearing upon such residential zoning change.

66 Del. Laws, Sp. Sess., c. 195, § 1.;

§ 4925. Changes in zoning.

In the case of a rezoning application the county government shall determine its voting requirement necessary to take action thereon, which shall not be less than a majority of all members elected to Levy Court.

68 Del. Laws, c. 272, § 2.;

§ 4926. Notice to property owners of zoning changes.

With respect to any proposed zoning change, unless the owner applies for the change or consents to the change, the county government shall notify the owner of the property and all adjacent property owners to the extent and in the manner the county by ordinance so provides as of June 28, 2000, mailed at least 7 days prior to the initial hearing upon such zoning change.

This act shall become effective for zoning changes initiated after July 13, 2000.

72 Del. Laws, c. 415, § 2.;

§ 4927. Emergency Communication Systems.

The zoning ordinance and regulations adopted pursuant to this chapter shall provide that newly constructed buildings of 25,000 square feet of gross floor area or more, shall be designed, constructed and/or equipped in accordance with the provisions set forth in § 2616 of this title.

76 Del. Laws, c. 181, § 2.;

Subchapter II. The Quality of Life Act

§ 4951. Short title; intent and purpose.

(a) This subchapter shall be known and may be cited as the "Quality of Life Act of 1988." It is the purpose of this subchapter to utilize and strengthen the existing role, processes and powers of county governments in the establishment and implementation of comprehensive planning programs to guide and control future development. It is the intent of this subchapter to encourage the most appropriate use of land, water and resources consistent with the public interest and to deal effectively with future problems that may result from the use and development of land within their jurisdictions. Through the process of comprehensive planning, it is intended that units of county government can preserve, promote and improve the public health, safety, comfort, good order, appearance, convenience, law enforcement and fire prevention and general welfare; facilitate the adequate and efficient provision of transportation, water, sewage, schools, parks, recreational facilities, housing and other requirements and services; and conserve, develop, utilize and protect natural resources within their jurisdictions.

(b) It is also the intent of this subchapter to encourage and assure cooperation between and among municipalities, counties and the State and to encourage and assure coordination of planning and development activities of units of county government, municipalities, regional agencies and state government in accord with applicable provisions of law. A growth management plan or policy plan that meets the standards and requirements of this subchapter shall be an acceptable comprehensive plan. The land use map or map series forming part of the comprehensive plan as required by this subchapter shall have the force of law, and no development, as defined in this subchapter, shall be permitted except in conformity with the land use map or map series and with county land development regulations enacted to implement the other elements of the adopted comprehensive plan.

66 Del. Laws, c. 207, § 1.;

§ 4952. Definitions.

For the purposes of this subchapter:

(1) "Area" or "area of jurisdiction" means the total area qualifying under the provisions of this subchapter, being all unincorporated lands within a county.

(2) "Comprehensive plan" or "comprehensive development plan" shall mean, from and after the respective dates by which the counties must be in compliance with this subchapter, a plan that meets the requirements of this subchapter. Whenever in this subchapter land use regulations are required to be in accordance with the comprehensive plan, such requirements shall mean only that such regulations

must be in conformity with the applicable maps or map series of the comprehensive plan. Whenever in this subchapter land use orders, permits or zoning district changes are required to be in accordance with the comprehensive plan, such requirements shall mean only that such orders, permits and changes must be in conformity with the map or map series of the comprehensive plan and county land use regulations enacted to implement the other elements of the adopted comprehensive plan.

(3) "Coordination" as used in this chapter means, in general terms, to act jointly, concurrently, and/or harmoniously toward a common end or purpose.

(4) "County" means Kent County.

(5) "Developer" means any person, including a governmental agency, undertaking any development as defined in this subchapter.

(6) "Development" means any construction or reconstruction of any new or existing commercial or residential building(s) or structure(s) upon lands which are not owned by the State or its agencies or its political subdivisions, or are not within the jurisdictional control of the State or its agencies or its political subdivisions.

(7) "Development order" means any order granting, denying or granting with conditions an application for a development permit.

(8) "Development permit" includes any building permit, zoning permit, subdivision approval, rezoning, certificate of occupancy, special exception, variance or any other official action of local government having the effect of permitting the development of land.

(9) "Governing body" means the chief governing body of county government, however designated, or the combination of such bodies where joint utilization of the provision of this subchapter is accomplished as provided herein.

(10) "Governmental agency" means:

a. The United States or any department, commission, agency or other instrumentality thereof.

b. This State or any department, commission, agency or other instrumentality thereof.

c. Any local government, as defined in this section, or any department, commission, agency or other instrumentality thereof.

d. Any school board or other special district, authority or governmental entity.

(11) "Land" means the earth, water and air, above, below or on the surface, and includes any improvements or structures customarily regarded as land.

(12) "Land development regulation commission" means a commission designated by a county government to develop and recommend, to the local governing body, land development regulations which implement the adopted comprehensive plan and to review land development regulations, or

amendments thereto, for consistency with the adopted plan and to report to the governing body regarding its findings. The responsibilities of the land development regulation commission may be performed by the local planning agency.

(13) "Land development regulations" means ordinances enacted by governing bodies for the regulation of any aspect of development and includes any county government zoning, rezoning, subdivision, building construction or sign regulations or any other regulations controlling the development of land.

(14) "Land use" means the development that has occurred on the land, the development that is proposed by a developer on the land or the use that is permitted or permissible on the land under an adopted comprehensive plan.

(15) "Local government" means any municipality.

(16) "Local planning agency" means the agency designated to prepare the comprehensive plan required by this subchapter.

(17) A "newspaper of general circulation" means a newspaper published at least on a weekly basis and printed in the language most commonly spoken in the area within which it circulates, but does not include a newspaper intended primarily for members of a particular professional or occupational group, a newspaper whose primary function is to carry legal notices or a newspaper that is given away primarily to distribute advertising.

(18) "Parcel of land" means any quantity of land capable of being described with such definiteness that its locations and boundaries may be established, which is designated by its owner or developer as land to be used or developed as a unit or which has been used or developed as a unit.

(19) "Person" means an individual, corporation, governmental agency, statutory trust, business trust, estate/trust, partnership, association, 2 or more persons having a joint or common interest or any other legal entity.

(20) "Public facilities" means major capital improvements over which the County has jurisdiction.

(21) "Public notice" or "due public notice" as used in connection with the phrase "public hearing," "hearing to be held after due public notice" or "public meeting" means publication of notice of the time, place and purpose of such hearing at least twice in a newspaper of general circulation in the area.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 22, 23; 73 Del. Laws, c. 329, § 49.;

§ 4953. Scope of subchapter.

(a) The County shall have power and responsibility:

(1) To plan for their future development and growth.

(2) To adopt and amend comprehensive plans, or elements or portions thereof, to guide their future development and growth.

(3) To implement adopted or amended comprehensive plans by the adoption of appropriate land development regulations or elements thereof. In furtherance of the authority to adopt, amend and implement comprehensive plans or elements or portions thereof to guide and control future growth, counties are expressly granted the authority to develop and adopt regulations governing the transfer of development rights from identified districts, zones or parcels of land to districts, zones or areas designated to receive such development rights. Such regulations may provide for the establishment of development right banking. Whenever a county exercises its authority to provide for the transfer of development rights it shall:

a. Comply with all requirements of this subchapter pertaining to the amendment of a comprehensive plan;

b. Provide for the transfer of development rights as an option to the use and development of the subject property according to the otherwise applicable zoning ordinance;

c. Limit designation of receiving areas to locations where the county has determined that growth should be encouraged and where a transfer of development rights would not result in the inability of either the existing or planned public facilities which serve the area to accommodate such growth;

d. Demonstrate that the creation and regulation of both sending and receiving districts are otherwise consistent with promotion of the policies expressed by the comprehensive plan and statewide planning goals and objectives established pursuant to Chapter 91 of Title 29; and

e. Consider appropriate incentives for the transfer of development rights, including bonuses for the use of transferred development rights and intergovernmental agreements with other counties or municipalities which would permit the transfer and use of development rights between counties and municipalities.

(4) To establish, support and maintain administrative instruments and procedures to carry out the provisions and purposes of this subchapter.

(b) Each county government shall prepare a comprehensive plan of the type and in the manner set out in this subchapter or amend its existing comprehensive plan to conform to the requirements of this subchapter.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, § 24; 72 Del. Laws, c. 122, § 3.;

§ 4954. Areas under this subchapter.

A county shall exercise authority under this subchapter for the total unincorporated area under its jurisdiction.

66 Del. Laws, c. 207, § 1.;

§ 4955. Local planning agency.

(a) The governing body of each county government shall designate and by ordinance establish a "local planning agency." The governing body may designate itself as the local planning agency pursuant to this subsection. The local planning agency shall prepare the comprehensive plan after meetings to be held after due public notice and shall make recommendations regarding the adoption of such plan or element or portion thereof. The agency may be a local planning commission, the planning department of the county government or other instrumentality, including a countywide planning entity established by special act or council of local government officials, provided the composition of the council is fairly representative of all the governing bodies in the county.

(b) The governing body or bodies shall appropriate funds for salaries, fees and expenses necessary in the conduct of the work of the local planning agency and shall also establish a schedule of fees to be charged by the agency. To accomplish the purpose and activities authorized by this subchapter, the local planning agency, with the approval of the governing body or bodies and in accord with the fiscal practices thereof, may expend all sums so appropriated and other sums made available for use from fees, gifts, state or federal grants, state or federal loans and other sources; however, acceptance of loans must be approved by the governing bodies involved.

(c) The local planning agency shall have the general responsibility for the conduct of the comprehensive planning program. Specifically, the local planning agency shall:

(1) Be the agency responsible for the preparation of the comprehensive plan and shall make recommendations regarding the adoption of such plan or element or portion thereof consistent with existing county laws or regulations. During the preparation of the plan, and prior to any recommendation for adoption, the local planning agency shall hold at least 1 public hearing or public meeting on the proposed plan or element or portion thereof. The local planning agency may designate any agency, committee, department or person to prepare, revise, monitor and oversee the effectiveness and status of the comprehensive plan or any element thereof. Prior to adoption of the proposed comprehensive plan, the governing body shall hold at least 1 public hearing, with due public notice, on the proposed plan or element thereof. Final recommendation of the adoption of such plan to the governing body shall be in accordance with existing county procedures, or absent such procedures, shall be the responsibility of the local planning agency.

(2) Review proposed land development regulations, land development codes or amendments thereto, and make recommendations to the governing body as to the consistency of the proposal with the adopted comprehensive plan.

(3) Perform any other functions, duties and responsibilities assigned to it by the governing body or special law.

66 Del. Laws, c. 207, § 1.;

§ 4956. Required and optional elements of comprehensive plan; studies and surveys.

(a) The comprehensive plan shall consist of materials in such descriptive form, either written or graphic, as may be appropriate to the prescription of principles, guidelines and standards for the orderly and balanced future economic, social, physical, environmental and fiscal development of the area.

(b) Coordination of the several elements of the local comprehensive plan shall be a major objective of the planning process.

(c) A capital improvements plan covering at least a 5-year period shall be developed in accordance with the adoption of, and be consistent with, the comprehensive plan. The capital improvements plan shall be designed to consider the need for and the location of public facilities in order to encourage the efficient utilization of such facilities and set forth:

(1) Principles for construction, extension or increase in capacity of public facilities, as well as principles for correcting existing public facility deficiencies, which are necessary to implement the comprehensive plan.

(2) Estimated public facility costs, including a delineation of when facilities will be needed, the general location of the facilities and projected revenue sources to fund the facilities.

(3) Standards to ensure the availability of public facilities and the adequacy of those facilities.

(4) To the extent provisions of the capital improvements plan anticipate State financial assistance, involvement or cooperation, such provisions shall be developed in conjunction with the state capital improvement plan and annual capital budget.

(d) The capital improvements plan shall be reviewed on an annual basis and modified as necessary. Corrections, updates and modifications concerning costs, revenue sources, acceptance of facilities pursuant to dedications which are consistent with the plan, or the date of construction of any facility enumerated in the capital improvements plan may be accomplished by ordinance and shall not be deemed to be amendments to the local comprehensive plan. All proposed improvements to public facilities shall be consistent with the capital improvements plan.

(e) Coordination of the comprehensive plan with the comprehensive plans of municipalities within the County, adjacent counties and applicable state regulations and policy shall be an objective of the comprehensive planning process. To that end, in the preparation of a comprehensive plan or element thereof, and in the comprehensive plan or element as adopted, the planning agency shall include a specific policy statement or coordinated mapping element indicating the relationship of the proposed development of the area to the comprehensive plans of municipalities within the County, adjacent counties and applicable state regulations and policy as the case may require. Such policy statement or coordinated mapping element shall specifically identify the coordination process undertaken and the official action taken by affected municipalities regarding the county comprehensive plan. Such statement or element shall also set forth the procedures to be followed to ensure continuing coordination with municipalities, regional agencies and the State. In addition, the comprehensive plan shall provide for coordination with state agencies regarding land use and development policies and shall

provide for review and consideration by the Cabinet Committee on State Planning Issues at such times as required by this subchapter.

(f) The comprehensive plan and its elements shall contain policy recommendations for the implementation of the plan and its elements.

(g) The comprehensive plan shall include:

(1) A future land use plan element designating proposed future general distribution, location and extent of the uses of land for such activities as residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities and other categories of the public and private uses of land. The plan shall include standards to be followed in the control and distribution of population densities and building and structure intensities. The proposed distribution, location and extent of the various categories of land use shall be shown on a land use map or map series which shall be supplemented by goals, policies and measurable objectives. Each land use category shall be defined in terms of the types of uses included and standards for the density or intensity of use. The future land use plan shall be based upon surveys, studies and data regarding the area, including the amount of land required to accommodate anticipated growth, the projected population of the area, the character of undeveloped land, and the availability of public services. The future land use plan may designate areas for future planned development use involving combinations of types of uses for which special regulations may be necessary to ensure development in accord with the principles and standards of the comprehensive plan and this subchapter. The land use maps or map series shall generally identify and depict historic district boundaries and shall designate historically significant properties meriting protection. Population, demographic, environment, oil economic data and projections used to determine present conditions, future land use, and public facility requirements shall be developed in conjunction with the State and municipalities, and shall, as a minimum, be consistent with projections officially adopted by the Delaware Population Consortium. The sources and assumptions used to develop such projections shall be clearly identified.

(2) A mobility element which is consistent with the approved area-wide transportation plan and has been developed in conjunction with the Department of Transportation. The mobility element shall provide a balanced transportation system addressing the movement of people and goods while showing existing and proposed rights-of-way, sidewalks, bikeways, rail facilities, terminals and related facilities. The mobility element shall include recommendations for land use regulations that promote a range of sustainable transportation choices for future transportation needs. The mobility element shall be consistent with the State Implementation Plan (SIP) for air quality attainment.

(3) A water and sewer element correlated to principles and guidelines for future land use, indicating ways to provide for future potable water, and wastewater disposal for the area. County government, in conjunction with the State, shall assess their current, as well as projected, water needs and sources. The element shall describe the problems and needs and the general facilities that will be required for solution of the problems and needs. The water and sewer element shall be developed in consultation with and reviewed by the Department of Natural Resources and Environmental Control. The water and

sewer element shall include an assessment of fiscal considerations and shall be consistent with approved area-wide wastewater treatment plans.

(4) A conservation element for the conservation, use and protection of natural resources in the area and which results in the identification of these resources. At a minimum, the element shall consist of such natural area classifications as wetlands, wood uplands, habitat areas, geological areas, hydrological areas, floodplains, aquifer recharge areas, ocean beaches, soils and slopes. The land use map or map series contained in the future land use element shall generally identify and depict natural areas classifications, such as those enumerated in this section. The land uses identified on said maps shall be consistent with applicable state laws and regulations. Identification and depiction of the above shall be based on the best topographic maps and other information available from state and federal agencies or other sources that the County deems appropriate. The conservation element shall also consider areas most suited for agricultural uses, silvacultural uses and watershed protection. The conservation element shall be developed in consultation with and reviewed by the Department of Agriculture and the Department of Natural Resources and Environmental Control.

(5) A recreation and open space element indicating a comprehensive system of public and private sites for recreation including, but not limited to, nature preserves, parks and playgrounds, parkways, water bodies including beaches and public access to beaches, open spaces and other recreational facilities. A county recreation and open space plan is acceptable in lieu of a recreation and open space element. The recreation and open space element shall be consistent with the Comprehensive Land Use Plan. The element shall be developed in consultation with and reviewed by the Department of Natural Resources and Environmental Control and shall reflect the State's open space preservation and outdoor recreation planning activities.

(6) A housing element that is consistent with county housing plans, standards and principles. Such housing plans shall be in accordance with state and federal rules and regulations and the housing plan or housing element of the comprehensive plan shall include the following:

a. The provision of housing for existing residents and the anticipated growth of the area.

b. The elimination of substandard dwelling conditions.

c. The structural and aesthetic improvement of existing housing.

d. The provision of adequate sites for future housing, including housing for low-income and moderate-income families, group home facilities and foster care facilities, with supporting infrastructure and public facilities.

e. Provision for relocation housing and identification of historically significant and other housing for purposes of conservation, rehabilitation or replacement.

f. The formulation of housing implementation programs.

g. Demonstrated coordination with the State Housing Authority including but not limited to guidelines to insure that sites for publicly assisted housing are located where adequate transportation opportunities, health and social services and other community services are available.

(7) An intergovernmental coordination element of the comprehensive plan shall demonstrate consideration of the particular effects of the plan, when adopted, upon the development of municipalities within the County, adjacent counties or on the applicable state regulations.

(8) A recommended community design element to assist in the achievement of the objectives of the comprehensive plan which may consist of design recommendations for land subdivision, neighborhood development, neighborhood redevelopment, design of open space locations and similar matters. To that end, such recommendations may be made available as aids and guides to developers in the future planning and development of land in the area.

(9) An historical preservation element which sets out plans and programs for those structures or lands in the area having historical, archaeological, architectural or similar significance. The historical preservation element shall be developed in consultation with and reviewed by the Division of Historical and Cultural Affairs of the Department of State.

(10) An economic development element setting forth principles and guidelines for the commercial and industrial development, if any, and the employment and personnel utilization within the area. The element may detail the type of commercial and industrial development sought while correlating the present and projected employment needs of the area to other elements of the plan and may set forth methods by which a balanced and stable economic base will be pursued. The economic development element shall include a general area redevelopment component consisting of plans, criteria and programs for community redevelopment, including reuse of housing sites, business sites, industrial sites, central business districts, public building sites, recreational facilities and other locations. The economic development element shall be developed in consultation with and reviewed by the Economic Development Office.

(h) The comprehensive plan may include such other elements as may be peculiar to and/or necessary for the area concerned and as are added by the governing body upon the recommendation of the local planning agency.

(i) Transferred.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 270, §§ 25-35; 74 Del. Laws, c. 186, § 8; 78 Del. Laws, c. 92, § 9.;

§ 4957. State responsibilities to local planning agencies.

(a) All elements of the comprehensive plan shall be based upon data appropriate to the element involved. State agencies shall provide to each county upon request existing data or information necessary to expedite the development and preparation of the comprehensive plan and elements of this section. Surveys and studies utilized in the preparation of the comprehensive plan shall not be deemed a

part of the comprehensive plan unless adopted as a part of it. Copies of such studies, surveys and supporting documents shall be made available to public inspection, and shall be made available to the public upon payment of reasonable charges for reproduction. The County shall be relieved of any requirement to comply with the data and information requirements of this subchapter when the State is unable to supply the necessary data and information to implement that requirement, except when such data and information is currently available or readily accessible to the County within budgetary limitations.

(b) The State, through the Office of State Planning Coordination, shall provide to the County, for use in the comprehensive planning process, state land use and development goals and policies, state regulatory requirements, estimates of future state financial capabilities, the State Capital Improvements Budget and Plan, State facility location plans, estimates of existing quantity of natural resources, economic development strategies and any other information which might reasonably influence the County's future land use decisions. The State shall provide the County with long-range plans, performance standards, land development polices, facility siting criteria and infrastructure impact assessment standards (necessary to ensure the availability of public facilities and the adequacy of those facilities), so as to enable the county to prepare the plan elements required by § 4956 of this title and to clearly set forth the criteria the State will use to review such elements. The review by the Cabinet Committee on State Planning Issues shall be pursuant to § 9103 of Title 29. During preparation of the county comprehensive plan, the county and the State shall jointly establish guidelines for the location and arrangement of public facilities, such as public schools, health care facilities, public safety and correctional institutions, libraries and other public buildings. Such guidelines shall be used to coordinate between the various levels of government so as to ensure that public buildings and facilities are located in a manner which are consistent with state and county development goals.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 35, 36; 74 Del. Laws, c. 186, § 9; 78 Del. Laws, c. 92, § 10.;

§ 4958. Evaluation and appraisal of comprehensive plan.

(a) The comprehensive plan or amendments or revisions thereto shall be submitted to the Governor or designee at such time as the plan is made available for public review. The County shall provide sufficient copies for review by the Cabinet Committee on State Planning Issues. Within 30 days of plan submission, the Cabinet Committee on State Planning Issues shall conduct a public meeting, at which time the County shall make a presentation of the plan and its underlying goals and development policies. Following the public meeting the plan shall be subject to the state review and certification process set forth in § 9103 of Title 29.

(b) The State shall not be obligated to provide state financial assistance or infrastructure improvements to support land use or development actions by the county where the County's adopted comprehensive plan or portions thereof are determined to be substantially inconsistent with State development policies.

(c) The planning programs shall be a continuous and ongoing process. The local planning agency shall prepare a report on the progress of implementing the comprehensive plan, which shall be sent to the Office of State Planning Coordination each year after adoption of the comprehensive plan. The report shall be due annually no later than on each anniversary of the effective date of the most recently adopted comprehensive plan or plan update until January 1, 2012, and annually no later than July 1 each year thereafter starting on July 1, 2012. The Cabinet Committee shall forward the report to the Office of State Planning Coordination, which will evaluate it in the context of state goals, policies and strategies, and the plans of other jurisdictions. The Office of State Planning Coordination will integrate the information, land use trends, and changing conditions found in the County's report into the annual report of the Cabinet Committee, which is to be prepared as specified in § 9101(d), Title 29. It is the intent of this subchapter that periodic updates on amendments to and the implementation of adopted comprehensive plans be communicated through the evaluation and appraisal reports to ascertain trends, monitor implementation and foster ongoing coordination.

(d) The report shall present an assessment and evaluation of the success or failure of the comprehensive plan or element or portion thereof, and shall contain appropriate statements (using words, maps, illustrations or other forms) related to:

(1) The major problems of development, physical deterioration and the location of land uses and the social and economic effects of such uses in the area.

(2) The condition of each element in the comprehensive plan at the time of adoption and at date of report.

(3) The comprehensive plan objectives as compared with actual results at date of report.

(4) The extent to which unanticipated and unforeseen problems and opportunities occurred between date of adoption and date of report.

(e) The report shall include reformulated objectives, policies and standards in the comprehensive plan or elements or portions thereof.

(f) The Cabinet Committee may prescribe a format and guidelines for the preparation of the County's report. Should the Cabinet Committee elect to do so, the Office of State Planning Coordination shall assist the Committee in the development and administration of such guidelines.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, §§ 35, 37-39; 73 Del. Laws, c. 186, § 3; 74 Del. Laws, c. 186, §§ 8, 10, 11; 78 Del. Laws, c. 92, §§ 11-14.;

§ 4959. Legal status of comprehensive plan.

(a) After a comprehensive plan or element or portion thereof has been adopted by County Council or Levy Court in conformity with this subchapter, the land use map or map series forming part of the comprehensive plan as required by this subchapter shall have the force of law, and no development, as defined in this subchapter, shall be permitted except in conformity with the land use map or map series

and with land development regulations enacted to implement the other elements of the adopted comprehensive plan.

(b) Nothing in this subchapter shall serve to invalidate any comprehensive plan, land development regulation, land use, development, development order or development permit which presently exists or which hereafter validly comes into existence prior to the date when full compliance with this subchapter is required.

(c) Any application for a development permit filed or submitted prior to adoption or amendment under this subchapter of a comprehensive plan or element thereof shall be processed under the comprehensive plan, ordinances, standards and procedures existing at the time of such application.

(d) All development permits and development orders heretofore or hereafter validly issued or approved by county government and not thereafter limited, rescinded or restricted shall automatically be incorporated into and become part of the present and all future comprehensive plans, subject to whatever time limitations may otherwise apply to such permits and orders at the time of issuance or approval.

(e) In the event that any comprehensive plan or element required to comply with this subchapter shall be determined as failing to comply herewith, such failure shall not invalidate those elements of the plan which do comply with this subchapter, nor invalidate any previously issued development permit or order that was not specifically and timely challenged in the legal action in which such noncompliance was determined.

66 Del. Laws, c. 207, § 1; 70 Del. Laws, c. 270, § 35.;

§ 4960. County comprehensive plan.

(a) The County shall submit a final comprehensive plan for submission to the Cabinet Committee on State Planning Issues no later than 5 years after the adoption of the current plan; provided, however, that the County may request an extension of such date by forwarding a written request to the Cabinet Committee at least 90 days prior to the deadline. The basis for the request shall be clearly indicated. The decision whether to grant a request an extension, and the duration of such extension, shall be at the discretion of the Cabinet Committee. Upon completion of the comment period set forth in this subchapter, the County shall solicit public comment and adopt a comprehensive plan for zoning, subdivision and other land use decisions. Such plan shall be updated every 10 years thereafter.

(b) Once the county government shall have in place said comprehensive plan, the County shall not be permitted to amend such plan without a simple majority of the entire membership thereof voting to do so.

(c) Within 1 year of the date of adoption of the county plan, the County shall initiate an implementation program regarding subdivision and development controls. The County shall report the status of the implementation program in the monitoring report as required by this subchapter. This report should include progress to date, problems, issues and opportunities.

(d) Subsequent amendments to the county comprehensive plan required by this chapter shall be submitted to the Cabinet Committee on State Planning Issues for review and certification pursuant to § 9103 of Title 29.

(e) Within 18 months of the date of adoption of the county comprehensive plan or revision thereof, Kent County shall amend its official zoning map(s) to rezone all lands in accordance with the uses and intensities of uses provided for in the future land use element for the County. In the event that the comprehensive plan includes provisions governing the rate of growth of particular planning districts or sub-areas of the County, the County's zoning district regulations shall be amended to reflect the timing elements of the comprehensive plan.

66 Del. Laws, c. 216, § 1; 70 Del. Laws, c. 270, §§ 35, 40, 41; 73 Del. Laws, c. 186, § 4; 74 Del. Laws, c. 186, §§ 8, 12; 78 Del. Laws, c. 92, §§ 15, 16; 78 Del. Laws, c. 129, § 2.;

§ 4961. Information from state and local agencies and school districts.

(a) All subdivision plans approved by the county government shall be filed with the Office of the Recorder of Deeds, and with such other state and local agencies as the County may by ordinance require.

(b) As part of its review of a rezoning or subdivision application, the county government through its designated local planning agency shall request and review information from all state and local agencies and local school districts identified on a list prepared by the County and shall file as part of the record any written information provided by such state and local agencies or local school districts with respect to the rezoning or subdivision application. If the planning agency makes recommendations that are in conflict with the information supplied by state and local agencies or local school districts, it must explain its reasons for doing so in writing.

(c) Any state or local agency or local school district which delivers to the head of county government a written request that it be notified of rezoning and subdivision applications shall be included on the County's list of agencies and school districts from which information shall be requested and reviewed in accordance with subsection (b) of this section.

66 Del. Laws, Sp. Sess., c. 198, § 1; 70 Del. Laws, c. 270, § 35.;

§ 4962. Highway capacity.

The county government shall not approve any proposed change in the zoning classification for land (i.e., any "rezoning request") without first complying with the following procedures:

(1) As soon as possible, but in any event no later than June 30, 1988, the county government, through its designated planning agency, shall establish an agreement with the Delaware Department of Transportation (DelDOT) to provide a procedure for analysis by DelDOT of the effects on traffic of each rezoning application.

(2) Each such agreement shall be approved by a resolution or ordinance, consistent with county procedures, and shall establish traffic level of service suitable to the County and DelDOT.

(3) The purpose of the agreement shall be to ensure that traffic analyses are conducted as part of the zoning reclassification process within the County.

(4) The agreement shall provide for the review of traffic impacts according to nationally recognized traffic criteria and shall, at a minimum, consider the effects of existing traffic, projected traffic growth in areas surrounding a proposed zoning reclassification and the projected traffic generated by the proposed site development for which the zoning reclassification is sought.

66 Del. Laws, c. 217, § 1; 70 Del. Laws, c. 270, § 35.;

DE Code Title 7, Part V, Chapter 45 (Public Lands)

Source: http://delcode.delaware.gov/title7/c045/index.shtml, accessed June 1, 2012.

§ 4521. Zoning and use.

Notwithstanding any provision of this chapter to the contrary, no state park, or any part thereof, open space as defined in § 7504 of this title, or other area acquired primarily for recreational use, shall be rezoned, neither shall there be a change in the use of any such lands requiring a variance or subdivision approval, except upon 45 days prior notice to all elected members of the General Assembly in whose district such lands, or any part thereof, lie.

72 Del. Laws, c. 156, § 3.;

DE Code Title 7, Part V, Chapter 47 (State Parks)

Source: http://delcode.delaware.gov/title7/c047/sc01/index.shtml, accessed June 1, 2012.

§ 4706. Zoning and use.

Notwithstanding any provision of this chapter to the contrary, no state park, or any part thereof, or other area acquired primarily for recreational use, shall be rezoned, neither shall there be a change in the use of any such lands requiring a variance or subdivision approval, except upon 45 days prior notice to all elected members of the General Assembly in whose district such lands, or any part thereof, lie.

72 Del. Laws, c. 156, § 1.;

APPENDIX F

Delaware National Estuarine Research Reserve Management and Facilities

Program Accomplishments

General Administration and Staffing

- Management plan is currently being revised in accordance with operations award grant tasks. Draft of revised management plan is due to NOAA by the end of March 2012.
- In 2009 a part-time seasonal Coastal Training Program Coordinator was hired. In May 2011, the part-time position was transitioned to a full time state merit position.

Facilities Enhancements

Adequate facilities and equipment permit the Reserve to implement its research, education and stewardship programs and to fully participate in NERRS national priorities. Through support from NOAA and other sources, DNERR added the following enhancements to facilities:

- St Jones Reserve
    - Photovoltaic panels added to the roof of the Coastal Training Center
    - Patio was installed
    - Demonstration Rain Gardens were installed in 2010 and 2011 as part of Rain Gardens for the Bays program.
    - Boardwalk enhancements are currently underway to improve light penetration and demonstrate alternative decking material
    - New exhibits and kiosks were installed
    - A new HVAC system in the Coastal Training Center and energy saving computer controls were installed
    - A demonstration composter was installed by an Eagle Scout in 2008.
    - The Native Plant Nursery expanded and installed additional storage sheds
    - An historic barn was destroyed during a winter storm in 2009. The old beams and posts were salvaged and made into benches.
- Blackbird Creek Reserve
    - Completed construction on the Blackbird Creek Reserve Stewardship Center: Renovated an unusable existing structure to include lab space, office space, meeting rooms and equipment storage through a NERRS PAC grant.
    - Access to the State's internet was installed
    - Canoe/Kayak launch constructed
    - Trails were established
    - New kiosks were installed
    - A bird watching station was built and installed by an Eagle Scout in 2006, but was unfortunately the victim of vandalism in 2009.

Delaware National Estuarine Research Reserve
Education & Outreach Program

Program Accomplishments

K-16 Estuary Education Program

- In the Spring 2006 the DNERR hosted the Delaware Envirothon Competition at the St. Jones Reserve in Dover, DE and at the Blackbird Creek Reserve in the Spring 2011 where the special topic focus was on estuaries.
- In 2007 the DNERR hosted the first Make a Splash water festival and estuary celebration in partnership with the Division of Historic and Cultural Affairs which is now an annual event held at the St Jones Reserve and John Dickinson Plantation. Make a Splash is a cooperative endeavor of the Delaware Department of Natural Resources and Environmental Control, the Delaware National Estuarine Research Reserve, the John Dickinson Plantation, Project WET USA, Tidewater Utilities, and numerous other conservation organizations and agencies. This daylong event is offered in the spirit of enhancing, celebrating and culminating Delaware's 4th grade students' awareness and appreciation of Delaware's water resources and history. This program was designed with the 4th grade Land and Water and Delaware History units in mind. The Make a Splash event has hosted between 400 and 800 students annually.
- In the Winter 2009/2010 the DNERR education staff conducted a Market Analysis and Needs Assessment (MA/NA) targeting the K-12 education community. The MA/NA has been completed and the information is being utilized in strategic planning for the DNERR education program.
- In the Spring 2010 the DNERR in conjunction with Delaware Fish & Wildlife, Maryland Department of Natural Resources, and the New Jersey Department of Environmental Protection celebrated the Green Eggs and Sand Curriculum's 10-year anniversary at the DNERR. Green Eggs & Sand (GE&S) is an innovative workshop experience and set of curriculum modules designed to explore the Atlantic Coast horseshoe crab (HSC)/shorebird phenomenon and management controversy. The award-winning curriculum is composed of 4 education modules for middle and high school level students and adults. Each module features an introductory video segment followed by a series of engaging exercises designed to expand understanding of the material. From 2009 – 2011 GE&S has undergone a curriculum revision and update. The revised curriculum was piloted in Spring 2011 and is scheduled to be finalized by the Spring 2012 workshops. In addition, the GE&S Planning Team has entered into a Memorandum of Understanding with Dodie Sanders from the University of Georgia (Skidaway Island, GA) to be the first facilitator for the GE&S Curriculum.

Community Education & Outreach

- On October 14, 2006 the DNERR partnered with the John Dickinson Plantation in providing the community with the John Dickinson Colonial Faire.

- In the Fall 2007 the DNERR planned and hosted the first annual Blackbird Creek Fall Festival which is now an annual event held at the Blackbird Creek Reserve in October. The festival was designed to foster stewardship of our coastal environments by celebrating the richness of estuaries, Delaware's cultural traditions, and our beautiful scenic Blackbird Creek site at the Delaware National Estuarine Research Reserve. In 2010 approximately 500 community members participated in the festivities.
- The DNERR in partnership with Delaware Coastal Management Program, The Nature Conservancy, and the Partnership for the Delaware Estuary launched the Thank You Delaware Bay campaign in February 2008. The campaign takes a unique approach to raise awareness, instill a sense of personal connection, and encourage the public to take actions to help safeguard and protect the Delaware Bay. The campaign includes a logo – TYDB – a strong visual image designed to bring identity and recognition to the effort. The logo and the campaign's slogan - *The Delaware Bay Takes Care of Us. Let's Return the Favor.* - are used in print advertisements, posters, and public service announcements to promote bay stewardship and direct people to the new website. The campaign has also been taken to outreach events such as the Delaware State Fair, Ag Day, Dover Days, and Coast Day. http://www.tydb.org
- In the Spring 2008 the DNERR hosted a national travelling exhibit called *Native Waters: Sharing the Source*. This exhibit is an approximately 500-square-foot traveling exhibit created by Native Waters, Project WET (Water Education for Teachers) to help both children and adults explore the importance of water in their lives. The exhibit was designed by the Native Waters project in cooperation with the Science Museum of Minnesota while at Montana State University, for use in schools, museum, libraries, and cultural centers. Using a variety of art forms, such as hands-on activities, interviews with tribal people and a film, *Native Waters: Sharing the Source* shares cultural and scientific ways of learning about water. The DNERR worked closely with the Lenape Indian Tribe of Delaware and the Nanticoke Lenni-Lenape Tribe of New Jersey to develop a Delaware specific exhibit for display during the showing of the Native Waters exhibit. The Kick-Off event held in February 2008 was well attended by the public and the local tribes.
- In 2009 the DNERR established the DNERR Herbarium to document the vegetation at each reserve component. As sea level rise, climate change, and the presence of invasive species become more prevalent, we will continue to see changes in the landscape especially vegetative diversity. The DNERR Herbarium is beneficial in biologic and restoration monitoring as well as education efforts at the Reserve.
- In the Fall 2009 the DNERR held the first annual St. Jones Reserve Open House in conjunction with the Delaware Native Plant Sale held at the DNERR the first Saturday in November. The DNERR has offered guest speakers, videos, exhibit tours, wetland hikes, and refreshments. This has been a successful effort in bringing new visitors to the Reserve. This effort is conducted in partnership with the Delaware Native Plant Society.

Exhibits

- Interpretive exhibits were installed in the Coastal Training Center in 2006 including panels on the National Estuarine Research Reserve System, Research for the Coast, Protecting Coastal Lands, and Understanding Estuaries.

- New Kiosks have been put in place at Blackbird Creek Reserve and St Jones Reserve with rotating information placed inside.
- A partnership effort with Kent County Department of Parks has resulted in kiosk space at Lebanon Landing in Dover to be dedicated for Reserve use.
- A Historic Marker for "St Jones Neck: Site of Settlement in the 1660s" was placed on St Jones Reserve in 2009 as part of the Delaware Historic Marker Program operated by Delaware Public Archives.
- Planning for renovating exhibits at the St Jones Reserve Visitor's Center and the new Blackbird Creek Reserve Stewardship Center are underway.

Communications and Publications

- Updated trail guide for the St Jones Reserve was published in 2011.
- Updated the Reserve website in the common look and feel of the Department of Natural Resources and Environmental Control.
- The DNERR Education staff embarked on social media as a communication tool including facebook, twitter, and a weekly blog post.

DNERR Education Expertise

- In February 2006 the DNERR hosted the NERR system Education Sector Meeting.
- The Estuarine Educator serves as a member of Delaware's Envirothon Planning Team and chairs the Aquatic Ecology workgroup.
- The Education Coordinator is the State of Delaware's coordinator for Project WET (Water Education for Teachers).
- The Education Coordinator serves on the Delaware Children in Nature Task Force established by the Secretary of the Delaware Department of Natural Resources and Environmental Control and the Secretary of the Delaware Department of Education in 2010. The Task Force is charged with developing a comprehensive plan with recommendations to the Secretaries. The mission of the State of Delaware's Children In Nature Project is to improve environmental literacy, create opportunities for children to participate in outdoor experiences, promote healthy lifestyles and provide better access to green space through schools and community programs. The Education Coordinator is the workgroup chair for community education.
- The education staff from DNERR advised in the formation of the Delaware Association for Environmental Education (DAEE) in 2008. DAEE's mission is to "promote environmental and outdoor education to facilitate positive community impacts on the conservation and sustainability of Delaware's resources." Using the environment as a basis for study can improve student achievement, reduce behavioral problems, and connect students and adults to tangible, real-world topics.

Delaware National Estuarine Research Reserve
Coastal Training Program

Program Accomplishments

Program Development

- Between January 2006 and October 2009, 19 coastal decision maker workshops were held by the Education Coordinator. Workshop topics covered a range of priority coastal management issues including: Managing for Visitor Use; Combat Communications for Conservationists; Delaware Estuary Benthic Inventory; Coastal Resiliency; Community Places, Natural Spaces; Wetlands and Land Use.
- The Education Coordinator updated the 2002 Delaware CTP Market Analysis and Needs Assessment (MA/NA) in 2008. In 2009 the DNERR submitted the MA/NA and strategic planning documents to the Estuarine Reserves Division at NOAA to implement CTP in Delaware. The DNERR CTP was officially approved on April 29, 2009. The DNERR CTP Coordinator was hired in July 2009, and in October 2009 the DNERR was granted funding to implement the first year of CTP. In May 2011, the CTP Coordinator position transitioned from a part time position to a full time position.
- The CTP has developed partnerships with multiple agencies and organization across Delaware that help support the goals and objectives of the program. This includes members of the CTP Advisory Committee, Partnership for the Delaware Estuary, Delaware Geologic Survey, Delaware Sea Grant, The Nature Conservancy, Dept. of Agriculture, Delaware Forest Service, and several Divisions within the Delaware Department of Natural Resources and Environmental Control.

Workshops and Trainings

- Between October 2009 and March 2011, the DNERR CTP hosted 22 workshops with more than 880 attendees – resulting in over 4,150 contact hours. Workshop topics have a covered a range of CTP priority issues, including Sea Level Rise, Wetlands Restoration Construction Techniques, Rain Garden Construction Training, Coastal Flood Monitoring System Training, Public Issues and Conflict Management, and Social Skills of Social Media.
- The CTP Coordinator serves on the Education and Outreach Committee of the Delaware Invasive Species Council (DISC) and has partnered with the DISC since the inception of the CTP to host the DISC's annual conference the past three years.
- The CTP continues to partner with DNREC's Watershed Assessment Section to host the bi-annual Delaware Wetlands Conference. In 2010, the CTP first partnered to host this event, bringing in more than 175 scientists, conservation organizations, land use planners and decision makers for a full-day conference designed to share resources, information and programs that help preserve and protect wetlands and the valuable services they provide to all Delawareans.

Technical Assistance and Science Translation

- In 2009, the CTP assisted Delaware Coastal Program with developing the Delaware Residents' Public Opinions on Climate Change and Sea Level Rise to examine current thoughts and opinions on climate change and sea level rise in the State, as well as opinions on management strategies and actions pertaining to these issues. The results were provided in December 2009 by the natural resource survey group, Responsive Management, and have since informed numerous sea level rise outreach and education strategies of the DNERR CTP and other partners.
- The CTP is assisting Delaware Coastal Programs with the facilitation of the Delaware Sea Level Rise Advisory Committee. The Advisory Committee was convened to make recommendations for adapting the State to the impacts of sea level rise. The CTP co-leads the Natural Resources Workgroup to develop a vulnerability assessment. The Adaptation Committee process will be an on-going Coastal Training Program project, and is expected to continue for the next two years.
- The CTP Coordinator is a co-leader of the Delaware Sea Level Rise Outreach Workgroup that has developed the State of Delaware Sea Level Rise Outreach Strategy, and is working to engage Delawareans in proactive efforts to adapt to and reduce the impacts of sea level rise through effective communication strategies. In this capacity, the CTP presented a display and supplied information packets for the Delaware General Assembly, gave several community presentations on sea level rise, and developed corresponding outreach materials as well, including the *Outdoor Delaware* article, "Sea Level Rise: Delaware's Rising Tide"
- The CTP provides technical assistance to support the Coastal Community Resiliency programs underway by the Delaware Coastal Programsoffice in the towns of Bowers Beach and New Castle, Delaware. The CTP coordinator partnered with DCP staff to hold informative workshops for community residents about resiliency planning.

Delaware National Estuarine Research Reserve
Research & Monitoring Program

Program Accomplishments

System Wide Monitoring Program and other DNERR Monitoring

- During the past 5 years the DNERR has proven itself as a leader in collecting quality data in the NERR System-wide Monitoring Program (SWMP). The NERR Central Data Management Office (CDMO) performs QA/QC on all data submitted by each Reserve and calculates the percentage of acceptable data. The DNERR achieved acceptance rates of 97% for water quality and over 99% for meteorological data submitted. The DNERR exceeds the required four water quality and one meteorological station by having three water quality stations and one meteorological station in each of the two components of the Reserve. This enables the DNERR and its researchers to better characterize the estuarine system along the salinity gradient of each component. To further the implementation of SWMP nationally, the Research Coordinator, Bob Scarborough, served as the Chair of the Data Management Committee (2006-2009). During his tenure as chair The SWMP data was incorporated as part of the backbone of the Integrated Ocean Observing System (IOOS), real-time telemetry was implemented and the program went through a successful external review. In addition, Mike Mensinger, an environmental scientist at the DNERR, serves as the SWMP Technician Representative for the NERRS on the Data Management Committee and annually provides training at the Technician Training Workshop administered by the CDMO.
- The DNERR maintains up to two buoys in the Delaware Bay to provide real-time wave data for research, navigation and safety. These buoys transmit via satellite information hourly on wave direction, period and height to the DNERR which is then processed and sent to the National Data Buoy Center (NDBC) for posting on their website.
- During the 2006-2008 the DNERR performed nekton sampling in the St. Jones River and Blackbird Creek to develop a baseline species database. In total 10,408 specimens comprised of 38 different species were caught in the trawls over three years.
- Researchers from the DNERR have installed 4 Sediment Elevation Tables (SETs) in each of the components of the Reserve. Elevation data is collected quarterly from the SETs to determine accretion and subsidence rates in the different habitats.

Visiting Researchers at the DNERR

- The DNERR has continued to promote and support research on the Reserve from outside Universities and organizations. Along with numerous researchers from the University of Delaware and Delaware State University, the list of institutions includes: Brown University, Drexel University, University of New England, University of Maryland Center for Environmental Science, St. Mary's College of Maryland, University of Houston, Haskins Shellfish Laboratory, USGS Patuxent Wildlife Research Center, Natural Resources

Conservation Services, and The Nature Conservancy. The research has involved all facets of study ranging from upland habitat restoration to living shorelines to sediment transport.

Gradate Research Fellows

- From January 2006 through August 2011 the DNERR has supported eight Graduate Research Fellowships (GRFs). Six of the students were from three different departments within the University of Delaware and the other two students were from Rutgers University in New Jersey and Drexel University in Pennsylvania. The DNERR has supported the GRFs by supplying boat and operator time, field support which included: site reconnaissance, nekton trawls, monitoring equipment deployment and retrieval, and RTK Surveys. In addition the GRFs have been furnished with copious amount of information from SWMP, topography, habitats, and hydrology and other data sets.
- The GRF students have provided critical support to the DNERR and valuable information pertaining to coastal Delaware issues. GRF research has been incorporated into DNERR Blackbird restoration efforts, accretion/erosion rates relating to sea level rise and marsh health modeling research to name a few.

DNERR and Cooperative Research

- What began as helping the Prime Hook National Wildlife Refuge perform some modeling for their 15 year Comprehensive Conservation Plan has evolved into a multi-year cooperative agreement with the Delaware Bay Costal Refuge Complex. With the primary focus to understand the changes occurring in the two refuges and assist in the conservation of the resources the DNERR is involved in several hydrology, water quality, bio-monitoring and accretion studies in conjunction with staff from the Bombay Hook and Prime Hook National Wildlife Refuges.
- The Benthic Mapping project for the State's Delaware Bay waters is mostly complete. This project involved using acoustic and benthic and sub-bottom sensors to identify the bay benthos and sub-bottom sediment types. During the last two years through an agreement with DNREC Division of Fish and Wildlife most of the work has been performed in the deeper waters off the trawl vessel *First State*. Information from this project has been used to monitor oyster grounds, locate sand stock for beach replenishment, and gather information for the main channel deepening project. This project is not planning to move offshore to the Atlantic Coast to gather information for wind energy location studies.
- The DNERR has supported and assisted in several projects with the University of Delaware's Delaware Environmental Observing System (DEOS). These projects have included the update of a costal storm report first done in the early seventies, a GAP Analysis to identify locations where more coastal monitoring stations are needed, to the development of an interactive Early Warning System for Coastal flooding from storm events.
- In order to estimate the survivability of Delaware marshes against the impacts of sea level rise the DNERR, based on conversations with Don Cahoon of USGS, began a sampling of *Spartina* marshes in the state, beginning with the Reserve's marshes. This project, now entering its 3rd collection season, has the goal to develop a Marsh Vulnerability Index (MVI) based on the elevation marsh surface in the tidal regime. By analyzing several biological

parameters and elevation data from each location the optimum growth range of the species is being determined for various locations. In the future knowing the marsh elevation and information from the network of SETs, highly susceptible marshes can be identified and targeted for conservation action.

- After a devastating coastal storm in 2008 the DNERR staff were asked to examine the hydrology of the neighboring community of Kitts Hummock by the DNREC Drainage Program. This study involved the placement of several water level and flow devices to determine the avenues of the coastal flooding and subsequent drainage issues of the community. This research also revealed a significant error in a local USGS tide gauge, the DNERR choreographed the resolution of problem with assistance from DCMP, USGS, and NGS.
- The DNERR provided background information and long-term monitoring for the South Wilmington Special Area Management Plan (SAMP). This investigation included determining hydrology and providing water quality information for a project to improve urban drainage and restore a former industrial site into a tidal wetland.
- In order to properly design a beneficial reuse and habitat restoration project near the Mispillion inlet the DNERR was engaged to analyze the hydrology of the area. The DNERR installed and maintained Acoustic Doppler Current Profiler (ADCP) and multi-parameter water quality sensor. The ADCP data was correlated to cross- sectional flow measurements to enable modeling of the tributary. The DNERR also coordinated and help install an off-shore meteorological station at the site with the University of Delaware. This data was complimented with migratory shore-bird and horseshoe crab studies of the surrounding beaches coordinated by the DNERR and DCMP.

DNERR Research Expertise

- Dr. Scarborough has provided individual support to several programs and institutions over the review period. He has served on 3 Doctoral committees and 8 Masters committees for the University of Delaware and Delaware State University. He has represented DNREC for the NSF funded Experimental Program to Stimulate Competitive Research (EPSCoR) and is on the Advisory Board of the Delaware Universities collaboration of the Center for Integrated Biological and Environmental Research (CIBER). Because of his work in the area of sea level rise he has been asked to make a presentation at the NOAA Mid-Atlantic on Sea Level Rise Conference, help develop the Wilmington Area Planning Council (WILMAPCO) Sea Level Rise Impact, and was also an invited participant at the NOAA Restoration Center workshop to develop guidelines on wetlands restoration and sea level rise. He also serves as technical advisor on several Delaware Coastal Management Program grant projects.
- Because of his expertise DNERR Researcher, Michael Mensinger has been called upon to participate in various projects over the past 5 years. He has designed and implemented several suspended solids and outflow monitoring programs for DNREC dredging projects to ensure EPA compliance. Michael assisted in the design and installation of water level and salinity datasondes for habitat feeding studies in coastal impoundments and provided SOP development and training. Finally his expertise was requested in locating and installing water

level recorders by the University of Delaware for a statewide coastal flooding early warning system.

Delaware National Estuarine Research Reserve Stewardship Program

Program Accomplishments

Land Protection

- Acquisition
    - The 61.57 acre Bluffs Tract, aka Cornelius Tract, parcel number 1401700003, was acquired and added to the Blackbird Creek Reserve component of the DNERR in December 2005.

Land Management & Restoration

- Blackbird Creek Reserve Master Ecological Restoration Plan was completed in 2007. This document provides a site conditions assessment and identification of restoration needs, restoration context and research framework, and restoration recommendations, prioritization, and phasing.
    - Invasive Species Management for kudzu, multiflora rose, autumn olive, Canada thistle and Phragmites are ongoing
    - Upland reforestation 3975 trees 18.25 acres
    - Riparian buffer 3446 trees 11.00 acres
    - Existing CRP cool season grass meadow is being managed for invasive and being partly replaced with warm season grass and forest for a more diverse habitat.
    - Stream restoration research and engineering design in progress with University of Delaware
- Demonstration Sites
    - Alvin G. Wilson Conservation demonstration area was maintained at St Jones Reserve
    - Hedgerow demonstration area was planted with 1750 trees on 6 acres by community volunteers in 2009 at Blackbird Creek Reserve
    - Rain Garden demonstration areas were installed in 2010 and 2011 as part of the Rain Gardens for the Bays program at St Jones Reserve
- Built and placed blue bird, wood duck, barn owl, and bat boxes at both the St Jones and Blackbird Creek Reserves.
- Completed clean up of trash, infrastructure, campers, and buildings acquired properties at the Blackbird Creek Reserve.
- Hunting on DNERR lands managed by the Division of Fish & Wildlife

Volunteers

- Volunteers spend between 1,500-3,000 hours annually conducting research, restoration, education, maintenance, construction, and administrative tasks including:

- Horseshoe Crab Survey: Since 2001, the DNERR has coordinated surveys on 3 beaches of horseshoe crabs spawning in Delaware Bay. The data collected by volunteers during these surveys is key for scientists to monitor changes in numbers of spawning crabs in the Bay. Now, every spring on several peak spawning days, volunteers donate their time to count crabs on key beaches in Delaware and in New Jersey. Delaware's well-trained and enthusiastic volunteers have made this program one of the most successful volunteer based wildlife surveys in the country.
- Native Plant Nursery: For over 10 years, the DNERR in partnership with the Delaware Native Plant Society has been the home to a Native Plant Nursery. Reserve volunteers are taking more of a lead on maintaining the nursery.
- DNERR Herbarium: Volunteers received training in the proper handling, identification and mounting of plant specimens.
- Coastal Clean up: The DNERR is one of the coordinators for the State of Delaware's Coastal Cleanup. In 2010 over 2,500 volunteers participated in this event.
- Annual community tree planting events: The DNERR has worked with community volunteers and organizations to assist with our restoration activities onsite.

APPENDIX G

Bombay Hook NWR	Agreement No.: **51550-B-J001**
	Acquisition Request #: BHWR0019
2591 Whitehall Neck Road Smyrna, DE 19977	Fund Source: 51550-1261-0000 **$6,900** 001 51550-1262-0000 **$25,000** 002 51560-1261-0000 **$10,000** 003 51560-1263-0000 **$15,000** 004 51550-1261-R5FS **$50,000** 005
Refuge Congressional District 00	BOC/ABC/ Fiscal Year: ~~252R~~ 411C/V5/2010
DUN: 069439474	Amount: **$ 106,900**

ENTERED
DEC 10 2010
G. Hubley

COOPERATIVE AGREEMENT
between the
U.S. FISH AND WILDLIFE SERVICE
Bombay Hook NWR
and
Delaware Department of Natural Resources and Environmental Control

I. RECIPIENT:

Type of Recipient: State Government

Delaware Department of Natural Resources and Environmental Control – Coastal Programs
Robert W. Scarborough, Ph.D., Environmental Scientist IV/Research Coordinator
89 Kings Highway
Dover, Delaware 19901
Phone: 302-739-9283
Fax: 302-739-2048

II. ADDITIONAL FINANCIAL DATA:

Tax Identification No: [51-6000279]
Catalog of Federal Domestic Assistance (CFDA) Number: 15.614

III. AUTHORITY and PURPOSE:

This Agreement between the U.S. Department of the Interior, Fish and Wildlife Service (Service) and Delaware Coastal Program/De National Estuarine Research Reserve (DCP/DE NERR), is entered into under the authority of the Fish and Wildlife Improvement Act of 1978, as amended (16 U.S.C. 753), Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 4601-4 through 11), the Migratory Bird Treaty Act, 16 USC 709 a, to manage migratory bird resources, the Fish and Wildlife Coordination Act, 16 USC 661 to 667e, and the National Wildlife Refuge System Improvement Act of 1997 to ensure timely and effective cooperation and collaboration with state agencies during the course of managing refuges [Public Law 105-57, Sec. 5 (a)(3)(M)].

Background of Issues/Objectives:
The purpose of this agreement is to continue collecting and building on recent climate change and sea-level rise scientific data obtained in 2009 and spring of 2010 on the Coastal Delaware NWR Complex (Bombay Hook NWR and Prime Hook NWR). This work was initiated by DCP/DE NERR under a cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) grant in FY 2009, at no cost to the Service, to examine the sustainability of both state and federally managed coastal impoundments in Delaware. The goal of the CICEET study and this 5-year agreement was/is to assess the vulnerability of Delaware's coastal impoundments and adjoining tidal marshlands to climate change and sea-level rise using a combination of field observations and predictive modeling, and to support Region 5-Coastal Wetland Impoundment and Sea-Level Rise Structured Decision Making (SDM) Case Study by providing the technical and scientific data needed for a refuge SDM-monitoring program on the Coastal Delaware NWR Complex.

Service Climate Change Responsibilities
The Service has accepted future sea-level rise and climate change challenges to conserve fish and wildlife in rapidly changing climate scenarios through writing and implementing its "Climate Change Strategic Plan." The responsibility of the Service to wildlife conservation in the face of climate change and accelerated sea-level rise is locally realized through this cooperative agreement by accessing climate science, modeling, and coastal management experts and developing a climate science partnership with the state's Coastal Program and National Estuarine Research Reserve Network. This agreement also serves to implement newly developed climate change objectives and strategies delineated in refuge Comprehensive Conservations Plans (CCPs) and Habitat Management Plans (HMPs).

This agreement also provides climate change outreach opportunities from real-time and archived storm inundation and other climate change related information that can be used on publicly-accessible online forums to share timely local climate change information and refuge-specific water level data with the public. These forums include the Delaware Environmental Observing System (DEOS) and the two coastal refuge websites.

Experience/Expertise of Recipient:
The certified geologist, modeling, research and coastal management scientists and engineers of the Delaware Coastal Program and DE NERR are the state's experts currently collecting scientific data that is guiding "Delaware's Sea-Level Rise Adaptation Policy." These scientists and experts have developed refined SLAMM products for Prime Hook NWR. They are currently determining the topography and tidal flooding characteristics of representative state and federal coastal impoundments

and adjacent tidal marshes, quantifying rates of marsh accretion and organic/inorganic mass accumulation in these areas averaged over the past 50-100 years using downcore profiles of radionuclides ^{210}Pb and ^{137}Cs, and establishing a DE NERR grid of surface elevation monitoring sites (SETs) throughout the state.

The Agreement is for limited financial support for continuation and expansion of the activities described above, and outlined in more detail under the Scope of Work.

IV. SCOPE of WORK:

The Recipient's proposal and budget dated June 23, 2010 (including any revision accepted by the program office), is hereby incorporated into this agreement as an integral part of this project. Recipient shall furnish the necessary personnel, materials and services, and do all things necessary to accomplish the following program objectives for each refuge in the Coastal Delaware NWR Complex:

Prime Hook NWR:

1. Design and installation of real-time water level and salinity monitoring network (Year 1)
2. Design and installation of sediment elevation table (SET) network (Year 1-3)
3. Design and develop SOPs to measure Suspended Sediment Concentration (SSC) and select nutrients (Year 1)
4. Training of Refuge personnel in proper collection, QA/QC, and primary data analysis for all monitoring networks (Year 1-2)
5. Perform a series of salinity transects in freshwater supply tributaries and across refuge impoundments (Year 1-2)
6. Collect and analyze sediment (radionuclide) cores to assess long-term accretion data (Yr 1-2)
7. Modify and supplement monitoring programs for any changes in Refuge management (Yrs 1-5)
8. Assist in acquiring expert technical support for public outreach when any proposed changes in Refuge management occur (Yrs 1-5)

Bombay Hook NWR:

1. Assist in acquisition of low-tide LIDAR data (Yrs 1-3 dependent on funding)
2. Perform marsh elevation transects (Year 2)
3. Design and assist in data collection of marsh health assessment in relation to sea-level rise (Yrs 1-3)
4. Quantify the flow patterns in the interior marsh waterways (Yrs 1-2)
5. Assist in acquisition (dependent on funding) and technical evaluation of hydrodynamic modeling of the refuge (Yrs 3-5)
6. Design and installation of sediment elevation table (SET) network (Yrs 3-5)
7. Collect and analyze sediment (radionuclide) cores to assess long-term accretion data (Yrs 2-4)
8. Modify and supplement monitoring programs for any changes in Refuge management (Yrs 1-5)
9. Assist in acquiring expert technical support for public outreach when any proposed changes in Refuge management occur (Yrs 1-5)

Description of Work: Itemized work descriptions below follow the same numbering as the program objectives outlined above. An itemized budget for scope of work items is attached with this agreement.

The Recipient will: *(Service contribution to the work is defined in parentheses where required)*:

Prime Hook NWR:

1. Water Level & Salinity Monitoring: Install 5 real-time stations monitoring water depth, temperature, and salinity and 1 station measuring water depth, temperature, salinity, dissolved oxygen. These stations would have real-time communication via cellular phone connections to an IP address. DCP will assist with installation of the monitoring stations (*Refuge staff will assist in building monitoring platforms*) and will provide technical assistance and training on maintenance of the equipment. Collection of data and facilitation of online data access will be provided through YSI, a separate contractor that specializes in this service (*Refuge will coordinate and administer YSI contract separately from this agreement*). **[$2,250** – independent of separate YSI contract]
2. Sediment Elevation Tables: The sediment elevation table project will be carried out over three years with the first year involving the purchase and installation of 9 SETS in Units I and II. In the second year 6 SETS will be installed in Unit IV and the eastern portion of Unit III. In the third year 3 additional SETS will be installed in the western portion of Unit III. In year I feldspar marker layers will be placed at proposed SET locations throughout Unit IV. *(Refuge staff will build auxiliary platforms and access walk-ways to SET locations)*. **[$14,750]**
3. SSC & Nutrient Monitoring: Standard Operating Procedures (SOP) will be developed and sites selected to monitor suspended sediment concentration (SSC) and nutrients at key locations in the Refuge. Training on the implementation of the SOP will be provided. One ISCO automated sampler will be purchased for the Refuge to be used to take storm and diel (24-hour) samples. Cost estimates are for 20 grab samples a year at 5 sites and 6 storm samples (series of 12 samples per storm) per year for one site. The samples will be analyzed by the Virginia Institute of Marine Science Analytical Service Center for the following parameters: Ammonium, Nitrate & Nitrite, Ortho-phosphorus, Total Dissolved Nitrogen, Phosphorus, and Chlorophyll A/Pheophyton (CHL in grab samples only). **[$13,750]**
4. Monitoring Training: Training will be provided to Refuge staff in proper data collection, sensor calibration, and quality assurance. This training will cover the SETs, water level and salinity network, nutrient, and SCC sampling. **[$750]**
5. Salinity Transects: Using a flow-through system provided by DCP, a series of salinity transects will be taken across Units II & III as conditions permit. Additional transects will be taken as far inland as possible of the tributaries supplying freshwater to the impoundments. Impoundment analysis may involve multiple transects to capture changes in salinity regime due to natural occurrences or from impoundment management actions. The data will be analyzed by DCP and provided to the Refuge in tabular and GIS based formats. If there are any changes in Refuge management policy that would require or benefit from changes in existing or additional monitoring DCP will develop new monitoring programs and protocols. (*Samples for SSC will be taken simultaneously for analysis by Refuge staff. The Refuge will provide watercraft to access remote areas and an operator for some transects*). **[$1250]**
6. Sediment Coring: Sediment coring will be completed in Yr 1. These cores ranging 1-2 meters will be collected and processed by DCP staff, and then radionuclide dated by the University of Delaware. Three additional cores are needed to complete the statistical series at Prime Hook. Long-term accretion data will be provided to the Refuge. **[$8250]**

7. If the Refuge requires technical support or assistance in public outreach for any proposed changes in management strategies the DCP will either provide the support or assist in locating and involving the appropriate experts, companies or agencies.

Bombay Hook NWR:

1. LiDAR Data Acquisition & Marsh Elevation Transects: The Delaware Coastal Program will work with the Refuge and any other governmental or non-governmental organization willing to participate to acquire LIDAR elevation data for the Refuge. The data collection must occur within a low-tide window in the late winter for optimum data accuracy and usability. The deliverable will include the raw data in LAS format, bare earth DEM and accompanying ortho-photography. DCP will perform several transects across the refuge marsh and impoundments, at the time of LIDAR data acquisition, to assess the accuracy and develop corrections for the LIDAR elevation data if necessary. The transect data in GIS format with any correction algorithms will be provided to the Refuge. **[$50,000 estimated to cover both refuges]**
2. Marsh Health Assessment: Using the DCP developed Marsh Vulnerability Index (MVI), DCP staff will design a sampling protocol and instruct Refuge staff on biomass sampling and analysis procedures. DCP staff will perform elevation measurements at sampling sites to calibrate the MVI for the area. Using the collected data and best available elevation data DCP will provide to the Refuge, in GIS format, images of the Refuge marsh based on marsh health and likely survivability against sea level rise. **[$1450]**
3. Hydrodynamic Analysis & Modeling: The DCP will continue to collect and analyze flow and water level data from select location within the Refuge. This information will be used to quantify the tidal regime and flow patterns in the Leatherberry Flats area. This information will be provide to the Refuge and used for any hydrodynamic modeling done for the Refuge. DCP will maintain the acoustic Doppler current profiles and perform any additional cross-sectional flow profiles that are needed. (*Refuge staff will be responsible for monitoring the water level recorders.*). Working with Refuge staff, DCP will assist in the design, contracting and evaluation of a hydrodynamic model of the tidal waters in the Refuge. *(This is dependent on acquisition of additional funding)* DCP experience in this field and use of expert contractors will facilitate the performance of this work. The emphasis of the model will be to quantify the sediment transport within the marsh and the consequences on marsh survivability. **[$1250]**
4. Surface Elevation Tables: Over years 3-5 DCP will purchase and install 6 SETs around the Leatherberry Flats area (Yr 3), and install 3 additional SETs in an area of healthy marsh (Yr 4). In year 5 additional SETs will be installed in impoundments. Training will be provided to Refuge staff to enable them to monitor SETS. *(Refuge staff will build auxiliary platforms and access walk-ways to SET locations. Once trained, refuge staff will collect marsh elevation data.)* [projected for Year 3 if funds become available]
5. Sediment Coring: A series of sediment coring (1-2 meters deep) will be collected and processed by DCP, and then radionuclide dated by the University of Delaware. 18 cores will be taken to characterize the areas of marsh loss versus adjacent areas and tidal marsh vs. impoundments. Long-term accretion data will be provided to the Refuge. **[$13,200]**
6. If there are any changes in Refuge management policy that would require or benefit from changes in existing or additional monitoring DCP will develop new monitoring programs and protocols. If the Refuge requires technical support or assistance in public outreach for any proposed changes in management strategies the DCP will either provide the support or assist in locating and involving the appropriate experts, companies or agencies.

V. REPORTS:

A. Quarterly Reports: The Recipient shall submit quarterly progress reports to the Service Project Officer that summarizes activities for the reporting period, including problems encountered and efforts undertaken for their solution.

B. Final Report: The Recipient shall submit a final report to the Service Project Officer that summarizes accomplishments. Recipient will also provide one (1) copy of all materials produced during the funded period, and one (1) copy of all news articles published about the project. Recipient shall submit the final report to the Service Project Officer by December 31, 2015.

C. Recipients shall submit, within 90 calendar days after the project completion date, all financial, performance, and other reports as required by the terms and conditions of the agreement. The recipient shall account for any real and personal property acquired with Federal funds or received from the Federal Government.

D. Recipients shall immediately notify the Service Project Officer of developments that have a significant impact on the activities. Also, notification shall be given in the case of problems, delays, or adverse conditions that materially impair the ability to meet the objectives of the agreement. This notification shall include a statement of the action taken or contemplated, and any assistance needed to resolve the situation.]

VI. PERIOD OF PERFORMANCE:

The period of this Agreement is from the date of final signature of the Service through September 30, 2015, beginning on the date of the last signature below (but not to exceed 5 years total).

VII. FINANCIAL ADMINISTRATION:

A. Service Funding: The total funding contributed by the Service is $106,900.00. The Recipient shall not accrue expenditures to be charged to the Service nor shall the Service be obligated to reimburse the Recipient for expenditures in excess of this obligated amount.

B. Other Contributions: Incorporate Recipient's cost-sharing contribution to the Agreement, whether in actual dollars or in-kind services, personnel, etc.]

The DCP will provide temporary use of some equipment associated with the tasks outlined above. The DCP is likely to contribute an unspecified amount of staff time not explicitly defined within the scope-of-work. In-kind contribution of DCP seasonal staff time also has not been included in this agreement directly, and represents additional in-kind contribution.

C. Travel Costs: Travel expenses incurred by the Recipient exclusively in direct performance of this Agreement shall not exceed the Recipient's standard, written, travel policy or the rates listed in the Government Travel Regulations.

D. Payment Schedule: Reimbursable payments will be made by electronic transfer to the Recipient's account on a monthly/quarterly basis. All Recipients, which are not currently receiving

funds electronically from the Department of the Interior or Fish and Wildlife Service, are responsible for completing a SF 3881, ACH (Automated Clearing House) Miscellaneous Payment Enrollment Form, and forwarding it to the Service Project Officer. The Recipient shall submit an original and two copies of any requests for payment to the Service Project Officer for approval and transmittal to the paying office. All such requests for payment shall include a reference to the Agreement No. (listed on page one of this document).

E. Subgrants/Contracts: (If applicable): N/A [Identification of any proposed sub-recipients, including not-to-exceed amounts authorized by pre-award negotiations.]

F. Consultant Services: (If applicable): N/A [Identification of consultants, including names and not-to-exceed amounts authorized by pre-award negotiations.]

G. Data in Support of Invoice: Standard Form 270, Request for Advance or Reimbursement, is for use in requesting advance or reimbursement payment. Either this form or your standard invoice can be used. The Recipient shall furnish the following minimum information in support of all costs invoiced: The period of performance for the costs claimed, current and cumulative expenditures by cost categories in the approved budget, and any other supporting data for unusual expenditures.

H. Expenditure of Funds: Recipient shall expend funds as shown in the Recipient's proposal unless modified by the Service Program Official. At the end of the period of performance, Recipient shall refund any unused funds to the U.S. Government. Funds shall not be used for travel by U.S. Government personnel.

VIII. GOVERNMENT FURNISHED PROPERTY:

The Service has not authorized the Recipient to incur expenses for capital equipment/ property to be chargeable to the FWS.

IX. PROJECT OFFICERS:

A. The Service Project Officer is responsible for administering the performance of work under this Agreement. However, no understanding, agreement, modification, change order, or other matter deviating from the terms of this Agreement shall be effective or binding upon the Government unless formalized by proper documentation executed by the Service Program Official.

On all matters that pertain to the Agreement's terms, the Recipient shall communicate with the Program Official. Whenever, in the opinion of the Recipient, the Project Officer requests effort outside the scope of the Agreement, the Recipient shall so advise the Program Official. If there still exists a disagreement as to proper work coverage, the Recipient, in writing, shall notify the Grants Officer immediately. Proceeding with work outside the terms and conditions of the Agreement could result in nonpayment of invoices.

B. Project Officer for the U.S. Fish and Wildlife Service:
Susan Guiteras, Supervisory Wildlife Biologist
Bombay Hook NWR
2591 Whitehall Neck Rd.
Smyrna, DE 19977
Phone: 302-653-9345

Program Official for the U.S. Fish and Wildlife Service:
Lamar Gore, Assistant Refuge Supervisor
Northeast Regional Office
Hadley, MA 01035
413-253-8542

B. Project Officer for Recipient:

Delaware Department of Natural Resources and Environmental Control – Coastal Program
Robert W. Scarborough, Ph.D., Environmental Scientist IV/Research Coordinator
89 Kings Highway
Dover, Delaware 19901
Phone: 302-739-3436
Fax: 302-739-3446

X. AMENDMENTS AND MODIFICATIONS:

Mutual agreement of the parties may amend this agreement. Either party may propose modifications or renewals anytime during performance and shall become effective upon the written approval of both parties.

XI. TERMINATION:

Either party may terminate this agreement following thirty (30) days written notification of its intent to withdraw support. In which case, the parties shall agree upon the termination conditions, including the effective date and, in the case of partial termination, the portion to be terminated.

The Service may unilaterally terminate this Agreement in whole or in part, if the Recipient materially fails to comply with the terms and condition of the award, or if a determination is made that it is in the best interest of the Service to terminate.

XII. SPECIAL PROVISIONS:

A. Title 44, U.S. Code, Section 501, requires Recipients must accomplish all printing and publishing through the Government Printing Office (GPO), if Federal funds are used. Therefore, the Recipient shall submit one complete copy of items to be printed for public distribution in print-ready format. The Recipient shall also submit the distribution list (complete with names and addresses), and any special instructions for printing. Acceptable formats include: WordPerfect or Word for text; Pagemaker or Quark Express for graphics; Illustrator, freehand or hardcopy for images; Photoshop, actual prints or slides for photographs.

B. Publication of any reports or parts thereof by Recipient's personnel shall be subject to Service review and comment. Authorship shall not incur any privileges of copyright nor restriction on distribution. Appropriate credits to the United States Department of the Interior, Fish and Wildlife Service, shall be in any formally published article providing the Service does not otherwise feel it appropriate to issue a disclaimer.

C. The Government reserves the right to reproduce and distribute, for its own purposes, any product(s) resulting from this agreement. These products may include, but not be limited to, leaflets, booklets, video recordings, slide presentations, or posters. The Recipient agrees, for a period not to exceed six months after the completion date of this agreement, to provide to the Government at its request and at no cost, camera-ready copy of any printed material produced under this agreement.

D. All documents approved for printing shall bear the appropriate Service logo, supplied by the Project Officer, on the first page inside the cover with the following statement:
"Partial funding for this program is supported by a grant/cooperative agreement from the U.S. Department of the Interior, Fish and Wildlife Service."

E. This Agreement and the obligations of the Service hereunder shall be subject to the availability of funding and nothing herein contained shall be construed as binding the Service to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this Agreement for the fiscal year, or to involve the Service in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

F. Two (2) copies of each publication produced under this Agreement shall be sent to the Natural Resources Library and the Fish and Wildlife Reference Service with a transmittal that identifies the sender and the publication. The addresses are:

U.S. Department of the Interior
Natural Resources Library Division of Information and Library Services
Gifts and Exchanges Section
1849 C Street, N. W.
Washington, D.C. 20240

Fish and Wildlife Service
Reference Service
Suite 110
5430 Grosvenor Lane
Bethesda, MD 20814-2158

XIII. GENERAL PROVISIONS:

A. The Recipient shall comply with the Code of Federal Regulation 43, Part 12, Administrative and Audit Requirements and Cost Principles for Assistance Agreements. As stated in 43 CFR 12,

Native Indian Tribes, State Governments and Local governments will follow the Administrative Principles contained in OMB Circular A-102, the Cost Principles of 2 CFR 225 and the Audit Requirements contained in OMB Circular A-133.

Furthermore, the Recipient agrees to comply with the following public policy compliance requirements, when applicable:

B. Each party agrees that it will be responsible for its own acts and the results thereof and shall not be responsible for the acts of the other party and the results thereof. Each party, therefore, agrees, to the extent authorized by applicable law (as specified below), the recipient will assume all risks and liability to itself, its agents or employees, for any injury to persons or property resulting from any operations of its agents or employees under this agreement, and for any loss, cost, damage, or expense resulting at any time from any and all causes due to any acts, or negligence, or the failure to exercise proper precautions of or by itself or its own agents to this Agreement.

The liability of the Federal Government will be governed by the Federal Tort Claims Act (28 U.S.C. 2761). The liability of the Recipient will be governed by applicable State statutes.

XIV. CERTIFICATIONS:

The Certifications Applicable to Federal Domestic Grants and Cooperative Agreements executed by the Recipient is a part of this Agreement.

In witness whereof, each party has caused this Agreement to be executed by an authorized official on the day and year set forth below their signature.

U.S. FISH AND WILDLIFE SERVICE

Lamar Gore

Signature

Lamar B Gore

Typed or Printed Name

ACTING Asst. Refuge Supervisor

Typed or Printed Title

12/10/10

Date

RECIPIENT

Signature

Robert J. Zimmerman

Chief of Operations

12/10/2010

Date

Estimated Budget

Estimated Cost, exclusive of DCP staff salary (*Tasks pending additional outside funding)

Project	Location	Year 1	Year 2	Year 3	Year 4	Year 5
Water Level & Salinity Monitoring Network	Prime Hook	1,000	1,000	1,000	1,000	1,000
Sediment Elevation tables (9,6,3)	Prime Hook	13,500	9,000	4,500		
SSC & Nutrient Monitoring	Prime Hook	12,500	7500	7500	7500	7500
Monitoring Training (associated with SET and SSC/Nutrient Monitoring)	Prime Hook	0				
Salinity transects (Conducted with SSC & Nutrient Monitoring	Prime Hook	0	0			
Sediment Coring	Prime Hook	7000	3000			
Monitoring Modification for Changes in Management	Prime Hook	TBD	TBD	TBD	TBD	TBD
Technical Support and Outreach	Prime Hook	TBD	TBD	TBD	TBD	TBD
LiDAR Data acquisition	Bombay Hook	50,000				
Marsh Elevation transects	Bombay Hook		0			
Marsh Health Assessment	Bombay Hook	200	200	200		
Hydrodynamic analysis	Bombay Hook	0	0			
Hydrodynamic modeling	Bombay Hook			*		
Sediment Elevation tables (6,3,3)	Bombay Hook			9,000	4,500	4,500
Sediment Coring	Bombay Hook	13,200	6,500	20000	20000	
Supplemental Monitoring for Changes in Management	Bombay Hook	TBD	TBD	TBD	TBD	TBD
Technical Support and Outreach	Bombay Hook	TBD	TBD	TBD	TBD	TBD
Total – Equipment, Supplies, Services, etc		$97,400	$40,700	$28,700	$28,500	$8,500

DCP Staff costs per year, exclusive of USFW support

Project	Location	Year 1	Year 2	Year 3	Year 4	Year 5
Water Level & Salinity Monitoring Network	Prime Hook	1250	250	250	250	250
Sediment Elevation tables	Prime Hook	1250	1250	750		
SSC & Nutrient Monitoring	Prime Hook	1250	250	250		
Monitoring Training	Prime Hook	750				
Salinity transects	Prime Hook	1250	1250			
Deep Sediment Coring	Prime Hook	1250	1250			
Monitoring Modification for Changes in Management	Prime Hook	TBD	TBD	TBD	TBD	TBD
Technical Support and Outreach	Prime Hook	TBD	TBD	TBD	TBD	TBD
LiDAR Data acquisition	Bombay Hook	TBD	TBD	TBD		
Marsh Elevation transects	Bombay Hook		2500			
Marsh Health Assessment	Bombay Hook	1250	1250	1250		
Hydrodynamic analysis	Bombay Hook	1250	1250			
Hydrodynamic modeling	Bombay Hook			TBD	TBD	TBD
Sediment Elevation tables	Bombay Hook			1250	1250	1250
Deep Sediment Coring	Bombay Hook		1250	1250	1250	
Supplemental Monitoring for Changes in Management	Bombay Hook	TBD	TBD	TBD	TBD	TBD
Technical Support and Outreach	Bombay Hook	TBD	TBD	TBD	TBD	TBD
Total - Staff Salary ($250/day)		$ 9,500	$10,500	$ 5,000	$ 2,750	$ 1,500
Grand Total		**$106,900**	**$51,200**	**$33,700**	**$33,250**	**$10,500**

Bombay Hook NWR	New Agreement No: F11AC00296
	Old Agreement No.: 51550-B-J001
2591 Whitehall Neck Rd.	Amendment #: 1
Smyrna, DE 19977	Purchase Request #: 0020014894
Congressional District - 00	Cost Center: FF05RBMH00 ($25,000) FF05RDIS00 ($5,000)
Delaware Department of Natural Resources and Environmental Control (DNREC) – Coastal Programs 89 Kings Highway Dover, Delaware 19901	CFDA: 15.614
	BOC: 411C
	WBS: FGRS12610500000T2 ($25,000) FXRS126109PC080S4 ($5,000)
	Partial Fund: 123
	DUNS: 069439474
	Amount: $ 30,000

EMAIL, PHONE, and FAX OF RECIPIENT:
Contact Name: Robert W. Scarborough, Ph.D., Environmental Scientist IV/Research Coordinator Email: Bob.Scarborough@state.de.us Phone: 302-739-9283 Fax: 302-739-2048

ISSUED BY: US Fish and Wildlife Service
Contracting and General Services
300 Westgate Center Drive
Hadley, MA 01035-9589

EFFECTIVE DATE OF AMENDMENT: Upon final signature below.
EXPIRATION DATE OF AMENDMENT: **9/30/2015**
EXPIRATION DATE OF AGREEMENT: **9/30/2015**

Recipient __ is not, _X_ is required to sign this document and return 1 copy to the issuing office.

DESCRIPTON OF AMENDMENT:

This Amendment is initiated to incorporate the following change/s:

Add an additional $10,000 to Water Level & Salinity Monitoring:

- In addition to the tasks in this category described in the original agreement, DNREC Coastal Program staff will assist with the collection of additional hydrological data, such as flow velocity, at 10 or more sites throughout the wetland complex. These sites include water control structures, road culverts, shoreline breaches/inlets, and freshwater creeks. This data is necessary to develop a hydrodynamic model to evaluate refuge restoration alternatives.
- Associated budget items: Hydrodynamic Modeling (DCP Staff costs)

Add an additional $10,000 to Perform marsh elevation transects

- In addition to the tasks in this category described in the original agreement, DNREC Coastal Program staff will assist with the collection of additional marsh elevation and bathymetry data, utilizing RTK survey equipment and underwater sonar equipment. This data will update and enhance elevation data collected previously, to evaluate changes in the intervening time and provide data for a hydrodynamic model to evaluate refuge restoration alternatives.
- Associated budget item: Marsh Elevation Transects (DCP Staff costs)

Add an additional $5,000 to Modify and supplement monitoring programs

- Changes in Refuge management policy will require changes in existing monitoring and additional monitoring. DCP will develop these new monitoring programs and protocols.
- Associated budget items: Monitoring Modification for Changes in Management and Monitoring Training (DCP Staff costs)

Add an additional $5,000 to Expert technical support for public outreach

- Specifically as it is related to proposed wetland restoration across a large portion of the refuge, as the Refuge requires technical support or assistance in public outreach for any proposed changes in management strategies the DCP will either provide the support or assist in locating and involving the appropriate experts, companies or agencies.
- Associated budget item: Technical Support and Outreach (DCP Staff costs)

The total amount obligated on this agreement is now $136,900.

All other terms and conditions, not listed herein, remain unchanged and in effect.

Recipient Signature
FOR Name: Robert J. Zimmerman
Title: Chief Operating Officer
Date: 8/31/12

USFWS
Name: Scott Kahan
Title: Regional Chief, NWRS
Date: 8/31/2012

MEMORANDUM OF AGREEMENT

Between
Delaware Native Plant Society
And the
Department of Natural Resources & Environmental Control,
Delaware Coastal Programs

It is agreed on this _____ day of _____, 2011 that this Memorandum of Agreement ("Memorandum") is between the Delaware Coastal Programs (DCP) and the Delaware Native Plant Society (DNPS). It is effective on the date signed by all parties.

It is believed that Delaware has lost a higher percentage of its native plant species than any other state in the nation. An estimated 41 percent of the state's plant species are rare or uncommon and are in need of protection. Delaware's native plants are under severe threat primarily due to the direct loss of the State's wetland and forest habitat. (Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation, Environmental Law Institute Research Report, 1999). Native habitat loss, caused by activities such as agriculture, road-building, residential and commercial development, logging, and the introduction of exotic species, are the primary cause of biodiversity loss in Delaware. To help address this problem, efforts are needed to protect native habitats and to restore degraded habitat areas through native species restoration programs. The DNPS will propagate native plants from seeds and occasionally cuttings collected from intact habitats in Delaware and occasionally in Maryland. If seeds are collected in Maryland the DNPS will restrict their collections to the Delmarva Peninsula.

The Delaware Coastal Programs, through their implementation of various sections of the Federal Coastal Zone Management Act, are charged with the responsibility to help manage conflicts between the use of irreplaceable resources by humans and the natural importance of these resources in the coastal management area. As such, it coordinates, encourages, and when possible provides resources, to promote programs that help address pressing coastal issues such as the loss of the State's biodiversity.

The Delaware Native Plant Society is a non-for-profit organization that promotes the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. As part of their mission, DNPS has established a native plant nursery on a site at the Delaware National Estuarine Research Reserve's St. Jones Reserve Component where propagated plants are provided at cost for native habitat restoration projects.

The mutual goals and common purpose of these organizations provide the basis and need for this Memorandum of Agreement.

IT IS MUTUALLY AGREED BY THE PARTIES THAT:

The Delaware Native Plant Society will:

A. Provide technical guidance and reimburse the Reserve for mutually agreed upon purchases required for the operations and maintenance of the nursery.

B. All DNPS members working in the native plant nursery must be registered volunteers of the DCPs' Delaware National Estuarine Research Reserve. Registration forms with all needed emergency contact information must be completed and approved prior to any work on the Reserve property.

C. Organize and provide an annual accounting report to DCP outlining annual plant sales at the St. Jones Reserve Component of the Delaware National Estuarine Research Reserve. In addition, the DNPS will provide documentation of its not-for-profit status (501-C) and immediately inform the DCP if any changes occur related to this status.

D. The DNPS members provide guidance to the DCP, upon DCP's request, in regards to native forest restoration projects in accordance with the Blackbird Creek Reserve Ecological Restoration Master Plan (2007) and plant species identification in the Reserve's Herbarium collection.

E. Notify the DCP of any public events scheduled to be held at the St. Jones Reserve at least 30 days prior to said event. Previously scheduled events hosted by the DCP will receive priority scheduling. DNPS recognizes that any appropriate public event hosted by DNPS at the DNERR site may be publicized by DCP.

F. Provide general guidance and other services, as they may be available and appropriate.

The Delaware Coastal Programs will:

A. Provide a two keys to the Delaware National Estuarine Research Reserve for the exclusive purpose of ingress and egress by DNPS members to access the native plant nursery. The keys will open the gate and the front doors of the main building for access to the restrooms only. Additional access must be requested by DNPS.

B. Provide coordination and scheduling of volunteer time in the nursery operation and maintenance activities. This may include staff assistance for roto-tilling areas, activities needing a small front-end loader, fence construction & repairs, and other nursery operation and maintenance activities.

C. Provide signage and assist in the development of interpretive and educational materials related to the plant nursery and the importance it can play in habitat restoration and the protection of Delaware's biodiversity.

D. Immediately contact the DNPS point of contact in the event of any unforeseen problems impacting the nursery.

E. Provide general guidance and other services, as they may be available and appropriate.

For good consideration it is agreed between the parties that:

A. The DCP and DNPS reserve the right to cancel this agreement by written notice, given at least 90 days written notice prior to cancellation. This may be due to unexpected difficulties in implementing the agreement or due to non-compliance with the MOA.

B. Donations of plant materials and volunteer hours benefit both organizations. The DCP may, after coordination with the DNPS, use a portion of volunteer hours and material donations as matching funds for the Research Reserve operations grant.

C. The term of this agreement will be for approximately 3 years and will automatically terminate without written notice on January 1, 2014. The DCP reserves the right to extend this agreement in three-year increments based on an evaluation of the project success and provided it is done in writing and with mutual consent of the DNPS.

Department of Natural Resources and Environmental Control,
Delaware Coastal Programs

_____	_____
Witness	Sarah W. Cooksey, Administrator Delaware Coastal Programs

Delaware Native Plant Society

_____	_____
Witness	William McAvoy, President Delaware Native Plant Society

MEMORANDUM OF AGREEMENT

Between
Delaware Native Plant Society
And the
Department of Natural Resources & Environmental Control,
Delaware Coastal Programs

It is agreed on this 18th day of January, 2011 that this Memorandum of Agreement ("Memorandum") is between the Delaware Coastal Programs (DCP) and the Delaware Native Plant Society (DNPS). It is effective on the date signed by all parties.

It is believed that Delaware has lost a higher percentage of its native plant species than any other state in the nation. An estimated 41 percent of the state's plant species are rare or uncommon and are in need of protection. Delaware's native plants are under severe threat primarily due to the direct loss of the State's wetland and forest habitat. (Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation, Environmental Law Institute Research Report, 1999). Native habitat loss, caused by activities such as agriculture, road-building, residential and commercial development, logging, and the introduction of exotic species, are the primary cause of biodiversity loss in Delaware. To help address this problem, efforts are needed to protect native habitats and to restore degraded habitat areas through native species restoration programs. The DNPS will propagate native plants from seeds and occasionally cuttings collected from intact habitats in Delaware and occasionally in Maryland. If seeds are collected in Maryland the DNPS will restrict their collections to the Delmarva Peninsula.

The Delaware Coastal Programs, through their implementation of various sections of the Federal Coastal Zone Management Act, are charged with the responsibility to help manage conflicts between the use of irreplaceable resources by humans and the natural importance of these resources in the coastal management area. As such, it coordinates, encourages, and when possible provides resources, to promote programs that help address pressing coastal issues such as the loss of the State's biodiversity.

The Delaware Native Plant Society is a non-for-profit organization that promotes the preservation, conservation, restoration, and propagation of Delaware's native plants and plant communities. As part of their mission, DNPS has established a native plant nursery on a site at the Delaware National Estuarine Research Reserve's St. Jones Reserve Component where propagated plants are provided at cost for native habitat restoration projects.

The mutual goals and common purpose of these organizations provide the basis and need for this Memorandum of Agreement.

IT IS MUTUALLY AGREED BY THE PARTIES THAT:

The Delaware Native Plant Society will:

A. Provide technical guidance and reimburse the Reserve for mutually agreed upon purchases required for the operations and maintenance of the nursery.

B. All DNPS members working in the native plant nursery must be registered volunteers of the DCPs' Delaware National Estuarine Research Reserve. Registration forms with all needed emergency contact information must be completed and approved prior to any work on the Reserve property.

C. Organize and provide an annual accounting report to DCP outlining annual plant sales at the St. Jones Reserve Component of the Delaware National Estuarine Research Reserve. In addition, the DNPS will provide documentation of its not-for-profit status (501-C) and immediately inform the DCP if any changes occur related to this status.

D. The DNPS members provide guidance to the DCP, upon DCP's request, in regards to native forest restoration projects in accordance with the Blackbird Creek Reserve Ecological Restoration Master Plan (2007) and plant species identification in the Reserve's Herbarium collection.

E. Notify the DCP of any public events scheduled to be held at the St. Jones Reserve at least 30 days prior to said event. Previously scheduled events hosted by the DCP will receive priority scheduling. DNPS recognizes that any appropriate public event hosted by DNPS at the DNERR site may be publicized by DCP.

F. Provide general guidance and other services, as they may be available and appropriate.

The Delaware Coastal Programs will:

A. Provide two keys to the Delaware National Estuarine Research Reserve for the exclusive purpose of ingress and egress by DNPS members to access the native plant nursery. The keys will open the gate and the front doors of the main building for access to the restrooms only. Additional access must be requested by DNPS.

B. Provide coordination and scheduling of volunteer time in the nursery operation and maintenance activities. This may include staff assistance for roto-tilling areas, activities needing a small front-end loader, fence construction & repairs, and other nursery operation and maintenance activities.

C. Provide signage and assist in the development of interpretive and educational materials related to the plant nursery and the importance it can play in habitat restoration and the protection of Delaware's biodiversity.

D. Immediately contact the DNPS point of contact in the event of any unforeseen problems impacting the nursery.

E. Provide general guidance and other services, as they may be available and appropriate.

For good consideration it is agreed between the parties that:

A. The DCP and DNPS reserve the right to cancel this agreement by written notice, given at least 90 days written notice prior to cancellation. This may be due to unexpected difficulties in implementing the agreement or due to non-compliance with the MOA.

B. Donations of plant materials and volunteer hours benefit both organizations. The DCP may, after coordination with the DNPS, use a portion of volunteer hours and material donations as matching funds for the Research Reserve operations grant.

C. The term of this agreement will be for approximately 3 years and will automatically terminate without written notice on January 1, 2014. The DCP reserves the right to extend this agreement in three-year increments based on an evaluation of the project success and provided it is done in writing and with mutual consent of the DNPS.

Department of Natural Resources and Environmental Control,
Delaware Coastal Programs

Witness

Sarah W. Cooksey, Administrator
Delaware Coastal Programs

Delaware Native Plant Society

Witness

William McAvoy, President
Delaware Native Plant Society

APPENDIX H

APPENDIX H: Public Access Policies

General Access Policy

Public access to the Reserve is permitted on a site-specific basis. The objective of controlled access is to maintain each Reserve component's integrity for research, long-term resource protection, and education while permitting traditional uses that do not conflict with Reserve goals.

Entering or remaining on lands that are under the jurisdiction of the DNERR when such lands are closed, or entering or remaining within any building, structure, or facility when such building, structure, or facility is closed, shall be prohibited without a written permit from the Reserve Manager.

No structure, facility, building, or area administered by the DNERR will be used for any activity other than that for which it was intended without prior written permission of the Reserve Manager.

The Reserve Manager may limit or close specific public-use areas, lands, waters, and facilities, and/or temporarily prohibit certain activities when such action is deemed necessary for resource management, research, education, and/or when it is in the best interest of health, safety, and the general welfare of the public.

The regulations of the NERRS allow for multiple uses of Estuarine Research Reserves to the degree compatible with each reserve's management plan and consistent with the mission and goals of the NERRS. The DNERR management plan focuses on maintaining areas as field laboratories and on developing a coordinated program of research and education.

Public access is encouraged on those parts of the Reserve that are publicly owned or that have received private landowner permission, as long as it is not to the detriment of the resource or does not interfere with approved research. Public access may be restricted in key resource-protection areas.

Future research directed at identifying resources of concern (i.e., Federal or State cultural resources) will help delineate these protection areas as well as direct research, education programs, and overall Reserve management. The Reserve Manager will develop access policies and coordinate enforcement of regulations that will help maintain natural conditions and preserve resources.

Traditional use activities (hunting, fishing, and trapping) in the DNERR may continue up to levels currently permitted under local and State laws, or under regulations in place with property owners, as long as these uses do not unduly conflict with research or educational concerns and the harvests conform to legal practices and limits. All traditional use activities are regulated and permitted through the DNREC's Division of Fish and Wildlife (DFW). Potential conflicts can best be avoided by coordination and reasonable compromise. Care should be given to managing the impacts of traditional use activities occurring in rare-species habitats or in unique biotic communities. These traditional use activities are allowed only in designated areas.

Site-Specific Policies

St Jones Reserve

The facilities at the St Jones Reserve are open to the public and provide hiking trails, hands-on interactive activities and exhibits, a recycling center, restoration demonstration areas as well as a variety of programs and volunteer opportunities for the community, teachers, students and families. The Center also supports ongoing research and monitoring, field studies, citizen monitoring programs, and training opportunities for coastal decision makers.

The general public is permitted to access outdoor facilities at the St. Jones River Reserve component, such as the boardwalk, trail, and outdoor exhibits, from dawn to dusk on a year-round basis, except as restricted for special uses. All access is for identified facilities only during posted hours; free roaming through the site is not permitted without written approval of the Reserve Manager. All areas open to the public are handicapped-accessible. All groups are advised to contact the DNERR Education Coordinator or the Reserve Manager to arrange for special programs, guided tours, meeting space, or other uses of the Visitors Center or Reserve property.

Blackbird Creek Reserve

The facilities at the Blackbird Creek Reserve are open to the public and provide several miles of hiking trails through uplands and along the marsh, a canoe/kayak launch, restoration demonstration areas as well as a variety of programs and volunteer opportunities for the community, teachers, students and families. The Reserve also supports ongoing research and monitoring, field studies, citizen monitoring programs, and training opportunities for coastal decision makers.

The general public is permitted to access outdoor facilities at the Blackbird Creek Reserve component, such as the trails, and outdoor exhibits, from dawn to dusk on a year-round basis, except as restricted for special uses. All access is for identified facilities only during posted hours; free roaming through the site is not permitted without written approval of the Reserve Manager. Stewardship Center is open to the public and is handicapped-accessible. All groups are advised to contact the DNERR Education Coordinator or the Reserve Manager to arrange for special programs, guided tours, meeting space, or other uses of the Stewardship Center or Reserve property.

Boat and Canoe Access

Access for canoe and kayak launch or retrieval is permitted only in designated locations and during times permitted for general public visitation.

The St. Jones Reserve component is easily accessed by boat launch from Scotton Landing, approximately 1.5 miles upstream of the boundary. Lebanon Landing and Legislative Landing, both further upstream, provide canoe and/or kayak access to the St. Jones River. The Delaware Bay sub-component is easily accessed by boat launch at the Town of Bowers Beach. Each of these tidal water access areas are managed by the Division of Fish and Wildlife.

The Blackbird Creek can be accessed by the canoe/kayak launch at the Blackbird Creek Reserve or by a boat launch at "The Rocks," a Division of Fish and Wildlife property several miles downstream of the Reserve boundary.

Fishing, Hunting, and Trapping

Users of the Reserve shall not disturb or remove any live animals (except for fish, game animals, furbearers, or waterfowl per fishing and hunting policies) or vegetation at any component unless it is part of an approved research or educational project and all necessary permits have been obtained.

Traditional activities of fishing, hunting, and trapping will be permitted up to levels currently permitted under local and State laws (unless these uses interfere with a research or educational activity that cannot avoid a conflict with these traditional uses). The Reserve adjoins the Ted Harvey Conservation Area, a large State hunting area managed by the Division of Fish and Wildlife. At the appropriate times of year, this Division is also responsible for ensuring that appropriate hunting regulations are followed by hunters on DNERR property.

Hunting at the St. Jones site is limited to a small land area due to the numerous public programs conducted at the Reserve. There are 5 deer stands on the property. The DFW also monitors two duck hunting blinds within the DNERR marsh. The DNERR and DFW coordinate locations and hunting seasons each year.

Hunting at the Blackbird Creek Reserve is limited to certain areas due to the numerous public programs and ongoing research at the Reserve. There are 6 deer stands on the property. The DNERR and DFW coordinate hunting seasons each year.

Other Uses

Reserve access for uses other than those listed will be permitted on a case-by-case basis. The Reserve Manager's written authorization must be received prior to initiating any other uses.

APPENDIX I

DELAWARE NATIONAL ESTUARINE RESEARCH RESERVE

COASTAL TRAINING PROGRAM STRATEGY

2012-2017

Introduction

The Delaware Coastal Training Program (CTP) at the Delaware National Estuarine Research Reserve (DNERR) was approved for implementation in April 2009. Through the support of the Reserve's staff and the strength of its partnerships, the CTP has successfully grown over the past few years to offer Delaware's coastal decision makers valuable training and assistance on several priority coastal issues.

The CTP requires a systematic program development process, involving periodic revisions to its program strategy. This document updates the CTP Strategy completed in 2009 for a five year period, from 2012 to 2017, with modifications based on its successes, partner and target audience feedback, CTP Advisory Committee recommendations, and formal and informal evaluations. This strategy document will identify the CTP's 2012-2017 goals and objectives, how the CTP will support and contribute to DNERR's goals and objectives, the CTP's current and anticipated partnerships and target audiences, and provide a description of the priority coastal issues that will be addressed by the program.

Overview of the Delaware Coastal Training Program

The Coastal Training Program addresses critical coastal resource management issues in Delaware by providing current scientific information, access to technologies and skill-building opportunities to Delawareans responsible for making decisions about the state's coastal resources. This can include partnering with other agencies and organizations to provide data relevant to current coastal issues including land use, sea level rise, climate change, and biodiversity.

The CTP's activities can range from seminars, hands-on skill training, and participatory workshops to lectures and technology demonstrations. Through these programs, coastal resource decision makers also have opportunities to share experiences, network in a multidisciplinary setting, and participate in field activities. Past workshops covered subjects such as sea level rise in Delaware, wetlands restoration techniques, public issues and conflict management, and social media skills.

The CTP's programming targets a range of audiences, such as land-use planners, elected officials, regulators, land developers, community groups, environmental non-profits, business, state agencies, and applied scientific groups. These training programs provide opportunities for professionals to network across disciplines, and develop new collaborative relationships to solve complex environmental problems.

One of the primary objectives of the CTP is to provide the best available science-based information, tools, and techniques to those individuals or groups who make important decisions regarding resources within coastal watersheds, estuaries, and near-shore waters. The CTP relies on expert speakers, including researchers, like the DNERR's Research Coordinator, resource managers, and policy makers to present the most current information at training events. Support materials are also developed to inform coastal decision-makers of current coastal and estuarine research.

Partnerships are important to the success of the program. The Delaware NERR works closely with Delaware Coastal Management Program and the Delaware Department of Natural Resources and Environmental Control's (DNREC) education staff, and a host of local partners in determining key coastal resource issues to address, as well as the identification of target audiences. Partnerships with local agencies and organizations are critical in the exchange and sharing of expertise and resources to deliver relevant and accessible training programs that meet the needs of specific groups.

The CTP periodically reviews and refines its niche in the training provider market through audience assessments, program strategy revisions, marketing plan updates, and with the guidance of its Advisory Committee (described in APPENDIX A), perspectives conveyed from partners and audiences, and advice from DNERR staff. The Delaware CTP also monitors its performance with an evaluation system, wherein staff report data in operations progress reports according to a suite of performance indicators related to increases in participant understanding, applications of learning and enhanced networking with peers and experts to inform programs.

Social and Ecological Context of the Delaware Coastal Training Program

Located on the Eastern Seaboard of the United States, Delaware is bordered by the Atlantic Ocean and Delaware Bay, as well as by the states of New Jersey, Pennsylvania and Maryland. Delaware's location affords easy access to the major metropolitan areas of the Northeast. Washington, D.C., Philadelphia, and Baltimore are all within a 2-hour drive. Though small in size, Delaware is rich in natural treasures. From the coastal beaches and dunes to freshwater wetlands and upland forests, the first state harbors a bounty of wildlife and habitats within its borders. Diversity best describes land use in the Delaware Bay and Estuary Basin. From the coastal marshes to rural farms and housing, to small towns and cities, the basin encompasses every type of land use.

Delaware is subdivided into three counties; from north to south they are New Castle, Kent County and Sussex. Each county elects its own legislative body which deals primarily in zoning and development issues. Most functions which are handled on a county-by-county basis in other states, such as court and law enforcement, have been centralized in Delaware, leading to a significant concentration of power in the Delaware state government. Wilmington is the state's largest city and its economic hub. It is located within commuting distance of both Philadelphia and Baltimore. All regions of Delaware are experiencing phenomenal growth, with Dover and the beach resorts expanding at a rapid rate.

In Delaware, there is high demand for its bounty of natural resources. The State of Delaware has been facing tremendous developmental pressures over the past decade due to an influx of businesses attracted to the state by friendly tax laws and great economic growth - making Delaware the seventh most densely populated state in the nation. By 2030, the population of Delaware is expected to be over a million people, an increase of 23% over today’s population.

This population growth and the resulting demand for new homes, jobs and services highlights the importance of improving the management of Delaware’s land and natural resources. Additionally, nearly 50 percent of Delaware’s visitors utilize coastal waters and beaches for recreational activities such as boating, fishing, sailing, sunbathing, and water skiing. Balancing development and the increasing population pressures will be one of the most important issues for the next 20 years.

Nevertheless, Delaware’s ecosystems have not always been seen as worthy of protection and conscientious management, and the increasing and competing demands upon the lands and water of our coastal zone have resulted in the loss of living marine resources, wildlife, nutrient-rich areas, permanent and adverse changes to ecological systems, decreasing open space for public use, and shoreline erosion. Increased development in the state has led to increased volumes of non-point source pollution in the form of urban runoff. The major pollutants found in runoff from urban areas include sediment, nutrients, oxygen demanding substances, road salts, metals, petroleum hydrocarbons, pathogenic bacteria and viruses. These pollutants are carried into surface waters and can cause water quality impairments. In addition to urban runoff, Delaware has had a history of problems with nutrient enrichment of inland waterbodies due to runoff as well. This problem is exacerbated by losses of wetlands to development activities, thereby reducing the system’s ability to deal with excess nutrients.

The exact acreage of Delaware's historic wetlands extent is unknown but scientific estimates show that Delaware may have lost as much as 54% of its wetlands since the 1780's. Anthropological impacts affecting wetlands overtime include but are not limited to filling from commercial, industrial and residential development; dredged material disposal; dredging for navigation; conversion of wetland forests to agriculture; alteration of hydrology and the creation of diked impoundments for water supply and wildlife management. From the early 1980's through 2007 the primary loss was that of non-tidal, forested wetlands to residential and development and agricultural conversion. Delaware continues to lose wetland acreage even with the federal 404 program. Most losses are palustrine forested wetland types regulated by the U.S. Army Corps of Engineers. Additional estuarine losses seen resulted from a possible combination of human alterations, eroding sediment, and rising sea levels leading to the conversion of vegetated wetlands to open water flats. Delaware's estuarine wetlands are well protected from human caused losses due to Delaware's "Wetlands Act" which enables the State to regulate tidal wetlands.

Delaware's coastal areas and natural resources are also particularly vulnerable to climate change, especially with respect to accelerated sea level rise, shoreline erosion, increased storm frequency and intensity, changes in rainfall, and related flooding among other potential impacts. Coastal shoreline change, rising sea levels, erosion and land subsidence are increasingly tough issues facing coastal managers, engineers, and planners charged with developing and protecting coastal habitats and communities in vulnerable coastal zones. Understanding these threats depends on early detection of vulnerabilities, and solutions will require vigorous public debate over issues such as engineering solutions, land use planning, and strategic retreat.

The impacts of sea level rise and shoreline erosion are additionally exacerbated by coastal storms such as tropical systems and nor'easters. As a result of the winds and flooding that occur in conjunction with coastal storms and their associated storm surges, tropical storms and nor'easters generate coastal damage (property damage, infrastructure, and beach loss), especially during the winter months, during very short time frames. Delaware continues to improve its preparedness and response for these types of storms through efforts such as working closely with emergency responders and local communities to improve planning and mitigation prior to events. The risks associated with coastal hazards, combined with the impacts of sea level rise are increasing as development continues to grow along the coastal areas of Delaware.

Despite the development pressures, the Delaware's coastal resources have always served as vital economic, social, aesthetic, and intrinsic purposes to Delaware. Maintaining a balance of these competing pressures and needs in the Delaware Bay's estuary while protecting the environment is one of the most trying challenges to Delaware's natural resource decision makers.

The Delaware Coastal Training Program (CTP) is designed to assist with this complex struggle by providing up-to-date scientific information and skill building opportunities to coastal decision-makers who are responsible for making decisions that affect coastal resources. By better understanding the health of our natural resources, we can better understand how to restore them and protect them from actions that cause damage. Through the CTP, the Delaware National Estuarine Research Reserves can ensure that coastal decision-makers have the knowledge and tools they need to address critical resource management issues of concern to Delaware's communities. Additional details on the development of the Delaware CTP are located in APPENDIX B.

The Coastal Training Program's Contributions to DNERR's Goals and Objectives

The overall mission of the Delaware National Estuarine Research Reserve as defined in the 2012 Management Plan is,

"Improving the understanding, stewardship and appreciation of estuarine and coastal resources in the State of Delaware and Mid-Atlantic Region."

The Delaware CTP supports this mission by providing information and training to Delaware's coastal decision makers so that they are able to make informed decisions based on the most current research available. The goals of the DNERR are to:

Goal 1: Improve the scientific understanding of estuarine and coastal ecosystems and the human influence on them.

Goal 2: Improve public awareness and environmental literacy in our communities to enable environmentally sustainable decision-making.

Goal 3: Protect, manage and restore the natural functions, diversity and cultural integrity of estuarine and coastal ecosystems within the Reserve to serve as a model site for sustainable community stewardship in the Region.

Goal 4: Improve the operations, infrastructure and stature of the Reserve.

The Coastal Training Program strives to support the goals of the DNERR by engaging and educating local decision makers with best available science to improve stewardship of coastal resources. The CTP also fosters networking and works to create strong partnerships that also enhance the success and stature of Reserve programs. In addition, the CTP works with the Reserve's Research staff to interpret and distribute DNERR research products to the coastal management community. This is accomplished by coordinating training events and technical publications. The CTP also assists in the translation and incorporation of complex science and research information into educational programs, products, and outreach opportunities. With this input, decision makers are empowered with sound science, helping them to further their efforts toward sustainable stewardship of Delaware's historical, cultural, economic and natural resources. Moreover, the CTP collaborates regionally and nationally to enrich and improve the science and information offered in its programs at the DNERR as well.

Strategic Goals of the Delaware Coastal Training Program

The Delaware Coastal Training Program's strategic goals are to:

Strategic Goal 1: Individuals or groups who make decisions regarding coastal resources will be exposed to the best available science-based information, tools, and techniques when they participate in a CTP event or activity.
Strategic Goal 2: Increased understanding of the environmental, social, and economic consequences of human activity within the coastal landscape with regard to the CTP's priority coastal issues.
Strategic Goal 3: Increase the application of science-based information, tools, and technical information in coastal decision making with regard to the CTP's priority coastal issues.
Strategic Goal 4: Increase networking and collaboration across sectors and disciplines related to decision making on priority coastal issues in Delaware.

As the program matures through increased experience, knowledge, and resources, more sophisticated tools may be implemented to market the DNERR CTP. The following planning objectives and strategies will be utilized to accomplish these strategic goals for 2012-2017:

Objective 1: The CTP will provide technical assistance and at least five training workshops per year on priority coastal issues to target audiences during the strategic planning period of 2012-2017.

Strategy 1A: The CTP will engage with Advisory Committee members annually to maintain and foster collaboration in order to provide the latest science and information on priority coastal issues;

Strategy 1B: The CTP will regularly coordinate with the Delaware Coastal Programs staff regarding past, current, and future research and decision-maker information needs

Strategy 1C: The CTP will engage with the local, state, and regional partners annually regarding past, current, and future research being conducted;

Strategy 1D: When applicable to workshop or program topics, collaborate with the Research Coordinator, Education Coordinator and the Stewardship Coordinator to present most current research and stewardship information available;

Strategy 1E: The CTP will communicate and collaborate with other NERRs staff and CTPs as appropriate to remain informed of emerging issues and decision maker needs;

Strategy 1F: The CTP will update the CTP webpage and quarterly and social media regularly to provide partners and target audiences with current information about the DNERR and CTP efforts.

Outcome – Strategic Goal 1: *Individuals or groups who make decisions regarding coastal resources will be exposed to the best available science-based information, tools, and techniques when they participate in a CTP event or activity.*

Objective 2: For each CTP training event over the next five years, at least 90% of the participating coastal decision-makers will report that their knowledge of priority coastal issues has increased as a result of attending the training event.

Strategy 2A: Conduct formal and informal needs assessments to identify the scientific and information needs of target audiences regarding priority coastal issues and identify effective means of reaching specific target audiences;

Strategy 2B: The CTP will communicate and collaborate with other NERRs staff and CTPs as appropriate to remain informed of successful training formats, tools, methods, and providers

Strategy 2C: The CTP will communicate and collaborate with the Advisory Committee and other partners as appropriate provide successful training formats, tools, methods, and speakers.

Outcome – Strategic Goal 2: *Increased understanding of the environmental, social, and economic consequences of human activity within the coastal landscape with regard to the CTP's priority coastal issues. Coastal decision makers will recognize the impact their decisions and actions have on preparing Delaware for sea level rise and climate change; protecting and restoring coastal habitat; and recognize the impact their planning decisions and actions have on coastal resources;*

Objective 3: In the strategic planning period of 2012-2017, 90% of training participants will report that they intend to apply the science-based information they obtained from CTP trainings in workshops in their coastal decision-making.

Strategy 3A: The CTP will translate emerging research and technology tailored to the needs of coastal decision-makers.

Strategy 3B: The CTP will increase the availability of management-relevant research and monitoring results for coastal decision makers

Strategy 3C: Whenever necessary, follow-up information and products for past training participants will be prepared and available as a resource (e.g. fact sheets and other informational products, webpages with related Powerpoint presentations, contact information)

Strategy 3D: The CTP will develop and evaluate innovative communication strategies and delivery methods that translate science effectively and support collaborative environmental decision-making.

Outcome – Strategic Goal 3: *Increased application of science-based information, tools, and technical information in coastal decision making with regard to the CTP's priority coastal issues.*

Objective 4: In the strategic planning period of 2012-2017, at least 80% of the participating coastal decision-makers will report that they were more than satisfied with the opportunities for networking at a CTP training or event.

Strategy 4A: The CTP will provide opportunities for networking at trainings, workshops, and events.

Strategy 4B: The CTP will engage with Advisory Committee members annually to maintain and foster collaboration and partnerships on priority coastal issues;

Strategy 4C: When applicable, American Institute of Certified Planners certification maintenance credits will be offered at trainings through a NERRs/NERRA partnership with the American Planning Association. Other continuing education credits will be offered as available from participating partners;

Strategy 4D: The CTP will participate in regional networks, including the Mid-Atlantic NERRs, such as at the Annual NERRs meeting and CTP sector meeting, at least once a year;

Outcome – Strategic Goal 4: *Increase networking and collaboration across sectors and disciplines related to decision making on priority coastal issues in Delaware.*

Priority Coastal Issues

Through results of the Market Analysis and Needs Assessment, consultation with DNERR CTP partners and staff, DNERR CTP efforts will focus primarily on three priority coastal issues. These broad topics encompass needs reflected by the majority of respondent types and are issues that fall historically within the expertise of the DNERR and CTP partners. The issue areas are:

1. Sea Level Rise and Climate Change
2. Habitat Restoration and Protection
3. Coastal Resource Planning

Priority Coastal Issue #1: Sea Level Rise and Climate Change

Sea level rise as a result of climate change affects more than beaches and oceanfront land owners in Delaware. Sea level rise can increase the height of storm waves, making more areas vulnerable to storm damage. It can inundate and flood low lying areas, causing losses to tidal wetlands, habitat, and agricultural areas. Sea level rise also can cause higher water tables and salt water intrusion, interfering with septic systems, drinking water and irrigation water.

Adapting Delaware to sea level rise simply means making changes to the way we plan for the future by incorporating sea level rise considerations into our current decision-making process. Most state and local policies and regulations for flood management, emergency management, infrastructure siting, building codes and natural resource management do not yet consider the future effects of sea level rise; without considering these impacts, additional homes, infrastructure and resources may be vulnerable in the future. To address these issues, a Statewide Adaptation Plan for Sea Level Rise will be developed by the Delaware Sea Level Rise Advisory Committee, led by the Delaware Coastal Programs Office, with support for the CTP.

The adaptation plan, when complete, will recommend policy changes and practices that will ensure that Delaware makes informed policy and investment decisions today to prevent damage and losses to infrastructure, resources and homes tomorrow. The plan will be developed with a team of stakeholders from a diverse network of interests including municipal governments, highway planners, landowners, emergency managers, wildlife managers, agricultural professionals, insurance agents, and tourism officials.
After this work is complete the CTP will support an implementation phase, during which, recommendations will be incorporated into policies and programs at all levels of government and where additional research will occur

Target Audience: Over the next 5 years the Delaware CTP will heavily be focused on Sea Level Rise and Climate Change. As a result, the CTP trainings will target local government officials (especially those municipalities who have the potential of being highly vulnerable to sea level rise), county government officials, state legislators, state agency representatives (DNREC, DelDOT, DEDO, DHSS, DDA, Office of State Planning), local and regional planning representatives, state planning representatives, utility provider representatives, economic development and tourism representatives, agricultural representatives (farmers, Farm Bureau reps., USDA), university researchers, and property owners. These stakeholders are key to assisting Delaware in adapting to sea level rise.

Anticipated Partners: Sea level rise and climate change are being investigated by several entities within Delaware. We anticipate partnering with several if not all of those entities. They include but are not limited to the Delaware Coastal Management Program, University of Delaware, Delaware Sea Grant, Partnership for the Delaware Estuary, DNREC Division of Energy and Climate, DNREC's Shoreline and Waterway Section, Center for the Inland Bays, Nanticoke Watershed Alliance, Delaware Nature Society, and the Delaware Geologic Survey.

Training Delivery System: There are several areas in which CTP would be able to assist in delivering information to coastal decision makers about current research in this area. The State is in the process of developing a statewide adaptation plan for sea level rise with assistance of the Delaware Sea Level Rise Advisory Committee. As part of this development process, CTP will provide technical assistance to the Committee's Education and Outreach work, and to its Natural Resource Workgroup. This may also include workshops, seminars, or trainings for target audiences to provide and receive information regarding impacts of sea level rise. In addition, the CTP will be assisting with producing informational documents/brochures for stakeholders and the general public.

Once the Sea Level Rise Advisory Committee has finalized its adaptation recommendations for the state, the CTP anticipates that it will assist communities that are vulnerable to sea level rise with developing their own adaptation plans though workshops and/or technical assistance.

The Coastal Training Program also contributes to the Climate Roundtable Group that is hosted by the Partnership for the Delaware Estuary. This group meets regularly to share information, activities, and strategies happing across the Delaware Estuary area on climate change and sea level rise adaptation and mitigation programs.

Priority Coastal Issue #2: Habitat Protection and Restoration

Delaware's coastal and estuarine areas are of highest importance to both humans and wildlife – they shield and buffer us from coastal storms; offer natural flood control; filter pollutants to maintain water quality, and provide waterfront access for recreation. Our coasts also harbor an abundance of fish and shellfish that support both commercial and recreational fisheries. Additionally, coastal habitats provide nesting and foraging areas for

shorebirds and other migratory birds. Coastal and estuarine lands support many animal and plant species, including rare, threatened, and endangered species.

Habitat protection and restoration are key topics for the Reserve and coastal decision makers as noted in the needs assessment. The Delaware CTP will provide the best available science to target audiences so they are able to maintain and restore healthy, productive and resilient coastal ecosystems. More specifically, restoration efforts, including tidal and freshwater wetland restoration and the removal and prevention of invasive species, continues to occur throughout the State of Delaware, and there is a need to research and monitor restoration efforts in Delaware. Freshwater wetland protection is also a high priority topic in Delaware since there is no state-wide freshwater wetland legislation.

Target Audience: The Delaware CTP trainings will target state agency representatives (DNREC and Delaware Department of Agriculture) elected officials, non-profit organizations, university researchers, agricultural representatives, consulting firms, US Army Corps of Engineers (Philadelphia District), developers, and private property owners.

Anticipated Partners: We anticipate partnering with organizations such as the University of Delaware, Delaware State University, Conservation Districts (Kent and New Castle), Delaware Invasive Species Council, The Nature Conservancy, Partnership for the Delaware Estuary, Delaware's Department of Transportation, Natural Resources Conservation Service (Delaware), Delaware Department of Agriculture's Division of Forestry, DNREC's Division of Fish and Wildlife, DNREC's Stormwater and Drainage Section, DNREC's Wetland and Subaqueous Lands Section, and DNREC's Watershed Assessment Section, and the U.S. Fish and Wildlife Service.

Training Delivery System: There are several areas in which CTP would be able to assist in delivering information to coastal decision makers about habitat protection and restoration. The DNERR's research sector, in conjunction with DCP's researchers, is currently exploring the impacts of sea level rise on various habitats of concern, including tidal and non-tidal wetlands. DNERR CTP will assist with facilitating restoration focus groups and field meetings for these restoration efforts. As research results are obtained, CTP will offer workshops and seminars (including field trips) to discuss these results with coastal decision makers.

Priority Coastal Issue #3: Coastal Resource Planning

Efficient and effective coastal resource planning decisions depend on the knowledge of the impacts of human activities on ecosystem integrity, vulnerable species, and valued ecosystem services. With planning, Delaware can better identify resources most suitable for various types or classes of activities in order to reduce conflicts among uses, reduce environmental impacts, facilitate compatible uses, and preserve critical ecosystem services to meet economic, environmental, security, and social objectives.

The Delaware CTP supports training key local planners, regulatory staff, and municipal officials in their capacity to implement or improve coastal resource planning and regulation. CTP workshops, online courses and technical assistance will help target audiences to effectively manage the direct, indirect and cumulative impacts of development on coastal resources and uses.

Target Audience: Planning includes diverse topics regarding community planning and societal planning as they relate to coastal resource management. Workshops and trainings will be tailored to specific issues such as buffers, waterway and wetland protection, marine spatial planning for the Delaware Bay and ocean area, and green space. In addition, alternative energy resources and energy conservation are topics related to land use planning and climate change which need to be addressed as they are becoming more prevalent issues for decision making. As a result, the DNERR CTP trainings/meetings will target local and regional planning

commissions, local and county government representatives, state agency representatives, municipalities, non-profit organizations, agricultural representatives, engineers, consulting firms, developers, and private property owners.

Anticipated Partners: We anticipate partnering with organizations such as the Institute for Public Administration (University of Delaware), community organizations, State Planning Office, The Nature Conservancy, the Partnership for the Delaware Estuary, Tributary Action Teams, Conservation Districts, Delaware Sea Grant, St. Jones Greenway Commission, DNREC's Watershed Assessment Section, DNREC's Wetland and Subaqueous Lands Section, DNREC's Stormwater and Drainage Section, Delaware Chapter of the American Planning Association, Mid-Atlantic Regional Council on the Oceans, and the Delaware Department of Transportation.

Training Delivery System: There are several areas in which CTP would be able to assist in delivering information to coastal decision makers regarding land use planning. DNERR CTP will conduct workshops in cooperation with partner organizations to inform decision makers of existing and new incentive programs for sustainable land use. When applicable the CTP will use its national partnership with the American Planning Association to certify programs for Certification Maintenance credit in order to attract professional planners. In addition, DNERR CTP will continue to assist with information dissemination of wetland and waterway protection issues through workshops, technical workgroup meetings, demonstration projects, and field meetings.

Monitoring and Evaluation Tools

Monitoring and evaluation will be ongoing to ensure that the Coastal Training Program is effective in its selection of topics, audiences, and delivery methods. Post-workshop evaluations are administered at every training event to determine the effectiveness of the workshop and if the participants intend to apply the knowledge they learned. These evaluations will assist in ensuring that these trainings are quality events which effectively meet participant needs. Workshop evaluations will also be used to report on performance measures established by the NERRS. Training efforts will also be improved through workshop participant discussions. Often the questions asked by participants or their immediate reactions to information provide valuable insight on training content and delivery. Methods of evaluation also include:

- Written evaluations for participants upon completion of a coastal training program session
- Maintenance of databases of CTP participants, providers, and partners
- Marketing evaluation tools (as discussed in marketing plan to assess marketing strategies of CTP)
- Continuing to assess needs of coastal decision maker workshops through detailed needs assessments targeted to individual types of decision makers.
- Consultation with the CTP Advisory Committee, partners, and target audience members. A list of the CTP Advisory Committee members is located in APPENDIX A.

In addition, the DNERR CTP will strive to meet the NERRS CTP minimum performance measures as stated in the Performance Monitoring Manual: The NERRS Coastal Training Program (2011).

Staffing and Infrastructure Support

The Coastal Training Program Coordinator is responsible for the Coastal Training Program, with the assistance of the Education Coordinator and the Reserve Manger. Other DNERR staff including the Research Coordinator, Environmental Scientists, Educators, and Conservation Technicians also support the CTP in many ways. This

may include providing scientific analysis or presentations at CTP events, technical assistance with planning tools and models, staffing CTP events, chartering on-the-water field trips, and more.

The following infrastructure components also are utilized to conduct training and are considered strengths of the Reserve:

Amenities	Blackbird Creek Reserve, Townsend	St. Jones Reserve, Dover
Auditorium/Conference Facility (including large meeting room, kitchen)	X (max. 30 ppl)	X (max. 80 ppl)
Meeting rooms (presentations or breakout sessions)	2 (30/10 ppl each)	5 (35/35/20/20/6 ppl each)
Teaching laboratory (including basic lab equipment for training)		X
LCD projection system (presentations)	X	X
Laptop and desktop computers (presentations)	X	X
Conference Call Capabilities	X	X
Mifi wireless internet connection (presentations)	X	X
Audio/visual equipment (presentations)	X	X
Color printer (publications and handouts)		X
Copier (handouts)	X	X
5 motor boats (for field trips/meetings, research)		X
8 canoes (for field trips/meetings, research)	X	
Demonstration restoration projects (existing and in progress)	X	X

The Delaware CTP intends to utilize the above resources in conjunction with other Reserve strengths such as technical expertise, the new DNERR Herbarium, and existing Reserve lands for research. These resources coupled with external resources such as additional technical expertise, publications, funding resources, and larger meeting spaces from partner organizations will bring quality training and research information to Delaware's coastal decision makers.

Marketing Strategy

The Delaware Coastal Training Program's marketing strategy is to promote its programs and trainings to relevant target audiences through clear and consistent messaging. The CTP maintains this communication through regular updates of its webpage, http://de.gov/dectp, the DNERR facebook page, http://www.facebook.com/dnerr, and twitter account, http://twitter.com/dnerr. The CTP also maintains an email contact list of past program participants through the online service Constant Contact. Those interested can sign up through the CTP website to receive Coastal Training Program emails and announcements about new programming. The Coastal Training Program Coordinator also enters all participants who have attended CTP workshops and trainings into the email system to maintain communication with its audience and to expand its reach to new participants. Some trainings and workshop are by invitation, and the CTP maintains separate lists of target audiences relevant to particular priority conservation issues as well.

APPENDIX A

Delaware Coastal Training Program Advisory Committee

The Coastal Training Program Advisory Committee is a technical committee that provides advice and input to the Delaware Coastal Training Program regarding the program's goals, objectives, and strategies. The members formally meets annually and additionally respond to requests for advice and input from the CTP coordinator in order to advance the Reserve's goal of increasing the ability of community leaders and other decision makers to address critical coastal management issues in Delaware. Membership is comprised of individuals and organizations with expertise relative to coastal issues and training needs, especially as it relates to Delaware coastal resource management issues. Membership in the committee is voluntary and, as a result, it is anticipated that membership in the committee will evolve over time.

Delaware CTP Advisory Committee Members

Wendy Carey, Coastal Processes/Coastal Hazards Specialist, Delaware Sea Grant College Program

Kimberly Cole, Reserve Manager, Delaware National Estuarine Research Reserve

Kate Hackett, Executive Director, Delaware Wildlands

Jennifer Holmes, Education Coordinator, Delaware National Estuarine Research Reserve

Rebecca Rothweiler, Wetland Outreach Specialist, Delaware Department of Natural Resources and Environmental Control, Watershed Assessment Section

Bob Scarborough, Program Manager, Delaware Coastal Programs

Lisa Wool, Program Director, Partnership for the Delaware Estuary

APPENDIX B

Development of the Coastal Training

Discussion about the addition of a Coastal Training Program to the Delaware National Estuarine Research Reserve began in April 2000. Potential advisory committee members to the CTP were contacted in December 2001, and the committee first met on March 22, 2002 to plan for the development of the CTP. From 2002 – 2009, the DNERR Education Coordinator administered the CTP, including the oversight of the Advisory Committee, with the assistance of the Reserve Manger. Workshops and trainings were held each year on priority topics such as sustainable habitat, land use, and water quality, featuring contemporary issues like clean marinas, brownfields, open space, wetland restoration, and land conservation options.

In 2008, a full Market Analysis and Needs Assessment of the Delaware CTP was conducted and combined with the consultation of DNERR CTP partners and staff to shape the 2009-2012 CTP strategy. This strategy identified sea level rise and climate change, habitat restoration, and land use planning as priority topics, which have served as focus areas of more recent CTP workshops and trainings.

The 2008 Market Analysis also suggested that all providers contacted be considered as potential partners. Beyond state agencies, these partners include various federal agencies and non-profit organizations. A database will be created from the list of providers to serve as a reference for future partnerships.

In April 2009, NOAA's Estuarine Reserves Division officially approved the Delaware CTP, and in July 2009, a CTP Coordinator was hired to take over immediate responsibility of the program with the assistance of both the Reserve Manager and Education Coordinator. A list of example programs and technical assistance offered from 2011-2012 can be found in APPENDIX C.

APPENDIX C

Delaware CTP 2011- 2012 Example Programs

Workshops and Trainings

Sea Level Rise Mapping Seminar for DNREC January 24, 2011

The Delaware Coastal Programs office presented a technical seminar on sea level rise inundation mapping for DNREC staff. Dr. Bob Scarborough gave the presentation, which covered how the DNREC Sea Level Rise scenario levels were determined for the agency's sea level rise policy and provided an explanation of how tidal and geographic datums were used in developing the inundation maps. Dr. Scarborough also discussed the accuracy of what the inundation maps depict, and the disclaimers on when they should not be used. Questions on these and other aspects of sea level rise were taken at the end of the presentation. More than 50 staff members attended the seminar.

Public Issues and Conflict Management February 9, 2011

This two-day course led by trainer with NOAA's Coastal Training Center was designed to increase participants' ability to design, conduct, and control public or targeted meetings. Participants learned techniques to reduce conflict, enhance cooperation, and achieve meeting objectives in a timely manner. They also learned how to use and practice facilitation skills to enhance communication between diverse groups with multiple perspectives. Participants included staff from the Office of State Planning, the Partnership for the Delaware Estuary, Delaware Forest Service, the Delaware Center for Horticulture and DNREC.

Wetlands Restoration Construction Techniques Workshop March 17, 2011

The Coastal Training Program held the Wetlands Restoration Construction Techniques workshop in partnership with DNREC's Drainage and Stormwater Section at the St. Jones Reserve Training Center. The workshop included a hands-on session that gave participants the opportunity to apply and understand numerous wetlands construction techniques and best management practices through the construction of small scale models that simulated full-scale wetland restoration projects. The workshop was attended by more than 30 participants from non-profit organizations, state agencies, county government, and private contracting companies. The workshop also included presentations on the implications of sea level rise on wetlands restoration by Bart Wilson from DNREC's Delaware Coastal Programs office and a presentation on restoration techniques for tidal wetlands from Melanie Tymes with DNREC's Wetlands and Subaqueous Lands Section. The Coastal Training Program facilitated the workshop and the keynote presentation on wetlands restoration was given by Tom Barthelmeh, DNREC's Drainage and Stormwater with assistance from Al Rizzo, U.S. Fish and Wildlife Service.

Rain Garden Construction Trainings March 23 and 30, 2011

The Coastal Training Program, in partnership with the DNREC's Division of Watershed Stewardship and the Rutgers Cooperative Extension hosted two Rain Garden Trainings focused on the design, construction and maintenance features of rain gardens. Included in each day long workshop were presentations by DNREC's staff including: Environmental Scientist John Martin, who focused on the Importance of Soil in Rain Gardens;

Environmental Engineer Sara Esposito, who focused on the Design and Construction of the DNERR's Rain garden; and design and construction techniques from Program Associates from Rutgers Cooperative Extension. In addition, a 520 square foot rain garden was designed in house by DNREC Sediment and Stormwater Program, to help eliminate ponding water and termite concerns at the DNERR facility. Approximately 45 participants from local gardening companies, state agencies, and county governments attended the workshops and also participated in an hour long planting of the new rain gardens, just in time for some rainy April weather.

Horseshoe Crab Volunteer Survey Trainings April 7 & 13, 2011

68 volunteers in total attended the two volunteer trainings for the Delaware Bay Horseshoe Crab Survey. The DNERR has coordinated the survey on 3 Delaware Bay beaches, Kitts Hummock, Ted Harvey and North Bowers Beach for the past 10 years and had over 90 volunteers assist with this citizen science effort during the months of May and June in 2010. The volunteer training gives the volunteers a sense of the purpose of the effort and builds an appreciation for the resource. During the training, Stewart Michels, Environmental Scientist with the Division of Fish and Wildlife gave a presentation highlighting results of horseshoe crab survey data and how it is being used for management purposes, and Susan Love, Planner with the Delaware Coastal Programs gave a presentation on the survey protocols, how to properly record data and how to distinguish between male and female horseshoe crabs.

Forest Health Workshop April 14-15, 2011

This two-day seminar was designed to help arborists develop professional skills with onsite demonstrations and presentations from expert scientists. Day 1 covered tree worker topics such as electrical hazards, rigging techniques, and aerial rescues. Day 2 covered common tree worker accidents, wood decaying fungi, pruning techniques, urban biofuel, threats impacting our urban forests, and pesticide exposure. Participants also will received 12 ISA Arborist CEU's and Delaware Pesticide credits.

DEOS Coastal Flood Monitoring System June 16, 2011

The CTP partnered with the UD's Delaware Geologic Survey and Delaware Environmental and Observing System to host a training event for community leaders and first responders in Kent County, Delaware on the new Kent County Coastal Flooding Early Warning System. The system was developed by the Delaware Environmental Observing System (DEOS) and the Delaware Geological Survey with grant funding from Delaware Coastal Programs in response to recent flooding events that severely disrupted and damaged Delaware Bay Communities, most notably the Mother's Day storm of 2008. The Coastal Flooding Early Warning System is able to warn local users of potential coastal flooding events in Kent County and it serves as a resource for emergency management decision making prior to and during events. The System can also predict tide heights about four days in advance of their occurrence, and it warns responders of an impending flood event before it happens. Related websites also provide forecasts, maps to show inundated areas, and cross-sections of evacuation routes so that responders will know how deep water will likely be on the important roads. Several individuals that would be deployed during a coastal flood event in Kent County participated in this training, including representatives from local fire companies, DEMA, Kent County Dept. of Public Safety, DelDOT, DNREC, and several community leaders.

New Castle Dike Flood Control System Tour June 29, 2011

Delaware Coastal Programs and DNERR's Coastal Training Program held a walking/driving tour of flood control dikes protecting the City of New Castle and surrounding areas last on June 29, 2011. The flood control

dikes protect not only the residents and businesses within the City of New Castle, but they also protect state and county roads, utilities, and surrounding communities and help to prevent flooding upstream from the Delaware River during large storm events. Over the years the dikes have become increasingly deteriorated as necessary maintenance has not kept pace with erosion, damage, overtopping, and other factors that are compromising their integrity. The City of New Castle, with the assistance of the Delaware Coastal Programs, is proactively working to repair and improve the flood control dikes to ensure they provide lasting protection with the development a long-term dike management implementation plan. Upon its completion, the dike management plan will establish specific actions to reduce further deterioration and, as funding become available, improve these structures in a continued effort to protect the city, its residents and its resources from the effects of coastal storm hazards and sea level rise. The tour highlighted management and safety issues confronting State and City officials as they decide on the next steps forward in their long-term repair and maintenance. Participants included representatives from the New Castle City Council, City Residents, New Castle County, and DNREC's Fish & Wildlife and SIRB sections. Additional tours may be planned as work progresses on their repair.

Kent County Government Boat Trip on the St. Jones Sept. 12, 2011

Employees and members of the Kent County Levy Court, Kent County Parks and Recreation, and Silver Lake Commission participated in a two-hour boat trip hosted by the CTP and DNERR staff on the St. Jones River. Participants learned about the value and functions of the St. Jones River Watershed, and its historical importance to the state and county. DNREC Watershed Assessment Section also assisted the program by supplying additional information about the current health of the St. Jones Watershed's wetlands, and wetland conservation options. Participants were also interested in creating additional connectivity along the St. Jones Greenways.

Delaware Invasive Species Council Annual Meeting Oct. 19, 2011

The CTP partnered with the Delaware Invasive Species Council to host their annual meeting at the Blue Ball Barn at Alapocas Run State Park in Wilmington. This year's theme was "Getting Them Before They Get Us: Early Detection and Rapid Response". The keynote speaker was Randy Westbrooks, Invasive Species Prevention Specialist with the U.S. Geological Survey, who spoke on the "The Emerging Role of State Invasive Species Councils in Shaping the Invasive Species Management Agenda of the United States." The meeting's speakers and presentations also covered: Nutria Eradication Program, White Nose Bat Syndrome, Emerging Tree Diseases, Snakeheads in Delaware, Early Detection and Distribution Mapping System, Field Trips to Local Sites Invasive Remediation Sites. Pesticide Credits were available for participating members. Participants included representatives of government agencies, academic institutions, non-profit organizations, contractors, nursery managers, and community organizations.

Living Shorelines: Opportunities and Challenges Workshop Dec. 13, 2011

The goal of this workshop was to share contemporary information on living shoreline options with decision-makers, identify barriers to implementing living shorelines in Delaware, and find ways to navigate challenges. Case Studies from Living Shoreline Projects in New Jersey and Maryland were also presented by David Bushek, Haskin Shellfish Research Laboratory and Kevin Smith, Maryland DNR, respectively. PDE also facilitated group discussion on existing barriers in Delaware to creating living shorelines and their possible solutions, a strategy for creating living shorelines in Delaware, and their potential best locations. A follow-up workshop that will focus on community implementation of living shorelines is currently in the planning stages for May 2012.

Invasive Species Early Detection & Rapid Response Network Development Workshop February 8, 2012

In partnership with DISC and the USGS, the Coastal Training Program sponsored an Invasive Species Early Detection and Rapid Response (EDRR) Network Development Workshop for the State of Delaware on February 8, 2012 at the St Jones Reserve. Kendall Sommers, DISC/Division of Parks & Recreation, Marcia Fox, DISC/Dept of Agriculture, and Dr. Randy Westbrooks, USGS, lead several topic discussions including State Interagency Coordination, Early Detection and Reporting by Trained Volunteers and Agency Field Personnel, Plant ID and Rapid Assessment by Cooperating Scientists, Archival of field Data by EDDMapS and Rapid Responses to New Invaders. The workshop participants, who included federal and state agencies, consultants, NGOs and academia, were asked to draw upon their experiences to identify gaps in information, skills and management tools that might need to be addressed through the development of a Delaware EDRR Network. Workshop participants were also offered three pesticide credits in categories 2, 3, 5a, 6, and 10.

Delaware Wetlands Conference February 29, 2012

The 2012 Delaware Wetlands Conference's theme was Protecting Our Communities and Coasts for the Future, and was jointly hosted by the Watershed Assessment Section's Wetland Monitoring and Assessment Program and the Delaware National Estuarine Research Reserve's Coastal Training Program. Our attendance was record breaking - reaching 231 presenters and attendees including staff from Congressman Carney's and Senator Coon's offices, the Delaware State Legislature, the Sussex Planning and Zoning Commission, and local municipalities. The biennial conference is an opportune time to join scientists, decision makers, and natural resource managers to share current research on the value of Delaware's wetland ecosystem services and the impact their management has on the community, tidal and non-tidal wetlands, and the effects of sea level rise.

Prime Hook NWR Restoration Workshop April 24-25, 2012

In partnership with the US Fish and Wildlife Service Coastal Delaware Refuge Complex of Bombay & Prime Hook National Wildlife Refuges and Delaware Coastal Programs, the DNERR's Coastal Training Program hosted a workshop on the Restoration of Prime Hook National Wildlife Refuge Wetlands. The purpose of the workshop was to have expert participants discuss and advise on the selection of potential wetland restoration scenarios for further research, modeling, and implementation. Participants toured the impacted areas of impoundments and wetlands at the Refuge and then heard presentations on its management history, the local community perspective, and a summary of current and ongoing research. Participants subsequently worked in breakout groups to analyze benefits and drawbacks of each scenario biologically, logistically, physically, and economically. A range of wetland/marsh restoration specialists, professionals, scientists, and academics participated in the workshop, including staff from DNREC, DELDOT, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service's regional and Washington offices. There were also several representatives of the local community and non-profit organizations including the Alliance for Delaware Bays and Ducks Unlimited.

Living Shorelines and Your Community Workshop May 17, 2012

On Thursday, May 17th, Delaware Coastal Programs staff participated in the Partnership for the Delaware Estuary's Living Shorelines and Your Community Workshop**.** The goal of the workshop was to learn from coastal community leaders where their communities are seeing erosion, talk about a living shorelines approach to stabilizing tidal wetlands, and learn whether community leaders think that a living shorelines approach could help them with their erosion issues. Living Shorelines is one technique that may help marshes keep pace with

erosion by working with nature to enhance or restore shellfish reefs that line the edges of wetlands. These reef structures are often capable of buffering marshes from wave action, slowing erosion, and buying more time for marshes to accumulate in place (vertical accretion) or move inland (horizontal relocation). Workshop participants included community leaders from Delaware City, the City of New Castle, and Bayview Beach, New Castle Conservation District, contractors, nonprofit organizations and DNREC. The workshop was funded in part with a grant from Delaware Coastal Programs.

Technical Assistance

Delaware Sea Level Rise Advisory Committee

The CTP is assisting Delaware Coastal Programs (DCP) with staffing the Delaware Sea Level Rise Advisory Committee by providing technical information and facilitation resources to support the Committee's work. The goal to the SLR Committee is to develop adaptation recommendations for sea level rise on a state-wide level. Their findings will provide DCP a path forward for developing a comprehensive plan for sea level rise. The Committee is comprised of a representative from each State of Delaware cabinet-level department and representatives from municipal governments, business advocacy organizations and citizen advocacy organizations. The CTP assists the Committee with its monthly meetings, its outreach efforts, and its Natural Resources Workgroup. The SLR Advisory Committee process will be an on-going Coastal Training Program project, and is expected to continue for the next year.

Sea Level Rise Public Engagements Sessions

The CTP planned a series of Public Engagement Sessions for the Delaware Sea Level Rise Advisory Committee in the month of November 2011. The Sea Level Rise Advisory Committee's had assessed Delaware's vulnerability to current and future inundation problems that may be exacerbated by sea level rise, and they wanted to share a Progress Report on this with Delawareans. The Public Engagement Sessions were arranged as open house forum in order for the Committee members to present the Vulnerability Assessment thus far and to obtain feedback and comments on this work from the public. At each session, members of the Advisory Committee and DNREC staff presented displays and information on why sea level rise is happening, what its potential future effects could be, and the progress they have made on their assessment of how it could impact our state's economy, society, public services, and natural resources in years to come.

Sea Level Rise Outreach and Education

The Coastal Training Program is participating in a statewide sea level rise outreach workgroup. In this role, the Coastal Training Program has been providing presentations and display with an overview of sea level rise and its possible impacts on the particular audiences that the presentations are given to. Most recently, in partnership with Delaware Coastal Programs, the CTP presented a display in Delaware's Legislative Hall on April 13, 2011 for State Representatives, Senators, and their staff - giving an overview of the statewide impacts of sea level rise. Subject matter experts from Delaware Coastal Programs and the CTP were on hand to speak with legislators, demonstrate statewide inundation and vulnerability maps, provide educational materials, and answer technical questions on the issue. Information packets were provided for legislators unable to stop by the display.

City of New Castle and Bowers Beach Coastal Community Resiliency

In partnership with the Delaware Coastal Programs office, the CTP is providing technical assistance to the towns of New Castle and Bowers Beach, Delaware as they develop coastal resiliency plans that will better prepare them for coastal storms and future sea level rise. In spring 2011, the Coastal Training Program offered

technical assistance to the City of New Castle's Dike Advisory Committee meetings. The CTP also assisted the City with educating community decision makers on the issues and potential solutions to repairing the dike flood control system through a tour of select dike and flood gate systems (as mentioned in the workshop summaries above). CTP's work with the towns will continue into the future as they move towards developing and implementing their resiliency plans.

APPENDIX J

APPENDIX J: RESEARCH POLICIES AND PERMIT

Research at the Reserve investigates the natural processes of the estuarine system and the human impacts on these processes. One of the highest priorities of the DNERR is to coordinate, facilitate, and conduct research to provide useful information for coastal management decision-making. Through State ownership or long-term agreements with property owners in each Reserve component, the State also has the opportunity to encourage and support certain research projects in these estuarine systems.

The DNERR makes both Reserve components available to researchers as long-term field laboratories, which are especially suitable for studying coastal and estuarine problems. The DNERR program offers:

- Long-term opportunities for temporal and spatial sampling in wetland, upland, and open-water estuarine habitats
- Greater opportunities for use of observational and analytical techniques in protected or controlled estuarine subsystems
- Opportunities for long-term accumulation of comparative data at the Reserve components

Research opportunities are available to any qualified scientist, faculty member, undergraduate, or graduate student affiliated with any college, university, or school; nonprofit, nonacademic research institution (e.g., research laboratory, independent museum, or professional society); private for-profit organization; or State, local or Federal government agency. These opportunities are also available to any individual who has the resources and capabilities needed to perform the work required.

Research permit

The DNERR utilizes a research permit system to track research activity on the Reserves. This provides DNERR an opportunity to review proposed research for consistency with DNERR goals and to ensure that the research will not unduly interfere with other research or activities at the Reserve.

Researchers wishing to conduct research on the Reserve must submit a written proposal. The Research Coordinator in consultation with the Reserve Manager reviews the proposals. Projects that do not meet all the above use requirements are not issued a permit and the project is not allowed to be conducted on Reserve properties. . Projects will be evaluated based on their importance to coastal management issues, scientific/educational merit, and technical approach. Other project evaluation criteria include the environmental consequences of the project, immediacy of need, and the proposed project's relationship to other available information and studies.

All proposals, publications, presentations, and other releases resulting from research at the Reserve will list the DNERR and/or the Research Coordinator as cooperators on the project. The Research Coordinator may only be listed as co-investigator if he/she is directly involved with the project and is willing and able to take full responsibility for the project if other investigators forfeit their involvement.

General Research Permit Conditions

This Research Permit is valid for the properties of the Delaware National Estuarine Research Reserve (DNERR), Blackbird and St. Jones Components, and any adjacent State-owned properties on which the DNERR had research agreements, to conduct research activities. The permit is valid for the duration of the study or three years, whichever comes first. Permits may be renewed if more time is needed to complete the project. The Permitee must comply with all DNERR rules and regulations and with any other applicable state and federal regulations. It is the permitee's responsibility to be aware of legal obligations.

If research activities include surveys or sampling of soils and vegetation in non-wetland regions of the DNERR, no additional permits are required. If activities are within wetland or subaqueous regions these activities are covered under the United States Army Corps of Engineers Nation Wide Permit #6 and no additional permitting is required. If the research requires the collection of certain species or installation of equipment, additional permitting may be required by the Delaware Department of Natural Resources and Environmental Control (DNREC), the United States Fish and Wildlife Service or the United States Army Corps of Engineers. The DNERR may assist obtaining any additional required permits, but the ultimate responsibility is with the Permitee.

All equipment left in the field during a project should be clearly marked with the Researcher's name and Research Permit number. Any items on DNERR property not labeled as above may be removed by DNERR staff. Permittee should also inform DNERR staff when equipment will be left in the field and for how long.

All equipment and other items related to the project must be removed from the DNERR within one month from the end of the project and, if applicable, the site returned to its original condition. This is a stipulation for research in the DNERR and failure to meet this stipulation can result in revocation of research privileges in the DNERR.

If there are deviations from original research plan during the project that involve physical or chemical disturbances the Permitee should contact the DNERR Research Coordinator to discuss permit revisions.

Permittee should carry a copy of the permit when on the DNERR. DNERR staff or other law enforcement officers have the right to request to see your research permit.

A final project report is required. It may consist of a short review of what was accomplished or a full copy of the paper(s) that resulted from work in the DNERR. The DNERR also requests copies of all subsequent publications, reports, or dissertations/theses that result from research in the DNERR components.

APPENDIX K

Blackbird Creek Reserve

Ecological Restoration Master Plan

March 2007

BLACKBIRD CREEK RESERVE
ECOLOGICAL RESTORATION MASTER PLAN

Prepared for:
Delaware Department of Natural Resources and
Environmental Control
Delaware National Estuarine Research Reserve
818 Kitts Hummock Rd.
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Prepared by:
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March 2007

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1.0 INTRODUCTION

1.1 Project Background

The Delaware National Estuarine Research Reserve (DNERR) is one of 27 National Estuarine Research Reserve System (NERRS) sites in the United States. The Reserve System was established by the Coastal Zone Management Act of 1972, as amended, as each reserve involves a partnership between the National Oceanic and Atmospheric Administration (NOAA) and the state the reserve occurs is located. The DNERR is a partnership between NOAA and the Delaware Department of Natural Resources and Environmental Control (DNREC), Division of Soil & Water Conservation—Coastal Programs Section. The DNERR consists of two Reserve components, the Upper Blackbird Creek Reserve Component (hereafter referred to as the Blackbird Creek Reserve) and the Lower St. Jones River Reserve Component, that are located about 30 miles apart (Figure 1.1). These two reserve components include both brackish and freshwater estuaries and are representative of the diverse array of estuarine ecosystems found throughout the Mid-Atlantic States (DNERR 2004). The important ecological values and relatively intact ecosystem components of the Blackbird Creek channel, corridor and watershed are what led to its selection for inclusion as part of the DNERR. This document is an ecological restoration master plan for the DNERR-owned parcels of the Blackbird Creek Reserve encompassing approximately 360 acres on four tracts (Figure 1.2) in southern New Castle County, Delaware. This plan is intended to identify and guide ecological restoration initiatives for the DNERR-owned parcels of the Blackbird Creek Reserve.

DNERR owned-properties of the Blackbird Creek Reserve include those purchased in 2004-05, encompassing the Lowe Tract (formerly Odessa Campground) and the Manwaring Tract. Additional land acquired in 2006 is known as the Cornelius Tract. Previously acquired parcels that are also part of the DNERR-owned lands are in the Union Church-Taylors Bridge Tract.

The four tract areas and their prominent features are as follows:

- Lowe Tract (52 acres)—Former campground area, successional upland woods, fallow fields, and tidal marsh fringe
- Manwaring Tract (85 acres)—Fallow fields, farm ponds, narrow riparian woods and tidal marsh
- Cornelius Tract (70 acres)—Upland forest stands, stream valleys, active agricultural fields and a house
- Union Church-Taylors Bridge Tract (150 acres)—Narrow riparian woods, small non-tidal wetland depressions and extensive tidal marsh areas

All DNERR-owned wetlands and forested uplands on the acquired parcels are shall be managed to preserve environmental quality, minimize detrimental impacts and control invasive species (DNERR 2004). This restoration master plan relates to the components of the NERRS mission to provide long-term research, education and interpretation, and the part of DNERR's mission which includes preserving and managing natural resources within the Reserve.

1.2 A Sense of Place--Historical Human Ecology

Since the King of England's original land grant in the late 1600's and William Penn's transfer of much of the Blackbird's lands to the Huguenots, there have been surprisingly few land ownership or land use changes for many of the properties in and around the Blackbird Creek and Reserve parcels.

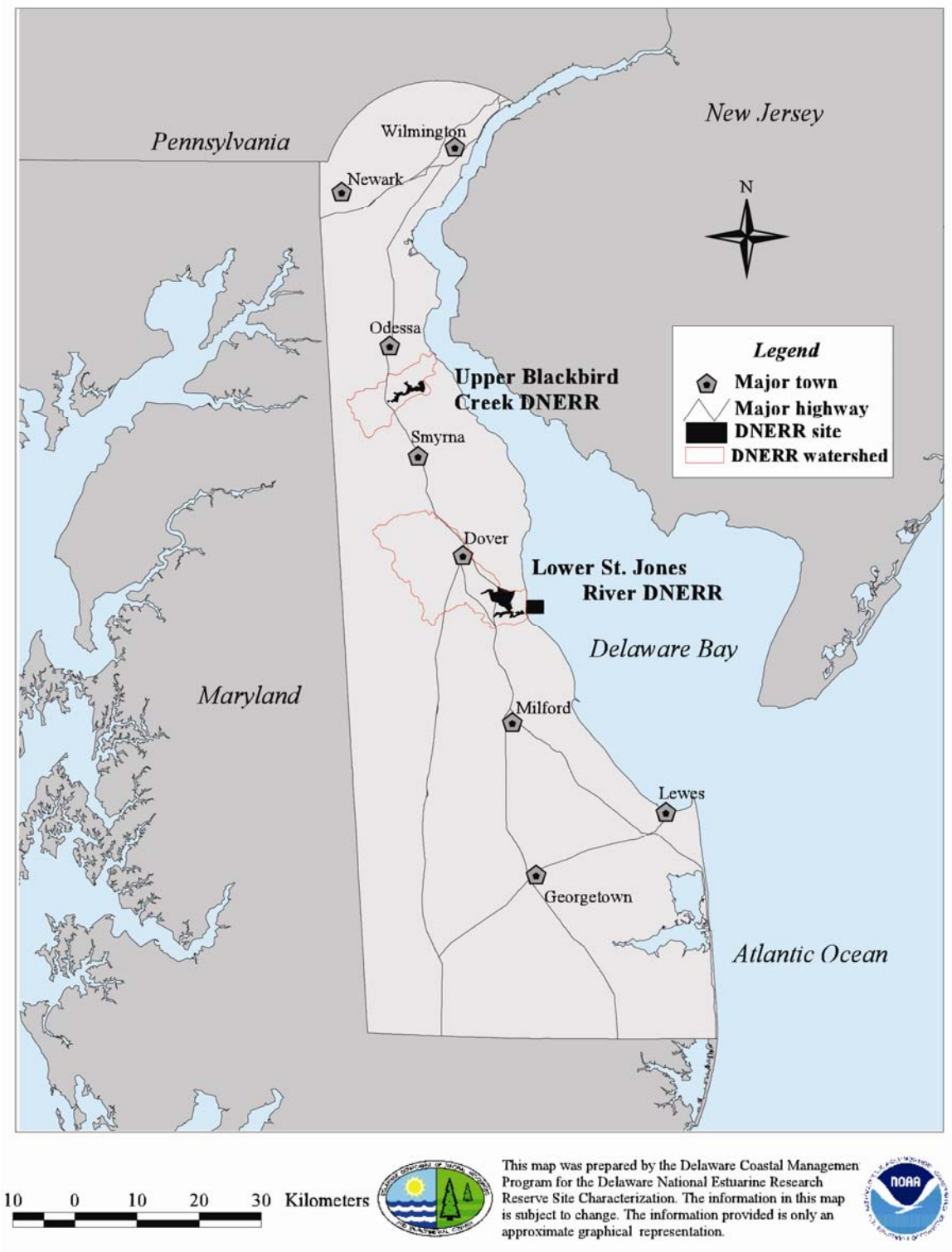
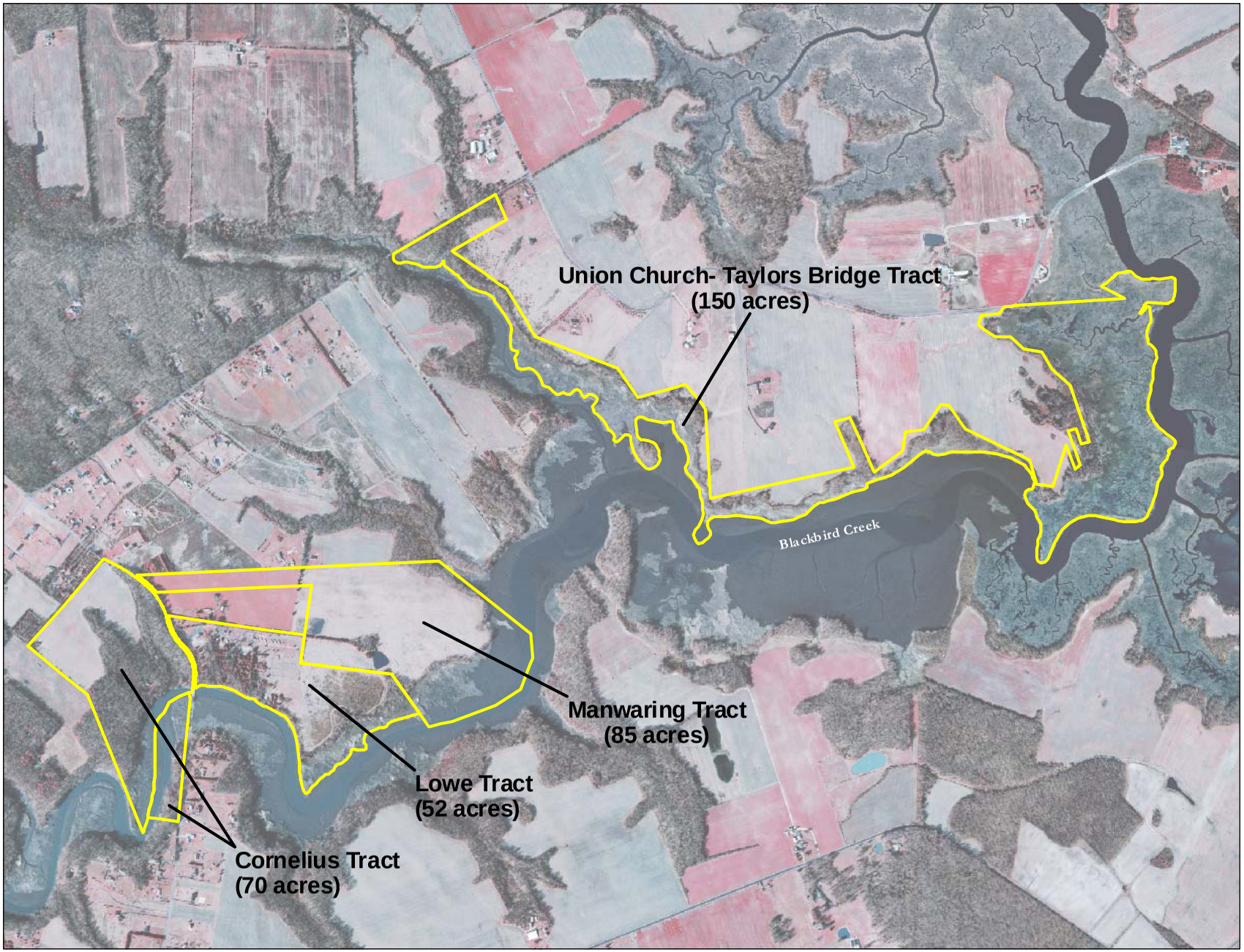


Figure 1.1 Blackbird Creek Reserve Location Map



Blackbird Creek Reserve
Ecological Restoration
Master Plan

DNERR-Owned Parcel Tracts
Figure 1.2

Legend
Blackbird Creek Reserve (DNERR-Owned Parcels)

DATE: 03/07

Biohabitats

N

0 312.5 625 1,250 1,875 2,500 Feet

The Blackbird Creek, often called simply "Blackbird", is frequently referred to as an example of one of the only 'pristine' creek systems in north/central Delaware (See watershed map Figure 1.3. This is especially true in comparison to the more heavily altered (filled, channelized or tide-gated) streams, creeks and rivers in northern Delaware.

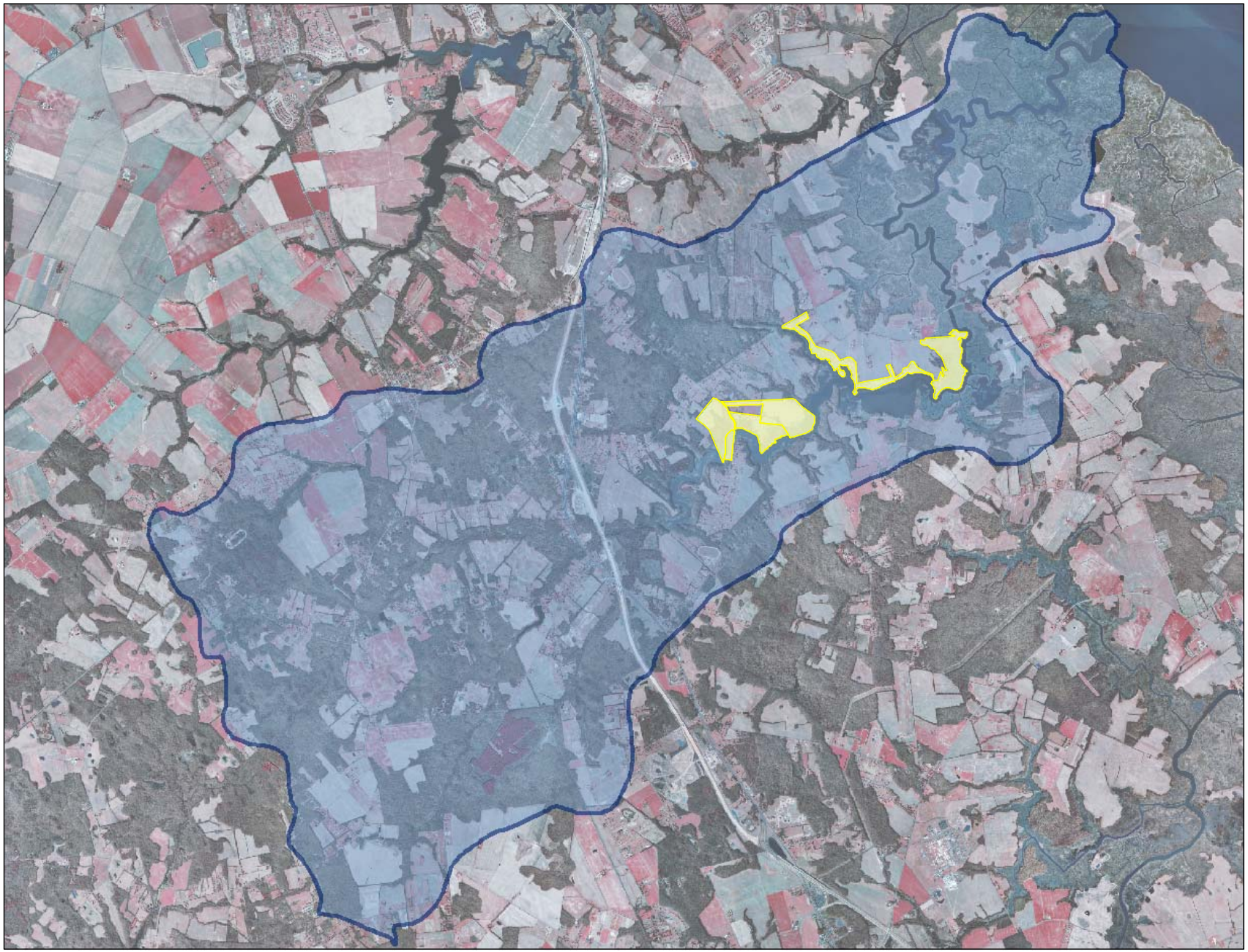
The ecological and cultural setting in which the Blackbird Creek Reserve resides is connected by a history of farming, fishing, hunting, trapping and other resource uses that have long been cornerstones of the local communities and their economy. The Cultural Resource Survey, maintained by the Delaware Bureau of Archaeology and Historic Preservation, lists 73 prehistoric archaeological sites in upland areas fringing Blackbird Creek marsh. While somewhat less so today, the influence of resource-based traditions still have a strong effect on the ecological health, and future of the Blackbird Creek Reserve and the creek system itself. This follows the tradition of generations of farmers, hunters, fishermen and trappers that have highly valued the land and waters of Blackbird Creek's watershed as a provider of resources for their livelihood, residency, recreation and aesthetic enjoyment. The conservation ethic of many of the landowners and stewards of the watershed result from a spirit of place that has developed over time. The Blackbird has a long history of active conservation advocacy by its major property owners, as profiled in the DNREC/NOAA sponsored video, "Blackbird": Delaware's Undiscovered Treasure. Several large conservation organizations, including Delaware Wild Lands, have significant land holdings in the area to protect and conserve important natural areas.

The entire Blackbird Creek Reserve comprises 50 parcels of land held by 46 private landholders in addition to the DNERR properties and other land under the control of the Division of Fish and Wildlife. The recent acquisition of several parcels adding to the Blackbird Component's holdings is only part of the regional conservation effort. The 'buffer' areas for the Reserve core include private landholdings that are protected under the Delaware State Wetlands Act. These buffer areas are permanently protected, but are held in private ownership (DNERR 2004). Many other large parcels in private ownership have been successfully placed in conservation easements. The State's Farmland Preservation Program serves a function of land protection in the watershed. Delaware's Farmland Preservation Program has two major components, Agricultural Preservation Districts and Agricultural Conservation Easements. The occurrence preserved farmland in the Blackbird Creek Reserve area is shown in Figure 1.4.

1.3 About This Plan

The need for an ecological restoration master plan for the Blackbird Creek Reserve, DNERR-owned tracts is clear. The newly acquired parcels in 2004-06 include the former campground and related facilities, as well as a modern suburban home, and several agricultural parcels in various states of cultivation, fallowness and natural condition. The parcels have had varying degrees of human influence and disturbance for many centuries, if not millennia, considering earlier Native American inhabitants. A plan to identify potential restoration initiatives and target conditions is an important step in charting a long term course for the Blackbird Creek Reserve. Without a big picture perspective of the site's ecological restoration needs and priorities, the potential exists for disjointed or uncoordinated efforts without a clear strategy. This ecological restoration master plan will guide the Blackbird Creek Reserve's restoration for immediate short-term efforts and provide a plan of action for the next 15-20 years.

The remainder of this document provides a site conditions assessment and identification of restoration needs (Section 2), restoration context and research framework (Section 3), and restoration recommendations, prioritization, and phasing (Section 4). Additionally, recommendations related to sustainability and stewardship opportunities are identified (Section 5).



Blackbird Creek Reserve
Ecological Restoration
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Watershed &
Reserve Area
Figure 1.3

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Blackbird Watershed Boundaries

DATE: 03/07

Biohabitats

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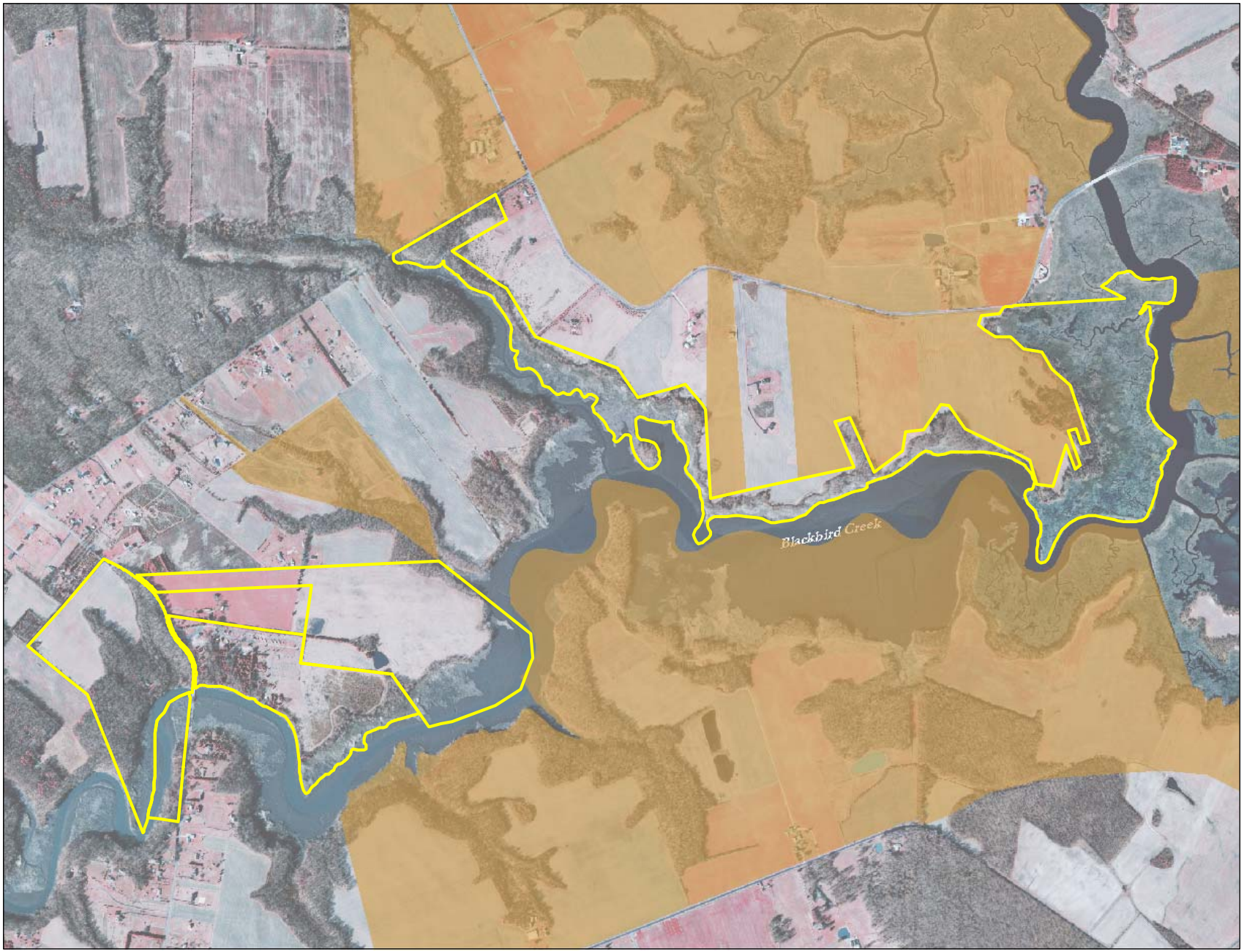

Blackbird Creek Reserve
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Farm Preservation Program Areas
Figure 1.4

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Farm Preservation Program Areas

DATE: 03/07

Biohabitats

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2.0 SITE CONDITIONS ASSESSMENT

2.1 Existing Information Review and Prior Study Perspectives

Biohabitats reviewed several existing documents and mapping information relating specifically to the Blackbird watershed. This information came from several divisions of Delaware DNREC, Delaware Office of State Planning, NOAA, The Nature Conservancy, NatureServe, and the University of Delaware. These documents include:

- Aerial photographs
- Geographic Information System (GIS)-geospatial maps
- Ecological investigation reports and data
- Natural resource management plans
- Graduate theses
- Peer reviewed journal articles

Previous Reports, Research Investigations and Plans

In the course of developing this restoration management plan, Biohabitats reviewed several management plans, investigation reports and data documents provided by DNREC as well as obtaining other pertinent information independently. These documents include the following (Please see Appendix A for full citations and abstract):

- A Guide to the Natural Communities of the Delaware Estuary
- Detecting and Monitoring *Phragmites* Invasion of Coastal Wetlands: A Comparison of Remote Sensing Techniques
- "Blackbird" Delaware's Undiscovered Treasure (Video)
- Blackbird-Millington Corridor Conservation Area Plan
- Appoquinimink – Blackbird Creek Environmental Profile: GIS map data layers
- Delaware National Estuarine Research Reserve: Estuarine Profiles
- Delaware National Estuarine Research Reserve Management Plan 1993
- Delaware National Estuarine Research Reserve Management Plan 2004-2009
- DNERR Comprehensive Site Description. Phase I – Description / Analysis of Dominant Vegetation / Cover Types.
- Detecting and Monitoring *Phragmites* Invasion of Coastal Wetlands: A Comparison of Remote Sensing Techniques
- Remote sensing of habitat change at Delaware NERRS sites
- Land use / land cover changes and ecological health indicators in the Blackbird Creek watershed: With recommendations for restoration
- Non-native species in our nation's estuaries: a framework for an invasion monitoring program
- Salem Nuclear Power Plant Ecological Baseline Data
- Scrub-Shrub/Emergent Wetland Ecotone Migration Along Delaware Tidal Rivers In Response To Relative Sea-Level Change, Natural Impacts, And Human Modifications
- Shoreline Development Drives Invasion of *Phragmites australis* and the Loss of Plant Diversity on New England Salt Marshes

These invaluable information sources, and others, formed the basis from which this Ecological Restoration

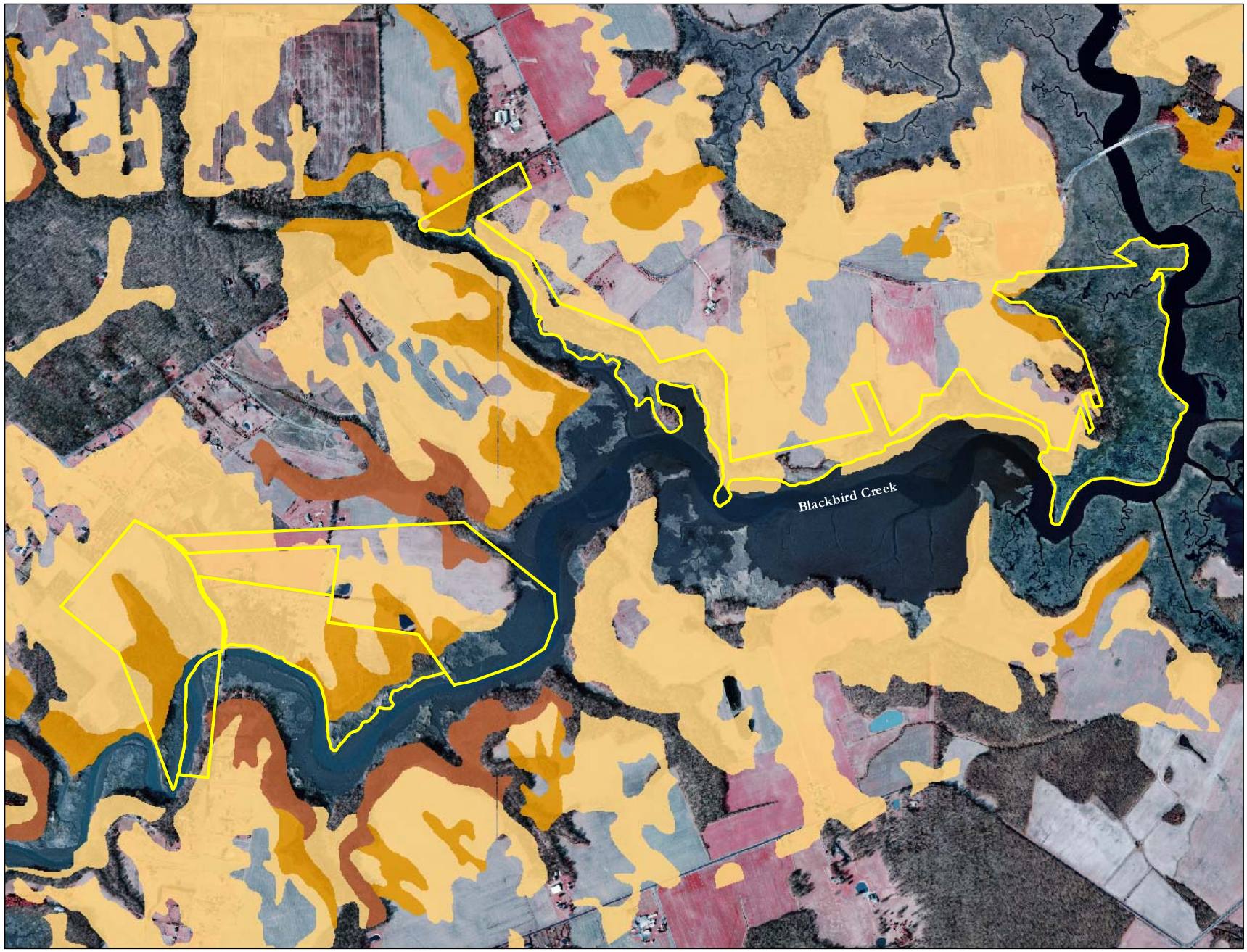
Master Plan document evolved. These sources helped to target potential restoration and research opportunities, characterize existing ecological conditions, and articulate past and more recent resource management activities for the Blackbird Creek area.

2.2 Site Observations

The Blackbird Creek Reserve project area was investigated by Biohabitats in the winter of 2006-07. The main purpose of the site investigation was to characterize the general site conditions, identify potentially ecologically significant resources, and determine ecological needs and restoration opportunities. Previous studies of the Blackbird Creek Reserve area, GIS mapping and personal communications with DNREC managers were all utilized to inform the site investigations.

2.2.1 Streams and Creeks

Numerous tidal creeks and non-tidal streams are found within the study tracts. The non-tidal headwater streams flow through highly erosive soil types (Figure 2.1), and many have incised significantly and/or have undercut banks and head-cuts. These erosion problems appear to stem from overland run-off from fields and in some cases impervious surfaces (i.e. roads). The distribution of stream channels and identified degraded stream reaches are identified in Figure 2.2. Generally, the shoreline banks of the mainstem Blackbird and tidal creeks are very stable with little evidence of active erosion, with the exception of minor erosion at isolated spots. There is a significant and variable width of tidal marsh (fresh to brackish gradient) along the creeks adjoining the study tracts. Tidal creeks and the Blackbird mainstem wetland systems are also facing varying rates of marsh loss, most likely from relative sea level rise, with some suggestion of possible herbivory stressors by foraging geese. The eroding, head-cut and unstable stream reaches identified are a clearly evident restoration need to enhance the streams and protect receiving waters.



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Soil Erodability
Figure 2.1

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Erodability

- Moderate
- Moderate to Severe
- Severe

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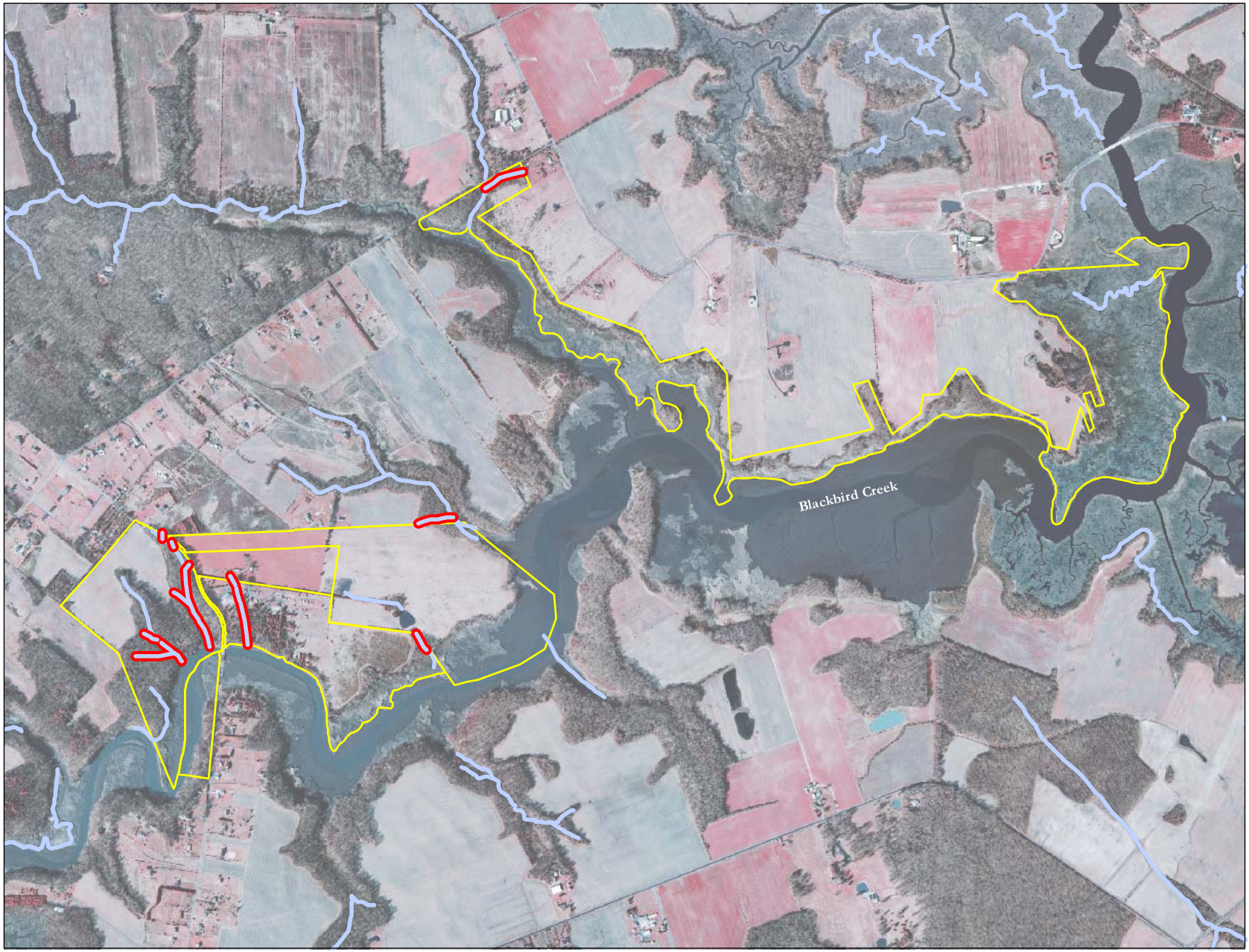

Blackbird Creek Reserve
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Master Plan

Degraded Stream Reaches Figure 2.2

Legend

- Blackbird Creek Reserve (DNERR-Owned Parcels)
- Stream Channel
- Degraded Stream Reach

DATE: 03/07

Biohabitats

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0 312.5 625 1250 1875 2500 Feet

2.2.2 Vegetation Communities

The following are the natural community association classifications that correspond most appropriately to the vegetation types identified during site investigations as defined by the National Vegetation Classification System (Figure 2.3) and (Table 2.1). The naming conventions have been referenced from the document *A Guide to the Natural Communities of the Delaware Estuary* (Westervelt *et al.* 2006):

Upland and Riparian Forests

Forest community associations dominated by trees and shrubs are shown in Figure 2.4, and include:

Atlantic Coastal Plain Mesic Hardwood Forest—This community is an upland system found in a variety of moist but non-wetland sites that include lower slopes and bluffs along streams and rivers in fragmented terrain, mesic flats between drier uplands and floodplains, and localized high areas within bottomland terraces or nonriverine wet flats. The vegetation of these forests is typically dominated by combinations of trees that consist of a significant component of mesophytic deciduous hardwood species. Typical species identified through site investigations of the study area are American beech (*Fagus grandifolia*), sweetgum (*Liquidambar styraciflua*), tuliptree (*Liriodendron tulipifera*), and maple species (*Acer sp*.). The understories are usually well-developed with shrub and herb layers that may be sparse or moderately dense. Site evidence of highbush blueberry (*Vaccinium corymbosum*), and field garlic (*Allium vineale*) were noted among others.

Northern Atlantic Coastal Plain Dry Hardwood Forest—This system is comprised of dry hardwood forests mainly dominated by oaks. These forests are found on acidic sandy to gravelly soils, often with an acid loving shrub layer supporting a thick duff. Typical vegetation includes American beech, white oak (*Quercus alba*), northern red oak (*Quercus rubra*) and tulip tree.

Maritime Red Cedar Woodland—This woodland system is found in small groves of varying age in the study area along the upper edges of the tidal river marshes, but most specifically in one older cedar stand associated with the former campground if the Lowe Tract. The eastern red cedar (*Juniperus virginiana*) is the dominant vegetation type with site identification of sweetgum, red maple (*Acer rubrum*), Japanese honeysuckle (*Lonicera japonica*) and field garlic.

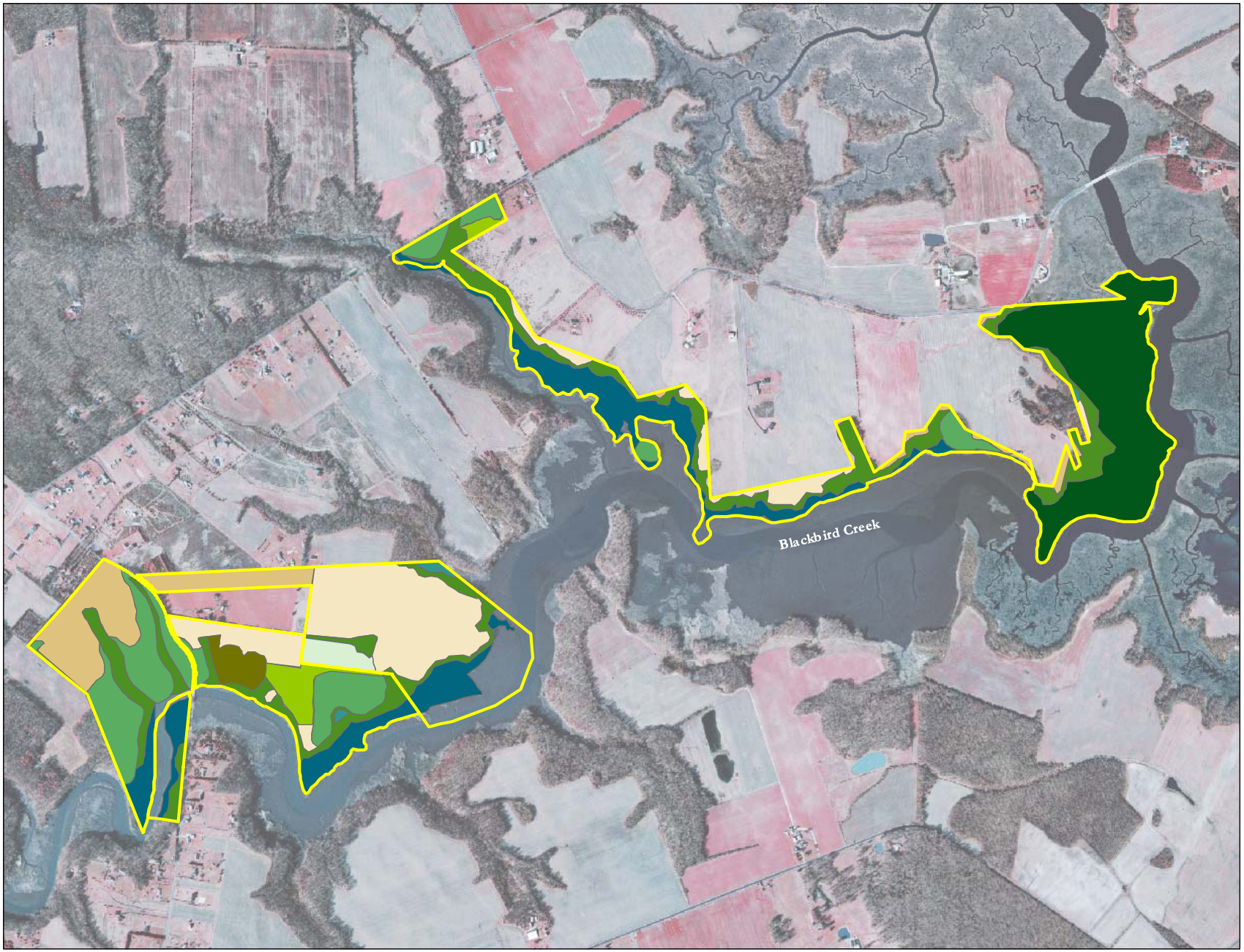
Table 2.1 Vegetation Community Acreages and Percent of Reserve Area

Community Type	**Acreage**	**Percent of Reserve**
Active Agricultural Fields	32.9	9.2
Atlantic Coastal Plain Mesic Hardwood Forest	59.7	16.7
Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest	1.5	0.4
Maintained Herbaceous	62.3	17.5
Managed Black Walnut Stand	5.0	1.4
Maritime Red Cedar Woodland	5.8	1.6
Northern Atlantic Coastal Plain Dry Hardwood Forest	44.8	12.6
Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh	51.7	14.5
Northern Coastal Plain Brackish Tidal Marsh	66.4	18.6
Upland Reforestation Areas	8.6	2.4

While the majority of the Blackbird Creek Reserve study area is in agriculture, several stands of maturing forest exist. These include areas on the Lowe and Cornelius tracts. The largest forest stand (31 Ac) within the DNERR-owned lands is on the Cornelius tract, and it is part of a larger forest block encompassing approximately 67 acres. A significant feature of the forested areas in the Reserve is the generally narrow bands of riparian buffer adjacent to the tidal tributaries and Blackbird Creek mainstem that commonly border agricultural fields. The morphology of these sites vary from low lying, near sea level floodplain forests to narrow bands of trees and shrubs along steep, high banks overlooking the Blackbird Creek and Beaver Branch.

Although there are some high quality patches of mature forest in this stand, high density non-native invasive species occupy the vast majority of the understory and ground cover of the remainder of the stand. Many of the forested upland and riparian forest areas visited during the site investigation were found to be significantly impacted by non-native invasive plants (Figure 2.5). Based on cursory winter-time qualitative observations, the general density and distribution in all vegetation layers in a given area was generally characterized as either low or moderate to high based on relative abundance. The predominant, invasive species identified during the site investigation include multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*), wineberry (*Rubus phoencolasius*), field garlic (*Allium vineale*), fescues (*Festuca* spp.) and Canada thistle (*Cirsium arvense*). A recent identification and eradication of a stand of kudzu (*Pueraria montana*) by the Reserve staff at a forest/agriculture field edge on the Cornelius Tract epitomizes the need for timely invasive species identification and control actions.

Restoration needs and opportunities identified for forests include riparian buffer restoration to augment poorly buffered corridors in terms of width and composition (Figure 2.6). Their current condition affects both water quality and habitat connectivity. Additional upland forest restoration is also needed to increase patch size and connectivity.



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Natural Community Associations Figure 2.3

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Vegetation Communities

- Atlantic Coastal Plain Mesic Hardwood Forest
- Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest
- Northern Coastal Plain Brackish Tidal Marsh
- Northern Atlantic Coastal Plain Dry Hardwood Forest
- Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh
- Managed Black Walnut Stand
- Maritime Red Cedar Woodland
- Upland Reforestation Areas
- Active Agricultural Fields
- Maintained Herbaceaous (Cool Season Grass Meadow and Mowed Lawn)

DATE: 03/07

Biohabitats

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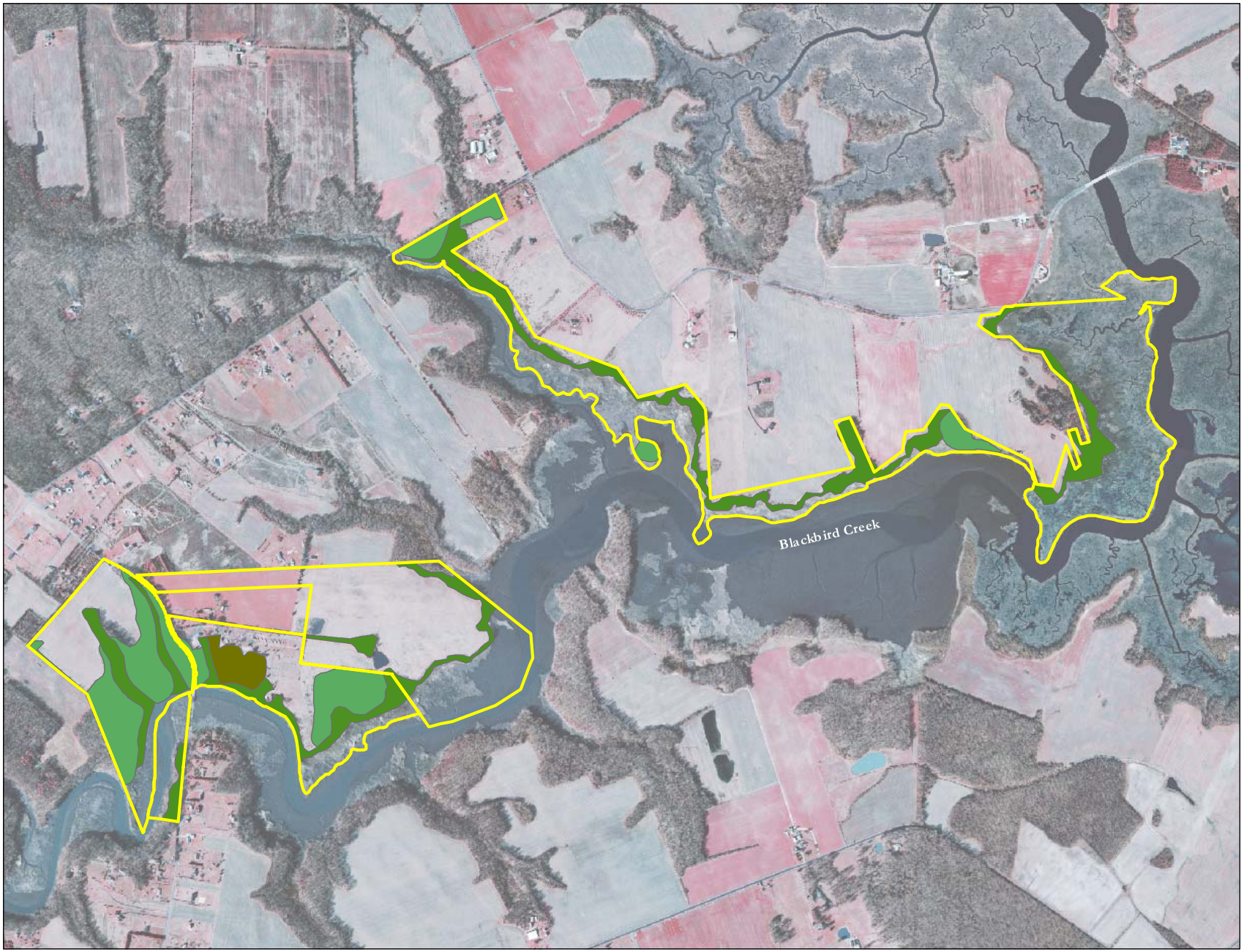
0 315 630 1,260 1,890 2,520 Feet



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Upland & Riparian Forest Communities Figure 2.4

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Vegetation Communities

Atlantic Coastal Plain Mesic Hardwood Forest: 59.7 acres, 16.7% of Reserve Parcels

Northern Atlantic Coastal Plain Dry Hardwood Forest: 44.8 acres, 12.6% of Reserve Parcels

Maritime Red Cedar Woodland: 5.8 acres, 1.6% of Reserve Parcels

DATE: 03/07

Biohabitats

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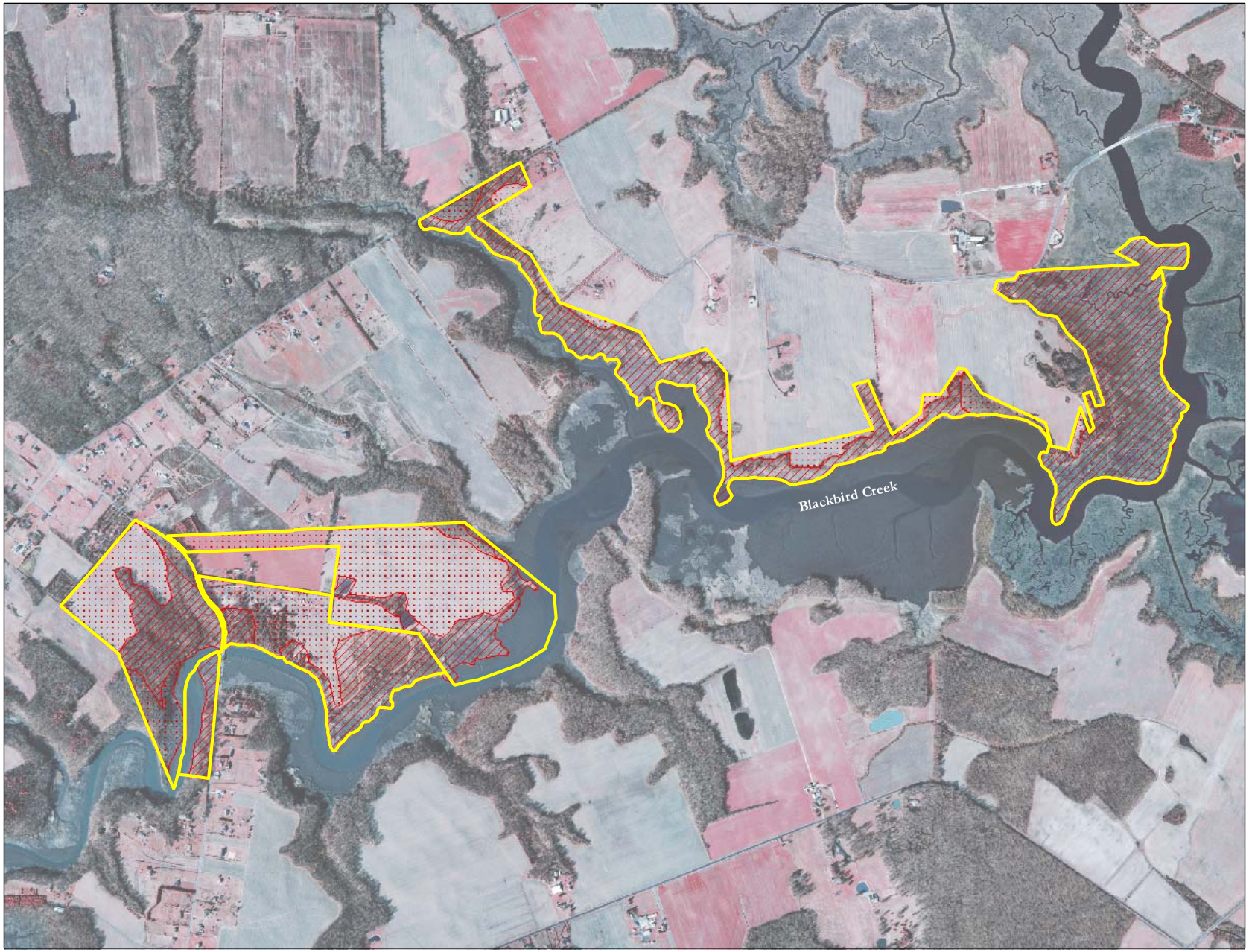

Blackbird Creek Reserve
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Non-native Invasive Species General Intensity Observations Figure 2.5

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

General Intensity Observations

Very low to low density

Moderate to high density

DATE: 03/07

Biohabitats

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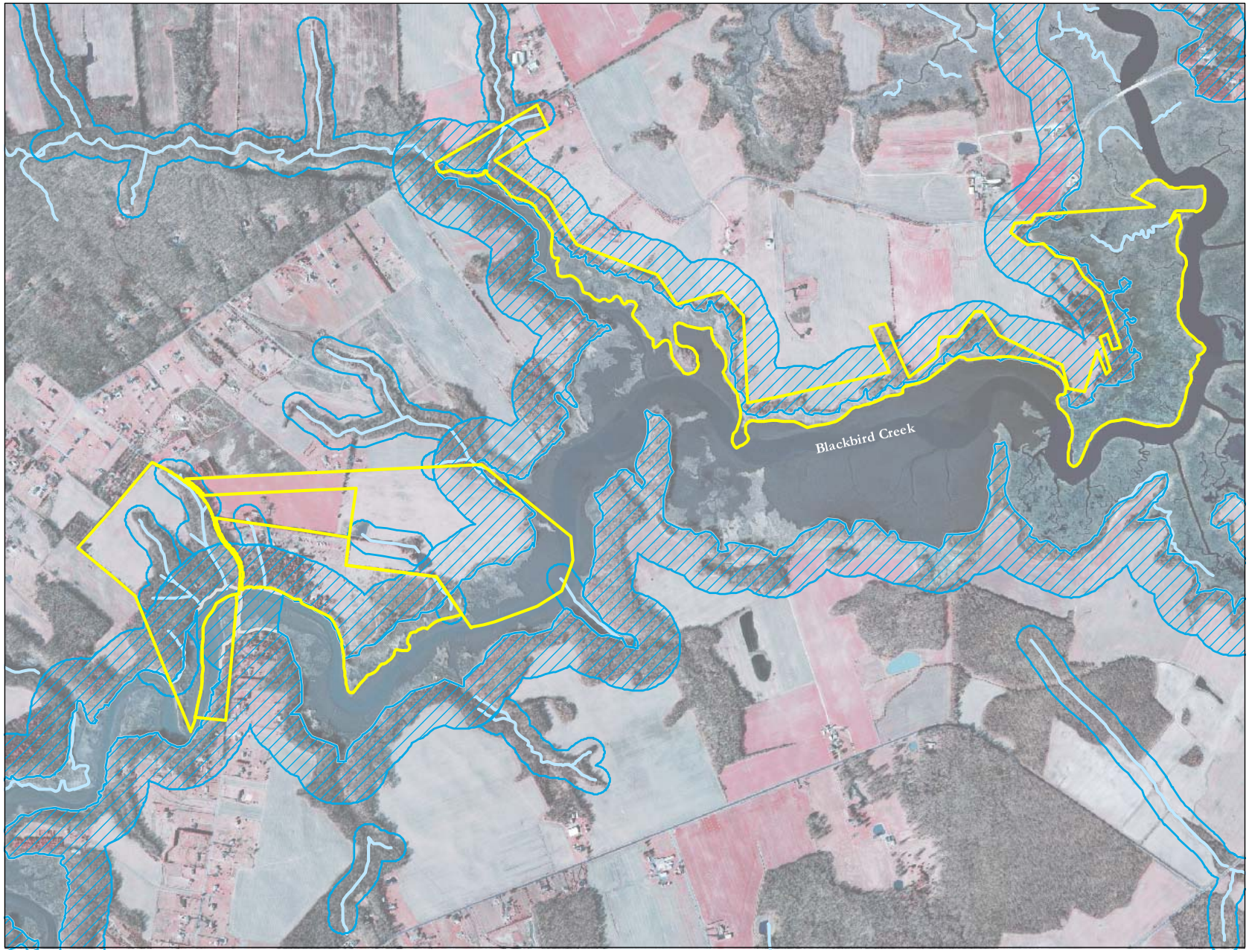
0 312.5 625 1,250 1,875 2,500 Feet



Blackbird Creek Reserve
Ecological Restoration
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Riparian Buffer Distribution Figure 2.6

Legend

- Blackbird Creek Reserve (DNERR-Owned Parcels)
- 100m Buffer Zone-- 50m each side of streams
- 300m Riparian Corridor Zone-- 150m each side of main stem creeks
- Streams

DATE: 03/07

Biohabitats

N

0 312.5 625 1250 1875 2500 Feet

Tidal and Non-tidal Wetlands

Tidal and Non-tidal wetland plant community associations (Figure 2.7) include:

Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest—This system is defined by deciduous hardwoods of seasonally flooded habitats hydrologically supported by shallow groundwater-influenced depressions and stream headwaters. While supporting some seepage characteristics, overland flow to topographic depressions is also a contributor to this system. The soil substrate is mineral in composition overlain with a non-peaty organic layer. Characteristic tree species found during site investigations included red maple, sweet gum, and green ash (*Fraxinus pennsylvanica*).

Northern Atlantic Coastal Plain Brackish Tidal Marsh—This coastal plain tidal marsh system is composed of brackish marshes occurring along the fringes of large tidal rivers and their tributaries where there is some saltwater mixing with freshwater. The typical vegetation associations are distributed within zones according to flooding frequency. Common species include saltmarsh cordgrass (*Spartina alterniflora*), narrowleaf cattail (*Typha angustifolia*), giant cordgrass (*Spartina cynosuroides*), and chair maker's bulrush (*Schoenoplectus americanus*).

Northern Atlantic Coastal Plain Fresh and Oligohaline Tidal Marsh—This system dominates the majority of the upper Blackbird Creek throughout most of the year as upland freshwater inputs typically overpower the salt wedge. The dominant plant associations are distributed by proximity to tidal waters and their depth and duration of inundation. The majority of the land side fringing marsh has been dominated by the common reed (*Phragmites australis*) for many decades (Bailey 1997). Other vegetation typical for the system includes wild rice (*Zizania aquatica*), water-hemp (*Amaranthus cannabinus*), and eastern rose mallow (*Hibiscus moscheutos*), among others.

The entire tidal marsh system in the area of the tracts is dominated by the highly invasive non-native common reed (*Phragmites australis*).The tidal marshlands of Blackbird have been dominated by common reed for decades and several studies have tracked the advancement of this ubiquitous non-native invasive species. There are also references to the suspected occurrence of one to several stands of the native Phragmites (*Phragmites australis americanus*) along the Blackbird Creek Reserve. Wetland restoration needs and opportunities identified include restoration of fresh and brackish tidal marsh primarily to address non-native plant invasion, along with the opportunity for additional restoration of shall open water to tidal wetlands to counter marsh loss.

Managed Vegetation Types

The Blackbird Reserve study area is dominated by former and active agricultural lands that are in different stages of use and the initial stages of management for other ecotypes. Determining what paths will be followed for their future use and management will significantly dictate the character of the Reserve for years to come. Current managed vegetation types (Figure 2.8) at the Blackbird Creek Reserve include:

- Maintained Herbaceous (Cool Season Grass Meadow and Mowed Lawn)
- Active Agricultural Fields
- Upland Reforestation Areas
- Managed Black Walnut Stand

A portion of the Cornelius tract is still in active agriculture, most of the other former agricultural lands within the DNERR-owned tracts are in varying stages of plant community succession. Different techniques for moving these former agricultural lands into another ecotype (reforestation and regeneration) are currently being employed actively and passively. Regular mowing, upland reforestation plantings with tree tubes, simple unmanaged "no mow" areas, and managing low lying moist fields (that may support an emergent /shrub-scrub wetland trajectory) are all techniques employed to varying degrees throughout the study tracts. As a research component is integral to the reserve, proposals for integrating passive and active restoration methodologies with long term monitoring will provide valuable feedback for this reserve as well as others.

Overall, the managed vegetation types provide opportunities for ecological restoration over the three phases of this master plan. The maintained fallow herbaceous fields on the Manwaring tract are under a Conservation Reserve Program contract and any habitat conversion for restoration cannot occur until after September 30, 2009. The managed vegetation types can be maintained in their current use and land cover until the restoration phases they are identified under are implemented. The managed black walnut stand can be managed for timber production, and potentially converted to natural habitat after the future harvest.

Vegetation Community Sensitivity

In terms of overall sensitivity to disturbance or alteration, the riparian forests, forested non-tidal wetlands, upland forests and tidal wetlands are generally the most sensitive vegetation community types. Riparian forests are sensitive to direct clearing impacts and associated habitat reduction, often resulting in water quality degradation effects. Upland forests (large blocks and corridors) communities are susceptible to fragmentation (reduction of patch size and interior forest area), loss of connection, and related plant and animal habitat availability and species diversity reduction. Forested non-tidal wetlands are susceptible to physical alteration, pollutants and hydrological alterations, which can change structure and function (e.g., hydrologic regime, habitat and support of biodiversity). Tidal wetlands are susceptible to localized and watershed level impacts including hydrologic alterations, stormwater run-off and water quality impairment (e.g., nutrient loadings, and excessive sedimentation), and related non-native plant invasion.

Unique Ecotypes Observed

During the field site investigations, several smaller elements comprised of unique, naturally formed ecotypes were encountered that were not found to be common or widely occurring throughout the Reserve. These unique ecotypes occur on the project parcels as very small patches, typically no more than a few hundred square feet in area. Given the cursory reconnaissance nature of the site observations for this master plan effort, determining the exact extent and distribution of these features throughout the Reserve tracts is not a part of this project. The master plan level observations are not intended to be a comprehensive inventory of ecological resources. However, given the uniqueness of these small ecotype examples to natural system recovery and native biodiversity, the occurrence and general locations of these observed features is important to note (Figure 2.9).

Palustrine Forested Wetland Depressions—Palustrine forested wetlands are characterized by the dominance of woody vegetation 20 feet or taller. These wetland types were found in the study area parcels as small depressions in upland and floodplain areas, with many bordering low areas along the riparian fringes of the tidal creeks. Red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), black willow (Salix nigra), sycamore (*Plantanus occidentalis*) and sphagnum (*Sphagnum sp*.) are several species that occur in these wetland areas.

Blackbird Creek Reserve
Ecological Restoration
Master Plan

Tidal & Non-Tidal Wetlands
Figure 2.7

Legend

Blackbird Creek Reserve
(DNERR-Owned Parcels)

Vegetation Communities

Northern Coastal Plain
Brackish Tidal Marsh:
66.4 acres, 18.6% of Reseve Parcels

Atlantic Coastal Plain Northern Basin
Swamp and Wet Hardwood Forest:
1.5 acres, 0.4% of Reserve Parcels

Northern Atlantic Coastal Plain Fresh
and Oligohaline Tidal Marsh:
51.7 acres, 14.5% of Reserve Parcels

DATE: 03/07

Biohabitats

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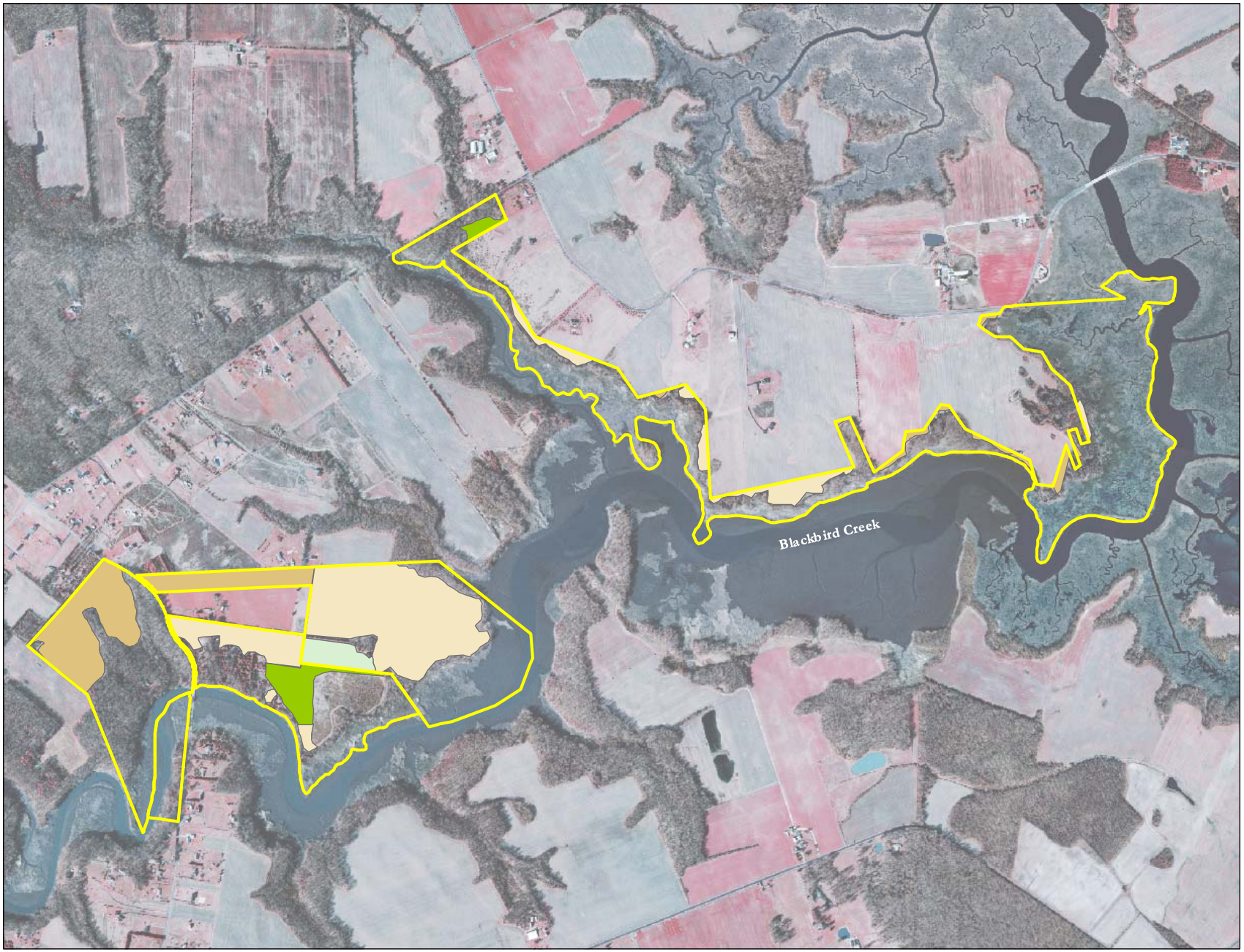
0 315 630 1,260 1,890 2,520 Feet



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Managed Vegetation Types Figure 2.8

Legend

Blackbird Creek Reserve
(DNERR-Owned Parcels)

Vegetation Communities

Maintained Herbaceaous (Cool Season Grass Meadow and Mowed Lawn):
62.3 acres, 17.5% of Reseve Parcels

Active Agricultural Fields:
32.9 acres, 9.2% of Reserve Parcels

Managed Black Walnut Stand:
5.0 acres, 1.4% of Reserve Parcels

Upland Reforestation Areas:
8.6 acres, 2.4% of Reserve Parcels

DATE: 03/07

Biohabitats

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0 312.5 625 1,250 1,875 2,500 Feet

Blackbird Creek Reserve
Ecological Restoration
Master Plan

Unique Ecotypes
Figure 2.9

Legend

Blackbird Creek Reserve
(DNERR-Owned Parcels)

Ecotypes
Existing Forested Wetlands

Forested Wetland Depression

Unique Habitat Elements

Bald Cypress Regeneration

Coastal Plain Pond

Emergent/Scrub Shrub

Hillside Seep Wetland

Native Meadow Regeneration Patch

DATE: 03/07

Biohabitats

N

0 312.5 625 1,250 1,875 2,500 Feet

Emergent/shrub-scrub Wetlands—These palustrine wetland types reflect a mix of herbaceous vegetation and low woody species (shrubs, vines and saplings). They are found as small patches in the study parcels in depressional areas of temporarily flooded meadows as well as along the wetter areas of the riparian zone and transition woodland edges bordering the Blackbird Creek and Beaver Branch. Vegetation found in these areas includes various sedges (*Carex sp*.), soft rush (*Juncus effusus*), goldenrods (*Solidago spp*.), and multiflora rose (*Rosa multiflora*), as well as saplings from deciduous trees such as red maple, green ash (*Fraxinus pennsylvanica*) and sweet gum.

Hillside Wetland Seep—This unique wetland type forms from the emergence of groundwater from a hillside, saturating the slope along the northern edge of the Manwaring tract. These conditions found in a location on one of the study parcels supported forested and herbaceous emergent vegetation types, including red maple and tulip poplar (*Liriodendron tulipifera*), as well as skunk cabbage (*Symplocarpus foetidus*) and sphagnum. The study parcel seep eventually met a headwater tidal marsh tributary of Blackbird Creek.

Bald Cypress Colonization—This unique plant species occurrence on the south-eastern edge of the Manwaring tract is somewhat of a mystery. Three, approximately 20 foot tall bald cypress (*Taxodium distichum*) trees are found within a larger patch of common reed (*Phragmites australis*), and no mature bald cypress were observed in the vicinity. The Blackbird Reserve is on the far northern edge of the range of bald cypress, although many bald cypress have been planted in Delaware and further north. The similar age and grouping of these trees in a cluster along the river shoreline may indicate colonization from propagules brought in from upstream populations, or possible they were intentionally planted.

Native Meadow Grassland Patches—While plenty of meadow habitat (maintained herbaceous fields) is evident on each of the study parcels, there are very few areas that support a native meadow community not overrun with invasive non-native species. Little bluestem (*Schizachyrium scoparium*), broomsedge (*Andropogon virginicus*), goldenrods (*Solidago* spp.), and aster (*Aster sp*.) are among the species found in these patch areas in the study parcels. Their occurrence indicates some native meadow regeneration potential from the soil seed bank.

A program for monitoring these natural elements within their larger systems should focus on detecting physical and biological changes spatially and temporally to the ecotype. The early identification of changes to these systems may require a quick response on the part of Reserve managers to prevent their loss, present an opportunity to encourage the expansion of their coverage, or move the system into a different ecotype. The long term monitoring of the Reserve's natural condition is not only a mandate of the NERR system, it is a useful tool in the detection of ecosystem changes that can be utilized for targeted management decision making and actions.

State and Federally Listed Species

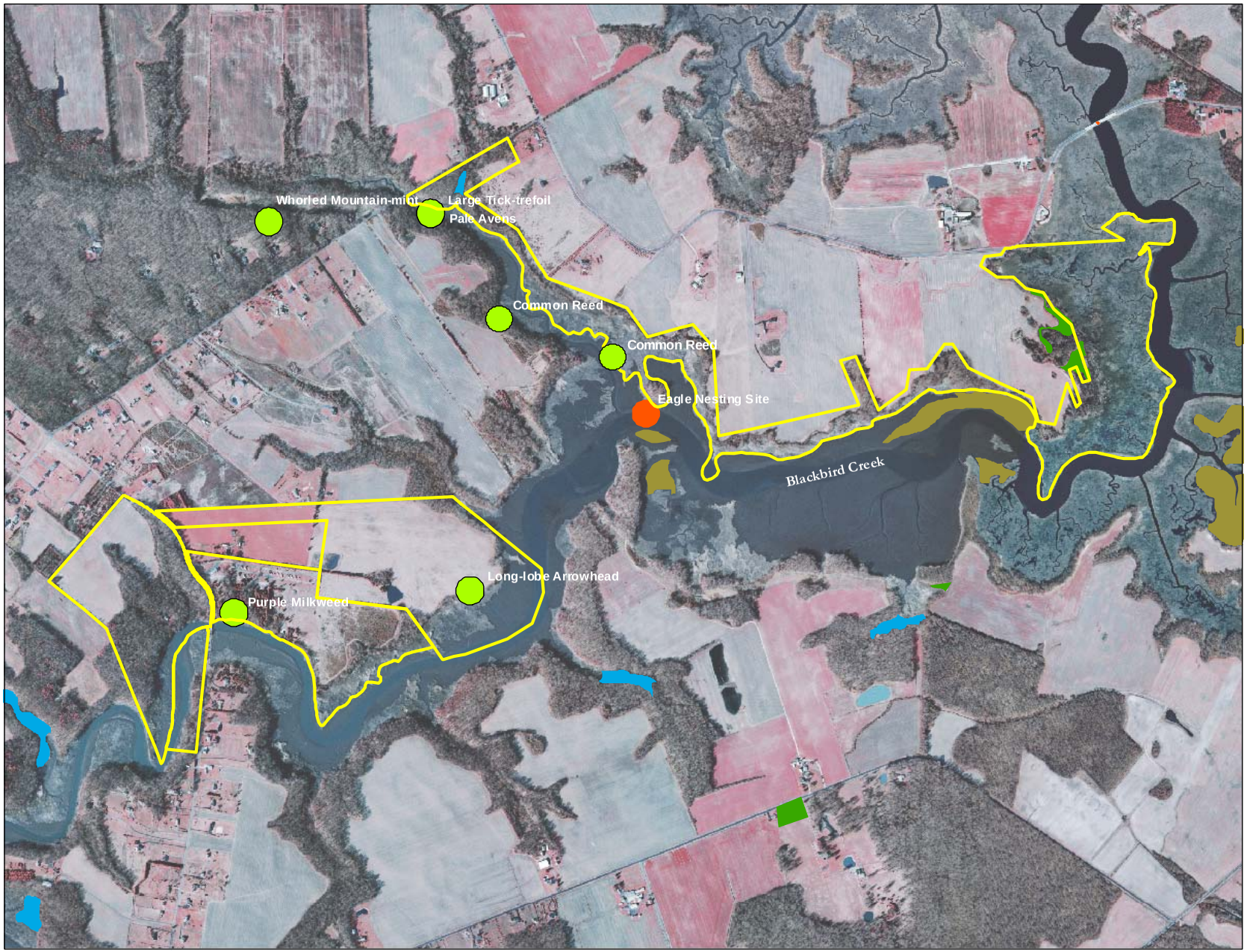
As part of its mission to track the status of rare and uncommon species of flora and fauna within the state, The DNREC-Delaware Natural Heritage and Endangered Species Program (DNHESP) utilizes a ranking system developed by The Nature Conservancy (TNC). A state rank reflecting the degree of rarity within Delaware has been assigned to each species in addition to a global rank which applies to rarity worldwide. There are four listed rare plant species and one animal species identified by the DNHESP as being found on the Blackbird Creek Reserve parcel tracts (Table 2.2). A fifth rare plant species, whorled mountain mint (*Pycnanthemum verticillatum*), is identified to occur near the Reserve parcels. The native common reed (*Phragmites australis*, var *americanus*) is not on the rare plant list, but it is on the State Watchlist of Uncommon Vascular Plants of Delaware, and it has a State Rank of SU (Status Uncertain). None of the plant species are federally listed, while the bald eagle (*Haliaeetus leucocephalus*) is federally listed as threatened. The bald eagle is also listed as Delaware State Endangered. A pair of bald eagles was observed actively nesting on an island at the confluence of Blackbird Creek and Beaver Branch during the site reconnaissance for this plan.

The location of known rare plant and animal species, as provided by the DNHESP, is provided in Figure 2.10. These locations represent recorded occurrences and do not indicate the only potential occurrences of rare plant or animal species within the Reserve parcels. The general ecological characterization observations were part of a limited, winter-time reconnaissance for this master plan project, and are not intended to provide a comprehensive rare species survey. Conducting a detailed multi-season and multi-year inventory and distribution study (and long term tracking) of rare plant and animal occurrences on the tract parcels is highly recommended. Information from a rare species study can then be used to further inform the restoration recommendations in this master plan, and conducting a rare species inventory in the vicinity of any ground disturbance or site clearing activity is imperative prior to project implementation.

Table 2.2 Rare Plants, and Animals of Conservation Concern as Identified by DNHESP

Scientific Name	Common Name	State Rank	Global Rank
Asclepias purpurascens	purple milkweed	S2	G4 G5
Desmodium glutinosum	large tick-trefoil	S2	G5
Geum virginianum	pale avens	S1	G5
Pycnanthemum verticillatum	whorled mountain mint	S2	G5 T5?
Sagittaria spatulata	long-lobe arrowhead	S3	
Haliaeetus leucocephalus	bald eagle	S2B S3N	G4

S1= Extremely Rare within the state
S2= Very Rare within the state
S3= Rare to Uncommon within the state
B=Breeding N=Nonbreeding
G4= Apparently secure globally, but uncommon in parts of its range
G5=Secure on a global basis, but the species may be uncommon on a local basis
T5=Intraspecific taxon ranked differently



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Rare Plants and Key Wildlife Habitats Figure 2.10

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Rare Species Occurrence

- Rare Plants
- Species of Greatest Conservation Need

Key Wildlife Habitats

- Early Successional Habitat
- Freshwater Tidal Forested and Scrub-Shrub Wetlands
- Unvegetated Intertidal Mudflat

DATE: 03/07

Biohabitats

N

0 260 520 1,040 1,560 2,080 Feet

2.2.3 Human Structures—the Built Environment

The Lowe Tract was purchased from an owner that had utilized the property as a campground for recreational vehicles and trailers. The structures have been razed and removed, although old and broken paved interior roads and parking surfaces, a small man-made pond, and other remnants of the campground still persist.

Additionally, a property acquisition that included a large suburban type modern home is intended for use as flexible space for offices, small meetings and equipment storage. Identified site features that are specifically anthropogenic in nature are shown on Figure 2.11.

2.3 Ecological Resource Impacts & Restoration Needs

Headwater Streams—Degraded headwater streams are the most apparent physically altered ecological feature on the Reserve parcels based on site reconnaissance observations. They have on-going and continual degradation processes including stormwater run-off conveyance, eroding and under-cut banks, incised channels, and riparian tree undermining and loss. The degraded streams are also directly impacting infrastructure including roads and culverts.

Riparian Buffers—Riparian corridor buffers along streams and creeks are a significant landscape context feature that is insufficient in terms of typical widths, structure and distribution. These deficiencies are evident from prior studies (McCorkle 2000), aerial photograph analysis and on-site existing conditions observations. Buffer enhancement through reforestation is a significant part of the Streamside Conservation Priority as one of the primary 'Conservation Priority Areas' in the Blackbird Millington Conservation Corridor Plan (TNC/DNREC 2005).

Non-native Invasive Species—A wide variety of non-native invasive plant species occur throughout the Blackbird corridor in all natural community habitat types. Within the Blackbird Creek Reserve they are a threat to native plant communities and their biodiversity as indicated by Bailey 1997 and TNC/DNREC 2005. Furthermore, invasive species are a primary management concern identified in the DNERR Management Plan (DNERR 2004), and are a part of the active management on the Reserve parcels. Attention to existing and future invasive species threats is necessary.

Freshwater Nontidal Forested Wetlands—Delaware has lost more than 50% of its historic wetlands resources since colonial times. This includes palustrine forested wetlands experiencing the greatest loss of all wetland types in Delaware from 1981-1992, encompassing 1500 acres (Tiner 2001). Wetland impacts include the loss of 'coastal plain ponds' or Delmarva Bays', and ecologically unique and regionally important type of forested wetland habitat. The Blackbird Reserve is within the distribution area of coastal plain pond occurrence, but this wetland type is only represented by potentially altered remnants remaining of the Reserve parcels. Areas that would have typically been headwater wetlands at the top of streams have been converted to agricultural fields and their function to protect stream channels has been lost.

Tidal Wetlands—Tidal wetlands, particularly emergent marsh, is a prominent habitat feature of the tidal creeks and rivers in the coastal plain of Delaware including Blackbird Creek. Tidal marsh loss and conversion to open water and mudflats, other ecotone shifts, and extensive common reed invasion have been extensively documented in the Blackbird Creek watershed including the Reserve area (McCorkle 2000, Klemas and Field 2004, and Valentine 2002).

Upland Forest—Coastal plain upland forests once covered much of the landscape in the coastal Delaware. Currently the forest cover is reduced to percent of the watershed. Corresponding habitat areas and habitat corridor connections have been lost due to forest conversion and fragmentation. The Forest Priority Conservation Areas identified by TNC/DNREC 2005, focuses on protecting and linking mature forests and also requires filling in gaps with new plantings and/or improvements to existing stands.

Upland Native Meadow—Early successional vegetation stages of native grassland communities occur as variable patches throughout the coastal plain. They help provide a diversity of habitat types for different species assemblages as a part of mosaic of community types in the region. This vegetation type supports native grassland plants and animals and can also serve to function as a valuable habitat 'placeholder' until future targeted efforts under adaptive management perhaps determine a shift to some other habitat type is warranted.

Blackbird Creek Reserve
Ecological Restoration
Master Plan

Anthropogenic Features Figure 2.11

Legend

Blackbird Creek Reserve (DNERR-Owned Parcels)

Anthropogenic Features

- Suburban House
- Trash/Debris Dumping
- Cut Logs/Woody Debris
- Man-made Pond
- Access Drive/Road

DATE: 03/07

Biohabitats

N

0 0.05 0.1 0.2 0.3 0.4 Miles

3.0 ECOLOGICAL RESTORATION & RESEARCH FRAMEWORK

3.1 Restoration Context

Setting the context for ecological restoration is important, as is defining over-arching goals, objectives, rationale and approach for restoration initiatives. The general emphasis of restoration efforts is often to restore damaged or degraded habitats, abate environmental impacts, or re-introduce historically present native species. There are many variations of the definition of ecological restoration by various groups that undertake or advocate restoration (See Mitsch and Jorgensen 2004; Perrow and Davy 2002; and SER 2004). To set the context for ecological restoration for this project we first look to NOAA, the lead organization for the National Estuarine Research Reserve System (NERRS), for their definition of ecological restoration:

The process of reestablishing a self-sustaining habitat that closely resembles a natural condition in terms of structure and function. (NOAA 2002)

3.2 Restoration Rationale

The State of Delaware and the Nature Conservancy recognizes the Blackbird Creek corridor as one of the most ecologically valuable areas of the state's "Green Infrastructure" (TNC and DNREC 2005). The ecological significance of the Blackbird Creek system is recognized as one of the most important remaining natural landscapes in Delaware as documented in the *Blackbird-Millington Corridor Conservation Area* Plan (TNC and DNREC 2005). Evidence from prior studies of this ecosystem and current observations indicate that the Blackbird Creek system is being degraded by invasive species, past agricultural practices and accelerated development in the watershed (Bailey 1997; McCorkle 2000; Valentine 2002; Klemas and Field 2004).

In addition to DNERR's land conversation protection efforts, ecological restoration is needed to counter these trends to protect the Blackbird system from further degradation. Simply relying on unassisted self-recovery of the system may take decades or longer to happen, or may never occur. These factors are the basis for the rationale that ecological restoration efforts are needed for the degraded resources on the DNERR-owned parcels of the Blackbird Creek Reserve. Effective tools for achieving ecological restoration, including an adaptive management approach, are needed for the Blackbird Creek Reserve to benefit the DNERR-owned parcels, as well as to educate and inform management decisions and influence future restoration efforts for the whole system.

3.3 Over-arching Mission and Goals

The over-arching mission and goals of ecological restoration for the Blackbird Creek Reserve are influenced at several levels, including guidance from the National Estuarine Research Reserve System (NERRS) and reserve-specific DNERR Management Plan goals. Additionally, objectives related to achieving these goals were provided by the DNERR Staff and DNREC personnel, specifically related to this ecological restoration master plan. The Reserve management staff also takes into account local community and stakeholder objectives for the Reserve area and its contributing watershed.

The overall NERRS mission is – *'To practice and promote coastal and estuarine stewardship through innovative research and education, using a system of protected areas.'*

A significant component of fulfilling the NERRS mission includes the basic *GOAL* of:

Protecting, restoring and monitoring of local estuarine and coastal resources for each of the Reserve system sites.

The NERRS also has an evolving restoration strategy (see inset).

A Restoration Science Strategy

The National Estuarine Research Reserve System is developing a Habitat Restoration Strategy to provide the scientific basis and technical expertise to restore, enhance and maintain estuarine ecosystems. The plan will develop and transfer effective approaches to identify, prioritize, restore and monitor degraded or lost coastal habitat. The strategy uses a partnership approach coupled with education and community involvement. The restoration areas in which the reserve system hopes to play a national role includes:

- Project planning
- Developing effective approaches to test and evaluate innovative technology for restoration
- Monitoring restoration response
- Serving as local reference or control sites
- Translating/transferring restoration information
- Providing scientific and technological advise to support policy and regulatory decisions
- Building awareness for the value of restoration science
- Coordinating regional science

The NERRS restoration science initiative has set general '*Habitat Restoration Priorities for Each Reserve'*. The DNERR restoration priorities, as determined by the NERRS restoration science initiative, are generally defined as:

- Invasive species
- Upland habitat
- And, Other

The 'Other' category references smaller, local habitat types of concern not representative of the national strategy.

As a companion, the NERRS also identifies '*Lost, Disturbed or Damaged Habitat Within Each Reserve*', and for the DNERR they are as follows:

- Salt/Brackish marsh
- Tidal freshwater wetlands
- Upland forest/meadow
- Riverine/riparian wetlands
- Coastal prairie/scrub

The above priorities are for both the St. Jones River and Blackbird Creek Reserves of the DNERR. Specific priorities for each site are not distinguished.

The Reserve and DNREC staff identified objectives for the outcome of this ecological restoration master plan and implementation process that include:

- Define restoration targets for the plan
- Improve land use activities from a water quality perspective
- Provide a holistic restoration plan for now, and set the stage for long-term monitoring
- Identify associated innovative stormwater techniques
- Produce results on the ground in the near-term
- Lead to demonstration plots for wildlife habitat types (e.g., for mammals)
- Act as a model for others in the watershed

3.4 Restoration Approach

The restoration of the Blackbird Creek Reserve study parcels will involve multiple techniques and restoration approaches. These techniques and approaches are dependant upon the condition of the ecological resources that are targeted for restoration and resources available to achieve the restoration goals.

The scale and focus of restoration effort is an important issue to address for any ecological restoration project or program. Ecological restoration can occur at a variety of levels including a system, community, population or species focus. At broad scales, it becomes even more difficult to decide what should be restored, where and how (Hobbs 2002). Other major considerations revolve around a landscape level ecological context and/or restoring natural functions and processes. Whatever is carried out in the way of restoration should involve working with, and not in opposition to, the natural processes that will form the system in the achievement of a functioning ecosystem (Bradshaw 2002).

The amount and type of intervention is dependent on the degree of degradation or ecological impacts. This can range from reconstruction, to less extensive enhancement, or simply improved management of the resource. Parker & Pickett (1997) indicate that restoration should be considered a process, with the degree of active intervention being determined by contextual circumstances.

Guiding Principles for Restoration

The following *Guiding Principles* are used to guide the conceptual ecological restoration initiatives identified in this plan, and are recommended for associated restoration design and implementation/construction processes.

- Protect and maintain existing habitat patches, and restore habitat to provide larger patches and increase the connectivity of habitat corridors
- Maintain existing high quality habitat conditions and improve degraded habitat conditions by removing threats or threatening processes
- Improve the condition of relic habitats in fragmented landscapes to ensure their persistence
- Emphasize supporting and regenerating natural processes for system recovery
- Conserve non-renewable energy in restoration approaches
- Support ecosystem conservation practices in all related activities
- Use applied monitoring and research to test ecological theories
- Consider human needs and compatibility with the needs of biotic systems

Given the degree to which specific ecological resources have been identified to be degraded or damaged, and other resources are threatened, the *Restoration Approach* for the Blackbird Component parcels is recommended to include:

- Active restoration of specific degraded or impacted existing ecological resources including; non-tidal wetlands, streams and riparian buffers
- Creation of additional habitats that are fragmented, reduced or eliminated from the landscape (including; wetlands, upland reforestation and native meadows)
- Use varying degrees of non-native invasive species management to protect existing natural communities, and as a part of restoring degraded habitat areas
- Identify compatible ideas for sustainable facilities, best management practices (e.g. stormwater), and stewardship opportunities to support restoration
- Adaptive management in the form of restoration implementation, monitoring and informed decision making based on the analysis of the monitoring results.

3.5 Restoration Targets & Trajectory

Inherently, achieving ecosystem restoration of the entire 'Blackbird' system cannot be accomplished in the context of only the Reserve parcels. However, leading by example, the restoration efforts on the Blackbird Creek Reserve can certainly be a significant part of ecosystem restoration. The benefit of the long-term mission and work of the DNERR is that the restoration efforts on the Blackbird Creek Reserve can be accomplished in the broader context of monitoring the changes in the system components. More importantly, the Reserve system research focus affords the opportunity for ecological modeling and entire ecosystem analysis. The key to achieving the Blackbird Creek ecosystem restoration is collaboration with other organizations to monitor and analyze broad-scale efforts. An important aspect of the proposed restoration approach is utilizing adaptive management in the form of restoration monitoring and informed decision making based on the analysis of the monitoring results and natural system responses.

Questions related to defining the specific targets for restoration may be thought of in terms of ecosystems, communities, plant assemblages or individual species. Primarily, what is the trajectory, or pathway to the desired restoration endpoint? To establish targets for ecological restoration it is important to consider the restoration priorities identified by NERRS, and the associated list of lost, degraded or disturbed habitats previously identified in this plan. These Reserve-specific priorities, along with the ecological resources identified to be degraded or lost in this part of the system, form the basis for specific restoration targets recommended. The prioritization, phasing, recommended methods and targets for each identified type of restoration are identified in Section 4 of this master plan.

The information assessed for the Blackbird Creek and watershed indicates that this highly valued system is showing signs of multiple stressors and degrading influences, and its ecological trajectory is showing a downward trend. This master plan recommends that active intervention must be taken to repair or regenerate specific degraded resources on the Blackbird Creek Reserve. Implementation of the restoration initiatives identified in this plan, along with adaptive management by monitoring, analyzing natural system responses, and revising restoration approaches in the future, is intended to assist the system along a recovery trajectory.

3.6 Restoration Research & Monitoring Framework

A critical component of long-term restoration success is the application of applied research and monitoring. These efforts will not only document the restoration site conditions upon implementation, but also serve to track natural system responses and trends. Restoration is not only a problem-solving matter; it is a tool for ecological research (Jordan *et al.* 1987). Created and restored ecosystems provide unique research opportunities to scientists that natural systems do not, particularly in subjects such as self-organization and ecosystem development (Mitsch and Jorgensen 2004). Monitoring restored coastal areas can provide tools for planning management strategies and help improve future restoration practices and projects (Washington *et al.* 2000).

The research-based mission of the NERRS and the DNERR directly support applying monitoring and scientific research to restoration projects. Restoration project monitoring must be based in scientific testing and experimental design. There is a fundamental need to document baseline conditions of monitoring sites, establish research test plots, identify control areas, and monitor resource conditions over a specified timeframe.

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration has produced several documents that provide guidance and specific protocols for coastal restoration project monitoring criteria. Given the NOAA relationship to the DNERR, following the guidance and framework of these documents is essential for Blackbird Creek Reserve ecological restoration project monitoring. Two key documents that should be used to guide the restoration framework are the *Science-Based Restoration Monitoring of Coastal Habitats Volume 1* (Thayer *et al.* 2003), and *Draft NOAA Fisheries Technical Guidance Manual for Success Criteria in Restoration Projects* (Pinit *et al.* 2000). Both documents emphasize the need to develop scientifically defensible monitoring plans, and every restoration project for the Blackbird Creek Reserve will need to develop one. There are twelve steps, and thirteen specific habitat types (coastal freshwater to marine systems) identified for developing a scientifically based and statistically valid restoration monitoring plan (Thayer *et al.* 2003). The corresponding habitat types are provided in Appendix B. Suggestions for possible monitoring parameters corresponding to each recommended restoration type is provided in Section 4 of this master plan.

4.0 RESTORATION RECOMMENDATIONS

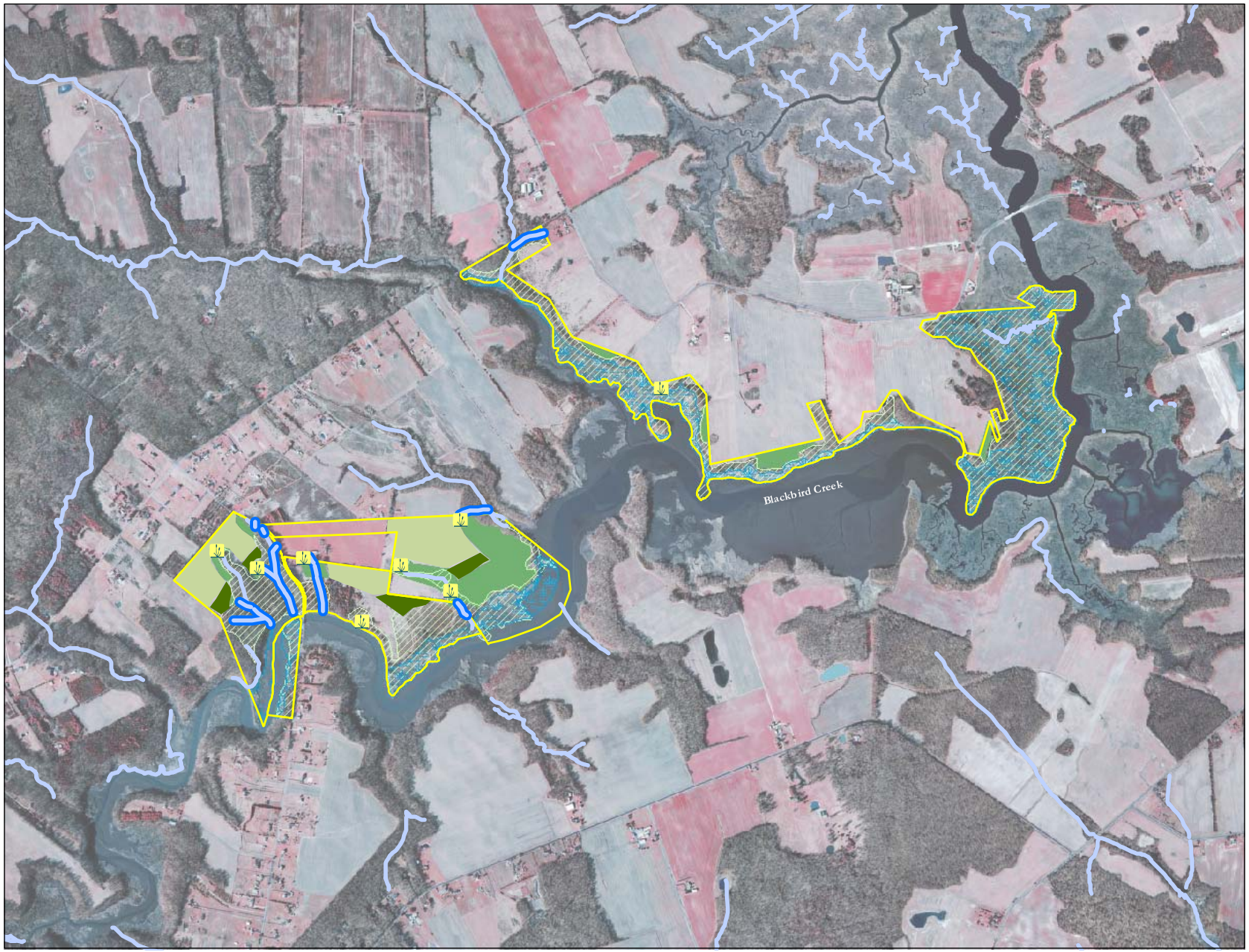
4.1 Restoration Phasing and Priorities

The identification of ecological restoration priorities and phases is important for the short-term immediate needs for Phase 1 (Year 1) and for the longer term Phase 2 (Years 2-5) and Phase 3 (Years 6-15). The prioritization and phasing recommended here is meant for general guidance as a starting point. In the truest sense of adaptive management (learning through implementation, testing and modifying practices) the actual restoration timing, techniques and priorities will and should change over time. This is necessary to account for research and monitoring results for initial efforts, changes in the watershed, related ecosystem function modeling/analysis and available resources (financial and material). Building in the flexibility for changes in acreages, locations and types of restoration projects and approaches is inherent in this ecological restoration master plan.

Restoration needs were evaluated for this project based on site observations and existing information review. The specific restoration recommendations are structured to effectively implement the restoration approach identified in Section 3. A list of priority ecological restoration needs by restoration type is provided below in order of need and importance as recommended by Biohabitats. It is based on GIS information, prior studies, our field reconnaissance and analysis. Priorities were assessed based on a number of considerations applied to each restoration activity type to rank their importance. The results of this screening are provided in Table 4.1. This does not suggest for example that all headwater stream restoration projects and actions need to happen first. Rather, we identified the order of highest priority, with the expectation that elements of each of the restoration type will occur in the near-term and longer term phases. The distribution of recommended ecological restoration types is provided in Figure 4.1. Phase 1 recommendations are shown in Figure 4.2, and Phase 2 & 3 recommendations are in Figure 4.3.

The recommended priority restoration project types are as follows:

- Headwater stream restoration
- Riparian corridor buffer restoration
- Invasive species management
- Wetland restoration—freshwater nontidal
- Wetland restoration—tidal marsh
- Upland reforestation
- Upland native meadow restoration



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Ecological Restoration Recommendations Figure 4.1

Legend

- Blackbird Creek Reserve (DNERR-Owned Parcel)
- Stream Channel

Ecological Restoration Recommendations

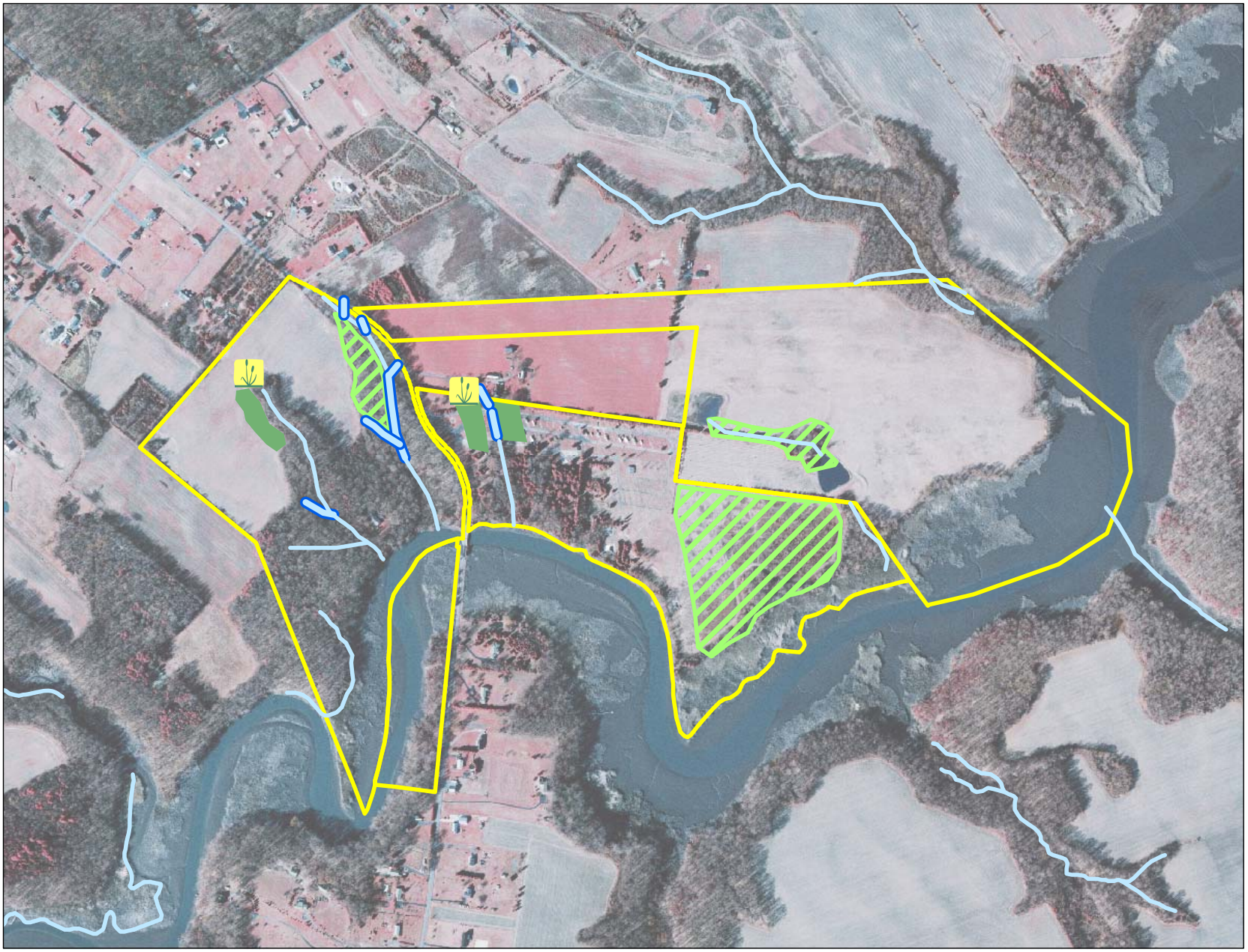
- Headwater Stream Restoration
- Wetland Restoration-Tidal Marsh
- Invasive Species Management
- Riparian Corridor Restoration
- Native Meadow Restoration
- Upland Reforestation
- Wetland Restoration-Freshwater Non-Tidal

DATE: 03/07

Biohabitats

N

0 312.5 625 1,250 1875 2500 Feet



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Phase 1
Ecological Restoration
Recommendations
Figure 4.2

Legend

Blackbird Creek Reserve (DNERR-Owned Parcel)

Stream Channel

Ecological Restoration Recommendations

Headwater Stream Restoration

Invasive Species Management

Riparian Corridor Restoration

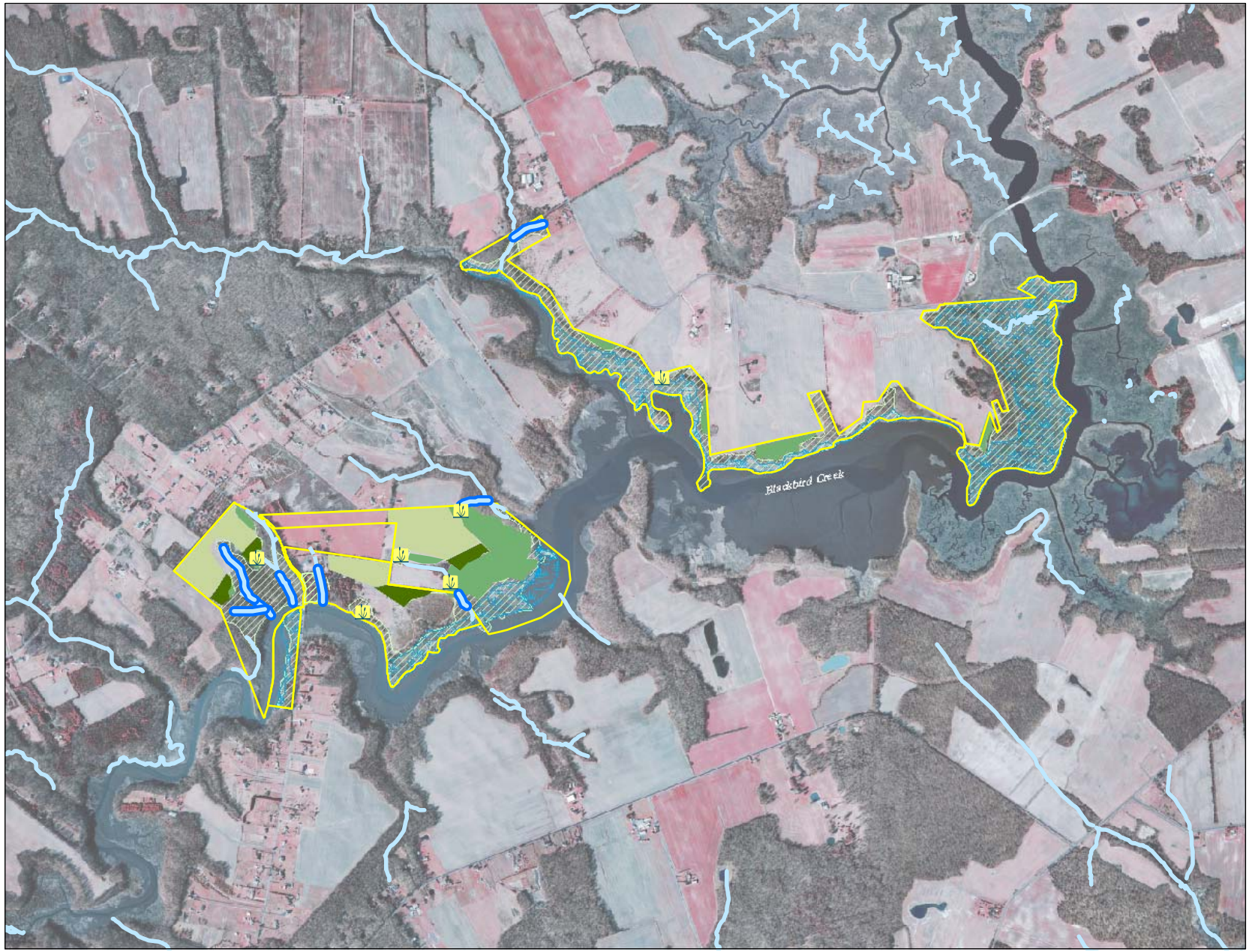
Wetland Restoration-Freshwater Non-Tidal

DATE: 03/07

Biohabitats

N

0 125 250 500 750 1,000 Feet



Blackbird Creek Reserve
Ecological Restoration
Master Plan

Phase 2 & 3
Ecological Restoration
Recommendations
Figure 4.3

Legend

- Blackbird Creek Reserve (DNERR-Owned Parcel)
- Stream Channel

Ecological Restoration Recommendations

- Headwater Stream Restoration
- Wetland Restoration-Tidal Marsh
- Invasive Species Management
- Riparian Corridor Restoration
- Native Meadow Restoration
- Upland Reforestation
- Wetland Restoration-Freshwater Non-Tidal

DATE: 03/07

Biohabitats

N

0 3125 625 1,250 1,875 2,500 Feet

Table 4.1 Restoration Prioritization Considerations

Ranking	Restoration Type	On-going active disturbance	Long-term degradation of resource	Recent acceleration of degradation	Continuation threatens infrastructure	Impacts other resources or areas	NERRS Priority for DNER Reserve	Additional DNERR Priority for tracts	Condition disrupts natural processes	Total
1	Headwater Stream Restoration	•	•	•	•	•		•	•	**7**
2	Riparian Corridor Buffer Restoration	•	•			•		•	•	**5**
3	Invasive Species Management	•	•			•	•		•	**5**
4	Wetland Restoration--Freshwater Non-tidal		•			•	•		•	**4**
5	Wetland Restoration--Tidal Marsh			•			•		•	**3**
6	Upland Reforestation		•				•		•	**3**
7	Native Meadow Restoration		•				•			**2**

The following sub-sections of this plan describe the recommended approach to each ecological restoration type. After the restoration approach is described, the following information is provided for each restoration type:

- Restoration target (amount and type of each ecological restoration measure)
- Focal animal species (representatives from guilds for assemblages habitat is targeted for)
- On-going management needs (short-term maintenance & management necessary to support future restoration)
- Pre-implementation needs/Data gaps (necessary studies, plans or actions prior to implementing restoration projects)
- Monitoring & research needs (types of collaboration, planning and possible parameters to provide research based restoration monitoring)

Table 4.2 identifies the associated restoration actions recommended for each phase of ecological restoration.

Restoration Target Determination

The restoration targets in section 4.2 are based on a combination of on-site resource conditions and extent, opportunities based on the master plan objectives, and applicable literature references. The determination of each recommended restoration target is based on the assessments made for this master plan effort, and are intended to be revised in future phases as restoration efforts are implemented, monitored and the system responses are assessed. This will support an adaptive management approach that targets future restoration efforts based on ecosystem recovery, new system stressors and available resources.

Focal Species Identification

The focal species identified for each restoration type are based on a combination of sources and are representative of the associated habitat/vegetation community types. These sources include prior ecological studies of the Blackbird watershed, species ranges and habitat affinity, professional experience, and specific inclusion of animal species/habitat associations identified in the Delaware Wildlife Action Plan (DNREC 2006).

Table 4.2 Ecological Restoration Implementation Phasing and Actions Schedule

	Restoration Phase and Type	Restortion Target	Refine Existing Management	Pre-implementation Data Collection	Initiate Design and/or Permitting	Develop Monitoring Plan	Construct or Implement Project	Conduct Monitoring and Research	Perform Follow-up Management	
	PHASE 1 (Year 1--2007-2008)									
	Headwater Stream Restoration	1635 Linear Feet	√	√	√	√	√			
	Riparian Corridor Buffer Restoration	725 Linear Feet (2.8 acres)	√	√	√	√	√			
	Invasive Species Management	18 acres of upland, riparian & wetland	√	√		√	√			
	Wetland Restoration--Freshwater Nontidal	1 Acre (including 2 'coastal plain ponds')		√	√	√	√			
	Wetland Restoration--Tidal Marsh	0 acres		√						
	Upland Reforestation	0 acres								
	Upland Native Meadow Restoration	0 acres								
	PHASE 2 (Years 2-5--2008-2013)									
	Headwater Stream Restoration	4280 Linear Feet	√	√	√	√	√	√	√	
	Riparian Corridor Buffer Restoration	1900 Linear Feet (34 acres)	√	√	√	√	√	√	√	
	Invasive Species Management	15-20 acres annually		√		√	√	√	√	
	Wetland Restoration--Freshwater Nontidal	2 Acres (including 6-8 'coastal plain ponds')		√	√	√	√	√	√	
	Wetland Restoration--Tidal Marsh	13 ac. fresh to oligohaline, 5 ac. of brackish, and 6 acres of open water to tidal marsh		√	√	√	√	√	√	
	Upland Reforestation	3 acres			√	√	√	√	√	
	Upland Native Meadow Restoration	23 acres	√	√	√	√	√	√	√	
	PHASE 3 (Years 6-15--2013-2023)									
	Headwater Stream Restoration	0 Linear Feet						√	√	
	Riparian Corridor Buffer Restoration	0 Linear Feet						√	√	
	Invasive Species Management	15-20 acres annually		√		√	√	√	√	
	Wetland Restoration--Freshwater Nontidal	2 Acres (including 6-8 'coastal plain ponds')		√	√	√	√	√	√	
	Wetland Restoration--Tidal Marsh	27 acres fresh to oligohaline and 45 acres of brackish		√	√	√	√	√	√	
	Upland Reforestation	5 acres			√	√	√	√	√	
	Upland Native Meadow Restoration	13 acres	√	√	√	√	√	√	√	

4.1.2 Additional Rare Species Needs & Considerations

Due to the fact that there are identified rare, threatened or endangered species (RTE) identified for the Reserve tracts, and other RTE species may occur, a detailed RTE inventory study is needed. This is necessary in order to specifically understand their extent and to effectively manage this important ecological resource. Specific needs for an RTE species study include the following:

- Conduct seasonal field investigations based on identified and potentially occurring species, their biology, life stages, seasonality and habitat needs
- Document the RTE species population sizes, distribution and condition to provide a baseline for protection, management and monitoring
- Identify direct threats and stresses to the RTE species populations

A comprehensive RTE study will help to inform the specific planning, design, implementation and management of the ecological restoration initiatives and facility/site amenity projects. Most importantly, integrating RTE species considerations into project implementation is intended to help ensure their protection and conservation.

The potential relationship of the currently known RTE species associated with the recommended ecological restoration habitat types identified in this section are:

- Purple milkweed—Upland and riparian forests (low, dry areas of shady woods)
- Large tick-trefoil—Upland forests (high, dry woods, clearings)
- Pale avens—Upland forests (forest openings, and thickets)
- Whorled mountain mint—Native meadow (dry fields/grassland, thickets)
- Long-lobe arrowhead—Tidal wetlands (muddy intertidal flats, water)
- Bald eagle—Riparian corridor buffers and tidal marsh wetlands (forests, bodies of water)

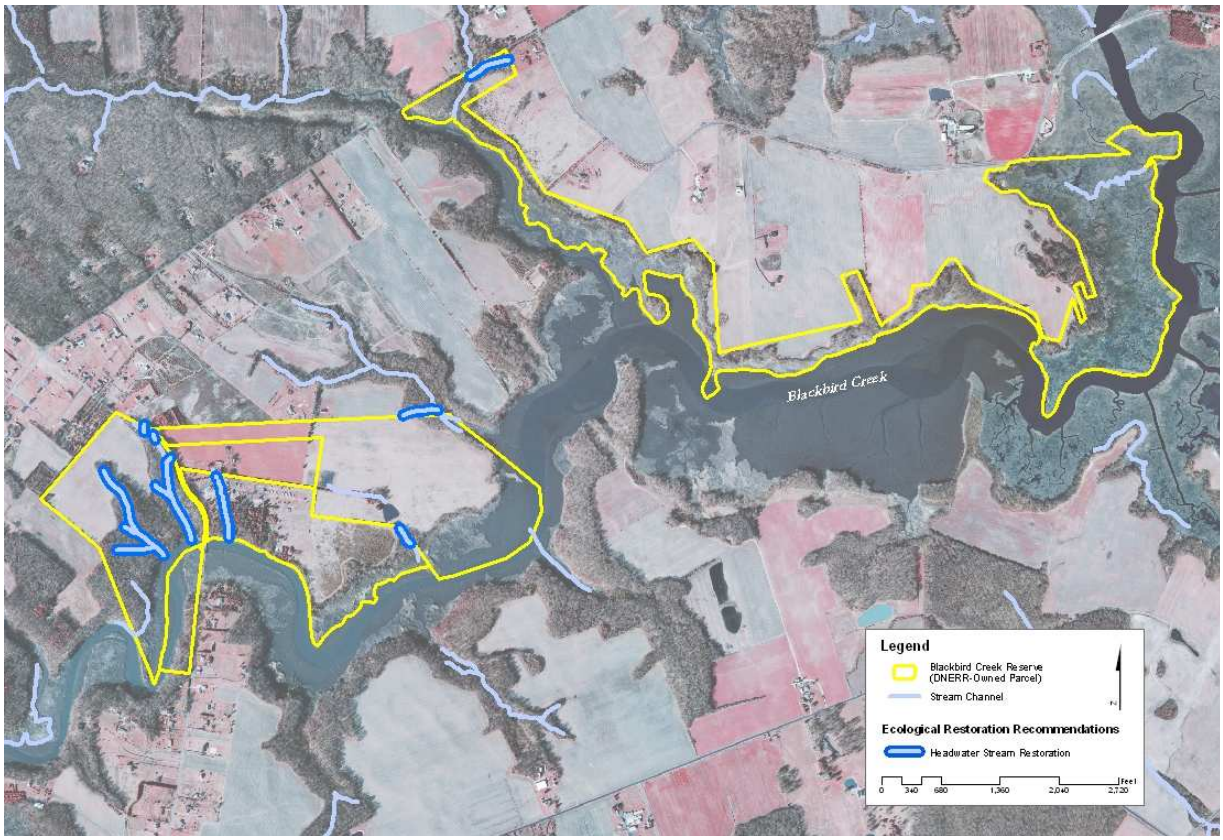
4.2 Recommended Restoration Types

4.2.1 Headwater Stream Restoration

Stream restoration is recommended for all of the degraded headwater stream tributaries. Stream restoration techniques shall target the most severely and actively eroding stream reaches, including first order head cuts (see habitat target and pre-implementation needs) and others based on a geomorphic assessment. The stream restoration approach shall use natural channel design techniques and emphasize the use of on-site native materials (logs, rocks, and vegetation cuttings). The work shall minimize excavation and grading, utilizing strategically placed stream (natural) structures and grade controls. Headwater stream restoration is recommended to occur in conjunction with strategically located headwater wetland restoration or creation. This will be beneficial for run-off interception in the form of hydraulic interruption and habitat features in high run-off agricultural and fallow fields. Stream channel restoration is a high priority for the Cornelius Tract roadside head-cut channels and the Lowe Tract entry area stream.

Restoration Target:

Restore a total of approximately 5915 linear feet of degraded headwater stream channels, approximately 1635 linear feet targeted for Phase 1 (Cornelius head-cut channels and Lowe entry stream), and approximately 4280 LF for Phase 2. The target for stream restoration is developed from a site-specific determination that all the identified degraded headwater stream reaches need to be restored in the near future, before further impacts occur to the stream system or other related ecological resources and infrastructure.



Focal Animal Species for Habitat Type
Bridle shiner (*Notropis bifrenatus*), spotted sandpiper (*Actitis macularia*), and midland clubtail (*Gamphus fraternus*).

On-going Management Needs

Reduce or eliminate the mowing of field edges and agricultural cropping within 100 feet of headwater channels. Consider closing off the trail from fields to house on Cornelius Tract.

Pre-implementation Needs/Data Gaps

- Identify and retain a geomorphologist/stream restoration specialist
- Conduct a geomorphic assessment of all on-site stream channels and further prioritize reach segments for restoration
- Monument stream restoration reach cross sections and record GPS/photo point locations to document current stream conditions.
- Identify a restoration design approach and concept for each reach to be restored.
- Initiate a stream plan design development, acquire regulatory approvals and make construction contracting arrangements.

Monitoring & Research Needs

Identify research partners from local or regional Colleges / Universities, DNREC or other collaborating consultants. Develop a monitoring plan for each stream restoration project. Establish testable hypotheses. Select and monitor appropriate reference sites, and on-site control reaches. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize these impacts.

Possible monitoring parameters include:

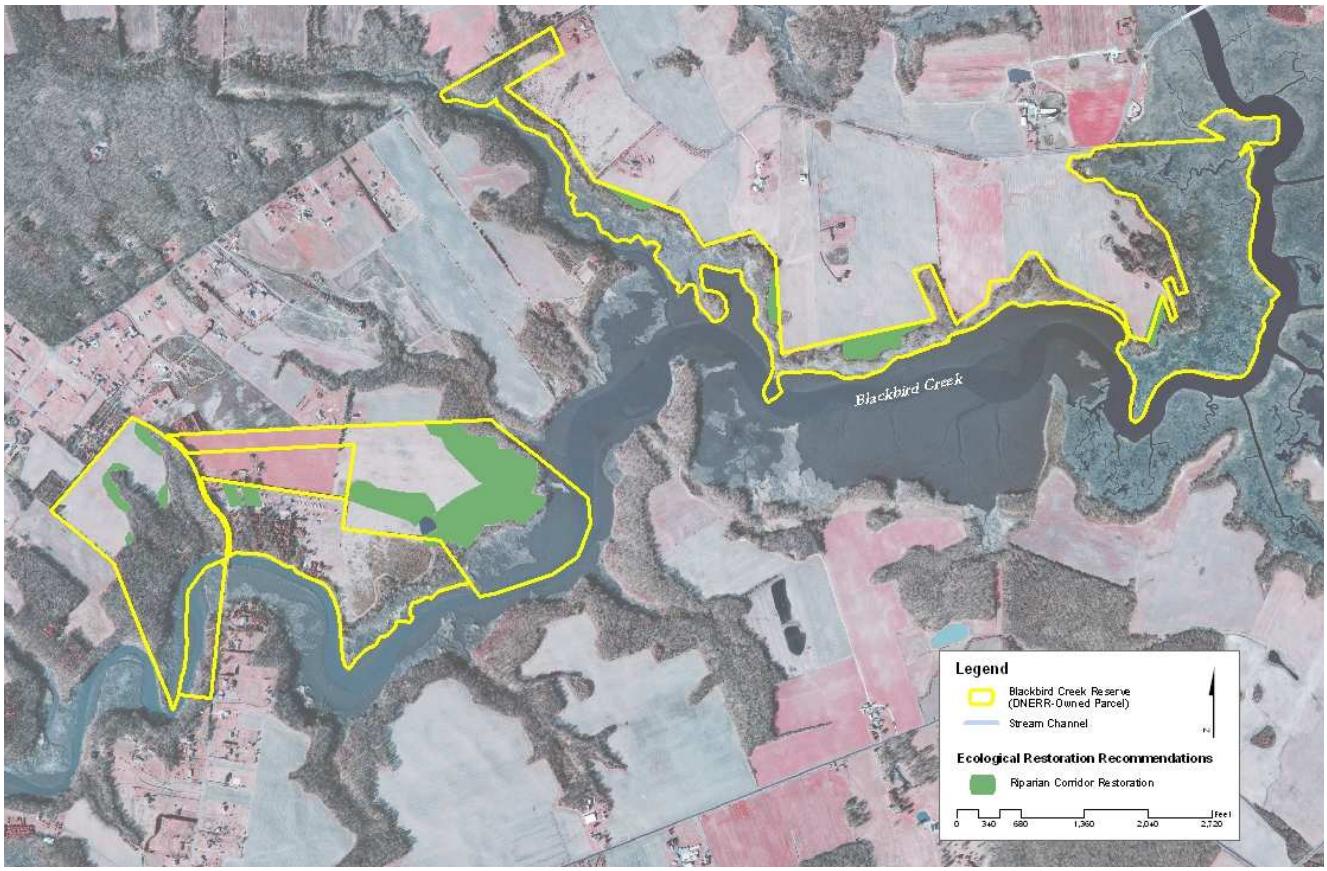
- bankfull width
- sinuosity
- bank full elevation
- bank erosion/scour
- bed characterization/pebble counts
- cross-sectional areas
- wetted width
- channel slope
- floodplain profile
- riparian vegetation
- aquatic organisms (fish and macro-invertebrates).

4.2.2 Riparian Corridor Buffer Restoration

Riparian buffer restoration is recommended for the Blackbird Creek mainstem and all the stream tributaries on the tract parcels. Buffer restoration is recommended in the form of native reforestation plantings and natural succession management where the existing buffer is non-existent, inadequate in width, or poorly structured. In this ecosystem, an expanded forested buffer area is generally recommended (for mesic to dry hardwood forest types) with the potential for minor inclusions of scrub-shrub or limited patches of native coastal plain meadow.

Restoration Target:

Restore a total of 2625 linear feet, approximately 37 acres of creek and stream corridor buffers to riparian forest habitat types. The phase targets are 725 linear feet, 2.8 acres in Phase 1; and 1900 linear feet, 34.0 acres in Phase 2. The riparian buffer target is based on a 300-meter wide (approximately 150m each side) riparian corridor for the mainstem Blackbird Creek and Beaver Branch. The riparian buffer recommendation for the non-tidal stream tributaries is a 100-meter wide (50 meters on each side). Riparian corridor buffer restoration target basis is derived from the recommendations in the Millington-Blackbird Corridor Conservation Area Plan (TNC/DNREC 2005).



Focal Animal Species for Habitat Type

Kentucky warbler (*Oporornis formosus*), evening bat (*Nycticeius humeralis*) and carpenter frog (*Rana virgatipes*).

On-going Management Needs

Maintain limited seasonal mowing of fallow field areas until decisions are made for each buffer segment to: 1) allow natural selection for woodland recruitment; 2) maintain in fallow field condition until future phases; 3) plant with reforestation propagules (tree stock or woody seeds).

Pre-implementation Needs/Data Gaps

- Establish buffer baseline documentation study sites with vegetation plots and GPS/photo point monuments to document current riparian composition, structure, and condition
- Conduct further growing season studies of native species composition, invasive species distribution, propagule sources, and soil analysis samples (to help determine appropriate species locations and potential soil amendment needs)
- Initiate planting plan development and plant source identification

Monitoring & Research Needs

Identify research partners from local or regional College / University partners, DNREC or other collaborating research organizations. Develop a monitoring plan for each riparian buffer project. Establish testable hypotheses. Select and monitor appropriate reference sites, and on-site control sites. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize these impacts.

Possible monitoring parameters include:

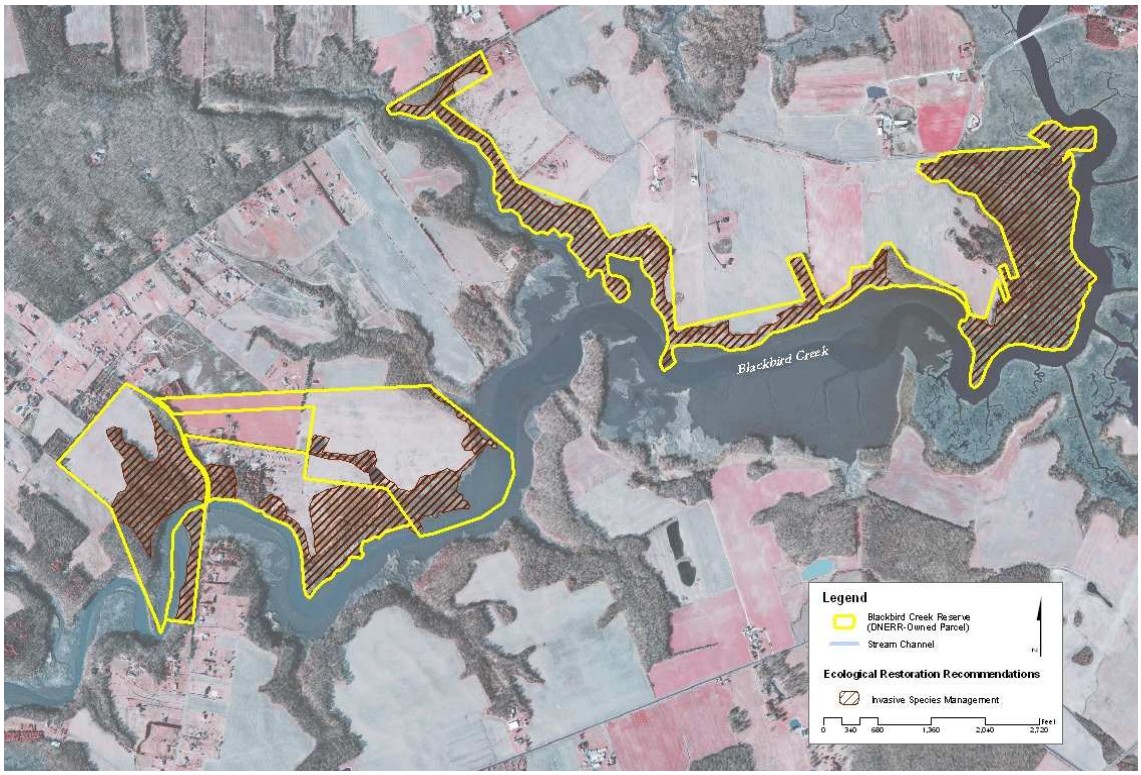
- species composition
- percent cover
- canopy extent
- interspersion
- litter fall
- mast/seed production,
- plant health (herbivory damage, disease)
- woody debris
- animal species (composition and relative abundance).

4.2.3 Invasive Species Management

Invasive species management is needed for all habitat types on the Black Creek Component. Not all invasive species management efforts involve active invasive species treatment, removal and control. Invasive species management includes baseline assessment, monitoring, active control, passive control and combining invasive species management with other types of projects such as stream restoration, wetland restoration and reforestation. Priority non-native invasive species for control are Kudzu (*Pueraria Montana*), Canada thistle (*Cirsium arvense*), and multiflora rose (*Rosa multiflora*). Common reed (*Phragmites australis*) needs to be addressed in a comprehensive long-term fashion, rather than attempts at short-term total eradication, due to it homogenous occurrence throughout the Blackbird Creek tidal marsh system. Further study of the implications of long-term agricultural land nutrient delivery to the marsh and creek system is needed to address common reed persistence and control potential. Recommended invasive species control techniques include stem/stump cut herbicide (non-persistent) treatments, physical manual removal, soil amendments, hydrology manipulation, controlled burning and native plantings.

Restoration Target:

For specific ecological restoration projects and managed areas, control all of the 'priority' species referenced above to < 5% coverage to keep these aggressive species in check. Due to requirements of Delaware's Noxious Weed Law, Canada thistle must be completely controlled (a 0% cover target). For all other existing non-native invasive species, manage for less than 15% total coverage, reflecting a greater tolerance for their occurrence in the system. For all existing community types, provide active control to 18 acres of invaded upland, riparian forests, non-tidal forested wetlands, and tidal marsh edges in Phase 1; and treating 15-20 acres annually in Phases 2 and 3. The targets for invasive species management are based on the biology and character of the species to be controlled, and the practicality of achieving control thresholds.



Focal Animal Species for Habitat Type

Various by habitat, representative species include red-headed woodpecker (*Melanerpes erythrocephlus*), marsh wren (*Cistothorus palustris*), and Cope's gray tree frog (*Hyla chrysoscelis*).

On-going Management Needs

Actively treat any identified occurrences of Kudzu, and control Canada thistle to <5% coverage in fallow fields. Treat all targeted non-native invasive species in existing reforestation areas to < 15% coverage, and monitor for invasion by additional highly invasive species.

Pre-implementation Needs/Data Gaps

- Establish invasive species management research sites (for treatment testing) with vegetation plots and GPS/photo point monuments to document current composition, structure and distribution
- Prepare a Blackbird Component-wide baseline inventory of non-native invasive species occurrence including species composition, dominance, percent cover, and distribution

Monitoring & Research Needs

Identify research partners from local or regional Colleges / Universities, ecological consultants, DNREC or other collaborating research and conservation organizations (e.g., The Nature Conservancy). Develop a monitoring plan for each invasive species management project. Establish testable hypotheses. Select and monitor appropriate on-site controls (in this context- untreated) areas, and treatment sites. Implement a restoration site monitoring plan. Other considerations for common reed control include understanding and addressing long-term and large-scale issues related to agricultural land nutrient transport, hydrologic and sediment dynamics (sea level rise, marsh subsidence, etc.) and changes in the watershed land uses.

Possible monitoring parameters include:

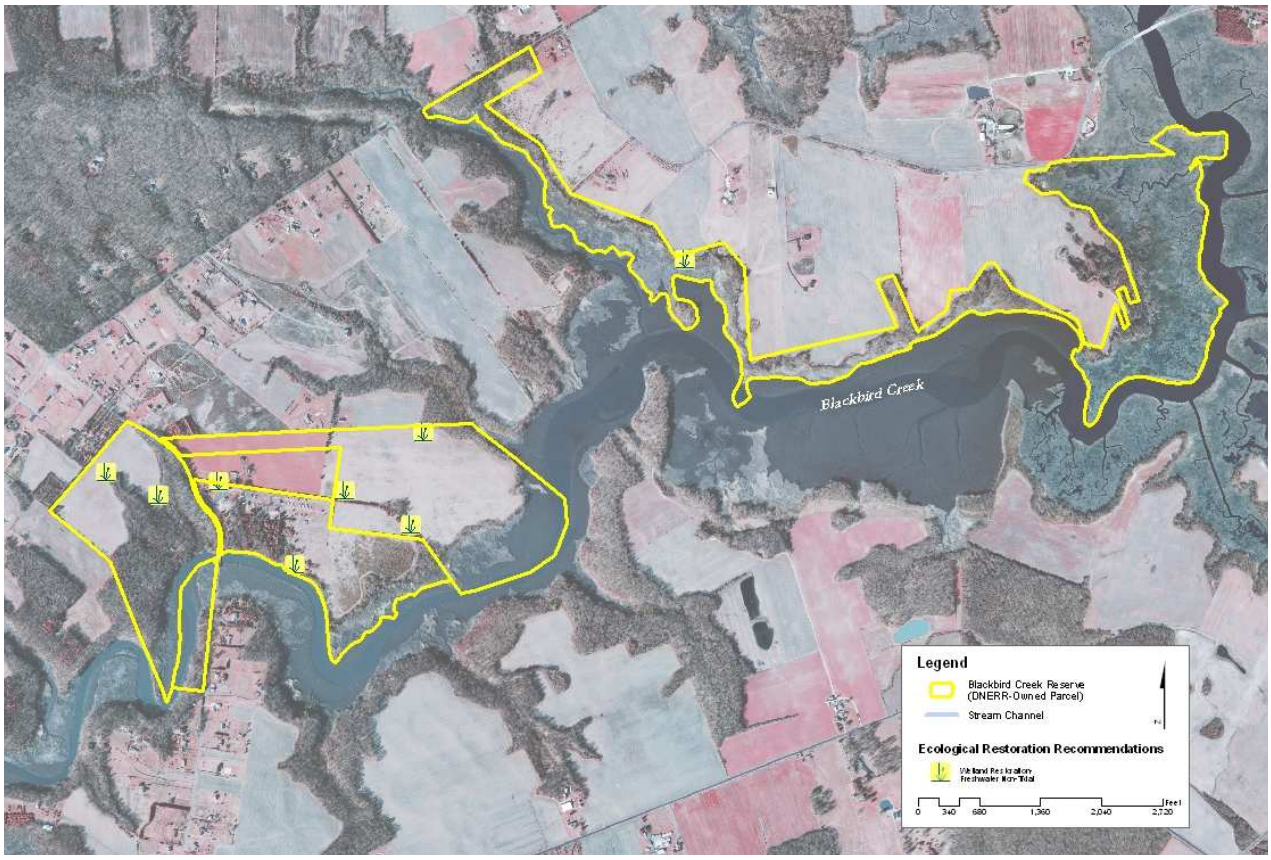
- species composition
- percent cover
- canopy extent
- interspersion
- litter fall
- mast/seed production
- seedling regeneration
- plant health (herbivory damage, disease)
- soil chemistry
- animal species (composition and relative abundance).

4.2.4 Wetland Restoration—Freshwater Non-tidal

Non-tidal wetland restoration is recommended to include 'coastal plain pond' restoration (also potentially involving the conversion of man-made ponds), and the creation of forested or emergent headwater wetlands at headwater streams and in lowing/moist soil areas of agricultural fields and fallow fields. Additional restoration of existing forested non-tidal wetlands primary involves invasive species management and supplemental native planting.

Restoration Target:

Restore a total of 5 acres of non-tidal forested wetlands (Phase 1—1 acre, and Phases2 & 3—2 acres each) at headwater stream locations. Within this forested wetland acreage, create a network of coastal plain ponds to fill in the regional pattern for the Blackbird-Millington corridor at a relative density of 6-8 per 100 acres, corresponding to 14-20 coastal plain ponds (Phase 1—2 ponds, and Phases 2 & 3—6-8 ponds each). Note--one discrete pond complex may be made of many small clustered ponds or 'pools' to achieve this density. The target for the non-tidal forested wetland component includes coastal plain pond wetlands based on a median density derived from TNC/DNREC 2005. Headwater wetlands are targeted for the upper end of each stream to help improve headwater stream conditions at each of these locations on the Reserve parcels.



Focal Animal Species for Habitat Type

Spotted salamander (*Ambystoma maculatium*), Eastern ribbon snake (*Thamnophis sauritus*), and barking treefrog (*Hyla gratiosa*)

On-going Management Needs

Maintain existing pond levels and continue limited seasonal mowing of fallow areas and agricultural field cropping until further study directs most suitable locations for coastal plain pond creation and other forested wetland restoration.

Pre-implementation Needs/Data Gaps

- For the existing man-made ponds and potential headwater wetland areas in agricultural or fallow fields, study and model the hydrology, install and monitor ground-water and surface water monitoring wells
- Perform geotechnical and topographic surveys of each of the restoration sites
- Establish wetland baseline research sites (proposed restoration sites and control sites) with hydrology stations, vegetation plots and GPS/photo point monuments to document conditions
- Initiate wetland plan design development, regulatory approvals and contracting arrangements

Monitoring & Research Needs

Identify research partners from local or regional College / University partners, DNERR, DNREC USFWS or other collaborating research and conservation organizations. Develop a monitoring plan for each wetland restoration project. Establish testable hypotheses. Select and monitor appropriate reference sites, and on-site control areas. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize these impacts.

Possible monitoring parameters include:

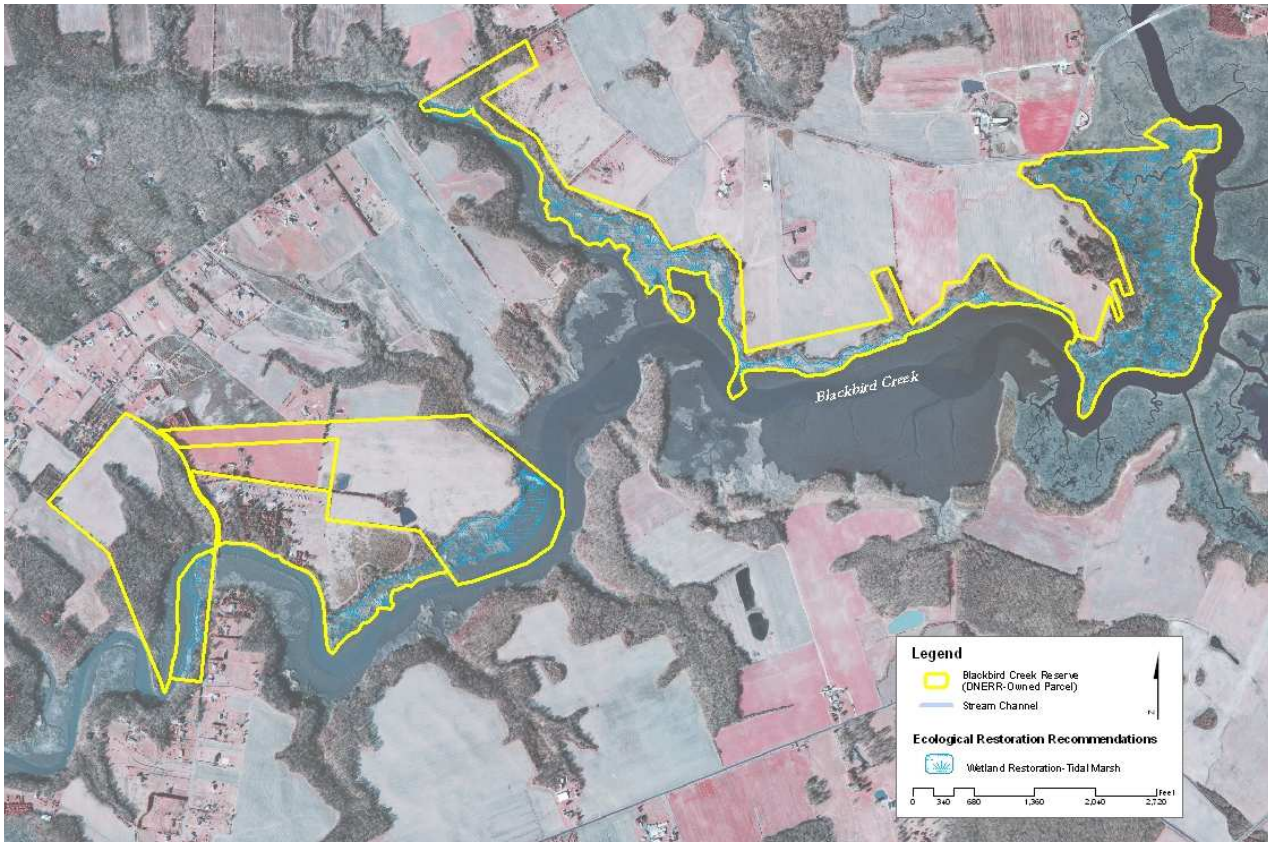
- groundwater and surface elevations
- soil texture, chemistry and nutrients
- sedimentation rates
- vegetation species composition
- percent cover
- canopy extent
- litter fall
- mast/seed production
- plant health (herbivory damage, disease)
- woody debris
- animal species (composition and relative abundance).

4.2.5 Wetland Restoration—Tidal Marsh

Tidal wetland restoration is recommended to include oligohaline to brackish marsh restoration involving a comprehensive strategy, in concert with the other types of restoration and management projects throughout the Reserve lands, to restore their native vegetation composition. Other related elements for wetland system restoration include addressing sea level rise and marsh subsidence in a localized, long term research and monitoring plan. Short-term efforts should focus on the control of non-native invasive *Phragmites* where it is encroaching into other native species dominated marshes. Other possible tidal wetland restoration measures can include sediment dredging and raising marsh surfaces or more passive natural material structures (logs and rock sills) and waterfowl exclusion to increase tidal marsh areas.

Restoration Target:

Restore a total of 40 acres of fresh to oligohaline tidal marsh (Phase 1 –0 acres, Phase 2—13 acres and Phase 3—27 acres); and a total of 50 acres of brackish tidal marsh (Phase 1—0 acres, Phase 2—5 acres and Phase 3—45 acres. Upon further study, there is the possibility for up to 6 acres of additional tidal marsh restoration in the DNERR owned open-water area of the Manwaring Tract (Investigate Phase 1, and implement Phase 2). The target for tidal marsh restoration assumes restoration of a high percentage (about 85%) of the total area of existing tidal wetlands. The restoration of open water to marsh will represent an increase of approximately 6 acres (or about 5% total marsh increase). This will partially help to offset the approximately 148 acre of estuarine emergent wetland loss identified in the Blackbird watershed from 1937-1997 by McCorkle (2000).



Focal Animal Species for Habitat Type

Coastal plain swamp sparrow (*Melospiza Georgiana nigrescens*), black duck (*Anas rubripes*), and northern diamondback terrapin (*Malaclemys terrapin terrapin*)

On-going Management Needs

Continue to keep equipment based maintenance activities out of all tidal wetlands, monitor roadside debris dumping potential Union Church Road crossing at Beaver Dam Creek marsh.

Pre-implementation Needs/Data Gaps

- Record tidal elevation data and pattern at additional Creek and marsh stations (e.g., Beaver Dam Creek, Manwaring shoreline and Lowe shoreline) and analyze tidal hydrology.
- Perform geotechnical/sediment coring study of marsh plain and selected channel bottom substrate to document historic patterns of sedimentation.
- Conduct an inventory and assessment study of native common reed (*Phragmites australis americanus*) stands along the Blackbird Component.
- Establish tidal wetland baseline research sites (proposed restoration sites and control sites) with hydrology stations, vegetation plots and GPS/photo point monuments to document conditions.

Monitoring & Research Needs

Identify research partners from local or regional College / Universities, DNREC, USFWS, US Army Corps of Engineers or other collaborating research organizations. Develop a monitoring plan for each wetland restoration project. Establish testable hypotheses. Select and monitoring appropriate reference sites, and on-site control areas. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize them.

Possible monitoring parameters include:

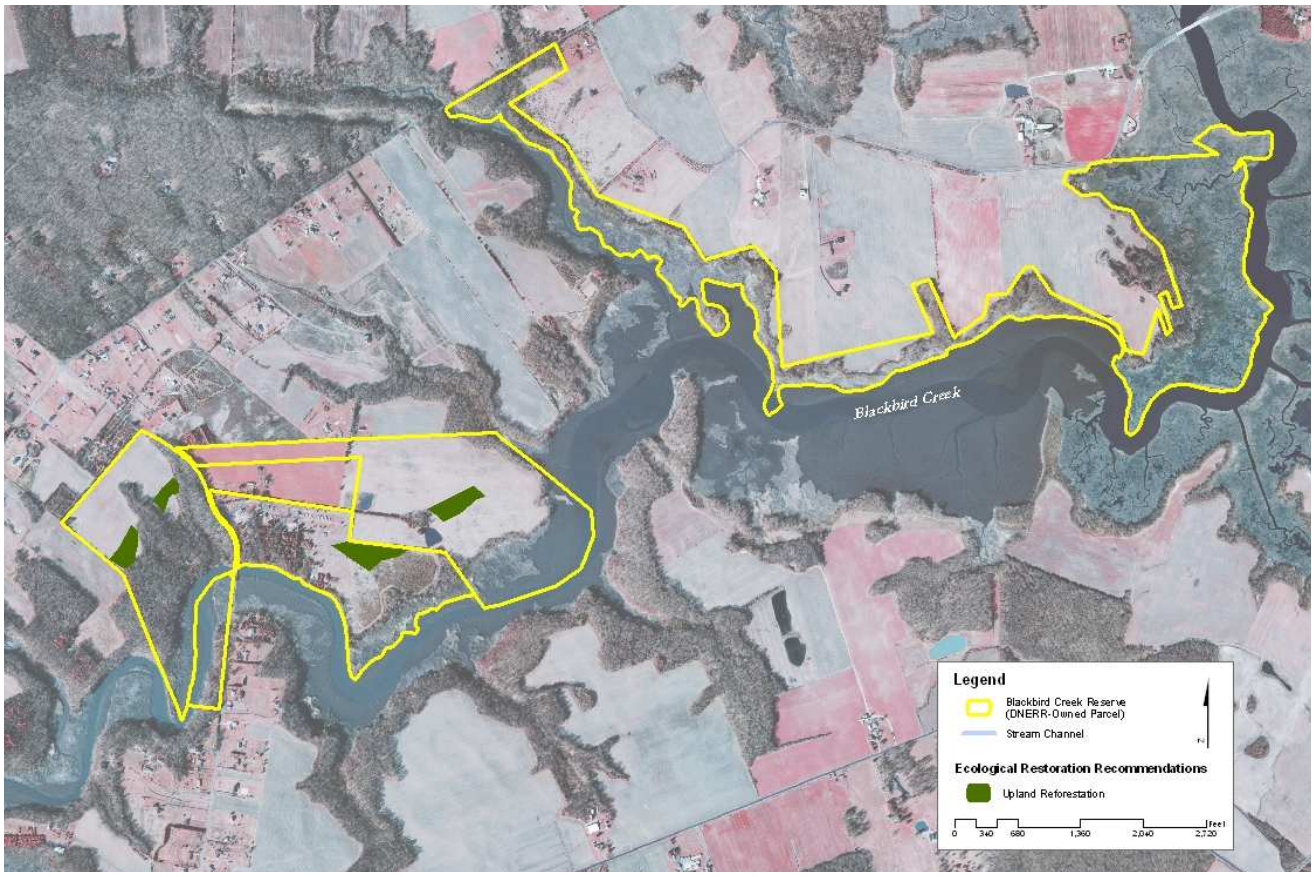
- Tidal elevation ranges and cycle
- marsh substrate texture, chemistry, composition and nutrients
- sedimentation rates (SET, sedimentation elevation tables)
- vegetation species composition
- percent cover
- biomass production
- detritus export
- plant health (herbivory damage, disease)
- animal species (fish, wildlife and invertebrate composition and relative abundance).

4.2.6 Upland Reforestation

Upland reforestation is recommended in addition to the recommendations for riparian buffer restoration reforestation. Additional reforestation is recommended specifically to extend existing blocks of upland forest and to add further buffer area to anticipated wetland restoration and coastal pond creation areas. Reforestation approaches will include various techniques including natural succession management, planting various propagules (seeds, tubelings, bare root plants, container-grown nursery stock), and soil amendments. Reforestation efforts will be integrated with invasive species management measures.

Restoration Target:

Restore a total of 8 acres of upland forest (Phase 1—0 acres, Phase 2—3 acres and Phase 3—5 acres) to include areas in the Cornelius tract agricultural fields, former campground fields on Lowe Tract, and part of the Manwaring Tract fallow fields. The target for upland reforestation is based on increasing the forest patch size on the Cornelius tract from 31 acres to 39 acres, thereby creating a total forest patch of 75 acres when the connected forest area off-site of the Cornelius tract is considered. Increasing patch size and interior forest area is intended to provide additional habitat for some area-sensitive species. There is the potential for the Reserve to convert the remainder (about 13-15 acres) of the Cornelius tract agricultural fields to upland forest to create an approximately 90-acre forest patch (with the possibility for larger areas working with adjacent land owners).



Focal Animal Species for Habitat Type

Wood thrush (*Hylocichla mustelina*), Scarlet tanager (*Piranga olivacea*), and broadhead skink (*Eumeces laticeps*)

On-going Management Needs

Maintain limited seasonal mowing of fallow areas and continue agricultural field use until decisions are made on the exact timing of each upland reforestation planting effort.

Pre-implementation Needs/Data Gaps

- Establish upland reforestation baseline research sites with vegetation plots and GPS/photo point monuments to document current upland forest composition, structure and condition.
- Conduct further growing season study of native species composition, invasive species distribution and propagule sources, and soil analysis samples.
- Initiate planting plan development and plant source identification.

Monitoring & Research Needs

Identify research partners from local or regional College / Universities, US Forest Service, DNREC or other collaborating research organizations. Develop a monitoring plan for each upland reforestation project. Establish testable hypotheses. Select and monitor appropriate reference sites and on-site control sites. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize these impacts.

Possible monitoring parameters include:

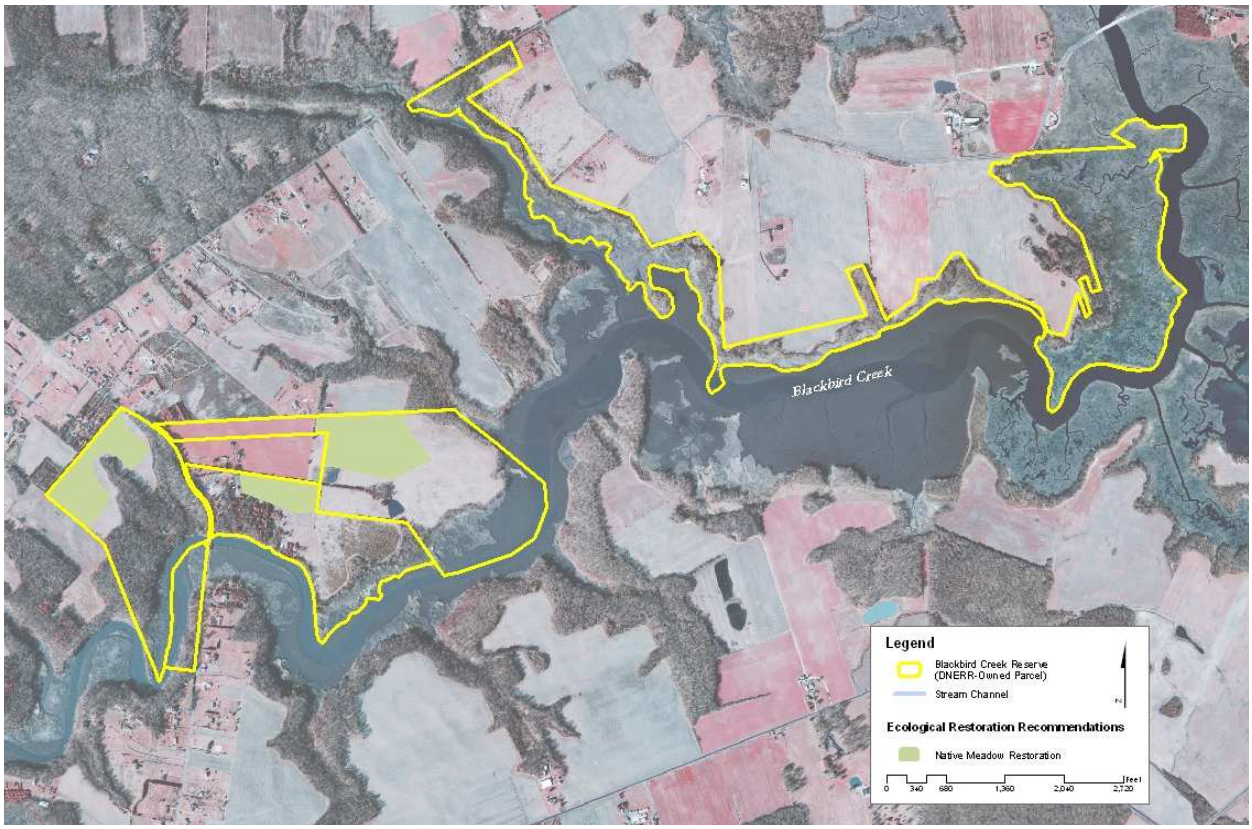
- species composition
- percent cover
- canopy extent
- interspersion
- litter fall
- mast/seed production and seedling regeneration
- plant health (herbivory damage, disease), and woody debris
- animal species (composition and relative abundance).

4.2.7 Upland Native Meadow Restoration

Upland Native Meadow restoration is recommended for a large portion of the currently fallow fields on the Manwaring Tract. This habitat type will add to the diversity and mosaic of habitat types on the Blackbird Component without compromising the intended riparian buffers, wetland restoration or upland reforestation. Native meadow will provide habitat for some niche species including Lepidoptera (butterflies, moths and skippers), small mammals, and non-area-sensitive grassland birds. Native meadow restoration approaches will include non-persistent, targeted herbicide treatment of cool season grasses and weeds followed by drilling seeding native warm season grasses and wild flowers. Other options include allowing natural succession and monitoring weeds or plant invasion potential and treating those invasions by strategic mowing, herbicides or controlled burning.

Restoration Target:

The remainder of the Blackbird Creek Reserve tracts that are not identified for other higher priority restoration types and targets are recommended for upland native meadow restoration. The target is to restore a total of up to 36 acres of upland native meadow including a 6-acre portion of the former campground fields fallow fields on the Lowe Tract, and a 17-acre portion of the fallow fields on the Manwaring Tract in Phase 2 (must be after September 30, 2009 due to Conservation Reserve Program contract), with the potential to also convert a 13-acre portion of the Cornelius Tract agricultural fields in Phase 3. Restoring adjacent areas on the Lowe and Manwaring tracts will establish approximately 23 acres of native meadow. Ecologically, this will provide additional valuable coastal plain habitat in a mosaic with the other habitat restoration efforts, and will support certain grassland dependent plant and animal species.



Focal Animal Species for Habitat Type

Bobwhite quail (*Colinus virginianus*), Eastern box turtle (*Terrapene carolina*) and Meadow fritillary (*Boloria bellona*).

On-going Management Needs

Maintain limited seasonal mowing of fallow areas and continue agricultural field use until decisions are made on the exact timing of each upland reforestation planting effort.

Pre-implementation Needs/Data Gaps

- Establish upland meadow restoration baseline research sites with vegetation plots and GPS/photo point monuments to document current upland forest composition, structure and condition
- Conduct further growing season studies of native species composition, invasive species distribution and propagule sources, and soil analysis samples
- Initiate planting plan development and plant source identification

Monitoring & Research Needs

Identify research partners from local and regional Colleges / Universities, Natural Resources Conservation Service, DNREC or other collaborating research organizations. Develop a monitoring plan for each upland native meadow restoration project. Establish testable hypotheses. Select and monitor appropriate reference sites, and on-site control sites. Implement a restoration site monitoring plan. Consider the impact of monitoring activities on the habitat and minimize these impacts.

Possible monitoring parameters include:

- species composition
- percent cover
- canopy extent
- interspersion
- litter fall
- mast/seed production
- seedling regeneration
- plant health (herbivory damage, disease), and woody debris
- animal species (composition and relative abundance).

5.0 SUSTAINABILITY AND STEWARDSHIP OPPORTUNITIES

5.1 Sustainable Facilities and Infrastructure

The DNERR proposes several new or redeveloped infrastructure projects on the Blackbird Component tracts to support the research, education and public access components of their mission. There are related site suitability and sustainability issues and opportunities associated with these new facilities. A key point DNERR recognizes is that these facilities need to be compatible with and support conservation and ecological restoration efforts on the Blackbird Reserve. General recommendations for addressing sustainability include avoiding the placement of new facilities in sensitive areas including wetlands, streams, riparian buffers, rare species habitat areas, steep slopes or forest interior areas. Additionally, the amount and location of new impervious surfaces need to be carefully considered and minimized to the extent possible. The associated stormwater run-off needs to be managed and reduced by best management practices (BMPs) and sustainable/low impact development (LID) techniques.

Basic principles related to infrastructure facilities sighting include:

- Minimize the overall size/footprint and disturbance of construction
- Avoid impacts to sensitive natural resources (identified above)
- Place facilities in existing disturbed/altered areas (e.g., maintained fields)
- Emphasize the minimization of run-off and design for infiltration

Specific suggestions for sustainability measures for currently proposed facility projects are as follows:

Canoe/Kayak Launch—Lowe Tract

- Locate in area of existing disturbed creek bank edge
- Create launch as carry-in facility with no vehicle access road/ramp
- Avoid nearby rare plant habitat for Purple milkweed
- Stabilize minor eroded bank areas at launch edges (using living shoreline techniques)

Education Pavilion and Rest Rooms—Lowe Tract

- Place in existing maintained grass field at entry area
- Evaluate building a recycled/re-used material structure (e.g., salvaged logs)
- Use composting toilets for rest rooms facilities
- Serve energy needs with all solar power

Parking and Turn-around/Drive—Lowe Tract

- Reduce driveway widths to minimal necessary for buses
- Formalize parking areas on porous paving materials (e.g., modular pavers)
- Add stormwater BMPs—wet or grassed swales, rain gardens, etc.
- Landscape remainder of entry area with native landscaping (demonstration habitat gardens)

Existing House-Future Offices—Cornelius Tract

- Modify existing landscaping/lawn to native plantings for demonstration and interpretation uses
- Create transition zones to woodland to minimize forest gap and diversify edge
- Formalize a small parking area using porous paving materials (e.g., modular pavers or wood mulch)

Entry Drive Access Road—Cornelius Tract

- Stabilize active head-cut channel with natural channel design stabilization as a part of headwater stream restoration
- Reduce (to narrow 4-5 ft. wide stabilized foot path) or eliminate existing drive path to agricultural fields, add supplemental forest plantings
- Create a roadside vegetated swale BMP along the agricultural field side of the road

Research and Interpretive Trails—Lowe and Manwaring Tracts

- Create a trail plan for placement and management
- Employ infrequent periodic mowing of grassed trails
- Future temporary trail placement can be strategic with invasive species control activities and other habitat restoration and research projects
- Place more permanent pedestrian trails in a limited fashion to highlight specific restoration types and interpretive opportunities

Woodland Stream Crossing Path—Cornelius Tract

- Construct stream crossing bridge in conjunction with adjacent headwater stream restoration to minimize disturbance activities
- Minimize width for pedestrian access only (4-5 feet wide), use leaf litter or hardwood mulch path material
- Meander trail route to avoid existing trees and their critical root zones
- Span a wooden (salvaged/recycled) footbridge over stream with no structural support in stream channel

5.2 Supporting Best Management Practices

BMP Opportunities

There are a number of related BMP opportunities for Stormwater and Agricultural BMPs that can work well with the research, restoration, and stewardship objectives of the Reserve. A few suggestions for applicable BMPs are as follows:

- Expanded agricultural field buffer strips (native grasses and legumes)
- Stormwater run-off or treatment wetlands
- Perimeter native grass or wetland swales
- Experimental winter cover crop varieties native/naturalized species for regenerating/improving soils
- Native hayfield testing trials with indigenous species for silage/feed
- Organic fertilizer/organic farming demonstration and monitoring of adjacent natural systems

BMP Monitoring Potential

Along with the research and monitoring based ecological restoration efforts, the establishment of agricultural and stormwater BMPs provides an opportunity for additional monitoring of BMP performance and effects on natural systems. A brief list of possible monitoring parameters is as follows:

- Precipitation and run-off volumes
- Stream flow
- Water quality
  - --Pollutant concentration
  - --Dissolved oxygen (DO)
  - --metals
  - --temperature
  - --nitrogen and phosphorus
  - --Biological oxygen demand (BOD)
  - --Organics/carcinogens/pesticides
  - --total suspended solids
  - --pH
- Influence of BMPs on downstream receiving waters
  - --Biotic communities (fish & invertebrates)
  - --Sediment transport
  - --in-stream water quality
  - --bank erosion
  - --stream flow

5.3 Stewardship Opportunities

There are stewardship opportunities on the Blackbird tracts related to public use and participation, interpretation and education opportunities. A list of suggested potential stewardship opportunities includes:

- School-aged educational opportunities to highlight a different part of the Delaware Estuary (fresh to brackish tidal creek and marsh system) compared to the St. Jones Reserve
- Applied ecological monitoring and research for college/university students to work with DNERR research staff on baseline and restoration studies
- Restoration practitioner training grounds to showcase and demonstrate a variety of applied ecological restoration practices and research results
- Self-guided, or periodically organized (education staff guided)interpretive trail and demonstration potential for natural communities and ecotypes
- Community-based resource for engaging farmers and other land owners to see restoration and BMP practices in action, to apply to their lands

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APPENDIX A

DNERR Management Plan 1993

This Reserve system management planning document established the inclusion of the DNERR in the National Estuarine Research Reserve System (NERRS). This original plan outlined a detailed acquisition agenda and site information for the two Reserve components, the Upper Blackbird Creek Reserve and the Lower St. Jones River Reserve. Plans were made to guide programs for education/interpretation, research, and resource protection through the first five years of operation at the Reserve components.

DNERR Estuarine Profiles, 1999

This technical document was developed as a comprehensive characterization and inventory of existing natural resources and environmental features of the DNERR's two component sites, the Upper Blackbird Creek Reserve and the Lower St. Jones River Reserve. Site specific inventories were carried out between 1993 and 1997 with backround information general to DE estuaries.

DNERR Management Plan 2004-2009

This management plan is the second edition of the management plan and is an addendum to the original plan approved by NOAA and adopted by the DNERR in 1993. The updated plan describes the mission, goals, and objectives of the NERRS and the DNERR, also describing the accomplishments of the DNERR since the 1993 plan. Action plans are articulated for the Reserve's administration; facilities and construction; public access; education, interpretation, and outreach; environmental research and monitoring; and stewardship.

The plan designates the Upper Blackbird Creek component as being primarily protected for research use with public access closely coordinated with the Reserve Manager to reduce the potential for human impact.

DNERR / DNREC. 1995. DNERR Comprehensive Site Description. Phase I – Description / Analysis of Dominant Vegetation / Cover Types.

The Phase I objective was to begin watershed / estuarine characterizations of the Reserve components by mapping and describing the dominant vegetation and cover types within the boundaries and adjacent lands of the two Reserves, upper Blackbird Creek and lower St. Jones River. This study was intended to serve as a baseline for long-term DNERR monitoring work.

DNERR / DNREC. 1995. Final Report - DNERR Comprehensive Site Description. Phase II – Characterization of Finfish and Aquatic Macroinvertebrate Communities and Waterbird Populations.

The Phase II objective was to complete the major natural resource element characterization of each of the Reserve components with finfish, aquatic macroinvertebrate and waterbird community sampling and analysis. This study was also intended to serve as a complimentary baseline to Phase I for long-term DNERR living resource monitoring work.

McCorkle, Richard C. 2000. Land Use / Land Cover Changes and Ecological Health Indicators in the Blackbird Creek Watershed: With Recommendations For Restoration. Master of Science Thesis in the Marine Studies Program of the University of Delaware.

Richard McCorkle's thesis assessed changes in land use and land cover of the Blackbird Creek watershed between 1937 and 1997. This study developed landscape metrics for land cover data to assess landscape

ecological integrity, identified areas with degraded ecological conditions, developed recommendations for ecological restoration, and provided data with the goal of aiding in the setting of priorities by decision makers concerning non-point source pollution control and wildlife habitat restoration efforts.

Among McCorkle's findings over the 60 year span of time was a 12.5% increase in development to 22% of the upland watershed. Cultivated land accounted for 47% of the upland watershed in 1997 but decreased by 16% over the study time period. There was an increase of deciduous forest by 5% accounting for less than 30% of the upland watershed with almost 70% devoted to human uses. Over this time period large areas of tidal marsh converted to open water and mudflats, a 120 ha increase.

Remote sensing techniques were also used to evaluate forest interior habitat availability, riparian forest width and the degree of forest patch isolation with regard to the sensitivity of some bird species to these conditions.

Klemas, V. V. and R. T. Field. 2004. Remote Sensing of Habitat Change at Delaware NERRS Sites. Final Report to DNREC/DSWC, Delaware Coastal Programs/DNEER.

This remote sensing research report utilized Thematic Mapper Images from 1993, 1999, and 2002 to detect and analyze changes in wetland and upland areas around the Blackbird Creek and St. Jones DNERR sites and the Milford Neck Wildlife Area. In the Blackbird Creek study area, large patches of vegetation loss occurred between 1993 and 2002 along the southern bank of the creek east and west of Blackbird Landing. Conversely, there were areas of considerable vegetation gain north and south of Taylors Bridge and along the north bank of the creek east and west of Blackbird Landing. It is stated that the losses are likely related to Phragmites control efforts. Most of the loss and gain occurred between 1993 and 1997.

Non-tidal wetland vegetation losses were also documented along the Delaware 1 construction corridor as well as wetland losses possibly associated with suburban development east of Route 13. Small areas of wetland loss and gain were seen in several farm fields, possibly reflecting a change in crop vegetation cover in farmed wetland areas. Upland land uses also showed considerable change although it was more difficult to interpret because of less significant land-cover definition than wetland signatures.

Valentine, V. J. 2002. Scrub-Shrub/Emergent Wetland Ecotone Migration Along Delaware Tidal Rivers In Response to Relative Sea-Level Change, Natural Impacts, and Human Modifications. Ph.D. Dissertation in the Marine Studies Program from the University of Delaware.

Research by Valentine articulated several factors affecting the migration of the emergent/scrub-shrub ecotone. The interpretation of historic photos showing wetland boundary migration that corresponded with long-term sea-level rise (SLR) over the same time period suggested the strength of SLR in driving ecotone migration. At the Blackbird tributary site it was found that over time ponding and tidal flat creation occurred. The multiple processes of channel straightening and pond/flat creation appeared to work together to flood the ecotone area, killing woody vegetation and displacing the ecotone. It was unexpectedly determined that ecotones along less altered waterways migrated more than those along highly altered waterways. Differences between migration rates at multiple sites suggested that other site specific factors were also influencing migration.

Muskrat and beaver activity, bridge modifications at Blackbird Landing and Taylors Bridges, *Phragmites australis* expansion, and punctuated storm effects are all forwarded by Valentine as possible mechanisms that are influencing the landward movement of the emergent / scrub shrub ecotone.

Non-Native Species at the NERRs

Wasson, K., Lohrer, D., Crawford, M., and Rumrill, S. 2002. Non-native species in our nation's estuaries: a framework for an invasion monitoring program. National Estuarine Research Reserve Technical Report Series 2002:1.

This NERRs technical report helps to define and guide the monitoring of non-native species in U.S. estuaries. Biological invasions by non-native species are considered a medium to high priority concern at most of the NERRs. Over 85 non-native species were identified by the reserve system with 8 species identified as priorities at 3 or more reserves. Monitoring is considered to be essential in the identification, understanding and management of invasions at the reserves. The document highlights the NERR Graduate Research Fellowship Program which recognizes invasions as a priority concern and sees graduate research a useful tool for focusing and funding research into the impact of invasions at NERRs sites.

Silliman, B.R. and M.D. Bertness. 2004. Shoreline Development Drives Invasion of *Phragmites australis* and the Loss of Plant Diversity on New England Salt Marshes. Conservation Biology 18 (5), 1424–1434.

Silliman and Bertness (2004) found a correlation between *Phragmites australis* invasion of coastal New England salt marshes and shoreline development. It was found that shoreline development, defined as the removal of woody vegetation bordering marshes, was correlated with reduced soil salinities and increased nitrogen availability. Freeing the plant community from several limiting factors allows for those species with a competitive advantage, such as *Phragmites*, to emerge and dominate. This suggests that removing woody vegetation bordering marshes facilitates Phragmites invasion by increasing nitrogen availability and reducing soil salinities. With the Upper Blackbird Creek Reserve area maintaining a tidal fresh to middle oligohaline salinity gradient, a likely contributor to *Phragmites* establishment and expansion along the marsh fringe is the increased availability of nitrogen from the dominant adjacent agricultural land use.

Bailey, A.R. 1997. Detecting and Monitoring *Phragmites* Invasion of Coastal Wetlands: A Comparison of Remote Sensing Techniques. Masters Thesis, College of Marine Studies, University of Delaware.

Bailey's thesis targeted the remote detection of *Phragmites* cover changes in the Blackbird Creek and St. Jones Rivers between 1979 and 1993. The study found that *Phragmites* aerial coverage and median patch size in the Blackbird Creek increased over that time period, although the number of patches decreased over the same period indicating that vegetative clonal growth was the primary mode of expansion.

TNC/DE-DNREC. 2004. Blackbird-Millington Corridor Conservation Area Plan. The Nature Conservancy / Delaware Department of Natural Resources and Environmental Control.

The Nature Conservancy (TNC) and the Delaware Department of Natural Resources and Environmental Control, Division of Fish and Wildlife partnered to develop an existing conditions assessment and conservation plan for the future of the Blackbird-Millington Corridor. The State of Delaware recognizes this corridor as one of the most important areas of the state's "Green Infrastructure." The scientific community, local residents, planning agencies and conservation organizations were all coordinated by the TNC to develop this planning and resource conditions document.

APPENDIX B

NOAA Restoration Monitoring Guidance

NOAA restoration monitoring guidance documents (Thayer et al 2003, Pinit et al 2000) identify 13 habitat types for coastal freshwater to marine systems, and their most recent habitat type designations for monitoring are:

- Water column
- Rock bottom
- Coral reefs
- Oyster reefs
- Soft bottom
- Kelp and other macroalgae
- Rocky shoreline
- Soft shoreline
- Submerged aquatic vegetation (SAV; seagrasses)
- Marsh (marine/brackish and freshwater)
- Mangrove swamps
- Deepwater swamps
- Riverine forests

The five habitat types from the list above that generally apply to the Blackbird Creek component tracts are water column, soft bottom, soft shoreline, marsh and riverine forests. First structural and functional characteristics are identified that correspond to the restored habitat type being monitored (e.g., provides breeding grounds, or supports biomass production). Based on the identified structural and functional characteristics of the habitat, specific parameters to monitor are chosen within the general categories of Geographical (acreage of habitat type), Biological (Plants and Animals), Hydrological (Physical and Chemical), and Soil and Sediment (Physical and Chemical). Many examples of specific monitoring parameters are identified in *Appendix II: Matrices of Habitat Characteristics and Parameters* (Thayer et al 2003).

APPENDIX L

Water Access and Use:
Appoquinimink River and Blackbird Creek

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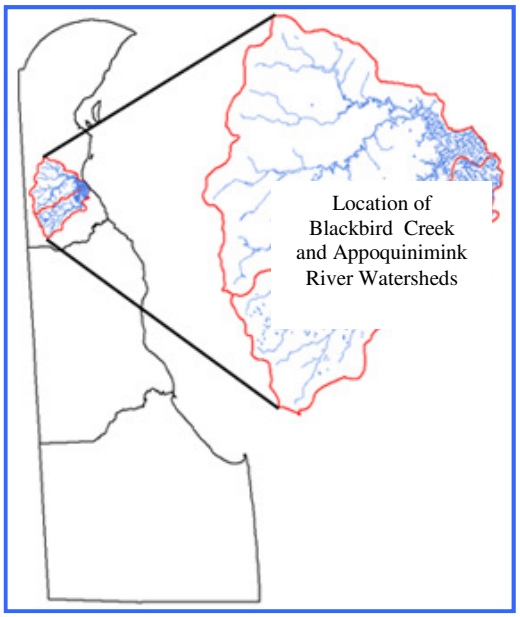
Water Access and Use of the Blackbird Creek, Appoquinimink River, and Their Shared Tidal Wetland Complex

Southern New Castle County (SNCC) is one of the most rapidly developing areas of Delaware. This area is expected to see an increase of over 26,000 homes by the year 2030. With increased population growth, an increase in the public's desire and demand for access to the water is expected. While public access allows people to be more connected to the resource and committed to its protection, it can also cause environmental stress if not carefully managed.

Increased public access to the water often results in an increase in conflicts between users, private property owners, hunters, paddlers, boaters, and environmentally sensitive riparian lands. In order to avoid or address the waterway use conflicts, it is necessary to fully understand the resources at risk, potential activities that may cause problems, and compatible uses for various reaches of the waterways.

The Blackbird Creek and Apoquinimink River provide a wide range of recreational opportunities ranging from more active pursuits such as waterfowl hunting, crabbing, fishing and motor boating to more passive activities such as canoeing, bird watching and nature photography.



As the population increases and recreational use increases balancing the resource protection with public use will become more complex. Sensitive areas and species provide unique recreational experiences that can also be significantly impacted by certain activities. Increasing public awareness of the resource protection needs is key.

This document examines the historic, cultural and ecological resources and needs for water access and use of the Blackbird Creek, Appoquinimink River, and their shared tidal wetland complex.

Historic and Cultural Resources of the Appoquinimink and Blackbird Watersheds

History of the Area

The combination of freshwater and tidal wetlands make up 16 % of the Appoquinimink and Blackbird watersheds and is productive ecosystem that provides shelter and food to many different types of wildlife and fish. This rich environment zone was a valuable resource to prehistoric hunter-gatherer populations providing an abundance of resources for hunting, plant foods, and lithic sources. During the construction and maintenance of Delaware's highway system, the Delaware Department of Transportation (DelDOT) revealed several sites of archaeological interest in the Appoquinimink and Blackbird watersheds. Research on the historic sites in this area has uncovered findings dating back to the Paleoindian (10,000 - 6,500 B.C.), Archaic (6,500 - 3,000 B.C.), Woodland I (3,000 B.C. - 1,000 A.D.), and Woodland II (1,000 - 1,600 A.D.) periods.

One of the most interesting archaeological sites found in this area was the Hell Island site near Odessa. First investigated in 1959 by a student from the St. Andrews School, Henry T. Wright, artifacts found at Hell Island dated back to the Archaic (6,500 - 3,000 B.C.) period. In 1966, DelDOT performed a more in-depth excavation of the island which uncovered an abundant amount of ceramics and tools dated back to the Woodland period.

Early European colonists began inhabiting the area during the European Contact (1,600 A.D.) period. The Native Americans in this area at this time were from tribes of Algonkian Indians. The Leni-Lenape tribe inhabited the area along the Delaware River to the north and later became known as the Delaware Indians by the early settlers. Many of the colonial authorities that were in place during this time respected the natives in land sales and court proceedings. During the 1700's this respect dwindled due to disagreements between the Natives and settlers and colonial authorities. Natives started losing their lands and were forced to move to reservations in what is now Sussex County and to the Northern and Western United States.

In 1682, the Duke of York granted William Penn the land that is now the State of Delaware. In order to establish a basis for taxation, Penn divided the land into hundreds. The Appoquinimink Hundred was established at this time, getting the name from an Indian term meaning "wounded duck". Divided in 1875, the lower portion of the Appoquinimink became the Blackbird Hundred.

During this time, the waters of the Appoquinimink River were navigable up to the Sassafras Branch. Early commerce began developing the area using the Appoquinimink as a trade route for ships. Mills were constructed along the route to process agriculture products and timber for trade. The major agriculture products shipped included corn, wheat, oats, and peaches. This area was also home to brick, tile and tan yards.

As more settlers inhabited the Appoquinimink and Blackbird Hundreds, small towns began shaping.

Middletown

Middletown was named for the area's location midway between the Appoquinimink Creek and Bohemia River, which became a shipping trade route stop for travelers. In 1736, Thomas Noxon purchased land south of Middletown which became known as "Noxontown". Noxon dammed a branch of the Appoquinimink Creek and created Noxontown Pond, then built a mill which is one of the earliest recorded industries in the area. Ships were able to dock at the mill's door and load goods for shipments. Caesar Rodney and the Delaware militia spent a season in 1777 encamped on part of Noxon's land.

After the Philadelphia, Wilmington and Baltimore Railroad Company constructed a draw bridge over the Chesapeake and Delaware Canal and in 1855, the railroad was extended from Wilmington to Middletown. This established the town as an important rail shipping point for agriculture products as this area was known as having the most productive farmland in the state. One of the most productive crops became peaches with orchards bearing thousands of baskets a year. Peaches remained a profitable crop until the 1870s when a disease known as the "Yellows" severely damaged orchards throughout the state.

Odessa

Odessa was originally an Indian village named "Appoquinimi". In 1731, Edmund Cantwell was granted permission to construct a toll bridge over the Appoquinimink Creek calling it Cantwell's Bridge, which the town then became known. During the 1800s, Cantwell's Bridge became a shipping point for grain which was distributed all throughout the country. The name was once again changed in 1855 to Odessa, after a Russian grain port.

Odessa has many historic buildings, the oldest dating back to 1700. The Corbit-Sharp House built in 1772 and the Appoquinimink Friends Meeting House built in 1785, were both known stops for Delaware's Underground Railroad. Today, you can stroll along tree-lined streets and admire examples of 18th and 19th century architecture. Chief among these are the five properties that make up the Historic Houses of Odessa managed by the Historic Odessa Foundation.

William Corbit, who operated a tannery on the banks of the Appoquinimink Creek, was the town's leading citizen when he built his handsome Philadelphia-style Georgian house in 1774. It remained in the Corbit family until 1938, when H. Rodney Sharp acquired it. Sharp restored the house as well as several other historically significant buildings in the town and is generally considered responsible for the first efforts at historic preservation in Odessa.

The Wilson-Warner House, built by prosperous merchant David Wilson in 1769, exemplifies Delaware-Georgian architecture. Its furnishings reflect those recorded in the 1829 family bankruptcy List of Sales.

The Brick Hotel, built in 1822, welcomed merchants, ship captains and visitors to the busy port town of Cantwell's Bridge. Guests would have found comfort in the accommodations offered at this fine establishment.

The Collins-Sharp House, one of Delaware's oldest houses, dates to 1700. This picturesque log and frame building is the site's center for educational programming. Activities include cooking demonstrations using original recipes from late 18th and early 19th-century sources.

The Bank was built in 1853 as the First National Bank of Odessa and served the Odessa community as a bank until 2000. This stately public building, designed by Philadelphia architect Samuel Sloan, included a well appointed two-story apartment upstairs that served as a residence for the bank president. Today the Bank houses the visitor's center and the offices for the Historic Odessa Foundation.

Townsend

Townsend started out as a small community of African Americans and was originally named "Charley Town", after resident Charles Lloyd. The land surrounding Charley Town was bought by Samuel Townsend around 1850. Townsend mined ore and was a timber merchant but found growing peaches to be more profitable. Becoming a prominent businessman in the community, he changed the name to Townsend. The railroad came to Townsend in 1856 and it became a shipping point for agriculture products grown in the area, especially peaches, grain and lumber from nearby mills.

The town served as a shipping point and a market place for the scattered rural population of the area. Townsend incorporated on April 3, 1885, at which time the Town was platted, and the streets were laid out. By 1888, the village had a population of 350. Since that time, the railroad has lost its prominence to trucking for freight hauling in the United States. However in Townsend, the railroad and agriculture are still important in shaping the character of the town, and today it is a quiet residential town more than four times from the original size of 111 acres to 587 acres today.

Cultural Resources and Traditional Uses

The Appoquinimink and Blackbird watersheds are located in Southern New Castle County, one of the fastest growing areas in the State. This area is also home to many environmentally sensitive lands. These opposing land uses—rampant development and environmentally sensitive areas—create unique problems and opportunities. Agriculture, tourism, fishing, hunting boating, commercial crabbing and other traditional uses of the undeveloped areas of the watersheds are heavily used year-round. Conflicts over public access and recreational use arise.

Land Use and Protection

Diversity best describes land use in the Delaware Bay and Estuary Basin. From the coastal marshes to rural farms and housing, to small towns and cities, the basin encompasses every type of land use. Balancing land development and the increasing population pressures at the northern and southern portions of the basin with development around the state capital at the basin's midpoint will be one of the most important land use planning issues for the next 20 years. A critical point of land use change is evolving in this basin and throughout the state. For many years, this basin resembled a rural farmed landscape interspersed with small towns. Beginning in the 1960s, an influx of people from adjoining states seeking a less hectic living environment has added to a steady increase in Delaware's population. This influx of people has increased dramatically since the 1980s. Most of the new residents have established permanent residency; however, within coastal communities in the southern portion of the basin, seasonal populations have evolved. The population of the Delaware Bay and Estuary Basin is roughly 222,000 based on the latest 2000 census data. Population projections for Delaware's three counties show expected increases of 21% for New Castle County, 30% for Kent County, and 55% for Sussex County between 1990 and 2020. These figures translate into an estimated additional 100,000 residents to the Delaware Bay and Estuary Basin for the 30-year period. These population changes can burden the infrastructure needed to support growth. New residents and developments often require more roads, shopping areas, police/fire/ambulatory services, schools, hospitals and other services. Proper planning at the county and municipal levels in coordination with state agencies has become a necessity to eliminate further sprawl and accommodate growth. While rapid increases in population and development can cause deterioration in air and water quality and natural habitat, increase pressure on water supplies and threaten preservation of open space, sound comprehensive land use plans for future development can mitigate negative environmental impacts. Urban land use now covers about 18% of the basin, which includes residential, industrial, commercial, and transportation land uses. Between 1992 and 1997, an approximately 3% increase in urban land use occurred in Delaware. If the trend continues, by 2020, the Delaware Bay basin urban land use will be approaching 30%. Urbanization has caused losses primarily to farmland, forestland and wetlands. Land use decisions that provide protective mechanisms and steer development to pre-determined growth areas could slow down these losses caused by urban development. Land-use planning and zoning authority in Delaware resides with the three county governments and individual municipalities. Each county and some municipalities develop land use plans in 5- or 10-year increments to help guide development to desired areas based on input from government agencies regarding issues such as agricultural preservation, infrastructure and the environment. Other planning and review processes allow input from various agencies on development projects and requests for zoning changes. These processes are extremely important in protecting exceptional forest and wetland habitat that may harbor state or globally rare species, and in helping to achieve the state's goals of protecting the quality of our air and water. (Delaware Bay Whole Basin Report)

Landuse	1997	2002	% Change
Cropland	173893255.84704	156534557.13664	0.90018
Deciduous	29581085.20096	27508490.80206	1.07534
Evergreen Forest	2807949.98965	608373.09064	0.21666
Farmsteads and Farm Related Buildings	2810708.27635	3081923.39373	0.91200
Mixed Urban or Built-up Land	37830.44000	54767.53138	0.69075
Multi Family Dwellings	867737.49575	454344.10571	1.90987
Other Urban or Build-up Land	114707.10800	1357472.10783	11.83425
Single Family Dwellings	26279398.39237	31336956.18361	1.19245
Wetlands	55890251.22936	56256857.78123	1.00656

Delaware's population will grow by an estimated 22 percent between 2006 and 2030, gaining slightly more than 189,000 persons to reach an expected population of just over 1.04 million in 2030. That's one of the findings of the 2006 Annual Population Projections series, approved by the Delaware Population Consortium on October 26, 2006.

Each year, the Consortium - a cooperative organization including state, county and local governments - provides 30-year population and employment projections for the State, the counties, and for selected municipalities.

The projections are based on the best available information provided to or generated by DPC members and other agencies at the federal, state, and local level. These data include the actual births and deaths since 2000, the latest Census Bureau estimates, and the latest migration data from the IRS.

Projected Population				
			Change, 2006-2030	
	2006	2030	#	%
State	854,977	1,044,105	189,128	22.1
Kent	147,675	189,536	41,861	28.3
New Castle	527,027	601,343	74,316	14.1
Sussex	180,275	253,226	72,951	40.5

Source: Delaware Population Consortium Annual Population Projections, October 26, 2006, Version 2006.0

Within the watersheds there are lands protected by state and private conservation ownership.

Delaware National Estuarine Research Reserve

The Blackbird Creek Reserve component of the Delaware National Estuarine Research Reserve (DNERR), located in southern New Castle County, is an excellent representative of an inland portion of a Delaware Bay tributary. The headwaters of the creek are formed,

in part, by some of the State's most valuable and unique freshwater wetlands. Blackbird Creek's watershed is still primarily agricultural or forested, although low-density residential development is increasing.

The Reserve is 1,180 acres in designated size, situated along 5.7 miles of low-salinity brackish and freshwater tidal creek, starting about 5.8 miles upstream from where Blackbird Creek empties into the lower Delaware River. It contains 50 parcels of land held by 44 private landholders, plus the DNERR and the Division of Fish and Wildlife.

Within the Blackbird Creek site's designated boundaries, about 212 acres of tidal marshes, upland fields, woodlots, and croplands were purchased by the DNERR in 1990, but the remaining majority of the reserve component is still in private ownership. An additional 183 acres of tidal marsh, woodlands, and croplands, across Blackbird Creek from the DNERR property and within the Reserve's designated boundaries, were purchased in 1996 by DNREC's Division of Fish and Wildlife (as part of the Division's Cedar Swamp Wildlife Area), and is available for use in DNERR activities. Two additional properties, totaling 147 acres, were purchased in 2004 and 2005.

The largest tributary of the upper creek segment is Beaver Branch, entering on the north side of Blackbird Creek about midway within the Reserve. Downstream of the seaward end of the Reserve, from Taylors Bridge to Delaware Bay, Lower Blackbird Creek passes by Red Bank and Stave Landing before reaching the bay. Much of the expansive tidal marshes and upland borders along Lower Blackbird Creek, downstream of the Upper Blackbird Creek Reserve component's designated boundaries, primarily consisting of a large parcel known as The Rocks (which is also part of the Cedar Swamp State Wildlife Area), are owned and managed by DNREC's Division of Fish and Wildlife (DFW). Upstream of the reserve component, in non-tidal areas west of Route 13, are extensive areas of forested wetlands containing unique coastal plain ponds ("Delmarva Bays"), much within Blackbird State Forest, which is managed by the Delaware Forest Service.

A total of 73 prehistoric archaeological sites in upland areas fringing Blackbird Creek Marsh were reported in the Cultural Resource Survey maintained by the Delaware Bureau of Archaeology and Historic Preservation. Blackbird Creek uplands and stream courses were intensively used from 3000 B.C. to A.D. 1000. Changes in settlement patterns from A.D. 1000 to A.D. 1650 focused primarily on estuarine resources in the floodplain, rather than in upland areas. The earliest historic period settlement in the Upper Blackbird Creek is the Huguenot House (built in the first quarter of the 18th century), which is listed on the National Register of Historic Places.

Balancing the need for research, preserving rare habitats and educating the public through strategic access to public lands is a never ending management task. The Blackbird Creek Reserve component can currently be accessed by a boat launch at "The Rocks," a Division of Fish & Wildlife property several miles downstream of the core boundary. Reserve property adjacent to Blackbird Landing Bridge offers access but no developed launch area. Launch or retrieval of other boats by the public on either Reserve site is not permitted without written permission of the Reserve Manager. Canoe and kayak access

may be a compatible low impact public use at the Blackbird component. This will be considered in the coming years as part of a public access assessment.

State Forest

The Forest Service manages three state forests totaling over 15,000 acres; Blackbird Forest near Smyrna, Taber Forest near Harrington, and Redden Forest near Georgetown. The forests are managed for a variety of objectives including: timber production, wildlife habitat enhancement, forest management demonstration, and recreational opportunities. Blackbird and Redden contain our northern and southern field offices, outdoor educational trails, and wildland fire suppression equipment. All three state forests are open to the public for a variety of recreational activities, including hiking, horseback riding, and in-season hunting.

Blackbird State Forest is found within the Appoquinimink and Blackbird watersheds. It is located on the border of New Castle and Kent Counties, and is Delaware's northernmost state forest. It has nine tracts totaling over 4,800 acres and contains a mixture of oaks, yellow-poplar, maple, gums, and hickories. Our northern regional office is located on the Tybout Tract on Blackbird Forest Road. Blackbird State Forest is a popular site for outdoor recreation. Its 40 miles of trails are used extensively for hiking, running, bicycling, horseback riding, and cross-country skiing. There is also a 2,200 foot paved nature trail designed for wheelchair accessibility. The trail system at Blackbird interconnects five primitive campsites and four picnic sites, available on a first-come, first-served basis. Blackbird is also open to hunting and catch-and-release fishing.

State Wildlife Areas

The Division of Fish & Wildlife develops and maintains public areas and facilities which insure that access to Delaware s natural resources will be available. The intent is to provide public hunting, fishing and wildlife viewing areas and boating access sites that are environmentally sensitive, modern, safe, clean and convenient in order that the states natural resources are available to all.

Augustine Wildlife Area 2,667 acres
- Port Penn Tract
- Warren Faella Tract
- Silver Run Tract
- Green Tract

Cedar Swamp Wildlife Area 4,983 acres
- The Rocks
- Bell Tract
- North Area
- South Area

Odessa Access Area

Near by
Woodland Beach Wildlife Area
C&D Wildlife Area

Farmland Preservation

The Department of Agriculture has been leading the effort to preserve farmland by establishing Agricultural Districts, and purchasing Development Rights to critical farmland throughout Delaware. Because many farms contain some natural areas, the purchase of development rights program offers protection for these areas as part of the overall "working farm".

The Delaware Agricultural Lands Preservation Foundation preserves farms - the cornerstone of rural Delaware. The Foundation preserves historic structures, wildlife habitats, important environmental features, wetlands, and forests, as well as setting aside, permanently, the critical farmland for future generations of Delawareans. Delaware's farmland preservation program has two major components Agricultural Preservation Districts and Agricultural Conservation Easements.

Agricultural Preservation Districts

A district is a voluntary agreement to use land only for agricultural purposes for at least a ten year period. Land must yield a minimum farm income, satisfy a scoring system standard, and undergo a review and approval process. Almost any size farm anywhere in the state can qualify. There is no payment to the landowner for creating the district.

However, there are several benefits to landowners in an agricultural district. The unimproved land in the district is exempt from real estate transfer, county, and school taxes. There are significant protections against nuisance suits for land in the district. Landowners are permitted limited residential uses. Permitted agricultural used include but are not limited to: crop production, herd animal and poultry operations, horse operations, forest production, non-commercial hunting, trapping and fishing, and agricultural eco-tourism operations, as well as farm markets and roadside stands.

Agricultural Conservation Easements

In order to permanently preserve farmland, the Foundation purchases development rights from landowners and imposes a permanent agricultural conservation easement on the land. Land must first be in an Agricultural Preservation District before the owner can apply to sell the development rights. The sale of development rights is a three-step process.

State Resource Areas

Lands purchased by local and state government is the latest and perhaps the most important step in providing protection for areas that contain significant habitat. Thousands of acres scattered across the watershed are now owned by public agencies.

Significant habitat remains on these properties. The State of Delaware has acquired land through various programs for recreational benefit and natural resource protection. The State of Delaware enacted Title 7, Delaware Code, Chapter 75: Delaware Land Protection Act on July 13, 1990.

Perhaps better known as the "Open Space Program," the initial funding for this program was provided by the sale of bonds. In 1990, the Open Space Program, administered by the Division of Parks and Recreation's Land Preservation Office, continued a systematic approach to land acquisition that had begun with the Governor's Land Acquisition Program established in 1987.

The Natural Areas Inventory

Natural areas within and around the Appoquinimink and Blackbird watersheds:

- Augustine Creek
- Silver Run Marshes
- Appoquinimink River
- Noxontown Pond
- Blackbird Creek
- Blackbird Delmarva Bays
- Cedar Swamp

New Castle County's Unified Development Code (UDC) provides protection for lands within New Castle County that have been listed on the State's Natural Areas Inventory. The owner, prior to the county's acceptance of any development plan, must produce a Critical Natural Areas Report. The UDC refers to lands on the inventory as "Critical Natural Areas." County planners work closely with the Office of Nature Preserves and private landowners to coordinate protection of these identified natural areas. The UDC also offers varying amounts of protection for steep slopes, riparian buffers, and floodplains.

Private Conservation Organizations

Significant habitats within the Delaware Basin have been acquired by two important non-profit organizations; Delaware Wild Lands, Inc., and The Nature Conservancy.

Delaware Wild Lands acquired perhaps the most important natural habitat in Delaware, the Great Cypress Swamp, in the 1970s when a major portion of the property was threatened with development. This 10,000-acre property has been responsibly managed by this organization for over twenty years. Within the Delaware Basin, Delaware Wild Lands holds important coastal and near coastal lands in the Port Penn and Augustine area, near the mouth of the *Appoquinimink River*, the Liston Point/Cedar Swamp area, and around Bennett's Pier in the Milford Neck area.

The *Delaware Chapter of The Nature Conservancy* has been very active in recent years working with landowners and acquiring significant coastal and near coastal natural sites in the Milford Neck area and cooperating with Delaware Wild Lands near the Bennett's

Pier site, a large parcel on the Mahon River near the bay coast. Lately, The Nature Conservancy has been proactively identifying "portfolio" sites in the headwaters of the Broadkill, Cedar Creek, and Mispillion River as part of a *Delaware Bayshore ecoregional planning effort.* This effort includes a major project within the *Blackbird Creek* corridor for strategic protection and partnering.

Recreation

The natural resources of the Delaware Bay and Estuary Basin provide numerous recreational opportunities. Situated along the Atlantic Flyway, Delaware's coast has become a well-known, ideal destination for birders. The vast salt marshes rimming the coast serve as outdoor environmental laboratories for studying and observing nature. Throughout the basin, a wide variety of ponds and interlacing streams provide exploration opportunities for canoeists and kayakers. Hunting, boating and fishing have long been popular pastimes for residents and visitors.

The Appoquinimink and Blackbird watersheds provide opportunities for a variety of recreational activities. From fishing to camping to hunting to hiking, the forests, marshes and open waters are popular places for recreation. Within the watersheds, there are 14 municipal and county parks, one state forest, two state wildlife areas, one reserve and numerous fishing access areas that provide a variety of opportunities for recreation ranging from baseball and basketball to tennis and horseshoes.

Parks

Recreational Use Facility Name	Baseball	Basketball	Boat Ramp	Camping	Fishing	Horseback Rding	Horseshoes	Hunting	Little League	Open Space	Parking	Pavilion	Picnic Tables	Pool	Playground	Running Track	Skateboarding	Soccer	Softball	Tennis	Walking Trails
Appoquinimink Creek Boat Ramp, Odessa			×		×						×										
Augustine Wildlife Area								×			×										
Blackbird State Forest				×	×	×		×			×		×								×
Cedar Swamp Wildlife Area			×		×			×			×										
Delaware National Estuarine Research Reserve										×	×										×
Doc Levinson Park, Middletown		×								×	×	×	×		×		×			×	×
Duke Field, Middletown									×		×										
Greenlawn Open Space, Middletown										×											
Lake Street, Middletown															×						
Levels Road Park, Middletown																					
Main Street, Townsend										×											
Memorial Park, Odessa		×									×				×						×
Middletown Village, Middletown										×	×		×		×			×			
Middletown Nature Area											×										×
Old Academy Building, Odessa															×					×	
Silver Lake Park, Middletown	×											×	×	×	×	×	×	×	×	×	
Townsend Elementary School											×				×						
Townsend Park							×			×	×		×		×						×
Wiggins Mill Park, Middletown																					

Hunting

Situated midway on the Atlantic Flyway, Delaware hosts a large concentration of wintering waterfowl, especially snow geese and ducks. Doves, squirrels, cottontail rabbits, white-tailed deer and raccoon also offer excellent seasonal hunting throughout the State.

There are 56,920 acres of State wildlife areas and 15,100 acres of State forests open to public hunting within the State. The State wildlife areas provide 192 waterfowl blinds (including five for disabled hunters), most of which are accessible only by water and more than 400 deer stands. In addition, six State parks -- Cape Henlopen, Delaware Seashore, Holts Landing, Fenwick Island, Lums Pond and White Clay Creek -- offer public access areas for licensed hunters with a valid permit.

At Bombay Hook National Wildlife Refuge, restricted public hunting is permitted for deer, waterfowl, and, in one small area, upland game. Goose hunting is the major attraction in this area. About 3,500 of the Refuge's 15,978 acres are open to hunting. Prime Hook National Wildlife Refuge, with 8,818 acres, has 25 waterfowl blinds and numerous areas designated for upland game hunting.

Within and adjacent to the Appoquinimink and Blackbird watersheds, there are several hunting areas open to the public for small game, waterfowl and deer including Blackbird State Forest, Augustine Wildlife Area, C&D Canal Wildlife Area, Cedar Swamp Wildlife Area, Woodland Beach Wildlife Area, and the Delaware National Estuarine Research Reserve.

Fishing and Boating

In 2005, 52,119 vessels were registered, of which 5,785 were Personal Watercraft

Tidal Waters

Recreational fishing in the Delaware Bay and its tributaries is a popular activity. In the Delaware Estuary, some of the commonly sought-after recreational fisheries include: striped bass, bluefish, carp, catfish, drum fish, summer flounder, white perch and yellow perch. Bluefish and summer flounder are the two most sought-after species in the Estuary (Dove and Nyman, 1995). It is recommended that before fishing individuals should contact the Division of Fish and Wildlife for the most up-to-date information regarding fishing advisories for the Delaware Bay and Estuary.

The Department of Natural Resources & Environmental Control provides fishing and boating access to tidal waters at six locations in and around the Appoquinimink and Blackbird watersheds. All motor boats launched from tidal access areas administered by the Division of Fish and Wildlife must be registered in Delaware or have a valid ramp certificate. Ramp certificates are available from the Division of Fish and Wildlife or its authorized agents.

Division of Fish & Wildlife Tidal Water Access

Area/Location	# of Ramps	# of Piers	Parking Capacity
Augustine Beach/Delaware River	2	1	100
Canal Wildlife Area/C&D Canal	None	4	Along road
Collins Beach/Delaware Bay	3	1	120
Woodland Beach/Delaware Bay	1	1	50

Odessa/Appoquinimink Creek	1	None	2
Staves Landing/Blackbird Creek	1 unimproved	None	

Non-Tidal Waters

The Department of Natural Resources & Environmental Control provides public access to several ponds within the State, but none are within the Appoquinimink and Blackbird watersheds. The closest ponds for the purpose of fishing and boating to the area are Masseys Mill Pond and Garrisons Lake near Smyrna and at Lums Pond near Kirkwood. In order to fish in non-tidal waters, a Delaware fishing license is required.

Area/Location	Size (Acres)	Boat Ramp	Bank Fishing
Division of Fish & Wildlife			
Masseys Mill Pond near Smyrna	30	Unimproved	Limited
Garrisons Lake near Smyrna	86	Yes	Yes
Division of Parks & Recreation			
Lums Pond near Kirkwood	189	Yes	Yes

Blackbird State Forest is also open to catch-and-release fishing.

Hiking/Walking/Jogging Trails

Several scenic miles of trails in local parks, state forests, reserves and wildlife areas hiking, walking and jogging areas are easily accessible throughout the Appoquinimink and Blackbird watersheds. The state's relatively mild terrain makes hiking and walking here something that everyone can do, whether you're young or old, a novice or a fitness fanatic.

Blackbird State Forest is a popular site for outdoor recreation. Its 40 miles of trails are used extensively for hiking, running, bicycling, horseback riding, and cross-country skiing. There is also a 2,200 foot paved nature trail designed for wheelchair accessibility.

Middletown Nature Area, Doc Levinson Park in Middletown, Delaware National Estuarine Research Reserve – Blackbird Creek Reserve in Townsend, Memorial Park in Odessa, and Townsend Park all have trails for use.

Camping

The trail system at Blackbird State Forest interconnects five primitive campsites and four picnic sites, available on a first-come, first-served basis.

Lums Pond, Killens Pond, Cape Henlopen, Delaware Seashore and Trap Pond State Parks all have family campgrounds. Cabins are available at Killens Pond and Trap Pond, and yurts can be rented at Lums and Trap Pond. Cottages are available at the Indian River Marina in Delaware Seashore State Park. The campgrounds are open from March 1st through November 30th, although all amenities are not guaranteed during cold weather. An exception is Killens Pond State Park, where you can experience year-round camping

at both its camping loops and cabins. Lums Pond State Park and Killens Pond State Park are the closest to the Appoquinimink and Blackbird watersheds.

Equestrian Trails

There are 20 miles of trail or road in Blackbird State Forest where riding is permitted. Carriage rides are available at the Tybout Tract of Blackbird State Forest as it has interconnecting trails.

Scenic and Historic Highways

Coastal Heritage Greenway Auto Tour – A driving tour highlighting Delaware's Coastal Treasures

The Coastal Heritage Greenway ties together the natural, historic and cultural resources of Delaware's coast. Stretching 120 miles from Fox Point State Park north of Wilmington, to the Maryland border at Fenwick Island, the Coastal Heritage Greenway encompasses the entire coastline in the Delaware Bay and Estuary Basin. To date, protection of resources along the Coastal Heritage Greenway has occurred without a strong coordinated effort. As areas along the coast come under greater development pressure, a more coordinated effort is needed to preserve the resources that give Delaware's coast its character. Through the Coastal Heritage Greenway, coordinated efforts have taken place to interpret Delaware's coastal resources. In 2000, the Coastal Heritage Greenway received national designation as a Millennium Legacy Trail. Additional efforts are needed to protect the coastal resources of Delaware and to keep their natural, historical and recreational significance in tact.

Thousand Acre Marsh

At approximately 1,300 acres, Thousand Acre Marsh is the largest freshwater tidal wetland in northern Delaware. The marsh is bordered on its northern edge by the Chesapeake and Delaware Canal; the eastern boundary is the coastal dike (Rt. 9). The southern and western boundaries meander through privately-owned agricultural properties.

The marsh was originally enclosed by the Dutch in the 1600's to control water levels for agriculture. In the early 1930's, an increase in the muskrat hide trade saw landowners maintaining the marsh at higher levels for muskrat production. In times past, an area of just less than a hundred acres yielded 4,000 muskrat hides in one year. The higher water levels placed the muskrat tradesmen in direct conflict with landowners who wanted to maintain the lower water levels necessary to preserve the area for waterfowl hunting.

Although the marsh has been subjected to varied, sporadic, and at times highly reactionary management practices for over a century, it has somehow maintained a well-deserved reputation as one of the most highly productive and diverse habitats in Delaware. The marsh is part of an extensive foraging area for wading birds that nest at

the Pea Patch Island heronry. Osprey and bald eagles have also been observed here. The marsh is currently under restoration under the Northern Delaware Wetlands Rehabilitation Program.

Port Penn

The village of Port Penn is situated a few miles north of the point where the Delaware Bay becomes the Delaware River. The land that makes up Port Penn was acquired by Dr. David Stewart in the mid-18th century. He built himself a two-story brick home and in 1764, proposed building a town. In keeping with Stewart's vision of Port Penn as a major harbor, docking facilities were constructed in 1780. In 1812, Port Penn was considered the best port in Delaware and a Customs House was built to oversee harbor activity.

In the 1850's, however, due to the agricultural blight in the area and the construction of both the Chesapeake and Delaware Canal and the Delaware Railroad, Port Penn's appeal diminished. By 1884, the Customs House and the piers were gone from the port.

It is unlikely that the village was ever visited by William Penn. Some accounts say that Penn once landed here for a supply of water, thus giving the town its name. It is more probable, however, that the name was coined by an early developer seeking to turn the town into a rival of the flourishing port of New Castle in the late 18th century. In any case, the name Port Penn did not appear on a map until 1780, more than 60 years after the great Quaker passed away.

The Village Walk allows visitors to see the historic houses of Port Penn, the oldest of which dates back to 1740. Trail guides for the Historic Homes of Port Penn Village Walk are available from the Interpretive Center— a former schoolhouse on the corner of Liberty and Market Streets. Inside the Center, you'll find a variety of exhibits depicting the interaction between people and the environment.

The Reedy Island Quarantine Station is included as a stop along the Village Walk. This facility was operated by the U.S. Public Health Service as a quarantine station from 1893 until about 1936. The detention center was built on six-foot stilts to guard against high tides that still flood the island. The station included a hospital, barracks, doctors' quarters, and delousing room. Remodeled and reequipped in 1935, it served as the Delaware River's main quarantine station, but that function was shifted to Marcus Hook, Pennsylvania, a year later.

After the station was closed, some of the houses now in Port Penn were moved from Reedy Island by floating them across the river on barges. There is no public access to this island, but it can be viewed from the observation platform on the Wetlands Trail in the Augustine Wildlife Area.

The Wetlands of Port Penn Interpretive Trail allows visitors take a closer look at the relationship that continues to exist between Port Penners and the wetlands that surround them. Once providing both sustenance and employment, the bounty of the marsh has

diminished in recent times. Even today, some residents still carry on the traditional ways of their ancestors.

Augustine Beach

Augustine Beach was named for Augustine Hermann, the Bohemian adventurer who mapped the Delmarva Peninsula and surrounding areas in the mid-1600's for Cecilius Calvert, the second Lord Baltimore. The spot is said to have been the easternmost stop along a trail Hermann had built across the peninsula from the Chesapeake to the Delaware Bay. Used by ox-carts and other rough conveyances for the movement of goods between the two bays, the trail roughly paralleled the present course of the Chesapeake and Delaware Canal.

Much later, during the late 19th century, Augustine Beach became a favorite retreat for day trippers from Philadelphia cruising down the river aboard the steamboat Thomas Clyde. Together with local farm families, these pleasure-seekers would crowd the pier and amusement buildings which have long since gone the way of steamboats themselves.

The most notable structure left at Augustine Beach today is the large brick Augustine Beach Hotel, formerly a social center of the region built in 1814. It has served more recently as a restaurant. The nuclear generating stations, across the river in New Jersey, dominate the vista. Augustine Creek, south of Augustine Beach, is currently being restored by the Division of Fish and Wildlife under the Northern Delaware Wetlands Rehabilitation Program.

Silver Run

The bridge at Silver Run is a popular site for fishing and crabbing. Perch and catfish are common catches. A small public boat ramp is available and is used primarily for waterfowl hunting.

Odessa

Though much smaller than New Castle, Odessa possesses one of the finest collections of late 18th- and early 19th-century architecture in the middle-Atlantic region. The center of town is now on the National Register of Historic Places, and local authorities have zoned the entire town as historic.

For the first 134 years after its founding in 1721, the town was known as Cantwell's Bridge, named after an early toll bridge across the Appoquinimink operated by a son of Captain Edmund Cantwell, who gained title to the area in 1664. Throughout the 18th century, the village grew in importance as a port for wheat, corn, tobacco, and other products produced on the large inland plantations of the upper peninsula.

Odessa enjoyed its greatest wealth and prominence from the last decades of the 1700's through the 1840's. The decline of the peach crop, which fell to a peach blight, as well as

the railroad passing through Middletown rather than Odessa both played a role in the decline of the town.

Odessa was given its present name in 1855 when town fathers, concerned by the decline of the town's former prominence as a shipping point for grain, renamed it for the Black Sea grain port in an apparent effort to shore up its sagging economy. The officials of the village of Duck Creek Crossroads, a few miles south, adopted a similar strategy by renaming their town Smyrna. In neither case was the renaming successful in meeting its goal; however, the new names have lasted. Today visitors to this picturesque village can enjoy much of that old atmosphere and stroll down the tree-lined streets past many restored and preserved 18th and 19th century homes.

The Historic Houses of Odessa is an enclave of 18th and early 19th century buildings which includes the Corbit-Sharp House (c.1774); Wilson-Warner House (c. 1769); Collins-Sharp House (c. 1700); Brick Hotel (c. 1822); and Odessa Bank (c.1853). Within the houses, the Historic Odessa Foundation's collection of over 4000 objects spans an interpretive period in regional decorative arts from 1760 through 1850. What sets the Historic Houses of Odessa apart from many other historic sites is the accuracy of its period rooms and furnishing plans. In addition to many pieces of original family furniture made by prominent Delaware cabinetmakers of the 18th century, the collection includes major works of regional paintings, prints, textiles, silver, pewter, and other metals. The Foundation's collection is steeped in Delaware history and rich in the finest examples of mid-Atlantic craftsmanship.

Taylor's Bridge

Near this quaint town is the Reedy Island Rear Range Light, a 135-foot tall cast-iron lighthouse dating from the mid-1800's. The light is among the more unusual survivors of the era when the Delaware River and Bay served as major highways for sailing vessels. As sailors cruised these waters, they timed the flashes from the range lights for navigation. The light tower is listed on the National Register of Historic Places.

Also near Taylor's Bridge is the Blackbird Creek component of the Delaware National Estuarine Research Reserve. Blackbird Creek consists of freshwater tidal and non-tidal wetlands and brackish-water marshes. The Creek supports prime examples of Spartina—a tall, tan-colored cordgrass. Native to Delaware, Spartina acts as cover for the fish and shorebirds that make their home in the marsh. As you travel south along the Greenway, notice how the diversity of marsh plants increases as the salinity level of the water increases.

Collins Beach

At the end of Route 491 (Thoroughfare Neck Road) is Collins Beach. This was a popular summer resort in the 1870's and a regular stop on the excursion route of the steam-powered side-wheelers serving Philadelphia and Wilmington. The great tidal wave of the

1878 hurricane destroyed the pier, buildings, roads, and the allure of the resort. Now there are three boat ramps, parking lots, and a short boardwalk through the marsh.

The same tidal wave that destroyed buildings and roads drastically altered the character of Cedar Swamp. Prior to the hurricane, Cedar Swamp was abundant with Atlantic white cedar (*Chamaecyparis thyoides*). The tidal wave breached the barrier in four places, inundating the swamp with saltwater. The new saltwater environment brought about a change in the types of vegetation that grow there. The Cedar Swamp property is owned jointly by the Delaware Division of Fish and Wildlife and a private conservation agency.

Fleming's Landing

Fleming's Landing marks the boundary between New Castle and Kent Counties. It is the site of an attractive mid-19th- century farm as well as a small fleet of oyster boats. From the 1700's through the 1800's, the Smyrna River was known as Duck Creek, and it is still called Duck Creek by some local residents. Here you can get a close look at typical marsh grasses—big cordgrass, feather grass, the shorter salt marsh cordgrass, and salt hay. Anywhere you see the word "landing" in a place name, there was once an actual landing where farmers brought their livestock and produce to be loaded onto barges and shipped to either Wilmington or Philadelphia. Some of these landings are still in operation today

<u>Route 9 Scenic & Historic Byway</u>

For 52 miles between the City of New Castle and the John Dickinson Plantation, the mostly rural two-lane road (Route 9) that parallels the western shore of the Delaware winds past a variety of landscapes that are the essence of Delaware: heavy industrial sites, forests, wetlands, tidal and non-tidal marshland, historic towns and quaint villages as well as cultivated fields of corn and soybeans. Route 9 is also rich with the wildlife, wetlands and ecosystems of the Delaware River and Bay estuary.

The Route 9 corridor from historic Old New Castle to the John Dickinson Plantation south of Dover is being considered for designation as one of Delaware's Scenic and Historic Highways. Administered through DelDOT, Delaware's Scenic & Historic Highways Program provides official recognition that showcases the special nature of a roadway. Route 9 is being nominated for its important natural and historic intrinsic qualities.

Scenic and Historic Highway designation provides official recognition of the special nature of a roadway corridor. The designation, though honorary, heightens awareness and recognition of the community and boosts community pride. Additional community benefits include the opportunity to apply for Federal Highway Administration Grant funding for creating a corridor plan, assistance from state offices of economic development and tourism, identification on state highway maps, leading to more tourism opportunities.

The natural and historic qualities of the 52-mile Route 9 corridor are regionally and nationally significant. Route 9 is a "green oasis" noted for its serenity and natural beauty.

The amount of preserved coastline in Delaware is unparalleled on the East Coast, and results from Delaware's commitment to stewardship in passing the landmark Coastal Zone Act in 1971 (1). Delaware is fortunate to have Route 9 with its natural areas, working farms and natural areas, sanctuaries, refuges and important habitat along the Atlantic Flyway that run through the corridor of preserved coastal areas.

The Route 9 corridor contains vast stretches of brackish and salt-water marshes that border the many shallow streams and creeks that empty into the marshes and run under Route 9 as they enter Delaware Bay. Thousand Acre Marsh (approximately 13, 000 acres) is the largest freshwater tidal wetland in northern Delaware. Route 9's heronry and horseshoe crab populations are unique. The Route 9 community where fishing and hunting are still a way of life for some puts a high value on the natural areas and scenic qualities found there.

Because of the importance of history, preservation and stewardship to the Route 9 community an amazing concentration of historic towns, sites, events and buildings exists today. The towns along Delaware Bay served as bases for fishing, hunting and trapping into the 20th century and in the 19th century also served as landings for shipment of farm produce and livestock to be loaded onto barges and into the local river markets serving Wilmington and Philadelphia.

Working farms, many of which are committed to being preserved, also important cultural resource along Route 9. Farming has been, and continues to be, an important economic and cultural force along Route 9.

Route 9 Scenic Byway traverses historic colonial towns and buildings, landings where farm products where shipped to market and preserved farms and marshes that have looked much the same for over 200 years. The important stories of Delaware's coastal natural areas and historic resources unfold before the traveler along scenic Route 9.

Natural Resources of the Appoquinimink and Blackbird Watersheds

I. TERRESTRIAL RESOURCES

A. Topography

Topography includes various characteristics of physical geography in a region. The term topography is derived from the Greek "topos" (place) and "graphein" (to draw) and refers to the lie of the land. This is usually expressed in terms of the elevation, slope, and orientation of terrain features. Topography is an important aspect of geography, including cartography, surveying, and GIS. The understanding of topography is critical for a number of reasons. Understanding the topography of an area enables the understanding of watershed boundaries, drainage characteristics, water movement, and impacts on water quality. Maps are the most common communication tool for topographic information. In topographic maps, the relief is often used to refer to the third dimension of a map in the form of raised relief, contours, hachures, or shading. Tectonic processes and erosion determine the topography of a region. Tectonic processes result in land elevation, and erosion wears away the land leading to lower elevations.

The Appoquinimink and Blackbird Creek Watersheds are both located in the gently sloping coastal plain region of the Delmarva Peninsula. The Blackbird Creek watershed contains rolling hills throughout, and reaches a maximum elevation of 25 meters (82 feet) at the western boundary of the watershed. (DNREC, 1999). The maximum range of elevation in the Appoquinimink watershed is 23.2 to 25.9 meters (76-85 feet) (See Figure 1). Similar to what is found in the Blackbird Watershed, the Appoquinimink area of maximum elevation is also located along its western boundary.

One interesting topographic aspect of the Appoquinimink Watershed involves the presence of moderate bluffs along the creek banks. A bluff is defined as a steep shoreline slope formed in sediment (loose material such as clay, sand, and gravel) that has three feet or more of vertical elevation just above the high tide line. Cliffs or slopes in bedrock (ledge) surfaces are not bluffs and are not subject to significant erosion in a century or more. The formation of bluffs is the result of complex terrestrial and marine processes.

Bluffs contribute both to the aesthetic beauty of the watershed and the stabilization of shorelines. Finegrained silt and clay eroded from bluffs may be deposited on mud flats or salt marshes which help reduce wave energy at the base of a bluff and slow the overall rate of bluff erosion. When sand and gravel erodes from bluffs it becomes part of a beach at the base of the bluff and helps to stabilize the shoreline position. Transfer of sediment from the land to the sea is natural and sometimes essential to sustain beaches, flats, or salt marshes. A particularly noteworthy example is located southwest of Delaware Route 1. The Appoquinimink River fork located within the Deep Creek and Appoquinimink I Subwatersheds contains a multitude of additional regions with similar topographic characteristics.

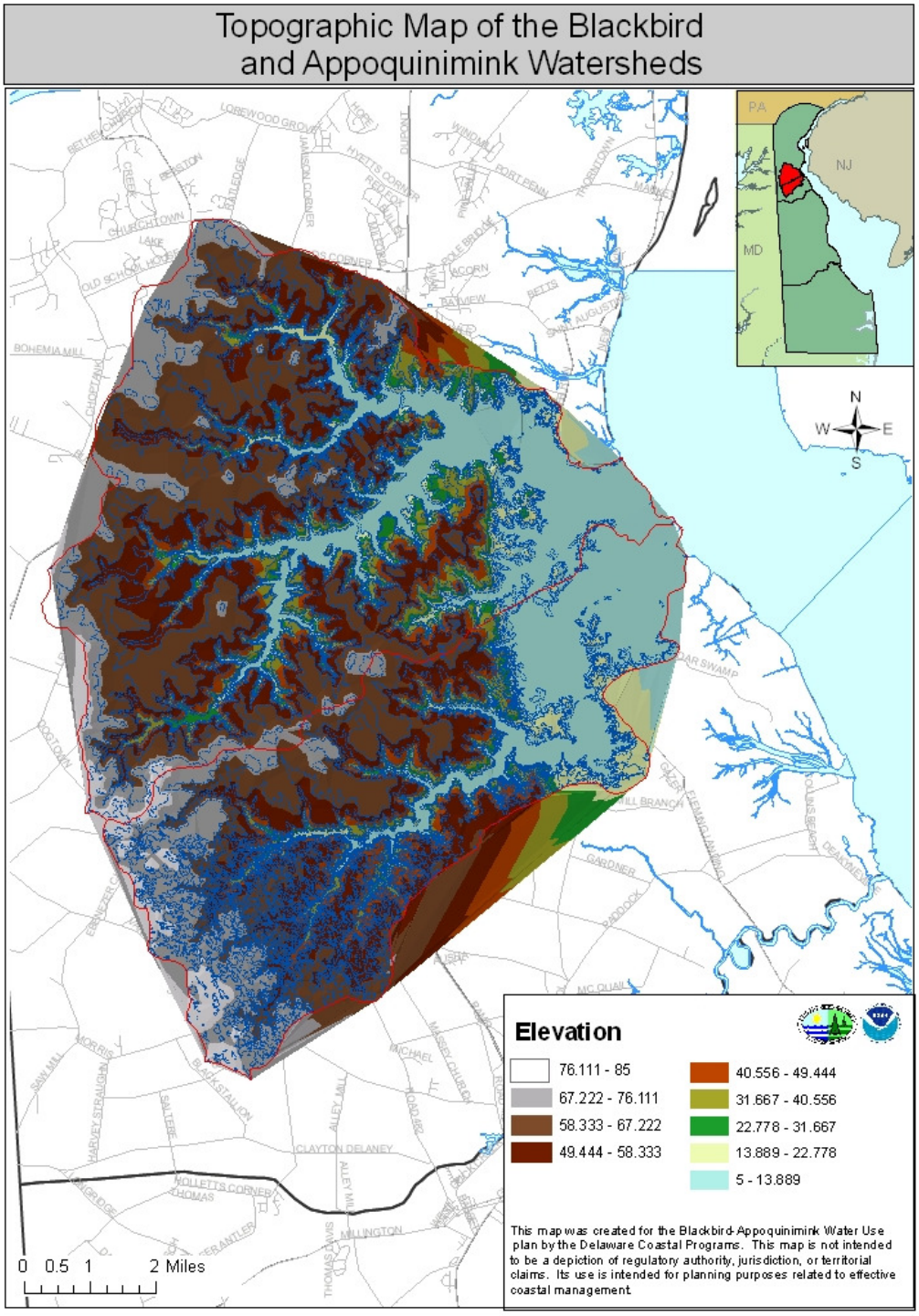


Figure 1 – Topographic Map of the Blackbird and Appoquinimink Watersheds

B. SOILS

Soil, along with the geology and topography that play a part in influencing its development, is what determines where we presently live and how far development can extend. Properties of soil such as texture (sand, silt, or clay), structure (granular size, shape, and arrangement), the rate at which substances flow through it (permeability), frequency and duration of non-saturated periods (drainage), and organic composition determine among other things: which food crops if any will grow, if a septic system is feasible in your area, whether your basement will stay dry, how quickly buried pipes will corrode, and if your lawn or driveway will erode away. The topographical features of surface slope and water table level greatly influence soil types and of course also play a part in the before mentioned factors. The five components of soil development are parent material (geology), relief (topography), climate (moisture and temperature), living organisms, and time. The geology of the Appoquinimink River and Blackbird Creek watersheds consists of medium to coarse grained sand fluvial deposits from the Triassic Period, 250 to 200 million years ago, overlaid by silt and fine sand deposited during the Cenozoic Era, 65 million years ago to present. These deposits formed a topography of terraced uplands rolling above broad low lying valleys that are frequently saturated by runoff and tidal waters.

Since 1836, when the Third Agricultural Society of New Castle voted to petition legislature, a need for soil mapping has been recognized in Delaware. In 1917, the first federal soil survey of New Castle County was published and then updated in 1970. Another update in electronic form is in progress. The United States Department of Agriculture maps soils by soil series/phase, soil complex, or land type. Soil series consist of soils with major horizons that have similar thickness, arrangement, and other distinguishing characteristics. The first discovered example of a soil series is named for a local town or geographic feature. Soils within a series have minor differences and are further divided into phases such as surface soil texture, slope, and some other features. When two or more series or phases become mixed in an area, a soil complex label is applied and named by the dominant soils.

Definitions of soil differ according to various uses but the general definition is that of an active natural material capable of supporting plant life and consisting of mineral and organic solids, gases, liquids, and living organisms (Brady, 2004). A profile of soil consists of several layers with air being the upper limit and the end of biological activity the lower limit. Each of these layers is a soil horizon usually parallel to the surface and distinguished from the other horizons by color, structure, texture, and other characteristics. While the number and distinctness of horizons within profiles varies, there are six hypothetical major horizons: O, A, E, B, C, and R which usually contain subhorizons identified with a number or letter. Profile characterization protocols differ and the profile example below is a combination of multiple characterization techniques.

General Soil Profile

Organic Horizons	Oi	Slightly decomposed vegetative matter that is recognizable.
	Oe	Moderately decomposed vegetative matter.
	Oa	Highly decomposed vegetative matter that is unrecognizable.
	A1	Decomposed organic matter mixed with mineral matter and coating mineral particles, resulting in darker color of the soil mass. Often coarser than lower horizons because of translocation of finer material.
	A2	Generally lighter in color and lower in organic matter content than the A1 horizon.
Mineral Horizons	E	Horizon of maximum clay, iron, and aluminum oxide leaching resulting in a heavy concentration of quartz.
	EB	Transitional horizon with properties more like E than B.
	BE	Transitional horizon with properties more like B than E.
	B	Clearly expressed layer where the soil lacks properties of the overlying A and underlying C horizons. Generally the zone of accumulation with high clay content and soil structure development.
	BC	Transitional horizon between the B and C or R horizons, but with predominant characteristics of the B horizon.
Lower Horizons	C	A mineral layer, exclusive of bedrock, below the zone of biological activity and the least affected by soil-forming processes. Lacks properties of either the A or B horizons.
	R	Consolidated bedrock, which is not necessarily the source of mineral matter from which the soil formed.

Soil Associations

The broader category of soil association can be used to give general comparisons of county regions. Soil associations are areas with distinctive proportions of soil series and are named by their major soils. The Appoquinimink River and Blackbird Creek watersheds contain five soil associations: Fallsington-Sassafras-Woodstown, Keyport-Elkton, Matapeake-Sassafras, Sassafras-Fallsington, and Tidal Marsh.

The **Fallsington-Sassafras-Woodstown association** has a minor presence at the headwaters of the Blackbird Creek watershed and is characterized by a rolling but fairly level landscape of dominantly poorly drained soils. Due to the poor drainage, most of the area has not been cleared and remains wooded; the Fallsington soil series is an exception within the association and is well drained and cleared for agriculture.

Keyport-Elkton association soils are also limited to the Blackbird Creek watershed and mostly level but occur near the coast bordering tidal marsh soils. When slopes are present they are long and gentle. The topsoil is moderately well drained and used for some agriculture but a poorly drained subsoil of silty clay loam and silty clay creates moderate to severe limitations for development.

In contrast, a deep well drained topsoil of silt loam or sandy loam provides perfect conditions for agriculture and development on the **Matapeake-Sassafras association**

which dominates the Appoquinimink River watershed. A nearly level landscape, with few steep and erosion prone areas, imposes only slight to moderate limitations for development.

The **Sassafras-Fallsington association** covers roughly half of the Blackbird Creek watershed. The landscape is fairly level and smooth with most slopes being less than 5 percent. Well drained and developable Sassafras soils make up 50 percent of the association but the Fallsington and minor soils are mostly poorly drained and create moderate to severe limitations for development.

Tidal Marsh association soils occur in all areas frequently flooded by incoming tidal waters and have varying levels of salt. Although permeability is moderately rapid to rapid in the organic surface layers, moderately slow permeability in subsurface layers combined with a 0-1% surface slope results in a very slow or ponded surface drainage of tidal water and the area's mean annual precipitation of 38 to 48 inches. When drained or removed for development, these normally alkaline soils become acidic. Texture ranges from sand to clay and can be mucky with very little intact plant fiber or peaty with abundant plant fiber present. There is a buildup of muck or peat in some areas caused by water induced oxygen depletion which slows anaerobic decomposition. Because of this organic buildup, studies in Maryland and Florida have shown that tidal marshes can contain 73-287% more carbon than neighboring upland forest soils (Choi *et al.*, 2001; Hussein and Rabenhorst, 2002). The Tidal Marsh association was once a broad label given to tidal soils that were considered to be too difficult to classify by soil series, but some tidal marsh areas have now been given series names. Soil series and complexes of the Tidal Marsh association within the Appoquinimink River and Blackbird Creek watersheds include: Broadkill mucky silty clay loam, Broadkill-Appoquinimink, Lenape mucky peat, Lenape-Nanticoke, Mispillion-Transquaking mucky peat, and Nanticoke-Mannington.

Soil Series and Land Types

Although soil associations are helpful for obtaining a general idea of an area's profile, it is important to look at each individual soil series when creating land use plans. Varying slopes, soil depths, drainage and other characteristics not necessarily segregated within associations will play a large part in determining exactly which areas can be expected to experience development and require public use and access points. The following descriptions are listed alphabetically and include symbols in parenthesis to be used in conjunction with the soils type map. With soil symbols, the first two letters refer to soil series and texture and the third letter and following number refer to slope range and erosion potential.

Using the Matapeake soil series as an example with symbology MeA, MeB2, MeC2, MeC3, MkA, MkB2, and MsB within the Appoquinimink River and Blackbird Creek watersheds: Me = Matapeake silt loam
Mk = Matapeake silt loam with a silty substratum
A = 0-2% slopes

B2 = 2-5% slopes with moderate erosion
C2 = 5-10% slopes with moderate erosion
C3 = 5-10% slopes with severe erosion
MsB = Matapeake-Sassafras-Urban Land complex with 0-5% slopes

The soil maps provided in this report are a combination of the 1970 New Castle County soil survey and the survey presently in progress and, although new soil series are being created and mapped as broader areas of description are refined, soil series descriptions follow according to the 1970 soil survey.

Collington (CsC3, CsD3)—A deep well drained fine sandy loam deposited over old marine fine sandy clay loam and sandy loam sediments with glauconite, a green sand, that results in a olive-colored subsoil 15 to 32 inches below the surface. Two very small areas of this series are found within the Appoquinimink River watershed, one near the river. Vegetation usually consists of herbaceous upland plants and deciduous shrubs or trees. Both areas have slopes of 5-15% and are prone to severe erosion when improperly exposed by agriculture or development. Areas previously exposed and unprotected have usually eroded down to the subsurface and gullied. Where slopes are 5-10% the use of septic tanks and home basements is only slightly limited but pavement and lawns are moderately limited. Where slopes are greater than 10% the use of septic tanks, home basements, and pavement is moderately to severely limited and lawns are severely limited. Shrink-swell potential is low but corrosion of untreated steel pipes is moderate and corrosion of concrete pipes is high.

Elkton (ElA, EmA)—Minorly present within the Appoquinimink River and Blackbird Creek watersheds as **Lenni** sandy loam (El) or silt loam (Em) and **Tent** silt loam (Em). Slopes are 0-2% (A). The sandy loam only differs from the two silt loams by surface texture and both developed over fine textured marine sediments. The 7 inch surface layers overlay 4 feet of subsurface layers of similar textures. Poor drainage and a seasonal high water table encourages the growth of wetland hardwoods including oak, gum, swamp maple, and holly providing good wildlife habitat. Likewise all forms of development are severely limited with shrink-swell potential being moderate and corrosion of untreated steel and concrete high.

Fallsington (Fa, Fs)—Covers the third largest area of any series in the watersheds and is present as **Evesboro** sandy loam (Fs), **Hurlock** sandy loam (Fa), and **Rosedale** loamy sand (Fa) in the Blackbird Creek watershed and present as **Fallsington** loam (Fs), Fallsington sandy loam (Fa), and the **Hatmonton-Fallsington-Humaguepts** complex (Fa, Fs) in both the Appoquinimink River and Blackbird Creek watersheds. The landscape is mostly level with some 0-2% slopes and limited erosion; Evesboro occurs at 0-5% slopes and Rosedale occurs at 2-5% slopes. These are wet upland soils with an 11 inch surface layer that is well drained when the water table allows, but the water table is usually high and development is severely limited. Shrink-swell potential is low; corrosion of steel and concrete is high.

Gravel pits and Quarries (Gp)—A land type description for areas where the soil has been removed to access gravel, sand, or rock deposits for construction projects.

Johnston (Jo)—Consists of the **Zekiah-Longmarsh** complex (Jo) in the Appoquinimink River and Blackbird Creek watersheds. Found in river floodplains, this soil is made up of very wet and poorly drained alluvial sediments and acidic organics 24 inches thick over a flowing subsoil of acidic structureless loose sand. Where river disturbance is reduced, hardwood forests are present. Development limitations are severe. Shrink-swell potential is low to moderate and corrosion is high.

Keyport (KeA, KeB2, KpC3)—Included within the Appoquinimink River and Blackbird Creek watersheds as **Keyport** silt loam (Ke) and **Leipsic** silt loam (Ke) in the 0-2% (A) and 2-5% (B2) slope ranges and Keyport sandy loam (Kp) with a 5-10% slope (C3). These upland soils are deep and moderately well drained though clay or silty clay subsurface layers slow water movement. Moderate erosion is present on 2-5% slopes in the form of gullies, severe erosion occurs on the 5-10% slopes. Development limitations are moderate to severe because of the impeded drainage. Shrink-swell potential is low to moderate and corrosion is high.

Made Land and Urban Land (Udorthents) (Ma)—A land type description for highly developed areas or areas that contain fill material such as soil or trash. Original soil may have been removed completely or filled in with 18 inches or more of other material.

Matapeake (MeA, MeB2, MeC2, MeC3, MkA, MkB2, MsB)—Covering the largest area this series is found in the Appoquinimink River and Blackbird Creek watersheds as **Leipsic-Reybold** (Me), **Reybold-Hambrook** (Me), and **Reybold-Sassafras** (Me) complexes in the 0-2%, 2-5%, and 5-10% slope ranges. **Matapeake** silt loam (Mk) with 0-2% (A) and 2-5% (B2) slopes and **Reybold-Urban Land** (Ms) complex with 0-5% (B) slopes occur in the Appoquinimink River watershed. These upland soils are deep and well drained but have a slow permeability. An 8 to 11 inch silt loam surface layer of silt loam usually overlays a subsurface layer of light silty clay loam, some areas contain a silt loam subsurface layer. Agriculture and development is only slightly to moderately limited by the slow permeability, but erosion potential becomes severe as slopes reach the 5-10% range. Shrink-swell potential is low, corrosion of untreated steel pipes is low to moderate and corrosion of concrete pipes is moderate to high.

Mattapex (MtA, MtB2, MtC2)—A deep and moderately well drained silt loam found in the Appoquinimink River and Blackbird Creek watersheds with 0-2% (A), 2-5% (B2), and 5-10% (C2) slope ranges. The 9 to 12 inch silt loam surface layer overlays subsurface silt loams and an older sediment layer of sandy loam 48 inches down. Erosion becomes severe on the 5-10% slopes. The use of septic tanks is severely limited on all slopes because of moderately slow permeability and impeded drainage. Most other development is moderately limited because of the moderately slow permeability and a moderately high water table. Shrink-swell is low to moderate and corrosion of untreated pipes is moderate to high.

Mixed Alluvial Land (Mv)—A land type occurring on flood plains of the Appoquinimink River and Blackbird Creek watersheds. Flooding occurs at least once a year and can be prolonged. Although this land type usually consists of soils which are variable and unidentifiable as texture ranges from silt to gravel within short distances, areas of this type within the watersheds are listed as being of the **Zekiah-Codorus** complex. These areas are usually forested since all land use is severely limited because of the frequent flooding.

Othello (Ot)—A poorly drained silt loam present in the upland flats of the Appoquinimink River and Blackbird Creek watersheds. Slope is nearly level but is greater than 2% in some areas. The 7 inch highly silty loam surface layer covers a 3 inch very fine sandy loam which overlays heavy silt loam subsurface layers. Poor drainage and a seasonal high water table severely limit land uses. Shrink-swell is low and corrosion of untreated pipe is high.

Pocomoke (Po)—Found as a **Mullica** sandy loam in the upland flats of the Blackbird Creek watershed and one small area of the Appoquinimink River watershed. This soil is poorly drained with frequent ponding caused by the water table being at or near the surface until late spring. Produces good tree growth and creates good wildlife habitat. All land uses are severely limited. Shrink-swell is low and corrosion of untreated pipe is high.

Sassafras (SaA, SaB2, SaC2, SaC3, SaD2, SmE)—Found within the Appoquinimink River and Blackbird Creek watersheds as **Downer** sandy loam (Sa), **Ingleside** loamy sand (Sa), **Ingleside-Hamonton-Fallsington** complex (Sa), **Noxontown-Westphalia** complex (Sm), **Sassafras** loam (Sa), and **Sassafras** sandy loam (Sa). These are deep and well drained upland soils with slopes in the 0-2% (A), 2-5% (B2), 5-10% (C2, C3), 10-15% (D2), and 15-30% (E) ranges. Surface layers of sandy loam 17 inches thick cover a 20 inch subsurface layer of sandy clay loam. Most erosion hazards are slight but Sassafras sandy loam with 10-15% slopes has moderate development limitations and the Noxontown-Westphalia complex with 15-30% slopes has severe limitations for all land uses. Shrink-swell is low and untreated pipe corrosion is high below 3 feet.

Silty and Clayey Land (StE)—A higher elevation land type represented by **Christiana** clay loam (St) in the Appoquinimink River and Blackbird Creek watersheds. This land type consists of a silty surface layer ranging in depth from a few inches to several feet overlaying a subsurface layer of old deposit clay that is not of the same origin as the silt. The lack of stability and a 15-40% slope severely limits all land use and it should not be disturbed.

Tidal Marsh (Tm)—Covers the largest area within the watersheds and, as stated, this land type was once a broad label given to tidal soils that were considered to be too difficult to classify by soil series and really unnecessary to study because soil surveys were prepared primarily for agricultural uses but some tidal marsh areas have now been sampled and given series names. Soil series and complexes of the Tidal Marsh land type within the Appoquinimink River and Blackbird Creek watersheds include: **Broadkill**

mucky silty clay loam, **Broadkill-Appoquinimink**, **Lenape** mucky peat, **Lenape-Nanticoke**, **Mispillion-Transquaking** mucky peat, and **Nanticoke-Mannington**. All development is severely limited and discouraged.

Woodstown (WoA, WoB2, WsA, WsB2)—A deep and moderately well drained upland soil present in the Appoquinimink River and Blackbird Creek watersheds as **Woodstown** sandy loam (Wo) and Woodstown loam (Ws) with 0-2% (A) and 2-5% (B2) slopes and primarily in the Blackbird Creek watershed as **Hammonton** sandy loam (Wo) with a 0-3% (A, B2) slope. These soils developed from old sand deposits with moderate amounts of silt and clay. A 7 inch surface layer of loam covers a 3 inch layer of fine sandy loam and 26 inch subsurface layer of sandy clay loam. Moderate permeability and impeded drainage create moderate limitations for land use. Erosion can be severe when slopes reach 5%. Shrink-swell is low, corrosion of untreated steel pipe is moderate, and corrosion of concrete pipe is high.

C. Wetlands

Consisting of frequently flooded areas, isolated wet spots on floodplains, and depressions seasonally submerged by an elevated water table, wetlands can be unpleasant environments for development or agricultural use and are viewed unfavorably by some but they are a vital part of the natural ecosystem and can be important tools for our benefit.

Wetlands are the nursery and feeding ground for 71% percent of species within the United States' commercial and recreational fisheries (Dahl, 2006), 38% of Delaware's endangered species, and the largest and most diverse population of birds (DNREC, 2001). In addition to their wildlife value, wetlands act as filters and buffers against the polluted runoff of urban sprawl and agriculture. Often compared to "giant kidneys," wetlands slow surface runoff and filter out 80-90% of sediments (Mid-Atlantic, 2004) removing excess nutrients, suspended solids, heavy metals, pesticides, and other pollutants. Sources of excess nutrients include fertilizers, manure, and municipal sewage; wetlands filter out roughly 75% of nitrogen from runoff, reducing the potential for fish-kill causing algae blooms, and temporarily hold up to 50% of phosphorous (EPA, 1993). Wetlands also trap 20-100% of heavy metals from runoff (Mid-Atlantic, 2004) either within plant tissue or in the top layer of soil. Copper and arsenic are absorbed by plants while lead, mercury, and pesticides are filtered from the water by soil.

Growths in urban development create an increase of paved areas and reduce permeation of storm water into the ground while also encroaching upon river banks and shorelines. Flash flood events and tidal surges can be reduced by preserving wetland buffers that absorb storm water and slowly release overflow, in the process also lessening river bank and shoreline erosion. This temporary storage of water also increases groundwater exchange and helps maintain groundwater levels. But the occurrence of horizons with slow permeability in most Mid-Atlantic wetland soils reduces the majority of aquifer recharge to wetland boundaries where other soil types are present.

Tidal wetlands, composed mostly of saltwater and brackish areas flooded by tides but also including freshwater areas near sea level but far enough inland to be unaffected by tides, are especially important to Delaware's ecology and economy. The saturated condition of tidal soils slows decomposition and causes a buildup of organic detritus that is slowly released into the waterways and serves as the base for Delaware Bay's food web. Crustaceans and small fish feed upon the decaying organic material while nutrients are taken in by marine vegetation and filter feeders.

Before we knew of their value, the destruction of wetlands went unregulated. It is estimated that Delaware lost 54% of its wetlands between the 1780's and 1980's and even though federal and state legislation has been created to protect wetlands, the goal of zero net loss has not been reached (Dahl, 1990). From the European settlement of Delaware until the 1970's, farmers used ditch and tile (perforated pipe that creates an underground channel for drainage) systems to convert wetlands into farmland. Tidal wetlands were grid ditched during the 1930's in an early mosquito control attempt only to become predator less havens for mosquito larvae as excavated material eroded back into the waterways and blocked access to fish. Natural processes and the Delaware Mosquito Control Section's modern Open Marsh Water Management program have since reduced the damage. Still other wetlands were drained or filled for urban, industry, and roadway development until a need for preserving water quality was recognized and the Federal Water Pollution Control Act Amendments of 1972 were passed and amended into the Clean Water Act of 1977. Section 404 of the Clean Water Act restricts the filling of waterways and thus protects wetlands, with an exception being those that were converted to farmland before December 23, 1985 and that have not been left unused for a period greater than five years. During the 1980's the interpretation of the Clean Water Act broadened from a focus on preserving chemical integrity by regulating point source pollution from industrial and municipal sewage facilities to also include non-point pollution from construction, urban, and agricultural runoff. At this time the importance of biological and structural preservation was also emphasized.

Since then, wetland loss has been slowed by almost 90% but still occurs. Delaware lost roughly 2,000 acres of wetlands between 1982 and 1992. Most of these wetlands were palustrine (shallow freshwater) with about 1,900 total acres lost: 1,500 acres forested, 255 acres scrub-shrub, and 129 acres emergent herbaceous vegetation. Half of this loss was from agricultural activities, 25% to residential development, 14% to highway and road projects, and 7% to pond construction. Forestry caused short-term damage by converting roughly 2,050 acres of forested wetland to emergent or scrub-shrub wetlands that will take decades to heal and slowly become reforested. Very little estuarine wetland (brackish sections of tidal marshes and coastal wetlands) was lost, only 106 acres were destroyed by impoundments or fill, due to DNREC's strong regulation of tidal waters under Delaware's Wetlands Act of 1973. (Tiner, 2001)

In 1991, Congress mandated the use of the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual, referenced under "Environmental Laboratory," for those involved in the mitigation and delineation of wetlands. The U.S. Army Corps of Engineers is

responsible for the federal regulation of wetlands under Section 404 of the Clean Water Act and defines wetlands as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory, paragraph 26a). In short, vegetation, soil, and hydrology are used to determine the presence of wetlands and visible wet conditions may not always be present. Further detail for determining wetland presence is provided in the Wetland Delineation Protocol Appendix.

The Delaware Department of Natural Resources and Environmental Control completed a statewide wetlands mapping project in 1992 by the standards of the National Wetlands Inventory. The National Wetlands Inventory categorizes wetlands into five ecological systems: Palustrine, Estuarine, Riverine, Lacustrine, and Marine. (Appendix 3: Maps) Within Delaware, although estuarine wetlands (brackish sections of tidal marshes and coastal wetlands) are abundant and represent about 36% of Delaware's wetlands, palustrine wetlands (shallow freshwater) are more prevalent representing 54% of the state's wetlands (Tiner, 2001). Riverine, lacustrine, and marine classified wetlands have limited land cover as they consist of non-persistent emergent vegetation wetlands, submerged vegetative beds, unvegetated flats, and intertidal beaches and bars. (Table 1) (The most complete description of Delaware wetlands and the primary reference for this summary of the National Wetlands Inventory is "Wetlands of Delaware" completed by Ralph W. Tiner, Jr. of the U.S. Fish and Wildlife Service in 1985. A 2001 update, also by Tiner, is shortened but useful for recent statistics or stands alone if a 1985 copy is unattainable.)

Table 1. 1992 Wetland Acreage of the Appoquinimink River and Blackbird Creek Watersheds

National Wetlands Inventory Category	Acreage within watersheds	Wetland % within watersheds	Acreage within state	Wetland % within state
Agriculture (state category)	69	0.58%	29,215	8.26%
Palustrine	4,175	34.98%	189,471	53.54%
Riverine	340	2.85%	3,053	0.86%
Lacustrine	274	2.3%	4,573	1.29%
Estuarine	7,079	59.3%	127,348	35.99%
Marine	0	0%	218	0.06%
Total Acres	11,937		353,878	

Palustrine wetlands contain the largest vegetative diversity of Delaware's wetland categories due to the multiple habitats and various hydrologies it covers. Any shallow water wetland, except non-persistent emergent vegetation within river beds, and with salinity less than 0.5 ppt is placed under the palustrine category. With this broad of a standard there are countless ways to characterize these wetlands and often several common names are applied to one type; Delmarva bay, Carolina bay, whale wallow, pothole wetland, spong, and pingo are all terms applied to freshwater wetlands present in natural depressions occurring separate of waterways along the Eastern coast but none refer to a vegetative, soil, or necessarily hydrologic characterization. The National Wetlands Inventory itself has modified the terminology and classification it uses to document wetlands. Although the map included with this report follows the terminology of the 2001 National Wetlands Inventory, the 1985 inventory provides better detailed descriptions of wetland habitats and was used as the primary written reference. As with the other four wetland categories, the 1985 National Wetlands Inventory describes palustrine wetlands according to hydrology and vegetation and lists palustrine habitats as submerged vegetative beds, emergent wetlands, scrub-shrub wetlands, and forested wetlands.

Submerged vegetative beds found in shallow permanent ponds include duckweed (*Lemna* spp.), common duckmeat (*Spirodela polyrrhiza*), water meal (*Wolffia columbiana*), pondweed (*Potamogeton* spp.), water milfoil (*Myriophyllum* spp.), waterweed (*Elodea* spp.), bladderworts (*Utricularia* spp.), marsh mermaidweed (*Proserpinaca palustris*), coon's tail (*Ceratophyllum demersum*), spatterdock (*Nuphar luteum*), white water lily (*Nymphaea odorata*), and water shield (*Brasenia schreberi*).

Palustrine emergent wetlands closely intermingle with other freshwater emergent wetlands and are distinguished from them by the presence of persistent vegetation in addition to non-persistent vegetation (herbaceous vegetation that completely decays between growing seasons). About one fifth of palustrine emergent wetlands in Delaware are tidal influenced (Tiner, 1985). They occur along the inland banks of tidal rivers where persistent emergents such as common reed (*Phragmites australis*), narrowleaf cattail (*Typha angustifolia*), broadleaf cattail (*Typha latifolia*), common rush (*Juncus effusus*), river bulrush (*Schoenoplectus fluviatilis*), soft-stemmed bulrush (*Schoenoplectus tabernaemontani*), three-way sedge (*Dulichium arundinaceum*), and crimson-eyed rose mallow (*Hibiscus moscheutos*) mix with non-persistent emergents including beggar-tick (*Bidens* spp.), sweet flag (*Acorus americanus*), yellow flag (*Iris pseudacorus*), blue flag (*Iris versicolor*), water smartweed (*Polygonum punctatum*), halberdleaf tearthumb (*Polygonum arifolium*), arrowleaf tearthumb (*Polygonum sagittatum*), wild rice (*Zizania aquatica*), water hemp (*Amaranthus cannabinus*), jewelweed (*Impatiens capensis*), arrowhead (*Sagittaria* spp.), green arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), swamp loosestrife (*Decodon verticillatus*), spatterdock (*Nuphar luteum*), spikerush (*Eleocharis* spp.), burreed (*Sparganium* spp.), smartweed (*Polygonum* spp.), and marsh fern (*Thelypteris palustris*). Thinly scattered shrubs and trees are also present including red maple (*Acer rubrum*), willow (*Salix* spp.), buttonbush

(*Cephalanthus occidentalis*), swamp rose (*Rosa palustris*), and wax myrtle (*Myrica cerifera*).

Non-tidal palustrine emergent wetlands are still semi-permanently flooded and vegetative communities are similar to tidal areas, but in addition to the previously mentioned species reed canary grass (*Phalaris arundinacea*), willow herb (*Epilobium* spp.), meadow beauties (*Rhexia* spp.), sensitive fern (*Onoclea sensibilis*), woolgrass (*Scirpus cyperinus*), and beakrush (*Rhynchospora* spp.) have a noticeable presence. Additional woody vegetation such as elderberry (*Sambucus canadensis*), smooth alder (*Alnus serrulata*), and silky dogwood (*Cornus amomum*) also appears. Goldenrods (*Solidago* spp.) and asters (*Aster* spp.) are present in temporarily flooded areas.

The previously mentioned Delmarva bays in Delaware are non-tidal emergent wetlands and commonly contain plume grass (*Saccharum giganteum*), Walter's sedge (*Carex striata*), and smooth sawgrass (*Cladium mariscoides*) with a groundcover of peat moss (*Sphagnum* spp.) and groups of persimmon trees (*Diospyros virginiana*). Delmarva bays and similar landforms in other states are often isolated from other wetlands making them the only habitat for some very rare species.

Palustrine scrub-shrub wetlands are common in Delaware but do not cover much acreage as they are usually only a transitional zone occurring in thin strips consistig of tree saplings and shrubs growing between emergent and forested wetlands in both tidal and non-tidal areas. In addition to the woody vegetation already listed as occurring in emergent wetlands, several other shrubs and trees are present including winterberry (*Ilex verticillata*), red chokeberry (*Photinia pyrifolia*), highbush blueberry (*Vaccinium corymbosum*), sweet pepperbush (*Clethra alnifolia*), sweet bay (*Magnolia virginiana*), southern arrowwood (*Viburnum dentatum*), and ashes (*Fraxinus* spp.). Herbaceous vegetation is representative of the bordering emergent wetland types.

Palustrine forested wetlands are tidal and non-tidal permanently, seasonally, or temporarily flooded areas where the woody vegetation is over 20 feet tall. Very few permanently flooded forested wetlands, such as cypress swamps, are found in Delaware and none of them occur in the Appoquinimink River and Blackbird Creek watersheds. Water-tolerant deciduous tree species such as red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), black gum (*Nyssa sylvatica*), black willow (*Salix nigra*), and sweet bay (*Magnolia virginiana*) dominate with an understory of shrubs including previous mentioned species along with swamp azalea (*Rhododendron viscosum*) and spicebush (*Lindera benzoin*). Roughly 13% of Delaware's forested wetlands are evergreen and dominated mostly by loblolly pine (*Pinus taeda*) and some Atlantic white cedar (*Chamaecyparis thyoides*) (Tiner, 1985). Temporarily flooded forested wetlands experience very little hydrology influenced growth and consist of species that normally occur in Delaware forests. Past human drainage of some seasonally flooded forested wetlands has converted them into temporarily flooded wetlands and allowed the growth of upland species.

Estuarine wetlands are arguably the most altered by human progress, scientifically studied, and commercially valuable wetland ecological system in Delaware. All wetlands with ocean-derived salts in concentrations greater than 0.5 parts per thousand are within the estuarine wetland category. This large continuous area contains three defined salinity ranges, polyhaline (18-30 ppt), mesohaline (5-18 ppt), and oligohaline (0.5-5 ppt) present within intertidal flats, emergent wetlands, and scrub-shrub wetlands.

Estuarine intertidal flats, mostly unvegetated and composed of sand and organic detritus completely exposed to air during low tide, commonly occur between salt marshes and the Delaware Bay. Although strong tidal motions limit larger vegetation to sparse clumps of growth if any at all, microscopic vegetation such as diatoms and algae is usually present.

Estuarine emergent wetlands contain low marsh and high marsh areas within salt (polyhaline) marshes, brackish (mesohaline) marshes, and oligohaline marshes identified according to vegetative communities and salinity. Differentiating flooding from tides and freshwater runoff often causes these wetland types to become intermingled, particularly brackish and oligohaline marshes, and distance from the bay is not necessarily a reliable indicator from which to form expectations of locations.

Salt marshes have drastic vegetative differences between low and high marsh areas with the tall form of smooth cordgrass (*Spartina alterniflora*) and common reed (*Phragmites australis*) dominating low marsh areas and the short form of smooth cordgrass (*Spartina alterniflora*), common reed (*Phragmites australis*), salt hay grass (*Spartina patens*), spike grass (*Distichlis spicata*), black grass (*Juncus gerardii*), switch grass (*Panicum virgatum*), sea myrtle (*Baccharis halimifolia*), high-tide bush (*Iva frutescens*), wax myrtle (*Myrica cerifera*), and red cedar (*Juniperus virginiana*) more or less listed in order of increasing elevation dominating high marsh areas.

Brackish marshes are exposed to large changes in salinity because of spring and late summer differences in freshwater runoff and contain a transitional vegetative community of salt, brackish, and salt tolerant species. Common reed (*Phragmites australis*), smooth cordgrass (*Spartina alterniflora*), salt hay grass (*Spartina patens*), spike grass (*Distichlis spicata*), and switchgrass (*Panicum virgatum*) mix with narrowleaf cattail (*Typha angustifolia*), big cordgrass (*Spartina cynosuroides*), water hemp (*Amaranthus cannabinus*), and crimson-eyed rose mallow (*Hibiscus moscheutos*) which mix further upstream with green arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), and soft-stemmed bulrush (*Scirpus validus*).

Vegetative diversity within estuarine wetlands reaches its peak in Oligohaline marshes where vegetation from brackish estuarine wetlands and tidal freshwater palustrine wetlands mix. Mudflats are dominated by non-persistent emergent species including green arrow arum (*Peltandra virginica*), spatterdock (*Nuphar luteum*), arrowhead (*Sagittaria* spp.), and pickerelweed (*Pontederia cordata*). Brackish species like smooth cordgrass (*Spartina alterniflora*) slowly dwindle away. Big cordgrass (*Spartina cynosuroides*), common reed (*Phragmites australis*), narrowleaf cattail (*Typha angustifolia*), and crimson-eyed rose mallow (*Hibiscus moscheutos*) mix with strictly

freshwater species like bulrush (*Scirpus* spp.), sedge (*Carex* spp.), beggar-tick (*Bidens* spp.), spikerush (*Eleocharis* spp.), rush (*Juncus* spp.), smartweed (*Polygonum* spp.), yellow flag (*Iris pseudacorus*), sweet flag (*Acorus americanus*), and annual wild rice (*Zizania aquatica*). Often, low salinity within channels from late summer saltwater intrusion is the only factor that places these areas into the estuarine category.

Relatively few acres of estuarine wetlands consist of scrub-shrub habitats but stands of high-tide bush (*Iva frutescens*), sea myrtle (*Baccharis halimifolia*), wax myrtle (*Myrica cerifera*), and northern bayberry (*Myrica pensylvanica*) exist along salt marsh upland borders and on the excavated material of grid ditch networks.

Riverine wetlands are composed of non-persistent emergent vegetation, submerged vegetative beds, and unvegetated shallow water areas between the shoreline and water roughly 7 feet in depth along rivers and their tributaries where salinity is less than 0.5 ppt. Seasonally vegetated (mapped as non-vegetated) mudflats represent the majority of this category as other areas are limited to fringes of non-persistent emergent vegetation along river banks and submerged vegetative beds within the channels. Mudflat vegetation is dominated by early season sweet flag (*Acorus americanus*), spatterdock (*Nuphar luteum*), green arrow arum (*Peltandra virginica*), and pickerelweed (*Pontederia cordata*) and late season water hemp (*Amaranthus cannabinus*), wild rice (*Zizania aquatica*), smartweed (*Polygonum* spp.), and beggar-tick (*Bidens* spp.). River edges are vegetated by non-persistent emergents such as burreed (*Sparganium* spp.), pickerelweed (*Pontederia cordata*), arrowhead (*Sagittaria* spp.), and green arrow arum (*Peltandra virginica*). Submerged vegetative beds include pondweed (*Potamogeton* spp.), riverweed (*Potamogeton* spp.), spatterdock (*Nuphar luteum*), and white water lily (*Nymphaea odorata*). Distinguishing between riverine and palustrine wetlands can become difficult in some areas as vegetation types mix.

Lacustrine wetlands consist of aquatic vegetation such as duckweed (*Lemna* spp.), common duckmeat (*Spirodela polyrrhiza*), water meal (*Wolffia columbiana*), pondweed (*Potamogeton* spp.), water nymph (*Najas* spp.), water milfoil (*Myriophyllum* spp.), waterweed (*Elodea* spp.), bladderworts (*Utricularia* spp.), american eelgrass (*Vallisneria americana*), marsh mermaidweed (*Proserpinaca palustris*), and coon's tail (*Ceratophyllum demersum*) covering the water surface or floating submerged. Non-persistent emergent vegetation such as arrowhead (*Sagittaria* spp.), green arrow arum (*Peltandra virginica*), pickerelweed (*Pontederia cordata*), spatterdock (*Nuphar luteum*), three-way sedge (*Dulichium arundinaceum*), spikerush (*Eleocharis* spp.), burreed (*Sparganium* spp.), smartweed (*Polygonum* spp.), and manna grass (*Glyceria* spp.) are also found within lacustrine wetlands around lakes and deep ponds, but distinction from palustrine wetlands becomes difficult closer to the shoreline.

Marine wetlands do not occur in the Appoquinimink River and Blackbird Creek watersheds as they are characterized in Delaware by intertidal beaches and bars with thin vegetative growth of sea rocket (*Cakile edentula*), Russian thistle (*Salsola kali*), sandbur (*Cenchrus tribuloides*), beach grass (*Ammophila breviligulata*), crested saltbush (*Atriplex arenaria*), rough cocklebur (*Xanthium strumarium*), slender seapurslane (*Sesuvium*

maritimum), and beach bean (*Strophostyles helvola*) occurring along the oceanfront coastline from Cape Henlopen to the Maryland border.

The Appoquinimink River and Blackbird Creek watersheds are greatly tidal influenced and consist of estuarine wetlands along roughly half of the total stream length. Estuarine wetlands of Blackbird Creek dwindle out upland directly into the palustrine category while the Appoquinimink River contains a few large areas of riverine and lacustrine wetlands formed by consistently flooded upstream waters.

Delaware Wetland Regulatory Statutes (Association of State Wetland Managers)

(Tidal) Wetlands Act of 1973. 7 Del. Code Chapter 66. Sec. 6601-6620 (primarily tidal wetlands). Permits are required from the Delaware Department of Natural Resources and Environmental Control (DNREC).

Subaqueous Lands Act of 1986, Del. Code Ann., tit. 7 Chapter 72 sec. 7201-72-16
http://www.dnrec.state.de.us/water2000/Sections/Wetlands/regulations/SubaqueousRegs19921.pdf

Coastal Zone Management Act of 1972. Del. Code Ann., tit. 7 Chapter 70 sec. 7001-7013

Beach Preservation Act, Del. Code Ann., tit. 7 Chapter 68 sec. 6801-6812

401 Water Quality Certification, Clean Water Act:
http://www.dnrec.state.de.us/water2000/Sections/SurfWater/Library/RGCWP.pdf

Application form for Wetlands and Subaqueous lands:
http://www.dnrec.state.de.us/water2000/Sections/Wetlands/Originals/basic.htm

D. CLIMATE

Both watersheds exist in close geographic proximity, thus their climates are identical. Both exhibit well-defined seasons, typical of the Middle Atlantic States region. These seasons are moderated by easterly winds, which typically raise winter temperatures and lower summer temperatures, while simultaneously contributing to humidity levels. Maximum air temperatures tend to occur during late July when air temperatures reach 89º F. Temperatures exceeding 100º F typically occur one out of four years. Minimum air temperatures tend to occur towards the end of January and beginning of February with average morning temperatures of 24º F. Temperatures below 0º F occur one out of six years (DNREC, 1999). Average temperatures range from 76.2º to 31.4º F (see Figure 2).

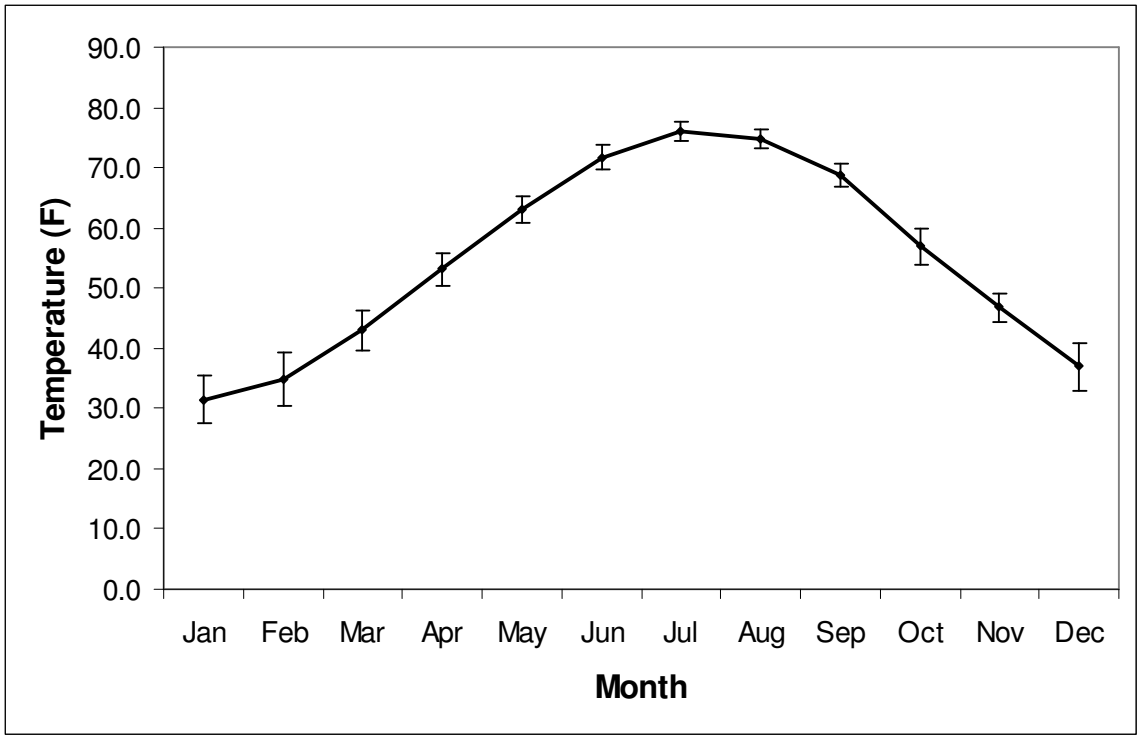


Figure 2 – Average Monthly Temperatures for Middletown, DE, 1952-1988.
Data courtesy of Delaware State Climatologist

The average annual precipitation in the nearby Middletown region from 1952 to 1988 was 34.81 inches (See Figures 3-6). Monthly precipitation trends vary considerably and this region is not considered to exhibit definite wet/dry periods.

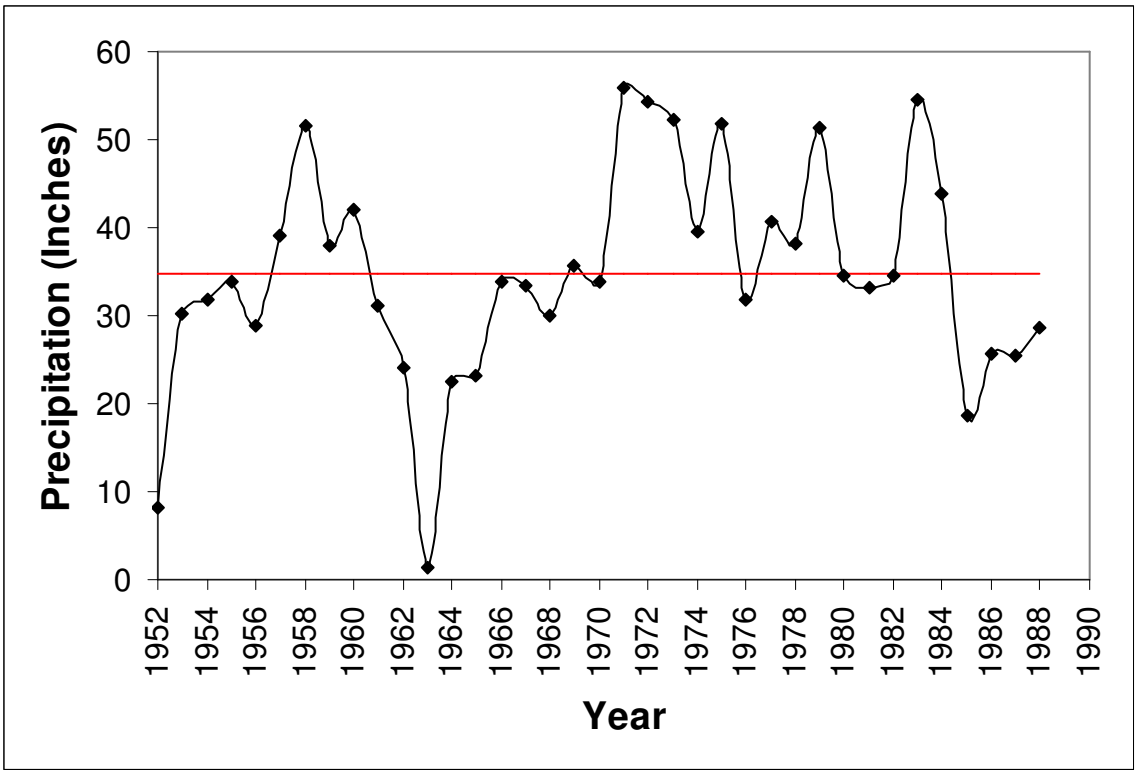


Figure 3 – Annual Precipitation Totals for Middletown, DE, 1952-1988
Data courtesy of Delaware State Climatologist

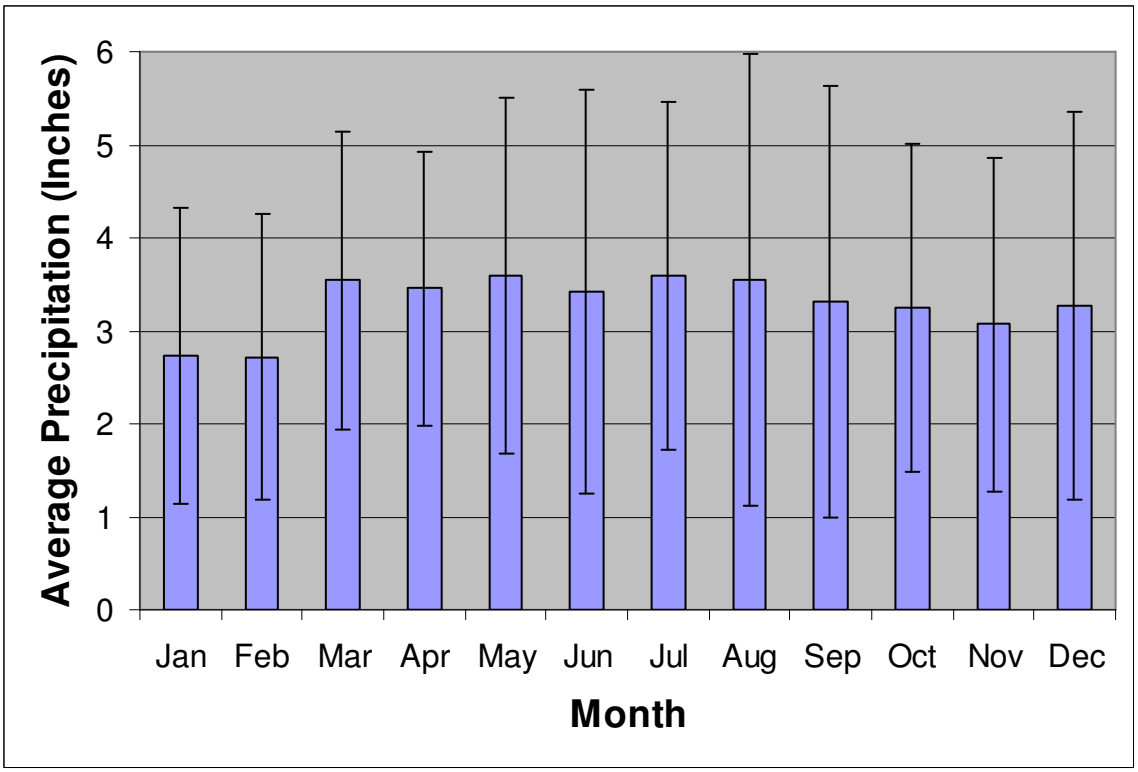


Figure 4 – Average Monthly Precipitation Totals for Middletown, DE, 1952-1988
Data courtesy of Delaware State Climatologist

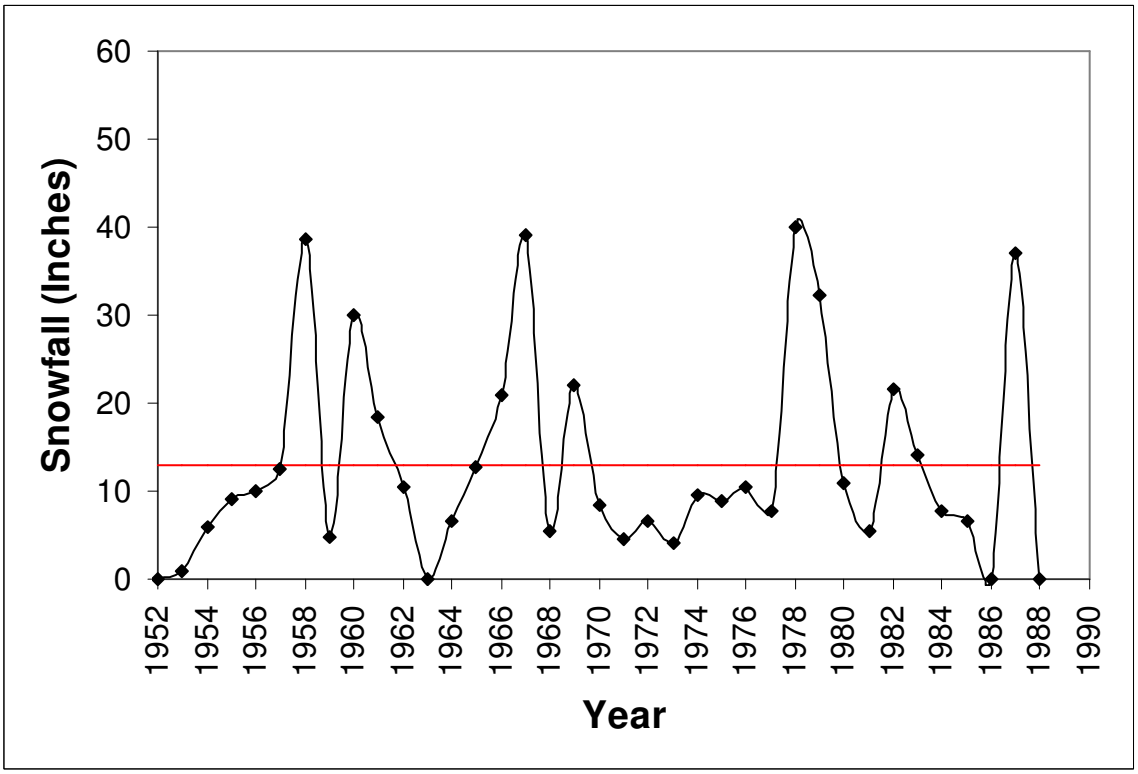


Figure 5 – Annual Snowfall Totals for Middletown, DE, 1952-1988

Data courtesy of Delaware State Climatologist

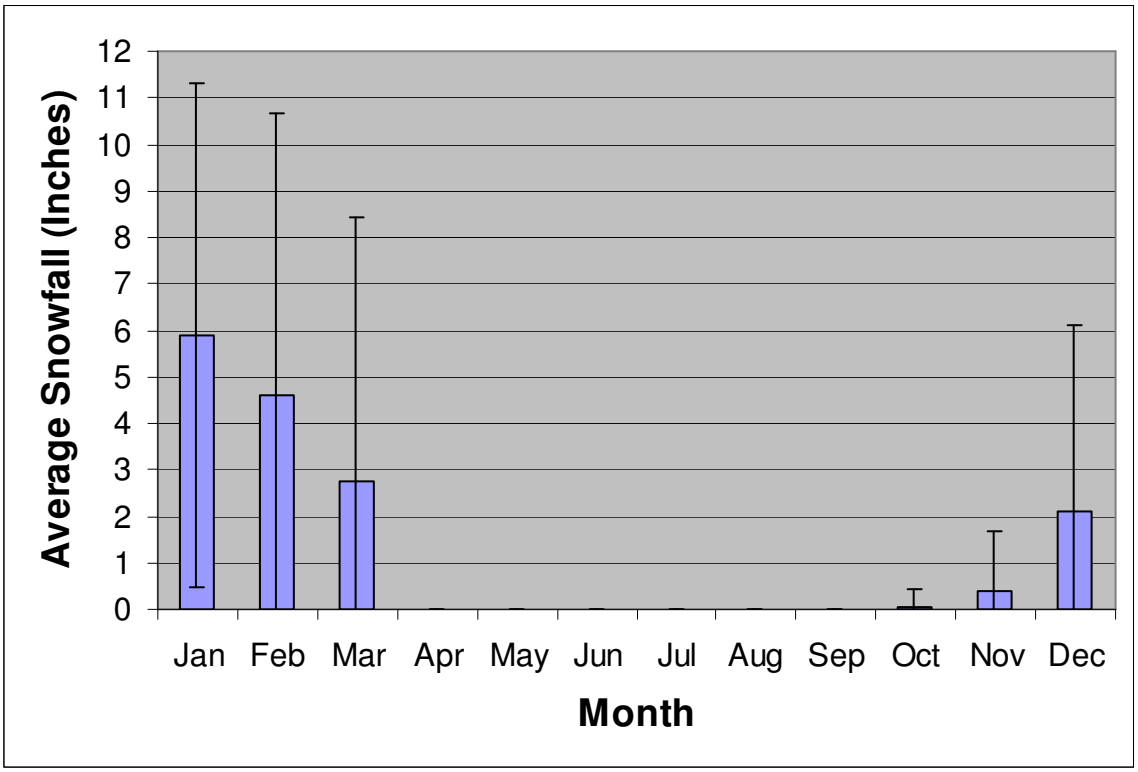


Figure 6 – Average Monthly Snowfall Totals for Middletown, DE, 1952-1988
Data courtesy of Delaware State Climatologist

II. WATER RESOURCES

A. Watershed Size, Drainage Characteristics, Etc.

The Appoquinimink River Watershed drains approximately 30,200 acres (47 sq miles) of coastal plain farmland in southern New Castle County, as well as the urbanized areas of Middletown, historic Odessa, and Townsend before discharging into the Delaware Bay (Center for Watershed Protection, 2005). The river's headwaters and major tributaries drain agricultural lands and feed four major impoundments: Shallcross Lake, Silver Lake, Noxontown Pond, and Wiggins Mill Pond. Shallcross Lake has a surface area of 43.3 acres and its dam is eight ft. tall. Silver Lake has 10 ft. tall dam and a surface area of 38.2 acres. The dam at Noxontown Pond is six feet high, and the pond has a surface area of 158.6 acres. Wiggins Mill Pond has a surface area of 21.2 acres and a 15 ft. dam (DNREC, 2001).

The Appoquinimink River is tidally influenced up to the outlet dams of Noxontown Pond, Silver Lake on Deep Creek, and the confluence with Drawyer Creek. The Delaware Bay provides tidal influences, while Drawyer Creek, Deep Creek, the upper boundary of the Appoquinimink River, and tributaries provide fresh water influence. The

flow rate of these waterways varies from 4.0 cfs (0.11 cm/s) at Deep Creek and the Appoqunimink River to 13.5 cfs (0.38 cm/s) at Drawyer Creek (DNREC, 2001).

Watersheds, like the Appoquinimink, may include relatively large areas of land, so they are often broken into more manageable segments called subwatersheds. One or more subwatersheds comprise a watershed. The Appoqunimink Watershed consists of seven subwatersheds: Drawyer Creek (6311 acres), Dove Nest Branch (4124 acres), Deep Creek (5104 acres), Noxontown Pond (5912 acres), Hangman's Run (2611 acres), Appoquinimink River I (3569 acres) and Appoquinimink River II (2588 acres) (See Figure 7). In terms of stream length, measured in miles, the Appoquinimink II Subwatershed ranks highest at 23.6 miles, while the Dove Nest Branch Subwatershed exhibits the shortest stream length at 7.9 miles. The Blackbird Watershed is not divided into subwatersheds.

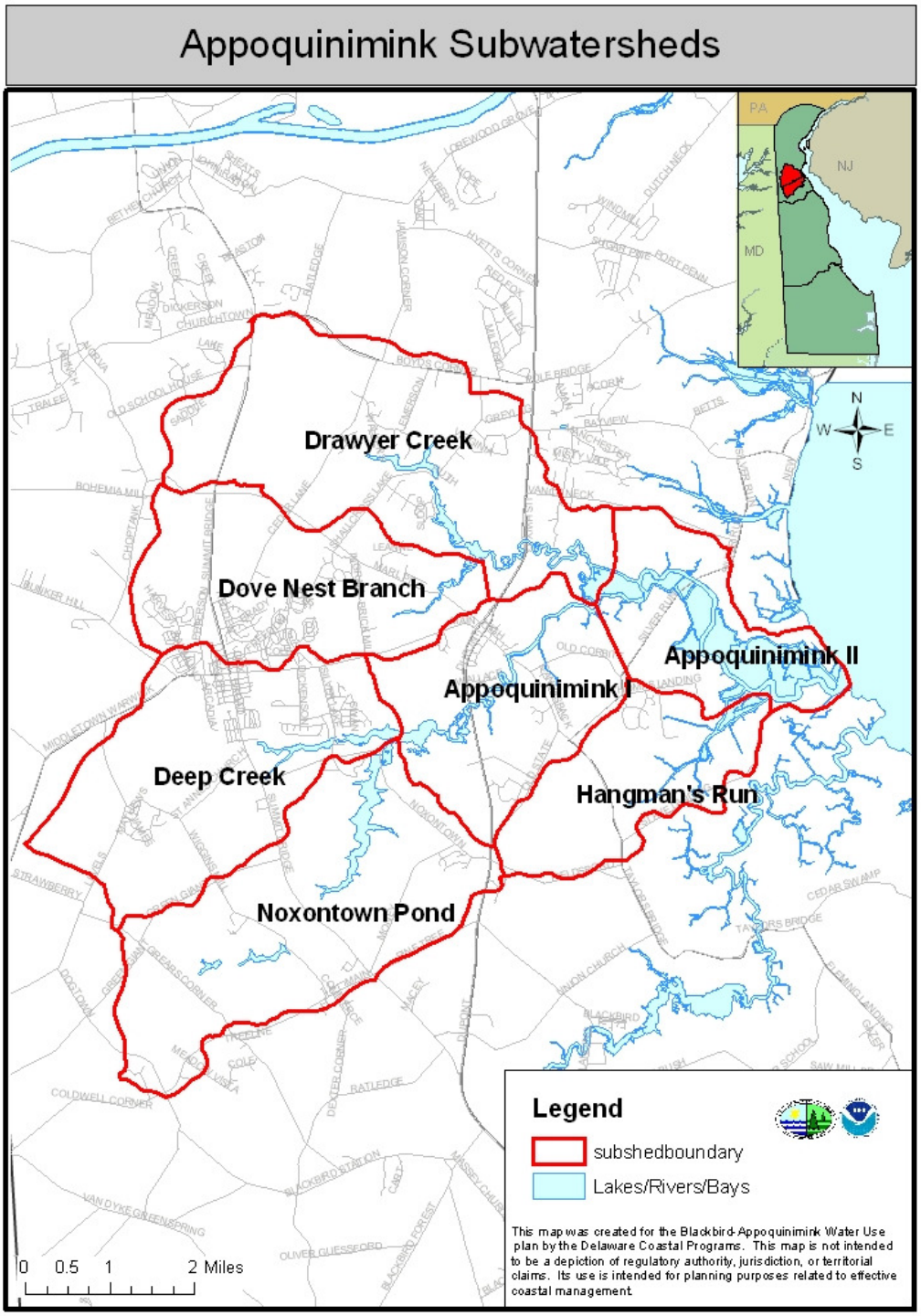


Figure 7 – Subwatershed Deliniation in the Appoquinimink Watershed.

Buildings, roads, sidewalks, and other impervious surfaces have necessary functions in modern society and they define the urban and suburban landscape. However, too many buildings and roads in a particular watershed can have a deleterious effect on water

resources and stream water quality. Impervious surfaces alter the natural hydrology, prevent the infiltration of water into the ground, and concentrate the flow of stormwater over the landscape. In undeveloped watersheds stormwater filters down through the soil, replenishing groundwater quantity with water of good quality. Vegetation holds down the soil, slows the flow of stormwater over land, and filters out some pollutants, by both the slowing the flow of the water and trapping some pollutants in the root system. As the imperviousness of a watershed increases, the greater volume of stormwater increases the possibility of flooding and reduces the potential for pollutants to settle out; meaning that more pollution is delivered to drinking water streams and aquifers. Too much paving and hardening of a watershed can reduce infiltration and groundwater levels which in turn can decrease the availability of aquifers, streams and rivers for drinking water supplies. The Dove Nest Branch Subwatershed of the Appoquinimink River Watershed exhibited the highest impervious surface percentage at 19% of the seven subwatersheds. In contrast the Appoquinimink II subwatershed exhibits the least impervious surcafe cover at 3%. (See Figure 8).

Research by the Delaware Department of Natural Resources and Environmental Control indicates that biological habitat and macroinvertebrate insect diversity dropped sharply at 19 nontidal streams in the Piedmont Physiographic Province of Delaware when the impervious surface coverage in a watershed exceeded 8 to 15% imperviousness (Maxted and Shaver, 1994). Maxted and Shaver also found that the majority of 53 urban streams in Northern Delaware had poor habitat. A strong negative relationship has been found between biotic integrity and increasing land use and riparian conditions, which begin at 10% imperviousness. (Schueler,1995). A study in the State of Washington found that channel stability and fish habitat quality deteriorate rapidly after 10% imperviousness (Booth, 1991 as cited in Schueler, 1995). The article "Site Planning for Urban Stream Protection", by the Center for Watershed Protection cites research conducted in many geographic areas has yielded a conclusion that stream degradation occurs at relatively low levels of imperviousness of 10% to 20% (Schueler, 1995). Research done in Maryland found that macroinvertebrate diversity declines above 10% imperviousness (Schueler and Gali, 1992 as cited in Schueler, 1995). In Maryland, the abundance and recruitment of brown trout declines sharply at 10% to 15% imperviousness (Galli 1993). Streams with increasing imperviousness exhibit many of the following conditions: increased flood peaks, lower stream flow during dry weather periods, degradation in stream habitat structure, increased stream bank and channel erosion, fragmentation of riparian forest cover, and a decline in fish habitat quality (Pelley, 1997). Based on the weight of this research in Delaware and elsewhere, streams can be considered stressed in watersheds where the impervious coverage exceeds a threshold of 10% to 15% (Brant 1999).

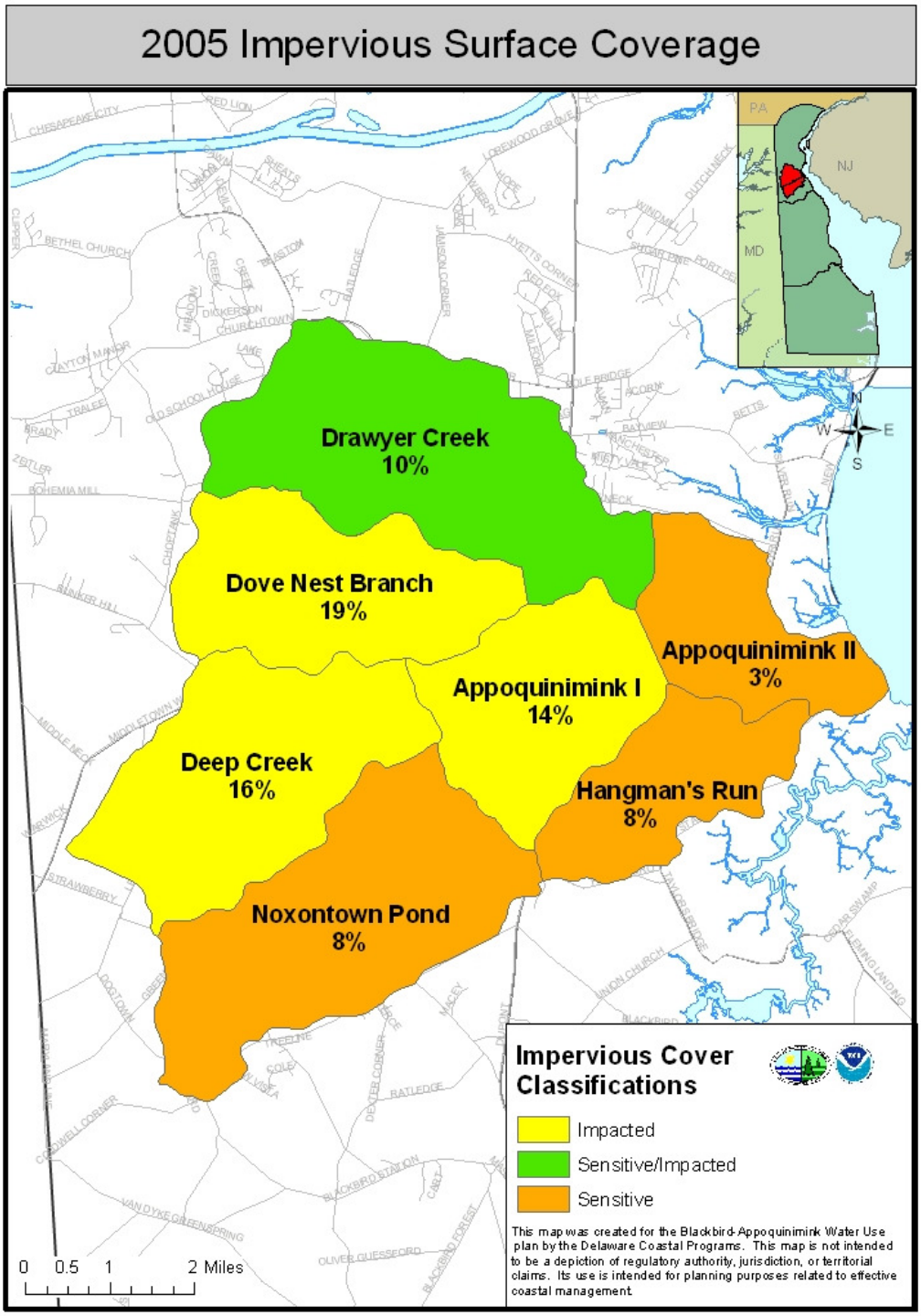


Figure 8 – Impervious Surface Coverage in the Appoquinimink Watershed.

Pollutants and stressors to the watershed include bacteria, PCB's, Dioxins, DDT, and DO levels. PCBs are mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids. They

were produced in extremely high quantities for commercial and industrial applications prior to the production, processing, and distribution ban established in 1977 as part of the Toxic Substances Control Act. PCBs are now considered probable carcinogens, thus the concern over fish consumption due to the substance's ability to accumulate in fatty tissue of fish and other animal species. Dioxins are quite similar to PCB's in that they too are toxic byproducts of industrial processes and exist as EPA designated probable human carcinogens. Additionally, dioxins have been linked to a variety of skin rashes. Much like PCB's, dioxins accumulate in fatty animal tissue, which accounts for the danger in consuming contaminated fish.

The Middletown-Odessa-Townsend (MOT) wastewater treatment plant represents the only point source of pollutants within the watershed. Although this plant typically uses spray irrigation to dispose of effluents, discharge may occasionally be released into the surface waters of the Appoqunimink River. On average the wastewater treatment plant releases 18.9 kg/d of Amonia (NH_3), 1.6 kg/d of Phosphate (PO_4), 36.9 kg/d of Carbonaceous Biochemical Oxygen Demand ($DBOD_5$), 1.3 kg/d of Disolved Oxygen (DO), 9.5 kg/d of Organic Nitrogen (ON), and 4.8 kg/d of Ortho Phosphates (OP) (DNREC, 2001). Nonpoint pollution sources are typically associated with agricultural run-off and construction.

The Blackbird Creek, primarily used for fishing, boating, research, hiking, is 11.5 miles long and drains approximately 19,721 acres of primarily agricultural land. Mid-channel maximum current velocities range from 50-60 cm/sec at neap tide to 60-70 cm/sec at spring tide. The Blackbird River is tidally influenced by the Delaware Bay, and the largest tributary is Beaver Branch (DNREC, 1999). Mid-channel, mid-depth maximum current velocities in Blackbird Creek occur around mid-flood (low slack water + three hours) or mid-ebb (high slack water + three hours) tides, with velocity dependent in part upon lunar cycle stage. For Blackbird Creek's lower (seaward) station these maximum current velocities range from 50-70 cm/sec (1.6-2.3 ft/sec). There were no observations of estuarine bi-layered flow in the system, and it is probable that this relatively narrow, shallow system has unidirectional channelized flow from top to bottom at almost all times during any given tide cycle. However, some bi-layered flow might occur during short periods of time near peak stand/slack water periods, especially near each system's seaward end.

There are no National Pollution Discharge Elimination System (NPDES) permitted point sources of pollution within the Blackbird Creek watershed. However, there is concern over non-point source pollution associated with agriculture, construction, and silviculture. The watershed currently holds a 6.65% impervious surface coverage (See Figure 9), however continued development pressure will surely escalate this percentage.Dissolved particulate nutrients (nitrogen and phosphorus) and suspended sediments are pollutants of particular concern (DNREC, 1999).

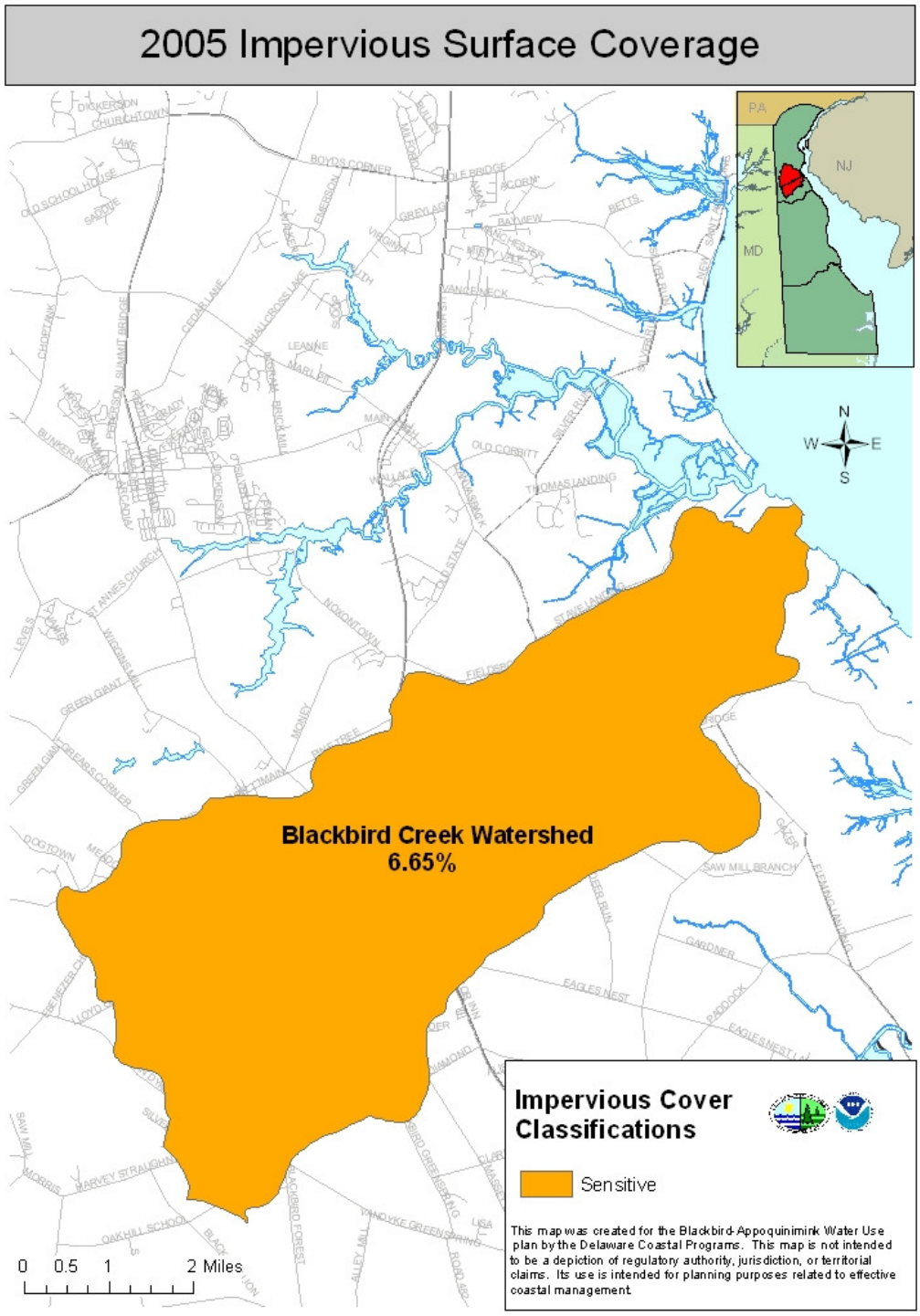


Figure 9 – Impervious Surface Coverage in the Blackbird Creek Watershed.

B. Tide Range

The word "tides" is a generic term used to define the alternating rise and fall in sea level with respect to the land. Tides are the result of the gravitational attraction of the moon and the sun. The earth's force of gravitational attraction acts in a direction inward toward its center of mass, and thus holds the ocean water confined to this surface. However, the gravitational forces of the moon and sun also act externally upon the earth's ocean waters. These external forces are exerted as tide-producing forces. The alternation of high and low tides is caused by the daily (or diurnal) rotation of the earth. Additional factors that affect the range, interval between high and low water and times of arrival of the tides include the configuration of the coastline, local depth of the water, ocean-floor topography, and other hydrographic and meteorological influences. The recurrence of high and low water of a tide usually occurs, but not always, twice daily. Knowledge of the times, heights, and extent of inflow and outflow of tidal waters is of importance in a number of applications, such as navigation, engineering projects, the establishment of standard chart datums for hydrography, and for the furnishing of data indispensable to fishing, boating, surfing, and a considerable variety of related water sport activities.

When the moon is at new phase and full phase, the gravitational attractions of the moon and sun work with each other, increasing their tidal force. This results in higher high tides and lower low tides. Such greater-than-average tides are referred to as spring tides, a term which merely implies a "welling up" of the water and bears no relationship to the season of the year. At first- and third-quarter phases of the moon, the gravitational attractions of the moon and sun upon the waters of the earth are exerted at right angles to each other. Each force tends in part to counteract the other, reducing both maximum and minimum forces. High tides are lower and low tides are higher than average. Such tides of diminished range are called neap tides.

The Blackbird Creek and Appoquinimink Rivers both experience semi-diurnal tides, with tides about 12.4 hours between two consecutive high tides or two consecutive low tides. Mean tide range near the mouth of Blackbird Creek is predicted to be about 1.7 meters (5.65 ft), with spring tides extending the range to 1.92 meters (6.3 ft). Neap tides contribute to an average decrease in tide height of 29% (DNREC, 1999).

In 1996 the Delaware Coastal Programs recorded depth data at a single station (referred to as the Captain Bones site) approximately 12.5 km upstream from the Appoquinimink River mouth from March to July (Figure 10). Tide readings at this station range from 0.1 m (0.3 ft) to 2.23 m (7.3 ft.). Tidal influence contributed to average tidal fluctuations ranging between 1.0 m (3.28 ft.) and 1.5 m (4.9 ft.).

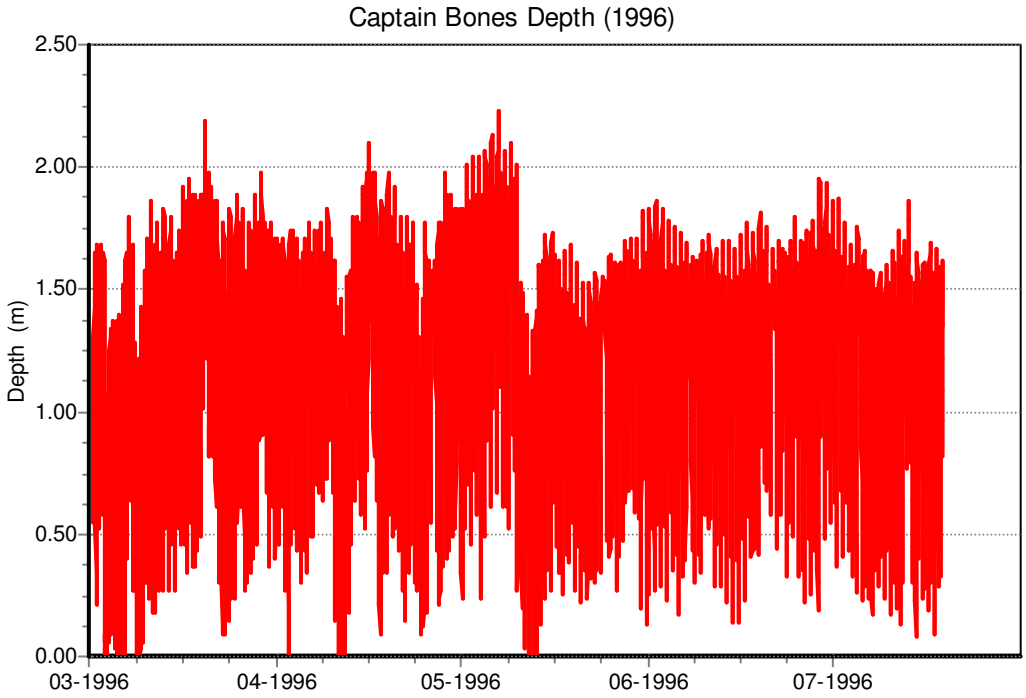


Figure 10.

C. Salinity

Salinity refers to the amount of salt present in a given water body and is expressed by the amount of salt present in one thousand grams of water. Thus salinity measurements are typically presented in parts per thousand (ppt). The average salinity of ocean water is 35 ppt, however the Appoquinimink River and Blackbird Creek are not true marine water masses. Due to the rivers' locations within the Delaware Estuary, their waters are considered as ranging from freshwater (<0.5 ppt) to brackish water (0.5-17 ppt) depending on the particular location and influence strength of freshwater inputs at any given time. Higher salinity regions are located on the watershed's eastern regions due to their proximity and connection to Delaware Bay.

Salinity in Blackbird Creek exists at its highest level near the river's mouth. During high flow years, salinity values range from 1-2 ppt near the river mouth, but reach 10-15 ppt during low flow years. (Sutton et al, 1996). Located approximately 15.3 km upstream, the Delaware National Estuarine Research Reserve (DNERR)maintains a water quality station located at the Blackbird Landing bridge. This station, a part of the National Estuarine Research Reserve (NERR) System-wide Monitoring Program (SWMP), was established in 1995. During the 1995-2006 sampling period, the average salinity at Blackbird Landing Bridge was 2.1 ppt (Min = 0.0, Max = 10.0, SD = 2.3) (see Figure 11).

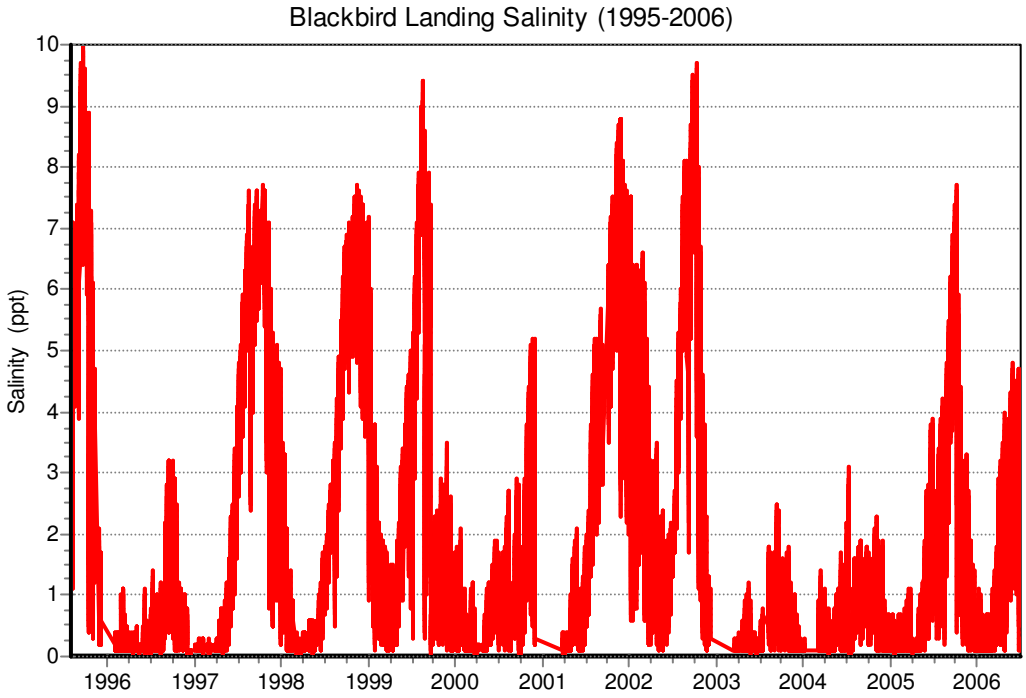


Figure 11 – Annual Salinity Trends for Blackbird Landing sampling station, Townsend DE, 1995-2006.
Data courtesy of the Delaware National Estuarine Research Reserve's System-wide Monitoring Program (SWMP)

The Appoquinimink River mouth, located approximately 1.2 km north of Blackbird Creek's mouth, exhibits similar salinity characteristics due to its close geographic proximity. Salinity measurements of 1-2 ppt near the river mouth are common during low flow periods, but increase to 10-15 ppt during heavy flow years. In 1996 the Delaware Coastal Programs (DCP) recorded salinity data (COMPAS project) approximately 12.5 km upstream from the river mouth from March to July. Salinity values ranged from 0-3.4 ppt during this time period.

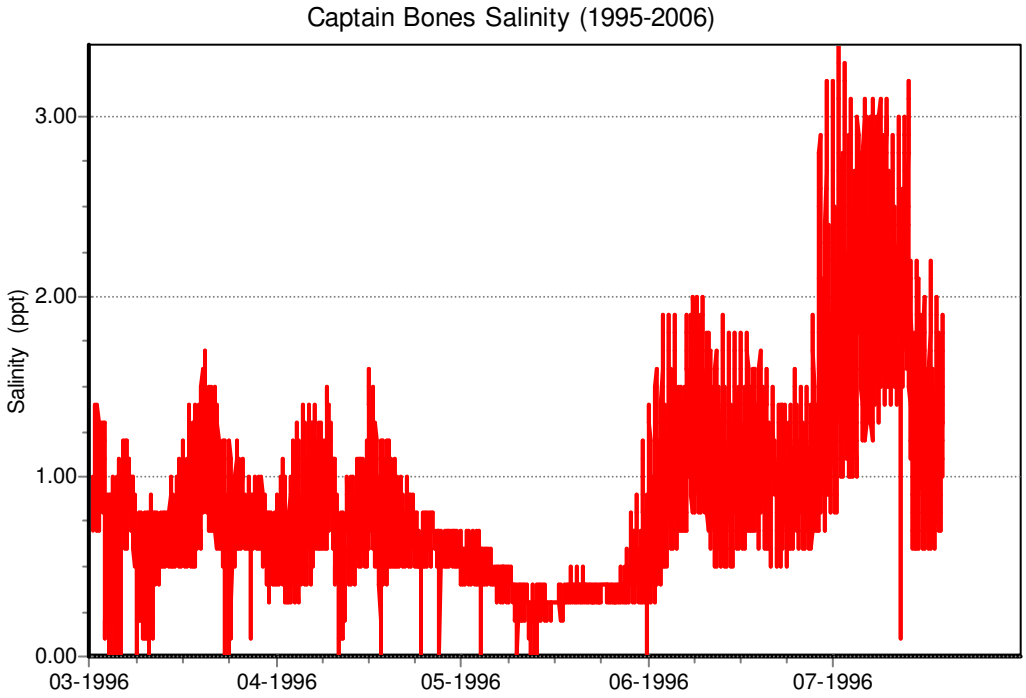


Figure 12 – Short-term Salinity Trend for Captain Bones sampling station, Townsend DE, 1995-2006.
Data courtesy of the Delaware Coastal Programs

D. Channel Width & Depth

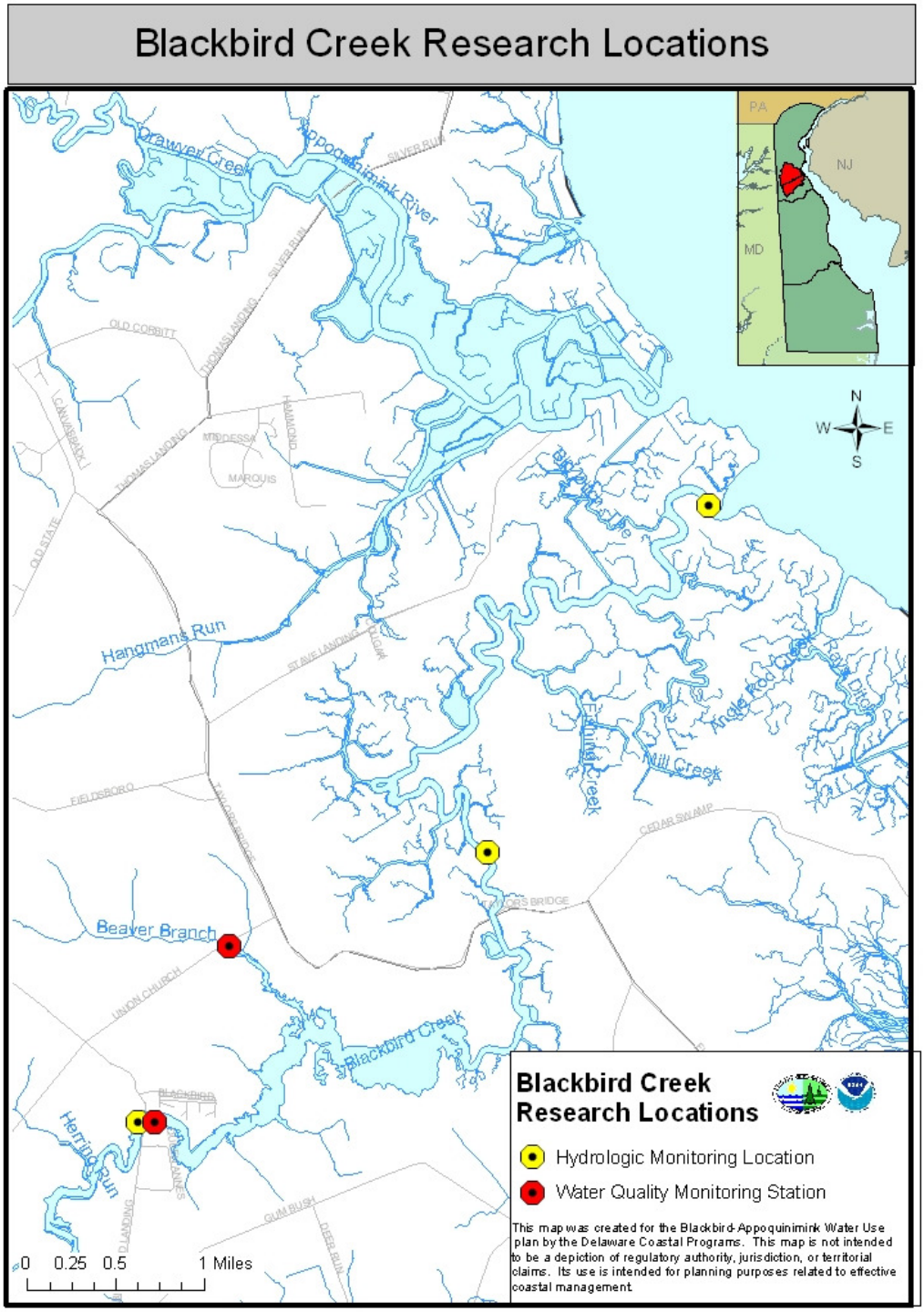


Figure 13 – Blackbird Creek Hydrologic Monitoring Stations.

Channel depths were recorded at three stations along Blackbird Creek during the creation of the Delaware National Estuarine Research Reserve's site profile (See Figure 13). The

width at the lower station is roughly 90 meters (295 ft.), at the middle station about 40 meters (131 ft.), and at the upper station, also in an upstream area with extensive mudflats adjacent to the main channel, about 75 meters (246 ft). Deepest depths tend to be achieved in the mid-channel. Mid-channel depth at the lower station is ~ 5.7 meters (18.7 ft), at the middle station about 2.3 meters (7.5 ft), and at the upper station about 0.5 meters (1.6 ft). Channel (creek) widths along the main stem of Blackbird Creek from the seaward to landward ends typically range from 75-110 m (246-361 ft. Low tide mid-channel depths in Blackbird Creek decrease proceeding landward, ranging from 5.7 m (18.7 ft) in lower reaches to only 0.5 m (1.6 ft) in upper reaches. (DNREC, 1999)

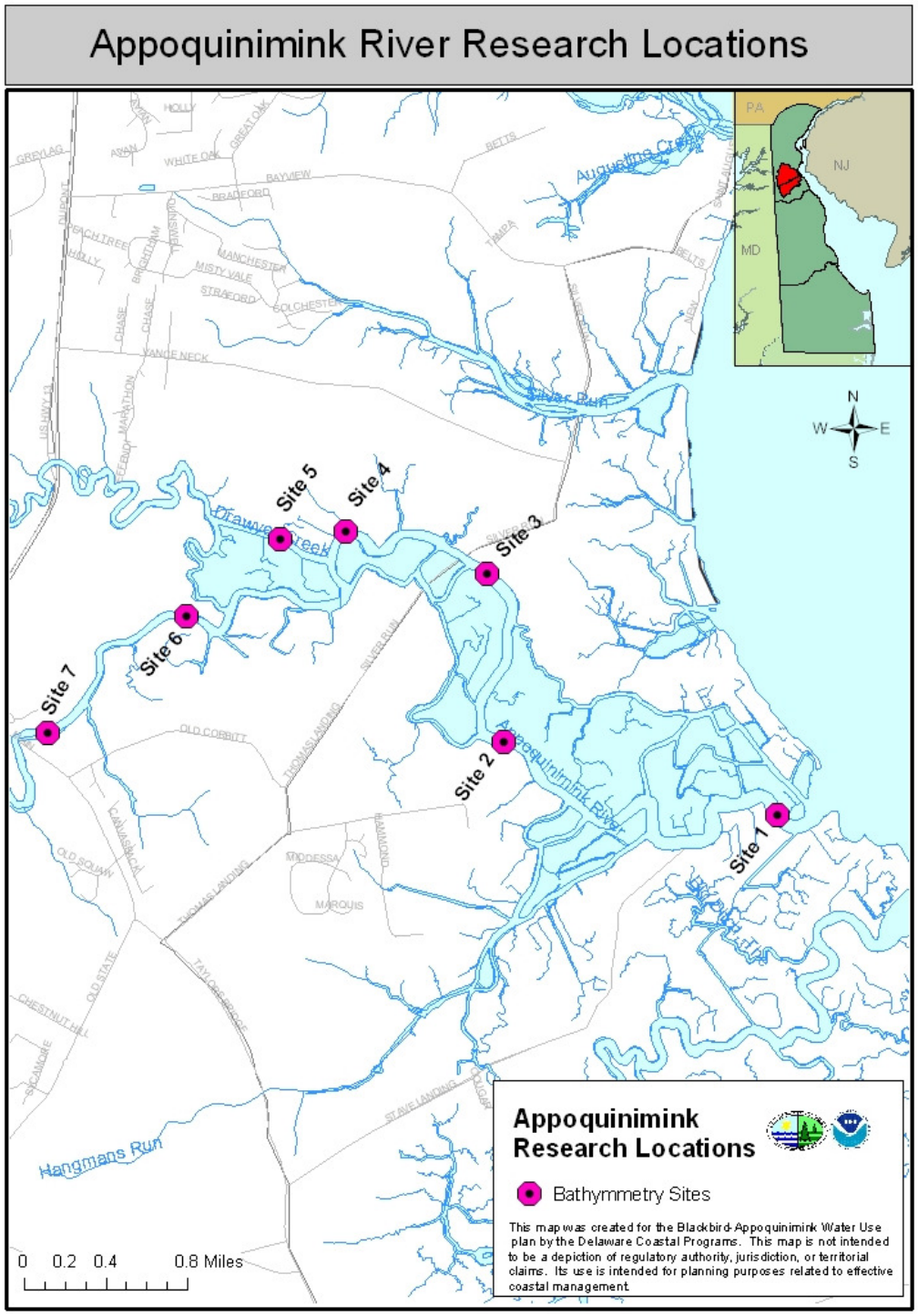


Figure 14 – Bathymmetry Collection Sites on the Appoquinimink River.

In 2000, seven different stations on the Appoquinimink River (See Figure 14) were assessed for depth and width measurements as part of a DNREC survey. River widths

ranged from 47.1 m (154.5 ft.) to 97.32 m (319.3 ft.). Depth varied from 2.11 m (6.9 ft.) to 4.8 m (15.7 ft.) (DNREC, 2001).

Table 2 – Bathymmetry Collection Sites on the Appoquinimink River.

Station	Width (m)	Depth (m)
1	94.35	4.6
2	74.78	4.1
3	97.32	2.72
4	64.9	4.8
5	62.6	2.11
6	47.1	3.37
7	51.1	3.0

E. Hazards

Hazards to boaters appear in many forms; dams, submerged objects, cold water, fast-changing weather, sun stroke and current. These hazards aren't always obvious. Boaters need to recognize these dangers and be ready to avoid them at all times. Developing a keen appreciation and understanding of the overall "boating environment" lets boaters avoid hazards on the water.

Outside of the channels, shoals, stumps, rocks, or other navigational hazards may be exposed or be lying just beneath the surface - creating potential hazards to boaters, water skiers, and swimmers. This is especially true during periods of lower than normal lake levels. The immense number of potential hazards, along with constantly changing water conditions, prohibits the marking of hazards outside of navigational channels.
Boaters are urged to use caution at all times but particularly when operating in unfamiliar areas or outside marked navigational channels. Please obey posted signs, markers, and navigational aids – they are there for your safety

Submerged objects
A submerged object in the water can be a hazard to an unwary boat operator. Rocks, stumps, logs and other objects can greatly damage a boat's hull or motor, sometimes resulting in injury or death to people on board.
Water levels vary on almost every waterway in the state. Even a few inches difference in depth can make the difference between "smooth sailing" and an abrupt end to the boating day. Running aground at high speed can result in people being ejected from the boat. Boaters can protect themselves by keeping a sharp lookout for objects in the water and changing bottom structure. A depth finder or fathometer can keep a boater informed of the depth of the water. Operators who are not sure of the bottom should reduce speed.

Debris
During the winter and spring when the water level is high and the current strong, much debris is carried down the river. This debris may lodge against docks, piles, and bridges

or float in midstream. Drifting trees and large timbers may be grounded in shallow areas, and if submerged, may be hard to see. Debris may also be encountered midstream during the summer when the water level is low and there is no wind to hold it close to shore. Boaters are advised to keep a proper lookout and reduce speed to minimize the risk of hitting floating or partially submerged debris.

Hazards like "strainers," fallen trees and debris collecting between rocks and bridge piers that can trap floating objects, are generally conspicuous. And those familiar with the dynamics of moving water know how the force of the water, as it comes in contact with different obstructions, can actually hold objects.

Bridge piers and rocks are potentially dangerous basically because they don't move and the water does. If the water is moving fast enough, anything or anyone coming in contact with these structures can be held tight against their upstream side. Once pinned in this way, escape is difficult. We can easily understand the danger and what is happening when water holds an object against an obstacle.

Current

Safety on the water depends on developing respect for the power of water. Current can be deceptive and boaters should never underestimate its power. Even a moderate current can exert a force of several tons on a capsized canoe, pinning it against a rock. Boaters venturing out in strong current must stay within their abilities and skill levels, especially in unpowered boats.

A strainer is an obstruction, like a tree or fence in the water, that allows water to pass through but holds and traps boats and boaters. Boaters in current need to keep a safe distance from strainers that they could be "pinned" against.

When anchoring in current, boat operators should always anchor from the bow. This allows the boat to ride up and over oncoming waves. Anchoring from the stern can cause water to rise over the transom and flood or even capsize the boat.

Tidal currents can be very powerful. Tides are the vertical rise and fall of ocean water (and waters affected by the ocean) caused by the gravitational pull of the moon and sun. Boaters venturing out onto tidal waters such as the lower Delaware River should understand how tides work. Tides affect where a boater can travel and anchor safely.

Other boaters

One of the least expected hazards on our waters is other boaters. Even an experienced, competent boater may be involved in an accident because of another boater's mistake or irresponsible action. Whenever possible, boaters should steer clear of other boaters. Report violations to a Waterways Conservation Officer (contact the Commission's Region Office in your area) and stay alert. Keeping a sharp lookout while boating is the best defense against an irresponsible operator on the water.

Weather
Factors that determine weather include temperature, barometric pressure and wind. Weather affects the condition of open water and can change suddenly. Smart boaters check the local forecast the night before going boating and again in the morning. The National Weather Service (NWS) issues a new marine forecast at least every six hours on designated VHF radio channels, or NWS can be telephoned for the latest forecast. The phone number appears in the phone book's US Government section under "Department of Commerce."

III. FLORA

Major Habitat Types

Fifteen different habitat types are present within the Blackbird Creek and Appoquinimink watersheds. Combined these fifteen habit types comprise a meager 4.43% (~1570 acres) of the land area within the Blackbird and Appoquinimink Watersheds (See Table X). These habitats include: Black Ash Seepage Swamp, Buttonbush-Mannagrass-Smartweed Coastal Plain Seasonal Ponds, the Delmarva Bay, Hydric Coastal Plain Oak-Pine Forest, Lamp Rush Wetlands, Loblolly Pine Plantation, Marsh, Mesic Coastal Plain Mixed Hardwood Forest (dry and wet variants), Phragmites Marsh, Red Maple-Green Ash Floodplain Forest, Red Maple-Sweetgum Upland Forest, Smooth Alder-Silky Dogwood Shrub Swamp, Successional, Swamp Cottonwood Coastal Plain Seasonal Pond, and Tuliptree Rich Woods. These habitat types are characterized by environmental descriptions and vegetative composition and are associated with several management concerns.

The soils found within Buttonbush Coastal Plain Ponds are typically silt loam or clay loam covered with a shallow organic layer. Because these habitats are small basin wetlands, bare substrate is often exposed at the end of the growing season, and these wetlands may completely draw down during dry years. The vegetation associated with Buttonbush Coastal Plain Ponds varies from sparse to dense shrublands and is characterized by *Cephalanthus occidentalis* (common buttonbush), *Torreyochloa pallida* (pale false mannagrass), *Dulichium arundinaceum* (threeway sedge), *Rhexia virginica* (Virginia meadowbeauty), *Panicum hemitomon* (maidencane), *Polygonum hydropiperoides* (swamp smartweed). Agricultural runoff and groundwater alterations are threats to this habitat type. (Westervelt et al., 2006)

Occurring adjacent to salt marshes, the Coastal Loblloly Pine Wetland Forest serves as an estuarine fringe within the Blackbird Creek and Appoquinimink watersheds. The soils within this habitat type consist of moderately shallow mush (15 cm) overlying organic matter-stained sands. The trees of this forest typically have a diameter ranging from 12-36 cm and tend to grow on slightly elevated hummocks, with standing water often present in hollows. A partially open to closed canopy within this habitat type is dominated by *Pinus taeda* (loblolly pine). *Smilax rotundifolia* (roundleaf greenbrier),

Toxicodendron radicans (poison ivy), and *Parthenocissus quinquefolia* (Virginia creeper) make up the understory, in addition to contributing to the canopy by covering the lower branches of trees. *Morella* cerifera (wax-myrtle) is a characteristic shrub of the Coastal Loblloly Pine Wetland Forest. The herbaceous layer of this community is relatively sparse, often characterized by a variety of ferns. This habitat tends to be threatened by development pressures. (Westervelt et al., 2006)

The Mid-Atlantic Mesic Mixed Hardwood Forest is a typical forest of the coastal plain of the Delaware Bay. The soils of this habitat usually consist of well-drained, acidic sandy and silt loams derived from low to moderate fertility plant material. This forest grows on mesic to submesic slopes and is often found in ravines of dissected topography. The canopy of this mixed forest is characterized by *Fagus grandifolia* (American beech), *Quercus alba* (white oak), *Quercus rubra* (northern red oak), and *Liriodendron tulipifera* (tuliptree), and the subcanopy is characterized by *Cornus florida* (flowering dogwood) and *Ilex opaca* (American Holly). The shrub layer varies from sparse to well-developed and can include *Asimina triloba* (common pawpaw) and *Viburnum acerifolium* (mapleleaf viburnum). The herbaceous layer often consists of *P. quinquefolia* (Virginia creeper), *Podophyllum peltatum* (mayapple), *Polygonatum biflorum* (smooth Solomon's-seal), and *Polystichum acrostichoides* (Christmas fern). (Westervelt et al., 2006)

A marsh is a frequently or continually inundated wetland characterized by emergent herbaceous vegetation adapted to saturated soil conditions. Both Tidal Freshwater Marshes and Tidal Saltwater Marshes occur within the Blackbird Creek and Appoqunimink watersheds. *Spartina alterniflora* (Saltmarsh cordgrass) is dominant in the saltmarshes of the watersheds. Subdominants found growing within lower salinity saltmarsh cordgrass communities include *Hibiscus palustris* (swamp rose mallow), *Polygonum hydropiper* (marshpepper smartweed), and *Pontederia cordata* (pickerelweed). Also found in select areas along channel banks is *Spartina cynosuroides* (Big Cordgrass). Patches of salt hay composed of *Distichlis spicata* (saltgrass) and *Spartina patens* (saltmeadow cordgrass) occur throughout. Communities of *Nuphar lutea* (yellow pondweed) and *Peltandra virginica* (arrow arum) are present. Some marshes are named for the dominant plant type within the community. An example of this is the Lamp Rush Wetland, which is a marsh that is dominated by the emergent plant *Juncus effuses (*DNREC, 1999*).*

Another marsh with a specific name is the Phragmites Marsh. Phragmites marshes occur in fresh to brakish marshes and are densely distributed throughout the lower Blackbird Creek Watershed. Although *Phargmites australis* (common reed) often forms dense monospecific stands, Phragmites marshes can also be associated with *S. alterniflora* (saltmarsh cordgrass), *S. cynosuroides* (big cordgrass), *Juniperus virginiana* (red cedar), *E. spicata* (saltgrass), *P. virginica* (arrow arum), *P. cordata* (pickerelweed), *Scirpus americanus* (American three-square), and *Iva frutescens* (marsh elder). The current distribution of *Phragmites* clusters suggests their radiation and colonization from creek bank, upland boundary, and occasional internal marsh locations. The expansion of this habitat over the past 50 years in Delaware and other areas of the mid-Atlantic and southern New England has become a serious problem. Extensive monotypic stands

seriously degrade coastal wetlands for wildlife habitat values, and possibly adversely affect estuarine detrital foodwebs (DNREC, 1999).

The Black Ash Seepage swamp is a rare wetland created when calcium-rich groundwater seeps into the soil. The soil in this habitat is permanently saturated with water and is covered with a layer of peat. The canopy level of this habitat is often composed of *Fraxinus nigra* (black ash), *Acer rubrum* (red maple), *Pinus strobes* (white pine), *Tsuga Canadensis* (Eastern hemlock), and *Betula alleghaniensis* (yellow birch). The herbaceous level typically consists of *Onoclea sensibilis* (sensitive fern), *Solidago patula* (rough-leaved goldenrod), *Carex leptalea* (delicate-stemmed sedge), and *Sphagnum centrale* (moss). Changes in the quanity and quality of ground water can have significant affects on this habitat type (Nature Conservancy, 2006).

Found on oxbows or floodplains of rivers and large perennial streams, the Red Maple-Green Ash Floodplain Forest consist of water-deposited clay or loamy sediments. Although, these soils are saturated to flooded for most of the growing season, water may be ponded in shallow depressions for a significant portion of the year. This closed-canopy deciduous floodplain forest is dominated by *Acer rubrum* (red maple) and *Fraxinus pennsylvanica* (green ash). *Quercus palustris* (pin oak), *Ulmus americana* (American elm), *Acer saccharinum* (silver maple), and *Platanus occidentalis* (sycamore) can also be found in the canopy layer of this habitat. The shrub layer often includes *C. occidentalis* (common buttonbush), *Carpinus* caroliniana (American hornbeam), and *Cornus amomum* (Silky dogwood). The herbaceous layer of this forest is well developed and may include numerous species of Carex (sedge), Glyceria (mannagrass), Juncus (rush), Urtica (nettle), and Leersia (cutgrass). The herbaceous layer of this community type is often invaded by exotic species.

The Red Maple Sweetgum forest is a seasonally flooded habitat. The substrates associated with this habitat type are acidic sandy or clay loams. *A. rubrum* (red maple), *Liquidambar styraciflua* (sweetgum), and *N. sylvatica* (black gum) are constant in the canopy of this forest. Other trees associated with this habitat are *I. Opaca* (American holly), *Sassafras albidum* (sassafras), *Quercus falcata* (southern red oak), and *Betula nigra* (river birch). *Smilax rotundifolia* (roundleaf greenbrier) is a particularly characteristic vine of this habitat. *Leucothoe racemosa* (swamp doghobble) is the most abundant shrub found in this forest. The herpaceous layer is sparse but may include *Juncus effuses* (soft rush), species of *Polygonum* (smartweeds), and species of *Carex* (sedge).

Delmarva Bays or Coastal Plain Ponds are small, patchy communities consisting of standing water in all but exceptionally dry years. The substrate of these ponds is usually deep muck, but this muck may be absent or reduced in oligotrophic ponds. The vegetation occurring within this habitat tends to grow on sand or mucky sand. The characteristic species of this community are *Eleocharis robbinisii* (Robbin's spikerush), *Nymphaea odorata* (white water-lily), *Nymphoides cordata* (little floating heart). The vegetation along the shores of these ponds is dominated by *Dulichium arundinaceum* (threeway sedge and *Juncus canadensis* (Canadian rush). Seasonal ponds that are

dominated by *Populus heterophylla* (cottonwood trees) are referred to as Swamp Cottonwood Coastal Plain Seasonal Ponds. Groundwater depletion, agricultural runoff, and recreation activities are threats to this habitat.

The Coastal Plain oak-pine forest occurs on well-drained sandy soils. The Oaks my include *Quercus prinus* (chestnut), *Q. rubra* (red oak), and *Q. alba* (white oak), and the pines are represented by *Pinus strobes* (white pine) and *Pinus rigida* (pitch pine). Other trees associated with this habitat are *Acer rubrum* (red maple), *Tsuga Canadensis* (hemlock), *Fagus grandifolia* (American beech). The ground layer of this habitat is generally sparse and low in species diversity.

A mesophytic hardwood forest, the Tulip Tree Rich Forest, occurs on moist, well-drained sites. The dominant trees include *Q. rubra* (red oak), *Liriodendron tulpifera* (tulip tree), *F. grandifolia* (beech), *A. rubrum* (red maple), and *Q. alba* (white oak). There is a subcanopy consisting of small trees and shrubs dominated by *Cornus florida* (flowering dogwood), *Hamamelis virginiana* (witch-hazel), and *Sassafras albidum* (sassafras). The shrub and ground layers tend to exhibit diversity.

Smooth Alder-Silky Dogwood Shrub Swamps are wetland communities dominated by shrubs ranging from 0.5 to 5meters in height. They tend to occur along the margin of a pond or river, in an isolated wet depression, or as a transition community between a marsh and a terrestrial community. The substrate of this habitat is typically muck. The most common vegetation of this habitat is *Alnus serrulata* (alder), *Cornum amomum* (silky dogwood).

There are areas that appear to be transitional zones between different habitats, such as dune grass lands and maritime forest or marsh shrubland and terrestrial forest. These habitats are classified as successional habitats and the vegetation found in these habitats is characteristic of both neighboring communities. (Westervelt et al., 2006)

Two community types have been identified by the Delaware Natural Heritage Program as habitats of concern. Both reside exclusively in the Blackbird Creek Watershed as opposed to being located in both watersheds The first is the Three-way Sedge-canada Rush Coastal Plain Pond vegetation community, while the second is the previously discussed Buttonbush-mannagrass-smartweed Coastal Plain Pond vegetation community. The first habitat, although not given a global ranking (GNR) has been assigned an S3 ranking at the state level. The vegetation is dominated by *Dulichium arundinaceum* and *Juncus canadensis*. Other associated species include *Scirpus cyperinus, Polygonum punctatum, Utricularia* spp., *Triadenum virginicum*, and *Scirpus cyperinus*. Similarly the buttonbush-managrass-smartweed Coastal Plain Pond vegetation has an S3 state ranking in addition to a global ranking of G3/G4. Given the increase construction thoughout the Blackbird Creek Watershed, it is likely that development pressure represents the largest threat to these two rare habitats located in the Blackbird Creek Watershed.

Table 3. Habitats Known to Occur in the Blackbird and/or Appoquinimink Watersheds.

Habitat Type	Acreage	Percent of Total Area
Black Ash Seepage Swamp	0.97	0.003%
Buttonbush-Mannagrass-Smartweed Coastal Plain Seasonal Pond	3.91	0.011%
Delmarva Bay	9.52	0.027%
Hydric Coastal Plain Oak-Pine Forest	44.92	0.127%
Lamp Rush Wetland	0.27	0.001%
Loblolly Pine Plantation	129.98	0.367%
Marsh	653.16	1.843%
Mesic Coastal Plain Mixed Hardwood Forest	436.65	1.232%
Phragmites Marsh	147.03	0.415%
Red Maple-Green Ash Floodplain Forest	8.94	0.025%
Red Maple-Sweetgum Upland Forest	53.59	0.151%
Smooth Alder-Silky Dogwood Shrub Swamp	0.18	0.001%
Successional	19.19	0.054%
Swamp Cottonwood Coastal Plain Seasonal Pond	0.5	0.001%
Tuliptree Rich Woods	60.34	0.170%

B. Rare & Endangered Species & Species of Concern

Several plant species listed in the Delaware Natural Heritage Program's *Rare Native Plants of Delaware* (DNHP 1996) have been found within boundaries of the Upper Blackbird Creek component of the Delaware National Estuarine Research Reserve. Marsh marigold (*Caltha palustris*) and rough avens (*Geum virginiana*) both possess an S1 ranking by the DNHP. This ranking is defined as an extremely rare species with five or fewer occurrences in the state of Delaware. Canada lily (*Lilium canadense*) and nodding bur-marigold (*Bidens cernua*) both possess an S2 classification, meaning they are very rare with six to twenty occurrences in the state. Swamp milkweed (*Asclepias incarnata*), ranked as SH, is historically known but not verified for an extended period (usually 15 years) (DNREC, 1999).

Marsh marigold is a member of the buttercup family, Ranunculaceae. The genus, *Caltha*, comes from the Latin term for "cup", while the specific epithet, *palustris*, is derived from the Latin term "paluster", meaning "boggy or marshy". The name gives away the plant's habitat preference toward marsh areas and stream edges. Marsh marigold grows to an approximate height of 8-24 inches and exhibits 1 to 1 ½ inch yellow flowers. Flowering time takes place between April and June. One of Marsh marigold's defining characteristics is its heart or kidney shaped leaves (Rook, 2006).

Rough avens (*Geum virginiana)* is a member of the rose family, Rosacea. The perennial plant grows roughly 1½–2½'' tall. Rough avens prefer partial sun, although full sun and light shade are also tolerated, and occur in moist to mesic conditions with a fertile loamy soil. The round stems are light green and covered with coarse spreading hairs. The plant blooms from May to July yielding green or cream colored flowers. Each flower is about ½" across, consisting of 5 petals, 5 triangular green sepals, and several stamens

surrounding a large cluster of green carpels with elongated styles. The plants habitat preference includes meadows, thickets, and open areas with wet soils. Rough avens is sometimes valued as an herbal treatment for a variety of ailments. (http://www.illinoiswildflowers.info/savanna/plants/rough_avens.htm)

The Canada Lily (*Lilium canadense*) is a member of the Lily (*Liliaceae)* family. This plant grows two to five feet high, and is typically found in moist meadows and woods margins. In June and July the Canada Lily produces two to three inch flowers which are usually yellow, but can be orange or red (http://www.ct-botanical-society.org/galleries/liliumcana.html). The leaves are lanceolate and less than 15 cm long in whorls of four to ten. North American Indians gathered the flowers and roots of this plant for food (Boreal Forest.org website, July 06, 2006).

The Nodding Bur Marigold (*Bidens cernua)* is a member of the family *Asteraceae*. In Latin *bidens* means "with two points", referring to the pronds on the seeds. *Cernua* is derived from the Latin term cernuus, meaning "inclining of the head". The Nodding Bur Marigold is an annual swamp plant that can grow up to 5 feet tall and has showy yellow rays. This plant is distinguished from other species by its undivided simple leaves, nodding heads, and somewhat winged fruits (Rook, 2006).

Table 4. Plant Species of Concern Known to Occur in the Blackbird and Appoquinimink Watersheds.

Common Name	Scientific Name	Global Rank	State Rank	Appoquinimink	Blackbird
Abruptly Bent Backed Flatsedge	*Cyperus refractus*	G5	S2		X
American Ginseng	*Panax quinquefolius*	G3G4	S2		X
American Pinesap	*Monotropa hypopithys*	G5	S2		X
American Wintergreen	*Pyrola americana*	G5	S2		X
Bird's-foot Violet	*Viola pedata*	G5	S1		X
Black Ash	*Fraxinus nigra*	G5	S2	X	
Broadleaf Ironweed	*Vernonia glauca*	G5	S2		X
Brome-like Sedge	*Carex bromoides*	G5	S1	X	X
Bulb-bearing Water-hemlock	*Cicuta bulbifera*	G5	S1	X	
Bush's Sedge	*Carex bushii*	G4	S2	X	
Climbing Bittersweet	*Celastrus scandens*	G5	S1	X	X
Cypress-knee Sedge	*Carex decomposita*	G3	S1	X	
Common Dittany	*Cunila origanoides*	G5	S2	X	X
Common Reed	*Phragmites australis*	G5	SU	X	X
Cutleaf Goldenrod	*Solidago arguta var. arguta*	G5T4T5	S1	X	
Drooping Sedge	*Carex prasina*	G4	S1		X
Dwarf Chinquapin Oak	*Quercus prinoides*	G5	S1		X
Eastern Hemlock	*Tsuga canadensis*	G5	S1	X	
Engelmann's Quillwort	*Isoetes engelmannii*	G4	S2	X	X
False Hop Sedge	*Carex lupuliformis*	G4	S2		X
False-hybrid Loosestrife	*Lysimachia hybrida*	G5	S2	X	X
Featherfoil	*Hottonia inflata*	G4	S2	X	X
Few-flowered Nutrush	*Scleria pauciflora*	G5	S1	X	X
Flaxleaf Aster	*Ionactis linariifolius*	G5	S2	X	

Golden-seal	*Hydrastis canadensis*	G4	S1		X
Hairy Angelica	*Angelica venenosa*	G5	S2	X	X
Hairy Woodrush	*Luzula acuminata*	G5	S1	X	
Large Tick-trefoil	*Desmodium glutinosum*	G5	S2		X
Large Twayblade	*Liparis liliifolia*	G5	S2		X
Large Whorled Pogonia	*Isotria verticillata*	G5	S2	X	X
Lined Sedge	*Carex striatula*	G4G5	S1	X	X
Log Wood Fern	*Dryopteris celsa*	G4	S1	X	X
Long-stalk Greenbrier	*Smilax pseudoc*hina	G4G5	S2		X
Marsh Dogwood	*Cornus foemina*	G5	S2	X	X
Marsh Marigold	*Caltha palustris*	G5	S2	X	
New Jersey Tea	*Ceanothus americanus*	G5	S2	X	X
Pale Avens	*Geum virginianum*	G5	S1	X	X
Purple Milkweed	*Asclepias purpurascens*	G4G5	S2		X
Reflexed Sedge	*Carex retroflexa*	G5	S1		X
Ribbed Sedge	*Carex virescens*	G5	S1	X	
Rough Horsetail	*Equisetum hyemale ssp. affine*	G5T5	S1	X	
Roundlobed Hepatica	*Hepatica americana*	G5T5	S1		X
Sedge	*Carex gynandra*	G5	S2	X	
Sharp-scaled Mannagrass	*Glyceria acutiflora*	G5	S2		X
Short-bristle Horn-rush	*Rhynchospora corniculata*	G5	S2		X
Slender Blueflag Iris	*Iris prismatica*	G4G5	S2		X
Smooth Hedge-nettle	*Stachys tenuifolia*	G5	S1.1		X
Southern Adder's-tongue	*Ophioglossum vulgatum*	G5	S2		X
Spongy Arrowhead	*Sagittaria calycina*	G5	S3	X	X
Sharp-scaled Mannagrass	*Glyceria acutiflora*	G5	S2	X	X
Sheep-laurel	*Kalmia angustifolia*	G5	S3		X
Straw Sedge	*Carex straminea*	G5	S1	X	
Swamp-pink	*Helonias bullata*	G3	S2		X
Swamp Wedgescale	*Sphenopholis pensylvanica*	G4	S1	X	
Sweet Joe-pye Weed	*Eupatoriadelphus purpureus*	G5	S3		X
Teal Love-grass	*Eragrostis hypnoides*	G5	S2		X
Upland Boneset	*Eupatorium sessilifolium*	G5	S1		X
Velvety Sedge	*Carex vestita*	G5	S2	X	
Virginia Bunchflower	*Melanthium virginicum*	G5	S2	X	X
Walter's Paspalum	*Paspalum dissectum*	G4?	S2		X
Water Horsetail	*Equisetum fluviatile*	G5	S1	X	
White Ash	*Fraxinus americana*	G5	S5		X
Whorled Mountain-mint	*Pycnanthemum verticillatum var. verticillatum*	G5T5?	S2		X
Wild Comfrey	*Cynoglossum virginianum*	G5	S1		X
Woodland Agrimony	*Agrimonia rostellata*	G5	S2		X
Woodland Lettuce	*Lactuca floridana var. floridana*	G5T5?	S2		X
Woolly Sedge	*Carex pellita*	G5	S2	X	X
Yellow Water-crowfoot	*Ranunculus flabellaris*	G5	S1.1		X

C. Invasive Species

Invasive species can rapidly and seriously degrade the quality of areas by altering natural processes and reducing biodiversity. On the other hand, invasive species control may also affect habitat areas. For this reason natural area managers must carefully balance control

measures efficacy with ecosystem preservation. While an extremely infested area may require extensive control, areas with isolated invasive species occurrences may require much less dramatic control actions. Table 5. illustrates various invasive plant species from the Blackbird and Appoquinimink watersheds.

Table 5. Common and scientific names of invasive plants known to occur in the Blackbird and/or Appoquinimink River watersheds.

Herbaceous Plants

Common Name	Scientific Name
Canada thistle	*Cirsium arvense*
Common reed	*Phragmites australis*
Japanese Stiltgrass	*Microsetgium vimenium*
Purple loosestrife	*Lythrum salicaria*

Shrubs

Common Name	Scientific Name
Autumn Olive	*Elaeagnus umbellate*
Japanese Barberry	*Berberis thunbergii*
Multiflora rose	*Rosa multiflora*

Trees

Common Name	Scientific Name
Bradford pear	*Pyrus calleryana* 'Bradford'
Paper mulberry	*Broussonetia papyrifera*
Princess tree	*Paulownia tomentosa*
Silk tree, mimosa tree	*Albizia julibrissin*
Tree of Heaven	*Ailanthus altissima*
White mulberry	*Morus alba*

Vines

Common Name	Scientific Name
English ivy	*Hedera helix*
Japanese honeysuckle	*Lonicera japonica*
Oriental bittersweet	*Celastrus orbiculatus*
Wisteria, exotic	*Wisteria sinensis*
Wisteria, exotic	*Wisteria floribunda*

Aquatic

Common Name	Scientific Name
Aquatic Primrose	*Ludwigia hexapetala*

Expansion of common reed (*Phragmites australis*) over the past 50 years in Delaware and other areas the mid-Atlantic and southern New England has become a serious problem, with extensive monotypic stands seriously degrading coastal wetlands for wildlife habitat values, and possibly adversely affecting estuarine detrital food webs. Researchers do not understand why *Phragmites* has undergone such aggressive expansions. Several hypotheses have been proposed, including anthropogenic marsh disturbances involving wetlands dewatering or marsh surface spoil deposition, increased nutrient loading of tidal waters, and possible introduction of a more aggressive European

strain of this species. The most practicable control technique developed to date involves application of glyphosate herbicide followed by prescribed burning. (DNREC, 1999).

Expansion of *Phragmites* cover within the DNERR's tidal wetlands is a serious management concern, especially in the lower salinity Upper Blackbird Creek Reserve. Within Lower Blackbird Creek marshes, immediately downstream from the Upper Blackbird Creek Reserve, the Delaware Division of Fish and Wildlife has treated over 390 ha (963 acres) of *Phragmites*-infested marsh on The Rocks parcel (part of Cedar Swamp State Wildlife Area). Private landowners have treated an additional several hundred hectares (acres) in the Lower Blackbird Creek basin, in concert with the Division's cost-share *Phragmites* control program for private landowners. (DNREC, 1999). *Phragmites* control also takes place in the Appoquinimink Watershed using cost-share funds. Due to the rapid control measures being implemented in both of these watersheds, coverage maps become quickly outdated, and have not been included in this document as a result.

IV. FAUNA

Fauna is a collective term used to describe the animal species in a given region or time period. The faunal assemblage of the Blackbird and Appoquinimink Watersheds includes: fish, mammals, birds, reptiles/amphibians, and invertebrates. The two Watersheds represent habitat for a total of 6 endangered species (Tiger Salamander, Bog Turtle, Cooper's Hawk, Northern Harrier, Bald Eagle, and Brown Creeper). Much like the flora of an area serves various ecological roles, so do the fauna of a region. The aforementioned five faunal groups fullfill ecological roles ranging from consumers (primary, secondary, tertiary, etc.) to detritivores and prey. Fish utilize tidal creeks as a nursery habitat for growth and protection. Anadromous species, fish that migrate from saline environments to brackish environments for breeding purposes, like the White Perch (*M. americana*) and American Eel (*A. rostrata*) depend on the estuarine environment of these two watersheds. Bird species, like the sanderling, may use beach or other areas as resting stops during migratory routes.

A region's fauna is extremely susceptible to anthropogenic change and influence. Habitat degredation and destruction, caused by development and pollution, may increase habitat fragmentation, eradicate sensitive species, and reduce species diversity. As development pressure continues to move towards and throughout southern New Castle County, the risk of impact to the Blackbird Creek and Appoquinimink Watersheds increases. The Delaware Natural Heritage Program (DNHP) uses a ranking system to determine the level of concern of each species. The two-tiered ranking system offers both state and global ranking for each species. Individual explanations of the various DNHP rankings are explained in Appendix I. Rare species are documented and discussed in the following sections.

FISH

A variety of commercially and recreationally important fish species utilize both the Blackbird Creek and Appoquinimink River habitats. A total of 40 different species, 34 in Appoquinimink and 30 in Blackbird, have been documented between the two rivers with 24 species existing in both (See Table XX). Although the Delaware Division of Fish and Wildlife has not issued a fish consumption advisory for the Blackbird Creek, an advisory has been established for all finfish within the tidal portions of the Appoquinimink River. The advisory suggests against consuming more than one 8 ounce meal of finfish per year from the area. The advisory exists due to concern over polychlorinated biphenyl (PCBs) and polychlorinated dibenzo-p-dioxin (dioxin) presence residing in bottom sediments. Both of the substances are deemed "probable human carcinogens" by the Environmental Protection Agency (EPA).

Table 6 illustrates the similarity in fish community species composition between both rivers, although some species have been documented in one river, but not the other. Table 6 also summarizes species data from various sampling efforts (Clark, 2004), (Delaware National Estuarine Research Reserve, 2005). Only a single fish species, Four-spine Stickleback, documented in the Appoquinimink River holds a "species of concern ranking" by the Delaware Natural Heritage Program. There are no fish species of conservation concern designated by the DNHP in the Blackbird Watershed at this time.

Table 6. Common and scientific names of fish known to occur in the Blackbird and Appoquinimink watersheds.

Common Name	Scientific Name	Appoquinimink	Blackbird Creek
Alewife	*Alosa pseudoharengus*	X	X
American eel	*Anguilla rostrata*	X	X
American shad	Alosa sapidissima	X	
Atlantic croaker	*Micropogonias undulates*	X	X
Atlantic herring	*Clupea harengus*	X	
Atlantic menhaden	*Brevoortia tyrannus*	X	X
Atlantic silverside	*Menidia menidia*		X
Banded killifish	*Fundulus diaphanous*	X	X
Bay anchovy	*Anchoa mitchilli*	X	X
Black crappie	*Pomoxis nigromaculatus*	X	X
Black drum	*Pogonias cromis*	X	X
Blueback herring	*Alosa aestivalis*	X	X
Bluefish	*Pomatomus saltatrix*	X	
Bluegill	*Lepomis macrochirus*	X	X
Brown bullhead	*Ameiurus nebulosus*	X	X
Channel catfish	*Ictalurus punctatus*	X	X
Common carp	*Cyprinus carpus*	X	X
Common pipefish	*Syngnathus fuscus*		X
Fourspine Stickleback*	*Apeltes quadracus*	X	
Hickory shad	*Alosa mediocris*	X	
Hogchoker	*Trinectes maculates*	X	X
Gizzard shad	*Dorosoma cepedianum*	X	X
Inland silverside	*Mennidia berylinum*		X
Lyre goby	*Evorthodus lyricus*		X
Mummichog	*Fundulus heteroclitus*	X	X
Naked goby	*Gobiosoma bosc*	X	X
Northern kingfish	*Menticirrhus saxatili*		X

Oyster toadfish	*Opsanus tau*	X	
Pumpkinseed	*Lepomis gibbosus*	X	X
Silver perch	*Bairdella chrysoura*		X
Silvery minnow	*Hybognathus sp.*	X	
Spot	*Leiostomus xanthurus*	X	X
Striped bass	*Morone Saxitilus*	X	X
Spottail shiner	*Notropis hudsonius*	X	
Striped anchovy	*Anchoa hepsetus*	X	
Summer flounder	*Paralichthys dentatus*	X	
Weakfish	*Cynoscion regalis*	X	X
White catfish	*Ameiurus catus*	X	X
White perch	*Morone americana*	X	X
Yellow perch	*Perca flavescens*	X	X

** indicates Natural Heritage Program identified species of concern*

Fish sampling data, located in the *Delaware National Estuarine Research Reserve Estuarine Profile*, denote spot, mummichog, Atlantic menhaden, Atlantic silverside, and white perch as the most numerous species found in a Blackbird Creek study.

Spot, *Leiostomus xanthurus*, are commonly found throughout the Delaware Estuary. This species holds significant economic importance. Spot, a member of the family Sciaenidae (drums or croakers), typically consume benthic organisms and detrital matter. They attain a maximum total length of 36.0 cm and typically weigh less than 450 g (the highest recorded weight for the species).

Atlantic menhaden, *Brevoortia tyrannus*, represents another economically important species for their use as fish oil, fish meal, and bait. Menhaden typically do not exceed a total length of 15 inches. It is not uncommon to see the species exhibiting schooling behaviors near the water surface.

White perch, *Morone americana*, is a commercially important finfish species in the Delaware Estuary. It also represents a popular species in the recreational fishing area. This member of the Family Percichthyidae typically attains a length of 7-10 inches, but may grow up to 19 inches. They are known to feed on fish eggs and juveniles of other species.

Mummichogs, *Fundulus heteroclitus*, provide a strong ecological benefit to the area. Their propensity to consume mosquito larvae makes them an effective natural bio-control method. A single individual may consume up to 2000 mosquito larvae in a single day. Mummichogs also serve as an important food source for higher trophic level species like wading birds. The species typically achieves a total length of roughly 5 inches and resides year round in various tidal creeks.

The fourspine stickleback, *Apeltes quadracus*, is a small, weak-swimming fish found in quiet brackish waters and marshes. The Delaware Natural Heritage Program has assigned this species an “S2” rarity ranking in Delaware, however the species ranks a G5 on the global scale (See Appendix X). This fish tolerates salinities ranging from fresh to marine (0-32 ppt). The fourspine stickleback is on average about 2 inches in length and lives

only one to two years. It is olive-green to brown with darker patches on the sides. The head is pointed with a terminal mouth. The distinguishing characteristic of the Fourspine stickleback is four dorsal spines of varying heights and angled alternately left and right. The dorsal spines have a sail-like membrane and are angled to alternating sides. Sticklebacks eat any food available to it including: worms, small drowned insects, fish eggs, crustaceans, and larvae. Males build nests made of weeds and have an elaborate courtship display to entice females to the nest. A single male may build and maintain several nests simultaneously, which are similarly constructed of grasses and fibers cemented by their secretions. Upon completion of spawning the female is driven off. (Government of Newfoundland and Labrador website, July 27, 2006).

MAMMALS

At least 29 different mammal species, representing 18 mammalian families, reside or likely reside within the Blackbird Creek and Appoquinimink watersheds, many of which serve important ecological roles or are of recreational importance. Small mammals serving as prey, and thus playing an important ecological role include: shrews, voles, mice, rats, and rabbits (DNREC, 1999). The DNHP recognizes 7 species as being of conservation concern (See Table 7).

Table 7. Common and scientific names of mammals known to occur or possibly found in the Blackbird and Appoquinimink River watersheds.

Order: (Artiodactyla)	
White tailed deer	*Odocoileus virginianus*
Order: (Carinivora)	
Gray fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Red fox	*Vulpes vulpes*
Long-tail weasel	*Mustela frenata*
River otter	*Lutra canadensis*
Striped skunk	*Mephitis mephitis*
Order: (Chiroptera)	
Big brown bat	*Eptesicus fuscus*
Eastern pipistrel	*Pipistrellus subflavus*
Little brown myotis	*Myotis lucifugus*
Order: (Didelphimorphia)	
Opossum	*Didelphis marsupialis*
Order: (Insectivora)	
Masked shrew	*Sorex cinereus*
Short-tail shrew	*Blarina brevicauda*
Order: (Lagomorpha)	
Eastern cottontail rabbit	*Sylvilagus floridanus*

Order: (Rodentia)

Gray squirrel	*Sciurus carolinensis*
Meadow jumping mouse	*Zapus hudsonius*
Meadow vole	*Microtus pennsylvanicus*
Muskrat	*Ondatra zibethicus*
Pine vole	*Microtus pinetorum*
Southern flying squirrel	*Glaucomys volans*
White-footed mouse	*Peromyscus leuco*pus
Woodchuck	*Marmota monax*

Table 8. Mammal Species of Concern Known to Occur in the Blackbird and Appoquinimink Watersheds.

Common Name	Scientific Name	Global Rank	State Rank
Beaver	*Castor Canadensis*	G5	S3
Rice rat	*Oryzomys palus*tris	G5	S3
Least shrew	*Cryptotis parva*	G5	S?
Mink	*Mustela vison*	G5	S3
Hoary bat	*Lasiurus cinereus*	G5	SU
Red bat	*Lasierus borealis*	G5	SU
Silver-haired bat	*Lasionycteris noctivagans*	G5	SU

The white tailed deer, *Odocoileus virginianus*, is the largest mammal found in these watersheds and represents a substantially harvested mammal for recreational hunters. The common name is largely derived from the white coloration located on the underside of the animal's tail, which is flicked/held upright during frightening situations or while running. Males grow antlers from March-August and shed the antlers during the late winter. Females do not exhibit antler growth. White tailed deer are herbivorous with twigs, plant buds, leaves, acorns, fruits, and agricultural crops representing typical food choices. (Maryland DNR website, July 06, 2006)

Delaware preformed its first aerial deer population survey in December 2005. This survey estimated a deer population of 48,295 before the hunting season. The study found that development is consuming deer habitat, forcing more animals to share fewer woods and pastures, leading to road kill issues (Kepner, 2006).Deer populations have also caused severe levels of damage to crops. In order to help farmers experiencing these losses, the Division of Fish and Wildlife is offering a new deer management program, the Severe Deer Damage Assistance Program (SDDAP). Under the new program a farmer will receive extra permits and will also be allowed to harvest antlerless deer from Aug. 15, 2006 through May 15, 2007. Participants in this program must meet predetermined requirements and regulations

A second commercially valuable species is the muskrat, *Ondatra zibethicus*, prized for its fur (DNREC, 1999). These semi-aquatic rodents craft various dens and lodges within marsh areas. Muskrat season runs from December through mid-March yielding over 30,000 harvested animals per year by licensed trappers. Although valuable, muskrats can be a hindrance by severely depleting vegetation or damaging pond levees.

BIRDS

Many different species of resident and migrant birds utilize the Blackbird and Appoquinimink River watersheds for overwintering, breeding, and migration. The birds occurring in this area are critical to their ecosystems, and some are of recreational value to human populations. The birds prey on fish, amphibians, reptiles, insects, crustaceans and plant material. While none of the birds residing in the Blackbird and Appoquinimink watershed are federally protected, a variety of bird species are considered to be rare. The Eastern meadow lark, hairy woodpecker, and pileated woodpecker all rank as a S3 with typically 21 to 100 known occurrences. The cattle egret, common tern, double crested cormorant, Forster's tern, glossy ibis, and snowy egret are classified as S1B with 5 or fewer occurrences. The bald eagle, black vulture, and great blue heron are S2B with 6 to 20 known occurrences. The species is susceptible to becoming extirpated. The bald eagle is considered a S3N as well.

Furthermore, species of special interest are the Scarlet tanager and the Wood thrush. These birds are of primary conservation concern in the Delaware region because they are a forest interior neo-tropical migratory species. Many species travel considerable distances the most common pattern being for birds to breed in the temperate or arctic northern hemisphere during the warmer months, and migrate to warmer regions during the winter months, often to the tropics or the temperate zones of the southern hemisphere. Birds may migrate to find the most suitable temperature and weather conditions, and also to move where there may be an abundance of food. In addition to conservation concern in Delaware, a large number of birds found in the Blackbird and Appoquinimink river watersheds are protected under the US Migratory Bird Act.

Table 9. Bird Species Known to Occur in the Blackbird and Appoquinimink Watersheds.

Common Name	Scientific Name
American crow	*Corvus brachyrhynchos*
American goldfinch	*Carduelis tristis*
American robin	*Turdus migratorius*
Barn swallow	*Hirundo rustica*
Belted kingfisher	*Ceryle alcyon*
Black vulture	*Coragyps atratus*
Blue jay	*Cyanocitta cristata*
Boat-tailed grackle	*Quiscalus major*
Canada goose	*Branta canadensis*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cattle egret	*Bubulcus ibis*
Common grackle	*Quiscalus quiscula*
Common tern	*Sterna hirundo*
Common yellowthroat	*Geothlypis trichas*
Double-crested cormorant	*Phalacrocorax auritus*
Downy woodpecker	*Picoides pubescens*
Eastern bluebird	*Sialia sialis*
Eastern kingbird	*Tyrannus tyrannus*
Eastern meadowlark	*Sturnella magna*

Eastern wood-pewee	*Contopus virens*
Fish crow	*Corvus ossifragus*
Forster's tern	*Sterna forsteri*
Glossy ibis	*Plegadis falcinellus*
Great crested flycatcher	*Myiarchus crinitus*
Great horned owl	*Bubo virginianus*
Greater yellowlegs	*Tringa melanoleuca*
Green-backed heron	*Butorides virescens*
Green-winged teal	*Anas carolinensis*
Grey catbird	*Dumetella carolinensis*
Hairy woodpecker	*Picoides villosus*
Herring Gull	*Larus argentatus*
Indigo bunting	*Passerina cyanea*
Killdeer	*Charadrius vociferus*
Laughing gull	*Larus atricilla*
Mallard	*Anas platyrhynchos*
Marsh wren	*Cistothorus palustris*
Mockingbird	*Mimus polyglottos*
Mourning dove	*Zenaida macroura*
Night heron	*Nycticorax nycticorax*
Northern bobwhite	*Colinus virginianus*
Northern cardinal	*Cardinalis cardinalis*
Northern flicker	*Colaptes auratus*
Orchard oriole	*Icterus spurius*
Pileated woodpecker	*Dryocopus pileatus*
Purple martin	*Progne subis*
Red-bellied woodpecker	*Melanerpes carolinus*
Red-eyed vireo	*Vireo olivaceus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Ring-billed gull	*Larus delawarensis*
Rufous-sided towhee	*Pipilo erythrophthalmus*
Scarlet tanager	*Piranga olivacea*
Seaside sparrow	*Ammodramus maritimus*
Sharp-shinned hawk	*Accipiter striatus*
Snow goose	*Chen caerulescens*
Snowy egret	*Egretta thula*
Song sparrow	*Melospiza melodia*
Spotted sandpiper	*Actitis macularius*
Tree swallow	*Tachycineta bicolor*
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
White-eyed vireo	*Vireo griseus*
White-throated sparrow	*Zonotrichia albicollis*
Wood duck	*Aix sponsa*
Wood thrush	*Hylocichla mustelina*
Yellow-billed cuckoo	*Coccyzus americanus*
Yellow-rumped warbler	*Dendroica coronata*
Yellow warbler	*Dendroica petechia*

Table 10. Bird Species of Concern Known to Occur in the Blackbird and Appoquinimink Watersheds.

Common Name	Scientific Name	Global Rank	State Rank	Appoquinimink	Blackbird
Brown Creeper	*Certhia americana*	G5	"S1B,S4N"	X	X
Great Blue Heron	*Ardea herodias*	G5	S2B	X	
Cooper's Hawk	*Accipiter cooperii*	G5	S1B	X	
Northern Harrier	*Circus cyaneus*	G5	"S1B,S4N"	X	
Bank Swallow	*Riparia riparia*	G5	S2B	X	
Bald Eagle	*Haliaeetus leucocephalus*	G4	"S2B,S3N"	X	X
Broad-winged Hawk	*Buteo platypterus*	G5	S1B		X
Least Bittern	*Ixobrychus exilis*	G5	S1B		X
Red-shouldered Hawk	*Buteo lineatus*	G5	"S2B,S3N"		X

AMPHIBIANS & REPTILES

At least 20 different species, representing 7 different families of amphibians and reptiles can be found in the Blackbird and Appoquinimink River watersheds. Two amphibian species and 6 reptile species found in these areas are considered rare by the Delaware Natural Heritage Program, and the success of these animals is heavily dependant on the state of their environment. Land alteration, pollution, climate change, and exploitation may cause a decline in the amphibian and reptile populations. Some regulations are in place to reduce possible negative effects on reptile and amphibian populations. For example in Delaware, one must possess a fishing license in order to take the North American Bullfrog. Both reptiles and amphibians are vital in the ecosystems of the Blackbird and Appoquinimink River watersheds; they consume a variety of insects and serve as a food source for small mammals, birds, and fish.

Table 11. Common and scientific names of reptiles and amphibians known to occur or possibly found in the Blackbird and Appoquinimink River watersheds.

Common Name	Scientific Name
Black rat snake	*Elaphe obsolete*
Bullfrog	*Rana catasbeana*
Eastern mud turtle	*Kinosternon subrubrum*
Green frog	*Rana melonata*
Northern spring peeper	*Hyla crucifer*
Northern two-lined salamander	*Eurycea bislineata*
Northern water snake	*Nerodia sipedon*
Red backed salamander	*Plethodon cinereus*
Red-bellied turtle	*Pseudemys rubriventris*
Snapping turtle	*Chelydra serpentine*
Southern leopard frog	*Rana spenocephala*
Wood frog	*Rana sylvatica*

Weighing approximately 4 ounces and reaching a length of 3-4.5 inches, the Bog Turtle (*Clemmys muhlenbergii*) is one of the smallest turtles in North America. The bog turtle's

body is dark with an orange-red wash on the inside of the legs of some individuals, and a bright yellow or orange blotch on each side of the head and neck is often used to identify this species. The domed carpace often exhibits prominent rings on the scutes and is generally black but is sometimes highlighted by a chestnut sunburst pattern in each scute. The plastron is hingeless, with a pattern of cream and black blotches. As with most turtles, the plastron of the male is slightly concave while the female's is flat.

The bog turtle prefers to inhabit Calcareous (containing calcium carbonate, calcium or lime) wetlands such as open sphagnum bogs, wet meadows and wet pastures. In addition to open sunny areas for basking, bog turtles rely on an abundance of grassy or mossy cover and high humidity for survial. Bog turtles eat seeds, berries, insects, slugs, worms, crayfish, frogs, snakes, snails and carrion. The turtles feed during the daylight hours but are seldom active during the hottest part of the day. During the winter months bog turtles hibernate underwater in about six to 18 inches of mud, but immature turtles do not hibernate in deep mud until they are two to three years old.

After reaching sexual maturity at five to eight years of age, bog turtles will breed. Breeding season begins in late April to early June after the turtles have emerged from hibernation. Two to Five eggs are left unattended in a nest within a tussocks or on sphagnum moss in sunny areas of a bog. After incubating for seven to eight weeks, the eggs hatch. The young are only 1 inch long at hatching and are often taken by a variety of birds and mammals. Although the exact maximum age of the bog turtle is not known, it is estimated to be between 30 and 40 years, though many turtles do not reach this point due to the fact that they fall prey to raccoons, skunks, foxes and dogs.

Wetland loss has resulted in the fragmentation of bog turtle populations. These small populations are isolated from one another and are only able to breed within their own communicties. The result is a loss of genetic variation, which then reduces the population's ability to adapt to a changing environment. Bog turtles are very sensitive to changes in their environment, such as increased nutrification, altered drainage, vegetation changes or pollution. Aditionally, collection for the pet trade has further depleted bog turtle populations. In 1973, the bog turtle was given protection by CITES, the Convention on International Trade in Endangered Species, and it is currently a candidate to be put on the federal endangered species list.

The spotted salamander (*Ambystoma maculatum*) can reach 19 cm long, and most specimens have yellow spots on their backs. This species inhabitats deciduous forests with fish-free ponds or vernal pools for egg laying and larval development. They feed primarily on invertebrates, such as earthworms, insects, spiders, slugs. Spotted salamanders spend most of the year in underground burrows, but are sometimes found under rotting logs or leaf litter.

This species begins to mate as soon as the snow melts in March or April. The adults follow creeks in their migration to pools of water which are free of predatory fish. Adults breed in the same pond throughout their lifetime, with females laying twenty five to 200 eggs in compact masses of jelly attached to underwater plants. The eggs take 31 to 54

days to hatch, depending on temperature. Once the larvae emerge, they require an additional 61 to 110 days before they leave the pond.

Table 12. Delaware Natural Heritage Program designated rare Reptile and Amphibian species known to occur in the Blackbird and Appoquinimink watersheds.

Common Name	Scientific Name	Global Rank	State Rank	Appoquinimink	Blackbird
Bog Turtle	*Glyptemys muhlenbergii*	G3	S1	X	
Common Kingsnake	*Lampropeltis getula*	G5	S2S3	X	X
Four-toed Salamander	*Hemidactylium scutatum*	G5	S1	X	X
Rough Green Snake	*Opheodrys aestivus*	G5	S2		X
Smooth Earth Snake	*Virginia valeriae*	G5	S1		X
Spotted Salamander	*Ambystoma maculatum*	G5	S2	X	X
Tiger Salamander	*Ambystoma tigrinum tigrinum*	G5	S1		X
Queen Snake	*Regina septemvittata*	G5	S1	X	

Aquatic Insects & Invertebrates

Invertebrates are often overlooked by the casual observer, however invertebrates, especially aquatic varieties play extremely important roles in the ecosystem. In addition to providing food for various fish and amphibians, aquatic invertebrates represent important indicator species for water quality and stream health. The Appoquinimink and Blackbird Watersheds provide habitat for a total of 10 different rare species, as reported by the DNHP (See Table 13). All 10 of these species are known to reside in the Blackbird Watershed, while at least one is located in both watersheds.

Three phyla of macroinvertebrates are known to occur in the Appoquinimink River watershed including; Annelida, Arthropoda, and Mollusca. The phylum Annelida, is comprised of segmented worms. The five species of Annelids occurring in the Appoquinimink River watershed belong to the class Oligochaete, which includes earthworms and a group of related, mostly freshwater, species of annelids. Oligochaetes feed primarily on detritus and algae. These aquatic Oligochaetes are an important food for fishes and larger invertebrates. The phylum Arthropoda is very diverse and includes animals such as crustaceans, insects, and spiders. The most abundant order of Arthropoda in the Appoquinimink watershed is Diptera. This order includes mosquitoes, caddis flies, midges, gnats, and black flies. Dipterans characteristically have sucking mouthparts, and may feed on plant juice or detritus. Dipterans represent an important food source for fishes and larger invertebrates. The third phylum, Mollusca consists of snails and mussels, and other related organisms. Members of the phylum Mollusca found in the Appoquinimink River watershed are primarily filterers and herbivores.

Reported data on aquatic insect communities is limited for the Appoquinimink, however two datasets exist. These two sources characterize macroinvertebrates as representative of impaired communities and imply water quality conditions as the main cause. State

accepted indices and metrics for classifying stream conditions based on the macroinvertebrate community are not fully described in either case. Ritter and Lake (1983) sampled aquatic insects at two stations in Noxontown Pond subwatershed (downstream of Rt 446 bridge and near Wiggins Pond). The general findings include:

- Collected 15,807 individual invertebrates, representing 64 taxa
- Biological monitoring indicated some water quality degradation
- Dominance of caddis flies, midges, black flies, snails and crustaceans (primarily filterers and herbivores) indicative of nutrient enrichment.
- Absence of stoneflies and many may fly species likely result of sediment loads in streams
- Main deterrent in improving biological conditions appears to be silt loads

Another sampling effort reported by DNREC (2003) included macroinvertebrate data from four stations collected in 1993 and in 2003 from which Table 14 is derived. Main findings include that all sampling sites were considered non- or partially supporting.

Table 13. Macroinvertebrates known to occur in the Appoquinimink River watershed.

Phylum: Annelida

(Order: Tubificida)
unid. (Tubificidae)
Dero sp.
Nais communis
Stylaria lacustris

Phylum: Arthropoda

(Order: Trombidiformes)
Limnesia

(Order: Coleoptera)
Ancyronyx variegate
Dubiraphia quadrinotata
Dubiraphia vittata
Macronychus glabratus
Peltodytes duodecimpunctatus
Neoporus
Ancyronyx variegates
Hoperius sp.
Ancyronyx variegate

(Order: Collembola)
unid. (Isotomid)

(Order: Isopoda)
Caecidotea communis
Caecidotea racovitzai

(Order: Odonata)
Calopteryx sp.
Gomphus sp.
Enallagma sp.
Ischnura sp.

(Order: Diptera)
Clinotanypus sp.
Polypedilum fallax
Atrichopogon peregrinus
Apsectrotanypus johnsoni
Cricotopus bicinctus
Microtendipes pedellus
Phaenopsectra punctipes
Polypedilum illinoense
Parakiefferiella sp.
Tribelos sp.
Ablabesmyia rhamphe
Chironomus
Dicrotendipes
Paratanytarsus
Phaenopsectra obediens
Procladius

Stempellinella leptocelloides
Tribelos jucundus
Chaetocladius
Micropsectra
Polypedilum aviceps
Polypedilum flavum
Tvetenia bavarica
Simulium vittatum
Rheotanytarsus sp.
Conchapelopia sp.
Meropelopia sp.
Paratanytarsus sp.
Stictochironomus sp.
unid. (Psychodidae)
Platypeza sp.
Micropsectra sp.
Hemerodromia sp.

Tanytarsus
Bittacomorpha
Diamesa
Parametriocnemus
Polypedilum illinoense
Rheotanytarsus
Hemerodromia
Tipula
Brillia flavifrons
Diplocladius cultriger
Parametriocnemus sp.
Stenochironomus sp.
unid. (Culicidae)
Dicranota sp.
Meropelopia sp.
Tribelos jucundum
Pericoma sp

(Order: Ephemeroptera)
Caenis sp.

(Order: Hemiptera)
Trichocorixa sp.
Sigara sp.

(Order: Trichoptera)
Cheumatopsyche sp.
Oecetis sp.
Hydropsyche
Lype diversa
Cheumatopsyche sp.
Hydatophylax sp.
Polycentropus sp.
Hydroptila sp.

(Order: Megaloptera)
Nigronia serricornis
Sialis sp.

Phylum: Mollusca

(Order: Veneroida)
Musculium secures
Pisidium casertanum
Pisidium compressum

(Order: Neotaenioglossa)
Amnicola granum
Amnicola limosus
Amnicola walkeri

(Order: Basommatophora)
Pseudosuccinea columella
Physa
Helisoma anceps
Physella sp.
Physella integra
Pseudosuccinea columella

(Order: Mesogastropoda)
Amnicola limosa

Like the Appoquinimink, limited aquatic insect data exists for the Blackbird watershed. The *Delaware National Estuarine Research Reserve Estuarine Profile* provides benthic macroinvertebrate community data for the upper Blackbird Creek region. This community consists of twenty-one taxa from three different Phyla. The three phyla include: Annelida (segmented worms), Arthropoda (insects and crustaceans), and Nemertea (ribbon worms). Five taxa represented 92% of the entire community sampled.

In order of decreasing abundance they are: oligochaeta (aquatic earthworms), chironomidae (midges), amphipods (*Corophium* & *Gammarus* spp.), and the isopods (*Cyathura polita*).

Table 14. Benthic macroinvertebrates known to occur in the Blackbird Creek watershed.

Phylum: Annelida

(Order: Canalipalpata)
Polydora ligni
Hypaniola florida
Scolecolepides viridis

(Order: Aciculata)
Nereis succinea

(Order: Spionida)
Streblospio benedicti

Phylum: Arthropoda

(Order: Amphipoda)
Corophorium sp.
Gammarus sp.

(Order: Isopoda)
Edotea triloba
Cyathura polita

(Order: Amphipoda)
Melita nitida
Chiridotea almyra
Gammaridae

(Order: Diptera)
Chironomidae
Ceratopagonidae

(Order: Decapoda)
Rhithropanopeus harrisi
Xanthidae

(Order: Mysida)
Neomysis americana

Phylum: Nemertea
Unknown species

The insect species of special concern in the Appoquinimink and Blackbird Watersheds are represented in seven different families. Six of these insects belong to the order Odonata, which are commonly known as dragonflies. These Odonates include: the bar-winged skimmer, blue-faced meadowhawk, comet darner, double-ringed pennant, harlequin darner, and sable clubtail. The remaining three insect species of concern are Lepidopterans, the order of butterflies and moths. The members of this order are: bronze copper, eyed brown, and gold-banded skipper (Bartlett website, July 31, 2006).

The bar-winged skimmer has an average size of about 2.2 inches and can be found in swamps, temporary pools and sedgy woodland bogs, seepages and mucky bogs. They prey on other insects and have a flight period from May through September. The bar-winged skimmer is classified by the State of Delaware as an S1.The blue-faced meadowhawk is most often found near temporary woodland ponds and swamps. Features like its pastel blue forehead and face, and bluish eyes distinguish the blue-faced

meadowhawk from others. The primary flight season is typically from August to late September. The blue-faced meadowhawk is ranked as an S1 by the State of Delaware. Darners are among the largest and fastest-flying North American dragonflies. The comet darner averages in size between 2 to four inches and maybe green, blue or brown in color. Their flight season is from September through August, and is ranked as an S1 by the State of Delaware. (Bangma, July 31, 2006) The harlequin darner is a very small darner with an average length of only 55 millimeters. They can be found in bogs and swamps, especially cypress, alder, and cedar swamps. The flight season for the harlequin darner is from January through August, and is ranked as an S1 (Bartlett website, July 31, 2006). The sable clubtail is a medium clubtailed dragonfly, usually found along small rocky, streams. Their flight season is from May through late June, and is considered an S1 by the State of Delaware (Bangma, July 31, 2006). The double-ringed pennant is usually found in lakes and ponds with emergent vegetation. They average in size between 31-36 millimeters, and have a flight season from May through June (Bartlett website, July 31, 2006). The Double-ringed Pennant is ranked as an S1 by the State of Delaware.

The bronze copper is a Gossamer winged butterfly, which are mostly small, and many of them very rare. The wings have delicate, streaked markings. They can be found in wet areas including marshes, swamps, wet meadows, and near reservoirs. These are medium-sized butterflies with a wingspan of 1 to 2 inches. The bronze copper is ranked as an S2 in the State of Delaware (Massachusettes Butterfly Club, July 31, 2006). The eyed brown is a member of the Nymphalidae family, which is comprised of brushfooted butterflies. The front pair of legs are modified into two small "brushes", and only four legs are used for walking around. These are pale brown with 4 eyespots on the forewing, and 6 on the hindwing, the spots are dark and slightly blurred. They prefer wet areas such as open sedge meadows, open bogs, cattail marshes, and slow streams containing sedges. The flight season for the eyed brown is from June to September, and is ranked as an SH by the State of Delaware (Bartlett website, July 31, 2006). The gold-banded skipper is a member of the Hesperiidae family; these differ from other families in slight ways. Their antennae clubs are hooked backwards and they have stocky bodies. The wing muscles are stronger than others in the order and their eyes provide better sight(Bartlett website, July 31, 2006). The gold-banded skipper averages between 1 to 2 inches in size and prefers damp, wooded ravines with permanent water sources. This insect is ranked as an SH by the State of Delaware.

The Alewife Floater is an aquatic mollusk belonging to the family Margeritiferidae. This fresh water muscle can be found in both the Appoquinimink and Blackbird watersheds. The Alewife Floater relies on the Alewife fish as a host for its larval stage. The Alewife Floater is a filter feeder, consuming algae and plankton in the water. These organisms keep the bacterial and planktonic populations under control and aid in the decomposition of detritus which helps to clean the water. They are a valuable food source for muskrats and other predators. The Alewife Floater is raked by the State of Delaware as an S1.

Table 15. Delaware Natural Heritage Program designated rare Invertebrate species known to occur in the Blackbird and Appoquinimink watersheds.

Common Name	Scientific Name	Global Rank	State Rank	Appoquinimink	Blackbird
Alewife Floater	*Anodonta implicata*	G5	S1	X	X
Bar-winged Skimmer	*Libellula axilena*	G5	S1		X
Blue-faced Meadowhawk	*Sympetrum ambiguum*	G5	S1		X
Bronze Copper	*Lycaena hyllus*	G5	S2		X
Comet Darner	*Anax longipes*	G5	S1		X
Double-ringed Pennant	*Celithemis verna*	G5	S1		X
Eyed Brown	*Satyrodes eurydice*	G4	SH		X
Gold-banded Skipper	*Autochton cellus*	G4	SH		X
Harlequin Darner	*Gomphaeschna furcillata*	G5	S1		X
Sable Clubtail	*Gomphus rogersi*	G4	S1		X

INVASIVE ANIMALS

Invasive fauna, much like flora, represents a threat to biodiversity and native organisms. Invasives may outcompete native species for resources such as food, habitat, etc. A larger number of invasive plants compared to animals have been reported in both watersheds. Nutria represent a relevant example of an invasive faunal species reported in the Blackbird and Appoquinimink Watersheds.

Nutria (*Myocastor coypu*) is a species native to South America that was introduced in the United States in the 1930's for fur production. Nutria may also be referred to as coypu, coypu rat, nutria rat, or swamp beaver. Nutria inhabit fresh and brackish marshes, rivers, bayous, farm ponds, freshwater impoundments, drainage canals, swamps and various other types of wetlands. Nutria are large rodents that look like beavers with long, thin tails. Nutria may weigh up to 20 lbs., but on average weight between 12-15 lbs. with males slightly larger than females. They have dense, grayish underfur overlaid by long glossy guard hairs that vary in color from dark brown to yellowish brown. Nutria are primarily nocturnal (active at night), with peak activity occurring near midnight. When food is abundant, nutria rest and groom during the day and feed at night. When food is limited, daytime feeding increases, especially in wetlands free from disturbance. Nutria feed almost entirely on vegetation. They consume about 25% of their body weight daily. They have high reproductive capacity and feed primarily on marsh plants, creating open water and removing habitat for native species, especially muskrat and waterfowl, which is why Nutria are creating problems in some areas. Individual sightings of Nutria in the Appoquinimink and Blackbird watersheds have been reported.

APPENDIX I: Wetland Delineation Protocol

Wetland Delineation Protocol

In 1991, Congress mandated the use of the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual, referenced under "Environmental Laboratory," for those involved in the mitigation and delineation of wetlands. The U.S. Army Corps of Engineers is responsible for the federal regulation of wetlands under Section 404 of the Clean Water Act and defines wetlands as: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (Environmental Laboratory, paragraph 26a). In short, vegetation, soil, and hydrology are used to determine the presence of wetlands and visible wet conditions may not always be present.

Hydrophytic vegetation consists of plants that have adapted for growth in water or soils excessively saturated and their dominant presence is the strongest evidence of wetland conditions because wetland hydrology, although sometimes only seasonally present, greatly determines where plants can grow and soils must be saturated for a long time before they become oxygen-deficient (anaerobic) and start to develop hydric soil properties. "Plants lacking morphological, physiological, and/or reproductive adaptations cannot grow, effectively compete, reproduce, and/or persist in areas that are subject to prolonged inundation or saturated soil conditions" (Environmental Laboratory, paragraph 32).

To simplify wetland identification, most plant species have been placed in one of five indicator status categories that were developed by the United States Fish & Wildlife Service's National Wetlands Inventory and modified by the National Plant List Panel. These five categories are: Obligate Wetland Plants (OBL), Facultative Wetland Plants (FACW), Facultative Plants (FAC), Facultative Upland Plants (FACU) and Obligate Upland Plants (UPL). The USDA's on-line plants database, http://plants.usda.gov/, provides the wetland category for most plant species. Each category is characterized by a percentage likelihood of growing in a wetland rather than upland: OBL=99%, FACW=67% to 99%, FAC=33% to 67%, FACU=1% to 33%, and UPL=1%. The facultative categories are further divided into wetter (+) and dryer (−) subcategories by the National Plant List Panel. The dominant presence of FACW to OBL species is strong evidence of wetland conditions, FAC species are treated as neutral, and the dominant presence of FACU to UPL species indicates that upland conditions exist. When evidence from plant communities is inconclusive, soils and hydrology must be observed for wetland indicators.

Since wetland conditions vary by season and from year to year, a dry period may allow upland plant species to temporarily invade wetland habitat and alter vegetative communities but that does not imply that an area is not a wetland. Observation of area soils is a better indicator of wetland status during these times of drought. As stated the presence of saturated soils influences the dominance of hydrophytic vegetation. The prolonged saturation of soil from flooding or ponding during the growing season, soil chemical processes are slowed as temperatures drop, creates anaerobic or oxygen

deprived conditions that form hydric soils and their distinctive characteristics. Soil series and land types in the Appoquinimink River and Blackbird Creek watersheds often exhibiting hydric soil characteristics include Elkton, Fallsington, Johnston, Mixed Alluvial Land, Othello, Pocomoke, and Tidal Marsh. (Hydric Soils map)

Evidence of hydric soils differs by sandy and non-sandy soil types. Non-sandy hydric soils are easier to identify since color and moisture are reliable indicators. Anaerobic conditions within non-sandy soils are indicated by:
Histosols—organic soils; soils that are composed of 50% or more organic material within the upper 32 inches or to depth of bedrock.
histic epipedons—an 8 to 16 inch mineral hydric soil surface layer that is normally saturated for 30 or more consecutive days each year and is composed of at least 20% organic matter when clay is absent or at least 30% organic matter when clay composes at least 60% of the soil. These levels of organic matter indicate that organic decomposition has been slowed by anaerobic conditions.
sulfidic material—hydrogen sulfide creates the odor of rotten eggs and is only produced by anaerobic conditions.
aquic or peraquic moisture regimes—nearly constant conditions of inundation or saturation that eliminate or severely reduce dissolved oxygen levels such as those present in tidal marshes.
reducing soil conditions—biological activity limiting state produced within aquic or peraquic moisture regimes, transforms ions of iron from a ferric valence state to a ferrous valence state and is detectable with a ferrous iron test.
gleyed soils—the final color of most soils undergoing oxidation-reduction of iron, manganese, and other elements as micro-organisms deprived of dissolved oxygen instead obtain oxygen from mineral compounds is a dark gray or "gley." Usually occurs in hydric soils below the A-horizon or within 10 inches of the surface, but does not always occur in red soils. Also, glauconite or green sand within some sandy soils can falsely produce the appearance of gleying.
bright mottles—splotches of lighter colored soil evident before soil layers become completely gleyed.
iron/manganese concretions—soft black or dark brown iron and manganese oxide concretions 2mm in diameter occasionally formed within reduced soils during the oxidation-reduction process and found within 7.5cm of the surface

Sandy soils are harder to classify as hydric because they usually do not experience drastic color changes caused by anaerobic conditions and can be deeper and thus display evidence of saturation further down, but the other evidence mentioned for non-sandy soils can occur in some form within sandy soils:
high organic matter—As stated before, the accumulation of organic matter within surface layers is strong evidence for anaerobic conditions.
subsurface streaking—organic matter can be pulled down through subsurface layers by a fluctuating water table and create vertical dark streaks.
organic pans (spodic horizon)—thin horizon of accumulated organic material cemented with aluminum and occurring at the average water table depth usually 12 to 30 inches below the A-horizon surface.

Wetland hydrology consists of all water events that occur in areas seasonally flooded or saturated during the growing season. Forms of wetland hydrology include:
inundation—the presence of surface water. Must be prolonged to create wetland conditions, some floodplains with good drainage never develop hydric soils.
soil saturation—elevated water table and/or surface water prevented from permeating downward by a compacted or cemented soil layer. Usually present within 12 inches of the surface before influencing plant communities.
drainage patterns—surface evidence of water flow; channels carved by storm water runoff, flooding, or tidal movements. Topography must also be observed since drainage patterns are evident on all land types.
drift lines—stream or tidal flood debris forming lines on the ground or entangled in vegetation near the extent of inundation.
sediment deposition—film of organic or mineral material encrusted on material as inundation subsides.
watermarks—stains left on objects, such as tree trunks and bridge pillars, after flooding events.

Although direct evidence of wetland hydrology is often seasonal, the dominant presence of hydrophytic vegetation and the development of hydric soils is strong secondary evidence since neither can occur without periodic inundation or soil saturation. In addition, the duration of inundation and/or soil saturation during the growing season is more influential than frequency towards hydrophytic vegetation dominance and hydric soil development. One long wet period is better than multiple short flooding events. Also, clay soils have a slower permeability than sandy or loamy soils and thus are more likely to develop prolonged durations of inundation or soil saturation. Finally, the type and density of vegetative growth influences hydrology. In general, dense plant cover slows drainage, which increases the frequency and duration of wet conditions, but increases transpiration rates which reduces the duration of those periods.

Appendix II: Heritage Ranking System

Heritage Ranking System

Delaware Natural Heritage Program utilizes the heritage ranking scheme developed by The Nature Conservancy. This ranking system is used by all Natural Heritage Programs, The Nature Conservancy, Conservation Data Centers and their network cooperators worldwide. Heritage ranks are assigned to all currently trackable taxonomic groups found within the state of Delaware. Each species is given a state rank to reflect the degree of rarity within the state, and a global rank to indicate degree of rarity worldwide. In general, animal ranks are determined by the number of known occurrences (or populations) of a particular species as determined by reproductive evidence through field investigations by knowledgeable individuals. These ranks are then used to prioritized conservation efforts to provide long-term protection for our most threatened animals.

The following are definitions of both the state and global ranking system reported on the Delaware Division of Fish and Wildlife web site. Some ranks do not appear within this document but are regularly used by the Delaware Natural Heritage Program.

GLOBAL RANK:

G1- Imperiled globally because of extreme rarity (5 or fewer occurrences worldwide) or because of factors which immediately threaten the existence of the species.

G2- Imperiled globally because of extreme rarity (6 to 20 occurrences) or because of factors which make the species particularly vulnerable to extinction throughout its range.

G3- A species which is either very rare and local throughout its range (21 to 100 occurrences) or found only locally in a restricted range, or because of some other factor making it vulnerable to extinction throughout its range.

G4- Apparently secure globally but uncommon in parts of its range.

G5- Secure on a global basis, but the species may be uncommon on a local basis.

GH- Historically known with the expectation that it may be rediscovered.

GX- Species apparently extinct throughout its historic range.

GU- Species apparently in peril, but status is undetermined.

G?- Species has not yet been ranked.

Q- If a taxon is treated as a full species, a "Q" can be added to the global rank to denote its questionable taxonomic assignment.

T- Species with a "T" denote that the infraspecific taxon is being ranked differently than the full species.

STATE RANK:

S1- Extremely rare within the state (typically 5 or fewer occurrences) or because some factor immediately threatens the future existence of this species within the state.

S2- Very rare within the state (typically 6 to 20 known occurrences). Species is susceptible to becoming extirpated.

S3- Rare to uncommon; typically 21 to 100 known occurrences. S3 species are not immediately threatened with extirpation, but may be if additional populations are destroyed.

S4- Species apparently secure within the state under present conditions.

S5- Species very common throughout the state; demonstrably secure under present conditions.

SU- Species status uncertain within the state. Usually an uncommon species which is believed to be of conservation concern but there is inadequate data to determine degree of rarity.

SH- Species historically known from the state but populations or reproductive evidence not verified for an extended period of time (usually 15+ years). There are expectations that this species may be rediscovered.

SX- Species presumed to be entirely extirpated from the state. All historical locations and/or potential habitat has been inventoried unsuccessfully. There are no expectations that this species will be rediscovered within the state.

SE- Exotic (introduced through human influence) within the state; not a part of the native fauna.

SR- Reported from the state, but no evidence exists for accepting or rejecting the report.

SRF- Reported falsely from the state but this report persists in the literature.

SA- A species which occasionally accidentally enters the state.

SC- A species which casually enters the state on a periodic basis but there is no evidence of reproduction or of potential reproductive habitat existing within the state.

S?- Species has not yet been ranked

For long distance migrant animals a particular species' breeding status may be very different than its nonbreeding status, i.e. a species which winters commonly in Delaware may be a rare breeder within the state. B and N qualifiers are used to denote breeding and

nonbreeding status respectively. For example, the Northern Harrier (*Circus cyaneus*) is a common winter resident but a very rare breeder and is, therefore, ranked S1B,S4N. A Z qualifier is used to denote species which regularly migrate or winter in Delaware, but do not maintain definable occurrences during such periods. For lepidoptera species, however, a SZB rank can be given for those individuals which regularly migrate through the state, breed, but no individuals survive to maturity.

Appendix III: Maps

Appendix IV: Public Opinion Survey Data

Region 2- Southern New Castle County
Blackbird/Appoquinimink Watershed Area

Statewide Comprehensive Outdoor Recreation Plan (SCORP)
Public Opinion Survey Data

State Comprehensive Outdoor Recreation Plan

In May and June 2008, the Division of Parks and Recreation conducted a telephone survey of Delaware residents to gather information and trends on outdoor recreation patterns and preferences as well as other information on their landscape perception. These findings are the foundation of the 2009-2011 Statewide Comprehensive Outdoor Recreation Plan (SCORP) providing guidance for investments in needed outdoor recreation facilities.

Importance of Outdoor Recreation

When looking at the findings from the 2008 telephone survey, it is apparent that Delawareans place a high importance on outdoor recreation. Statewide, 91% of Delaware residents indicate that outdoor recreation had some importance in their lives, while 64% said it was very important to them personally. These findings are very close to the result of the same question asked in a similar 2002 public opinion telephone survey, indicating a continued demand for outdoor recreation opportunities throughout the state.

Placing high importance on outdoor recreation resonates throughout the five SCORP regions. In Region 2 (Southern New Castle County), 92% of residents indicated that outdoor recreation had some importance in their lives, while 68% (more than any other region) said it was very important to them personally.

Reasons for Participating in Outdoor Recreation

Similar to the 2002 public opinion telephone survey, the top reasons for participating in outdoor recreation include; for physical fitness, to be with family and friends, and both for relaxation and to be close to nature. According to the 2008 telephone survey responses, physical fitness is, by far, the number one reason given for participating in outdoor recreation. This response to the same question increased statewide from 2002-2008 from 49.7% to 59% respectively. A similar increase in the response from the 2002 telephone survey and the 2008 survey can be seen across all SCORP regions.

Region 2 had the highest percentage (64%) of the residents that said they participate in outdoor recreation for their physical fitness. This is a 18% increase from the same question asked in 2002. The second most frequent response included both to be with family and friends (21%), for relaxation (18%), and to be close to nature (17%).

When asked which of the following would encourage more active participation in outdoor activities, more than half of the respondents (54%) statewide said more close to home outdoor facilities and opportunities. When asked what would encourage Region 2 residents to participate more actively in outdoor recreation, nearly two thirds of the responses included more outdoor facilities or opportunities close to home.

Water-based Participation in Outdoor Recreation

Water based outdoor recreation activities are more popular in Region 2 than in most other regions throughout the state. In Region 2, more than half of those surveyed (52%) expected a member of their household to go fishing within the next 12 months while nearly a third expected a member of their household to boat by canoe/kayak (31%) or powerboat (29%).

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APPENDIX M

additional input from fishermen in convenient locations. These meetings address that recommendation and will solicit input from attendees on all of the potential ways to improve squid assessment and management that were recommended at the workshop.

Special Accommodations

The meeting is physically accessible to people with disabilities. Requests for sign language interpretation or other auxiliary aids should be directed to M. Jan Saunders at the Mid-Atlantic Council Office, (302) 526–5251, at least 5 days prior to the meeting date.

Dated: May 2, 2013.

Tracey L. Thompson,

Acting Deputy Director, Office of Sustainable Fisheries, National Marine Fisheries Service.

[FR Doc. 2013–10751 Filed 5–6–13; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

National Estuarine Research Reserve System

AGENCY: Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

ACTION: Notice of Public Comment Period for the Grand Bay, Mississippi National Estuarine Research Reserve Management Plan and the Delaware National Estuarine Research Reserve Management Plan revisions.

SUMMARY: Notice is hereby given that the Estuarine Reserves Division, Office of Ocean and Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce is announcing a thirty day public comment period for the Grand Bay, Mississippi National Estuarine Research Reserve Management Plan and the Delaware National Estuarine Research Reserve Management Plan revisions. Pursuant to 15 CFR Section 921.33(c), the revised plans will bring the reserves into compliance. The Grand Bay Reserve and Delaware Reserve revised plans will replace the plans approved in 1999 and 2004 respectively. Both revised management plans outline the administrative structure; the research & monitoring, education, training, and stewardship goals of the reserve; and the plans for future land acquisition and facility development to support reserve operations. The Grand Bay Reserve takes an integrated approach to management, linking research, education, training and stewardship functions to address high priority issues including climate change, threats to reserve resources and ecological functions, watershed development, and changes in water quality. Since the last management plan, the reserve has built out its core programs and monitoring infrastructure; constructed a L.E.E.D. certified Coastal Resources Center that includes laboratories, offices, classrooms, interpretative areas and dormitories; and created interpretive trails.

With the approval of this management plan, the Grand Bay Reserve will decrease their total acreage from 18,400 acres to 18,049. The change is attributable to accuracy adjustments based on improved geographic information for the site. The revised management plan will serve as the guiding document for the 18,049 acre Grand Bay Reserve for the next five years. The Delaware management plan will focus on improving the scientific understanding of estuarine and coastal ecosystems; improving public awareness and environmental literacy to enable environmentally sustainable decision-making; and protecting, managing and restoring the reserve to serve as a model site for sustainable community stewardship. Notable changes in the revised plan include a boundary expansion, a new coastal training program, implementation of the Blackbird Creek Reserve Master Ecological Restoration Plan, the opening of the Blackbird Creek Stewardship Center and facility improvements to the St. Jones Coastal Training Center. With the approval of this management plan, the Delaware Reserve will increase their total acreage from 4,930 acres to 6,206. The change is attributable to acquisition of two parcels, totaling 64.3 acres, and increased mapping accuracy. The two parcels possess high ecological value and increased opportunities for research, education, and restoration. The revised management plan will serve as the guiding document for the 6,206 acre Delaware Reserve for the next five years. View the Grand Bay, Mississippi Reserve Management Plan revision at (*http://grandbaynerr.org/reserve-management-plan*) and provide comments to (*dave.ruple@dmr.ms.gov*). View the Delaware Reserve Management Plan revision at (*http://de.gov/dnerr*) and provide comments to (*Kimberly.Cole@state.de.us*).

FOR FURTHER INFORMATION CONTACT: Matt Chasse at (301) 563–1198 (Grand Bay), Michael Migliori at (301) 563–1126 (Delaware) or Laurie McGilvray at (301) 563–1158 of NOAA's National Ocean Service, Estuarine Reserves Division, 1305 East-West Highway, N/ORM5, 10th floor, Silver Spring, MD 20910.

Dated: April 25, 2013.

Christopher C. Cartwright,

Associate Assistant Administrator for Management and CFO/CAO, Ocean Services and Coastal Zone Management.

[FR Doc. 2013–10372 Filed 5–6–13; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648–XC661

National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration; Northwest Fisheries Science Center; Online Webinar

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of online webinar.

SUMMARY: The Northwest Fisheries Science Center (NWFSC) will hold an online Pre-Assessment Workshop webinar to provide an overview of the data sources, data trends and population models that will be used in the upcoming Pacific coast groundfish stock assessments for rougheye rockfish, aurora rockfish, shortspine thornyhead and longspine thornyhead. The online NWFSC Pre-Assessment Workshop webinar is open to the public, although space for online access is limited to the first 25 participants.

DATES: The NWFSC Pre-Assessment Workshop webinar will commence at 1 p.m. PST, Tuesday, May 28, 2013 and continue until 4 p.m. or as necessary to complete business for the day.

ADDRESSES: See **SUPPLEMENTARY INFORMATION** for specific addresses and all other necessary information pertaining to the webinar.

Science Center address: Northwest Fisheries Science Center, 2725 Montlake Boulevard East, Seattle, WA 98112.

FOR FURTHER INFORMATION CONTACT: Ms. Stacey Miller, NMFS Northwest Fisheries Science Center; telephone: (541) 867–0562.

SUPPLEMENTARY INFORMATION: To attend the NWFSC Pre-Assessment webinar, please reserve your seat by visiting: *https://nwfscfram.webex.com/nwfscfram/j.php?ED=19623343&UID=*

DNREC – Delaware Coastal Programs

PUBLIC NOTICE

Draft 2013-2018 Delaware National Estuarine Research Reserve Management Plan:
The Delaware National Estuarine Research Reserve Management Plan is being revised. The Reserve received vital input from advisory groups and stakeholders during the development of the draft 2013-2018 management plan which is available to the public for review and comment.

The Reserve takes an integrated approach to management, linking research, education, training and stewardship functions to address priority coastal and estuarine issues. The 6,206 acre Reserve located in New Castle County and Kent County was designated into the National Estuarine Research Reserve System in 1993.

A copy of the draft plan is available online http://de.gov/dnerr.

Comments concerning the draft management plan will be accepted for 30 days from the date of this notice. Comments should be sent to: Delaware National Estuarine Research Reserve, Ms. Kimberly Cole, Environmental Program Manager, 818 Kitts Hummock Road, Dover, DE, 19901 or via email to kimberly.cole@state.de.us. For additional information please call (302) 739-6377.

Insert date: April 03, 2013

No Comments Received.