

Land Use Decision Making and Wetland Protection: A Guidebook for Public Participation



*“A universe in a few square feet...It has to do with edges.
Life loves those joints, intersections, overlaps and seams where land joins
water, forest borders field, fields fall off to beaches and marshes, marshes
to shallows, shallows to channels.”*

—Tom Horton The Bay Journal

Delaware Wetlands

Purify...Provide...Protect

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You can make a difference for future generations!

Since settlement, we have lost approximately 50% of Delaware's wetlands. Despite efforts to save our remaining wetlands we continue to lose them and harm their health through pollution, development and agricultural pressure. To turn the tide, private citizens, corporations, government agencies, and conservation groups must team-up to reduce wetland loss and to improve the health of our remaining wetlands. Citizens and conservation groups can work together to urge public officials in our towns, counties, and state to effectively protect wetlands, including the current most vulnerable habitat—freshwater wetlands.

This guidebook is intended to share with you Federal, State, and County decision making processes that can affect wetlands and how you can work to protect wetlands by becoming involved in your land use decisions.

We thank you for picking-up this guide and joining us in the effort to protect our wetland resources in order to share their splendor with future generations and to allow wetland habitats to continue providing the valuable services on our landscape such as purifying our water, protecting us from storms, and providing habitat for wildlife, and places for us to rest, recreate, and restore.

Approximately 80% of our State's wetlands are privately owned. Landowners with wetlands on their property can serve as stewards of these rich natural resources by voluntarily enrolling in conservation and restoration opportunities for their land. Everyone has a role to play in wetland conservation and everyone can make a difference!

Landowners can find information about voluntary wetland restoration and protection programs at <http://de.gov/wetlandrestoration>.

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Sussex County, www.sussexcountyde.gov/





Background

What Good Are Wetlands?

Ecosystem services are “the components of nature, directly enjoyed, consumed or used to yield human well-being.”

Wetlands provide a variety of benefits to humans and the environment. They provide habitat for plants and wildlife, cleanse our water, decrease the impact of severe storms, reduce flooding by absorbing runoff, and provide educational and recreational opportunities. In some ways their worth is inestimable, and in others we are only now beginning to put a dollar value on the services they provide. It has been estimated that the global value of wetland ecosystems reaches \$14.9 trillion (Costanza et al. 1997). What we do know is that—when removed from the landscape—the benefits wetlands supply are sorely missed and can cost significant amounts of time and money to replace or recover.

Flood Conveyance—Wetlands along rivers and streams and their adjacent floodplains help to channel water and convey it downstream during storms. If the natural channel systems are filled or blocked, flooding occurs. Recent natural disasters, such as the damage done to the Gulf Coast by Hurricane Katrina, speak to the significance of wetlands in protecting coastal areas from the damaging impacts of storms and floods, and to the magnitude of human and economic losses that occur where their services have been lost.

Barriers to Waves and Erosion—Wetlands help reduce damage during storms by absorbing wave energy before it reaches adjacent upland areas. The extensive root systems of wetland plants protect the land from erosion.

Flood Storage—Wetlands act like sponges during flood conditions. They capture rain and flood waters and slowly release the water downstream. A one-acre wetland can hold 330,000 gallons of water. The cost to construct flood control facilities to replace the flood storage capacity lost from the filling of wetlands would, in most cases, be prohibitive.

Erosion Control—When runoff enters a wetland the vegetation slows the flow of the water. Wetlands along the edge of streams, bays, ponds, and other water bodies help to stabilize shorelines and prevent erosion from occurring. Erosion can lead to the need for costly and potentially environmentally damaging dredging to clear channels and waterways that are choked with sediment generated by runoff that is not buffered by wetland vegetation.



Pollution Prevention and Control—Because of their amazing water-cleansing capacities, wetlands have been called “the kidneys of our watersheds.” Wetlands filter and process some nutrients, chemicals, and sediment coming from stormwater runoff. Often the contamination is introduced via runoff and if the water bodies were better protected by wetland buffers and upstream wetland complexes our water bodies would be less threatened.

Fish and Shellfish Production—It is estimated that anywhere from 85-95% of our recreationally and commercially important coastal fisheries rely on tidal wetlands as a place to shelter and grow their young. Salt marshes are some of the most productive systems on earth, out competing modern agriculture. When the plants that grow in these systems breakdown and decompose, the detritus or organic materials they generate are useful as nutrition for the marsh food web. The tiny fragments of plants and organic matter flow through the wetlands and out into the open water to be fed upon by plankton up the food chain to commercially important fish such as oysters and striped bass.



Habitat for Waterfowl and Other Wildlife, Including Rare and Endangered Species—Both coastal and inland wetlands are such unique places existing at the land water interface that they provide habitat for many rare plant and animal species. They serve as nesting, feeding, and nursery grounds for fish, birds, insects, reptiles, amphibians, and mammals alike. The habitats adjacent to wetlands are also very important to diversify the resources available to wildlife and their different life stages.

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(The Value of Wetlands continued)



Recreation—Great numbers of sport and recreational fish species are dependant on wetlands for feeding and spawning. Waterfowl species are also connected to wetlands for foraging, resting, and reproduction. A U.S. Fish and Wildlife Service survey in 2006 reported that in Delaware wildlife-associated recreation expenditures reached \$299 million. Fishing accounted for \$97 million, hunting for \$41 million, and wildlife watching for \$131 million. These hobbies depend on wetland resources and drive an industry to supply the equipment and guide needs of those that practice wildlife-related recreation.

Water Supply—Wetlands contribute to ground water and surface water supplies, important sources of drinking water in Delaware. Wetlands help to store and purify surface waters. In times of drought, wetlands play a key role in storing and holding on to water.

Historic, Archeological Values—Native people on Delmarva relied on both coastal and inland wetlands to provide seasonal food and other resources to survive. Artifacts of these former settlements still exist around the Inland Bays.

Education and Research—Wetlands are fertile environments for learning. Some schools are creating and restoring wetlands on their property to use as outdoor classrooms, providing a hands-on settings for science, math, language, and art.

Open Space and Aesthetic Values—The diversity and beauty of wetland habitats are unmatched and contribute to human gratification. Exposure to and recreation in nature reduces stress and provides health benefits.

Wetland Types of Delaware

Delaware’s landscape is rich in variety of wetland habitats, with each type supporting unique communities of plants and animals. What follows is an attempt to acquaint you with the most prominent kinds, including ones you are most likely to ‘bump into’ in your travels throughout the state, and may even have an example of on your land.

Salt and Brackish Marshes fringe Delaware’s coast from the upper reaches of Delaware Bay south to the Inland Bays. Flooded daily by tidal waters carrying salt water from the ocean and bay, these habitats are strongly influenced by salinity—becoming less salty the further up bay, river and stream. Dense stands of *Spartina* grasses characterize the treeless landscape. A more varied flora and fauna can be found as the water becomes less salty.

Salt marshes provide critical nursery habitat for fish and shellfish, vital resting areas for migratory waterfowl and wading birds, and protect us from impacts of coastal storms and floods. Historically, many coastal marshes were drained or ditched for agriculture or mosquito control. Restoring natural tidal flow is a key restoration focus. Unexplained vegetation dieback is a current concern.



Freshwater Tidal Marshes are becoming rare in Delaware due to salt water intrusion from sea-level rise, with the best remaining examples occurring upstate along the Christina River and downstate along the upper reaches of the Nanticoke. Like salt and brackish marshes, they are flooded daily by the tide, but are so diluted by freshwater sources that their salinity levels are very low. These conditions foster a high diversity of wetland plants, including: spatterdock, pickerelweed, arrowhead, cattail, wild rice, water-willow, buttonbush and others.

Because freshwater tidal marshes have become scarce, and since those that remain supports numerous rare and threatened plant species



(many of which are being displaced by invasive plants, such as *Phragmites*), these habitats merit a high priority for preservation and restoration.

Scrub-Shrub Wetlands may occur as isolated wet thickets fed by seasonal high water tables (non-tidal situations) or in tidally-fed river bank areas along coastal waterways (e.g. Spring Creek, Cedar Creek, and the St. Jones, Murderkill and Broadkill Rivers). As the name implies, shrubs are prominent in the flora, including: buttonbush, red maple, black willow, smooth alder, marsh elder, high-tide bush, and others, the mix depending on the level of salinity influence.



Scrub-shrub wetlands help stabilize stream banks and provide cover for birds and other wildlife. Although not as strongly impacted by human activities as many other wetland habitats, certain scrub-shrub wetland subtypes (red maple/ash tidal swamps and smooth alder/silky dogwood swamps) are listed as habitats of special conservation concern in Delaware.

Atlantic White Cedar Swamps are found mainly in Sussex County, where they occur in poorly-drained, acidic, highly organic soils, either along river floodplains (including Cedar Creek, the Mispillion River and the Nanticoke River), or in the headwaters of mill ponds. They feature a white cedar tree canopy with deciduous (typically maple/gum) trees mixed in. A unique community of sphagnum moss and carnivorous plants occupies the forest floor.



Prior to extensive timbering and drainage during the 1800's and 1900's, white cedar swamps were abundant in Delaware, including hundreds of acres within the Great Cypress Swamp. Though now scarce in Delaware, cedar swamps provide critical habitat for certain species (sundews, pitcher plants, dragonflies, salamanders, etc.) found in few other places in the state.

Bald Cypress Swamps in Delaware are the northernmost in the United States, and thus comprise an especially unique ecosystem to this region. Easily distinguished by the presence of the evergreen, knobby-kneed Cypress trees, these swamps can be found within forested floodplains of some southern

Delaware rivers and creeks, including the James Branch near Trap Pond, Trussum Pond, the Great Swamp, and a small stand near Killens Pond.

In addition to supporting unique plant and animal communities and providing wetland benefits to the watershed, Delaware's Bald Cypress swamps are among the most scenic and serene places to explore by canoe or kayak, with Trap Pond State Park being a prime point of entry.



SEASONAL FRESHWATER WETLANDS

The following wetlands share several features. They are largely freshwater non-tidal, usually fed by seasonal rains or high groundwater levels, and appear wet at the surface for only part of the year (typically winter through early spring). They also feature some of our most vital habitats for biodiversity in the state (including many species found nowhere else), and are also the ones most vulnerable to loss through human impacts. Many people do not realize that these places are indeed wetlands.

Wet Flatwood Swamp Forests are one of the most important, but least well-recognized wetland types in Delaware. Also called “winter wet woods”, they occur as mixed hardwood forests in the headwaters of many coastal plain streams, and as Loblolly Pine/maple-gum swamps in areas fringing the Inland Bays. They are seasonally-wet in nature.

Flatwoods provide large areas that can filter pollutants coming off the surrounding lands before they reach the stream, and are thus critical to maintaining water quality downstream. As with the other freshwater wetlands featured here, their seasonality makes wet flatwoods especially vulnerable to human impacts, and thus a critical focus for preservation efforts.



Floodplain Hardwood Swamps, also called ‘riparian’ or ‘riverine’ swamps, occur along the more downstream portions of some of the major rivers and their tributaries in Delaware. Historically, many were dammed to form impoundments (e.g. Killens Pond on the Murderkill, Haven Lake on the Mispillion, and Collins Pond on the Nanticoke). Those remaining feature a mix of deciduous trees, including: red maple, sweet gum, black gum, willow oak, pin oak and others.

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(Wetland Types continued)



As their name implies, floodplain swamps play a critical role in absorbing runoff reaching rivers and streams, thus reducing the impacts of floods and storms. Like the other wetland types on this page, floodplain swamps also provide vital wildlife habitat, adding to their conservation value.

Wet Meadows are another freshwater wetland type that may escape notice for not appearing wet over much of the year. But they do receive sufficient groundwater; rainwater and/or snow melt to show standing water at the surface for part of the year. Just below the surface, soils remain waterlogged for longer periods, supporting development of a plant community that includes a variety of reeds, sedges, rushes, asters, goldenrods and other soggy-soil adapted plants.

Wet meadows also support unique wildlife species, most notably, the endangered bog turtle. Because they appear dry at the surface for the better part of the year, wet meadows have often been viewed as non-wetland in

nature and thus vulnerable to filling and draining for other uses. Where water source and soil conditions allow, wet meadows restoration projects are easily done.

Coastal plain ponds, also called Delmarva Bays, are isolated, small, shallow, seasonally-wet areas, often circular in shape, fed by groundwater, rainfall, and snow melt in winter or spring and drying up in summer and fall. Over a thousand

of these exist in the state, concentrated in inland parts of lower New Castle and upper/middle Kent counties. Often surrounded by woodlands, the inner (wetter) zones feature a variety of low shrubs (e.g. buttonbush) and non-woody plants.

Despite their isolated, seasonal nature, coastal plain ponds provide critical habitat to many rare and threatened plants and animals, and are especially vital to frog and salamander breeding. Many of these habitats have been lost already, and those remaining are vulnerable to development. Preservation of adjacent contiguous forested habitats is a high conservation priority.

UNIQUE SWALES, FENS, AND SEEPS

The recent Delaware Comprehensive Wildlife Conservation Strategy recognizes at least 119 habitat types in the state, of which 79 are wetlands. This includes several subtypes of the above-described categories, as well as various other small, but specialized, wetland types far too numerous to distinguish here.

Although the latter—featuring such catchy names as interdunal swales, sea level fens (pictured at right), and Piedmont streamside seeps—typically comprise small, off-the-beaten path kind of places—they also offer habitats unique and essential to some of our most rare and threatened species, and are thus of critical conservation concern to Delaware’s natural heritage.



Delaware Wetlands Status and Trends¹

Currently 30% of the state is covered by wetlands representing over 350,000 acres. Tidal wetlands represent about one third of Delaware's wetlands, the remainder are non-tidal and include all of our freshwater wetland areas.

Losses:

From the early 1980's through the early 1990's, 2,000 acres of wetlands were lost. The losses were primarily comprised of non-tidal wetlands, mostly forested. Main causes of loss:

- Conversion to cropland or pasture
- Residential development

DNREC was recently awarded a grant to fund an updated Status and Trends Report to determine the most recent causes of wetland loss. The results will be available on the Delaware Wetlands website www.dnrec.delaware.gov/Admin/DelawareWetlands/Pages/DelawareWetlandsStatusandTrends

Human impacts:

Delaware has lost approximately 54% of its wetlands since the 1780's. Human impacts to Delaware wetlands include:

- filling for commercial, industrial, and residential development
- disposal of dredged material and garbage (e.g., sanitary landfills)
- dredging for navigation and marinas
- conversion to cropland or pasture
- conversion of natural wetland forests to pine plantations
- creation of diked impoundments for water supply and wildlife management
- pond construction
- alteration of hydrology (e.g., drainage and channelization projects)
- direct or indirect discharge of pollutants (e.g., oil, pesticides, herbicides, and other chemicals, sediment, domestic sewage, and agricultural wastes)
- spreading invasive and/or exotic species (e.g., Phragmites and Purple loosestrife).

¹Delaware's Wetlands: *Status and Recent Trends*. U.S. Fish and Wildlife Service, Northeast Region, Hadley, MA. Prepared for the Delaware Department of Natural Resources and Environmental Control, Watershed Assessment Section, Division of Water Resources, Dover, DE. Cooperative National Wetlands Inventory Publication. 19 pp.



Filling of wetlands



Stream Channelization



Dumping in wetlands

Wetland Health · Inland Bays Example

Why do we assess and monitor the health of our wetlands?

By better understanding the health of our wetlands, we can better understand how to protect them from actions that cause damage. Wetlands provide many important services to humans and the environment including: water quality, providing habitat for fish, wildlife and rare plants, protecting us from flooding and storm damage, and providing open space on the landscape. An unhealthy wetland is less likely to provide these services to its fullest abilities. Data we obtain from scientifically assessing our wetlands is being used to design wetland restoration plans for watersheds and help us better understand how land use decisions impact the health of wetlands.

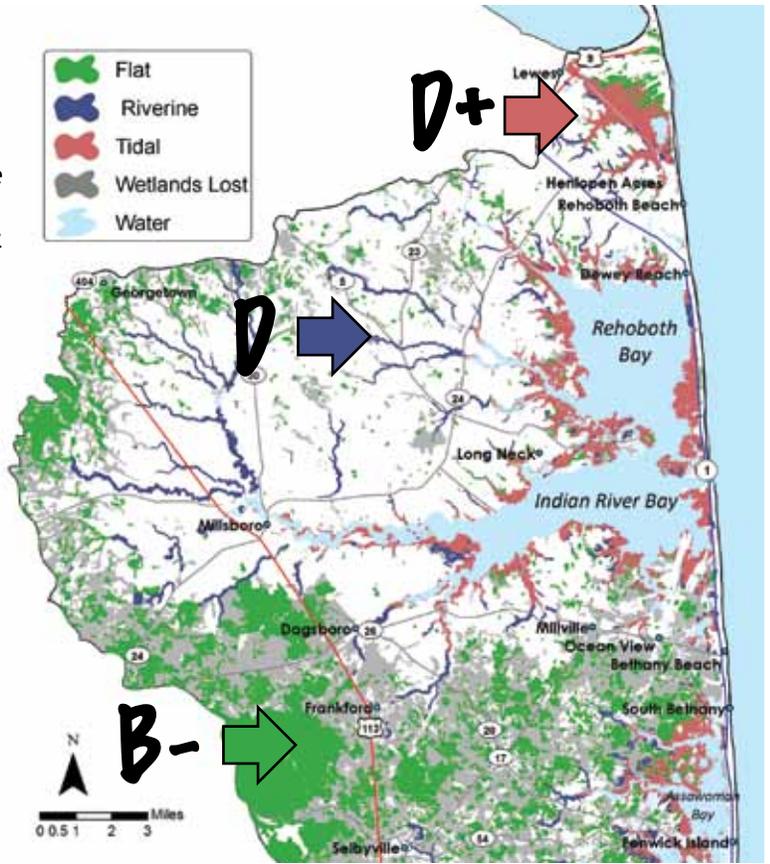
Assessments have been completed in the Nanticoke, Inland Bays, St. Jones, and Murderkill watersheds. Thus far, the data indicates that the majority of Delaware's remaining wetlands have been degraded from their ideal condition.

The main stressors degrading our wetlands include: direct and indirect impacts listed on page 15.

As reports are completed for each watershed, they will be placed at the link below.

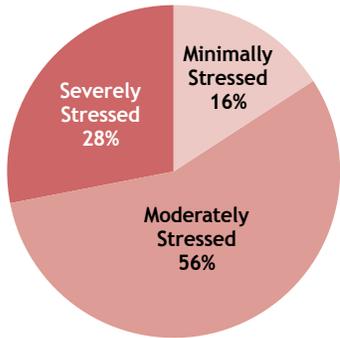
www.wr.dnrec.delaware.gov/Information/OtherInfo/Pages/WetlandMonitoringandAssessment

Inland Bays Watershed Wetlands



In addition to the out right loss of wetlands, many of the remaining wetlands in Delaware have been degraded by human activities which reduces the services that they provide. Based on an assessment of wetlands in the Inland Bays watershed the majority of wetlands have been degraded which further supports the need to prevent additional loss and focus on improving the condition of the remaining wetlands so that they can continue to provide services to the citizens of Delaware.

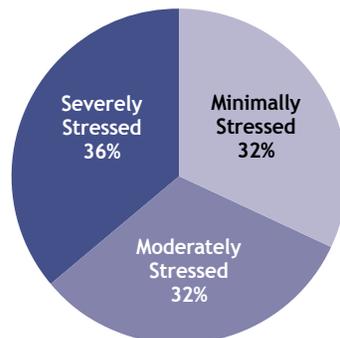
Data was collected between 2005 and 2008.



COMMON STRESSORS DEGRADING TIDAL WETLANDS:

- Wetland diking
- Wetland ditching and draining
- Invasive plants
- Hard surfaces that limit marsh migration
- Development adjacent to marsh

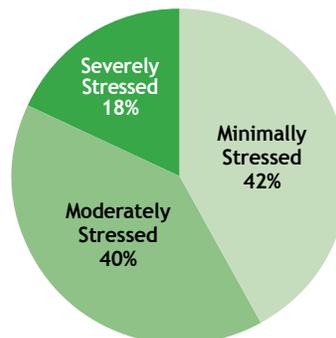
Recommendations:
Minimize development adjacent to wetlands, restore natural distribution of water, control invasive plants



COMMON STRESSORS DEGRADING RIVERINE WETLANDS:

- Channelized streams and ditches (disconnecting wetlands from streams)
- Invasive plant species
- Fill or excavation

Recommendations:
Restore channelized streams to more natural streams, remove invasive species



COMMON STRESSORS DEGRADING FLAT WETLANDS:

- Fill or excavation
- Roads
- Ditching to remove water
- Forest harvesting

Recommendations:
Protect large forest blocks, restore natural distribution of water, implement sustainable forest management



Status of Wetland Regulation in Delaware

In Delaware, approximately 30,000 acres of non-tidal/freshwater wetlands may be considered isolated meaning these wetlands are unregulated and threatened to be lost. This is about 20% of the non-tidal/freshwater wetland extent throughout the state and is in-line with the estimated 20% considered isolated nationally.

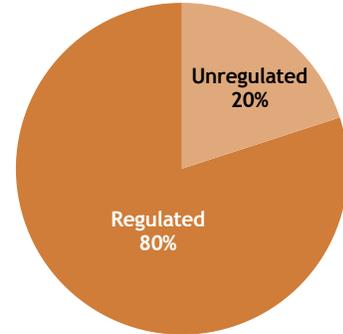
Tidal wetlands are well protected by State of Delaware regulations and very little impacts are permitted annually. Yet, even with numerous federal and state level protection efforts, many nontidal (e.g., headwater tributaries) and isolated (e.g., flooded forests, seasonal ponds) wetlands are threatened because of gaps in existing regulations or because they are being impacted illegally due to limited enforcement activity.

Legally, some wetlands are permitted to be impacted on a small scale with blanket approvals with no reporting or mitigation requirements through the Nationwide Permit process. The sum of the small scale impacts can be detrimental to habitat, water quality, and flood control. In addition, some previously converted wetlands (e.g., wetlands converted to agricultural uses) do not fall under regulatory control or disincentive programs.

The Clean Water Act provides the majority of federal regulatory protection for wetlands, but recent Supreme Court challenges (SWANCC and Rapanos/Carabell decisions) question the extent of waters covered by the Clean Water Act. This has created confusion in discerning which wetlands and waterways are currently under the U.S. Army Corps of Engineer's jurisdiction. Essentially, the further upstream and the further disconnected the wetland is from a navigable waterway the less it is protected by regulations. This ambiguity has resulted in a period of vulnerability for some wetlands due to an uncertainty in permitting and enforcement responsibilities.

Some of Delaware's most special and rare wetlands provide critical habitat for rare plant and animal species are considered isolated and are therefore not protected by regulations. There are approximately 6,000 acres of these unique wetland types in Delaware. Delmarva Bays, or Coastal Plain Ponds, are predominantly isolated wetland pockets which cause this type to be extremely threatened. Approximately 1,500 acres or 25% of Delmarva Bays/Coastal Plain Ponds fall into the isolated designation and currently have no regulation to protect them. Also headwater wetlands, now unprotected in many cases, are some of the most important wetlands for maintaining water quality in downstream rivers and bays while absorbing water to prevent flooding. The following pages include a table of Delaware and Federal Wetland Regulations for reference.

Delaware's Freshwater Wetlands



Many nontidal and isolated wetlands are threatened because of gaps in existing regulations or are being impacted illegally due to limited enforcement activity.



Filling of a wetland associated with construction.

Regulation	Agency	Regulation Summary	Agency Role	Contact information
Clean Water Act, Section 401	US Army Corps of Engineers	Ensure that activities pursuant to Section 404 will not violate the State Water Quality Standards. Section 401 addresses the discharge of pollutants into the surface waters of the state, including tidal and non-tidal wetlands.	In order for the permit issued by the Corp to be valid, the applicant must apply for and receive certification from the state. DNREC may deny certifications, issue them with conditions, or issue as is.	US Army Corp of Engineers Philadelphia District Regulator-of-the-Day (215) 656-6728 www.nap.usace.army.mil/
Clean Water Act, Section 401	DNREC, Div of Water, Wetlands and Subaqueous Lands Section	Ensure that activities pursuant to Section 404 will not violate the State Water Quality Standards. Section 401 addresses the discharge of pollutants into the surface waters of the state, including tidal and non-tidal wetlands.	DNREC issues water quality certification for all projects reviewed by US Army Corp of Engineers.	Wetlands and Subaqueous Lands Section 302-739-9943 www.wr.dnrec.delaware.gov/Services/Pages/WetlandsAndSubaqueousLands.aspx
Clean Water Act, Section 402	DNREC, Div of Water, Surface Water Discharges Section	Under both state and federal laws and regulations, any discharge of pollutants from a point source to State surface waters is unlawful unless sanctioned by a permit. Such permits are administered under the National Pollutant Discharge Elimination System (NPDES).	DNREC's Surface Water Discharges Section is responsible for administering the NPDES program in Delaware.	Surface Water Discharges Section 302-739-9946 http://www.dnrec.delaware.gov/wr/Services/Pages/SurfaceWaterDischarges.aspx
Clean Water Act, Section 404	US Army Corp of Engineers	Regulates the discharge of dredged or fill material into "navigable waters" and their "adjacent" wetlands. Activities include fill for development, dams and levees, infrastructure development, and mining.	U.S. Army Corps of Engineers reviews and issues the authorizations	US Army Corp of Engineers Philadelphia District Regulator-of-the-Day (215) 656-6728 www.nap.usace.army.mil/
Section 10 of the Rivers and Harbors Act 1899	US Army Corp of Engineers & DNREC, Wetlands and Subaqueous Lands Section	Requires authorization from the U.S. Army Corps of Engineers for the construction of any structure in or over any navigable water of the United States, the excavation/dredging or deposition of material in these water or any obstruction or alteration in a "navigable water". Structure or work outside the limits defined for navigable waters of the U.S. require a §10 permit if the structure or work affects the course, location, condition, or capacity of the water body.	U.S. Army Corps of Engineers reviews and issues the authorizations	US Army Corp of Engineers Philadelphia District Regulator-of-the-Day (215) 656-6728 www.nap.usace.army.mil/ Wetlands and Subaqueous Lands Section 302-739-9943 www.wr.dnrec.delaware.gov/Services/Pages/WetlandsAndSubaqueousLands.aspx

Regulation	Agency	Regulation Summary	Agency Role	Contact information
Coastal Zone Management Act 1972	DNREC, Delaware Coastal Programs	The entire State of Delaware has been designated as the Coastal Zone Management Area. Projects conducted directly by a Federal agency, projects authorized by a Federal permit, and some projects implemented with Federal funds must be consistent with Delaware's Coastal Zone Management policies.	Projects are reviewed by DNREC's Coastal Program (DCP) staff in close coordination with other agencies. If projects are consistent with the policies, Federal Consistency "concurrence" is issued. Projects that are not consistent with DCMP policies cannot proceed.	Delaware Coastal Programs 5 E. Reed Street Weyandt Building, Suite 201 Dover, DE 19901 302-739-9283 http://www.dnrec.delaware.gov/coastal/Pages/FederalConsistency.aspx
The Wetlands Act 1973	DNREC, Div of Water, Wetlands and Subaqueous Lands Section	Authorization is required for any activity taking place in State-regulated wetlands (tidal wetlands and non-tidal wetlands >400 contiguous acres) in the State of Delaware.	Wetlands Permits are reviewed and issued by DNREC	Wetlands and Subaqueous Lands Section 302-739-9943 www.wr.dnrec.delaware.gov/Services/Pages/WetlandsAndSubaqueousLands.aspx
The Subaqueous Lands Act 1986	DNREC, Div of Water, Wetlands and Subaqueous Lands Section	Authorization is required for dredging, filling, or the placement of any structure in, on, over or under public and privately owned underwater lands in the State of Delaware. Subaqueous lands are the lands under all tidal and non-tidal waters of the State.	Subaqueous Lands Permits are reviewed and issued by DNREC	Wetlands and Subaqueous Lands Section 302-739-9943 www.wr.dnrec.delaware.gov/Services/Pages/WetlandsAndSubaqueousLands.aspx
Food Security Act of 1985	Department of Agriculture, Natural Resource Conservation Service	Discourage landowners from converting wetlands to agriculture use by making lands ineligible for agriculture benefit programs if wetlands are farmed, with the exception of prior converted wetlands.	NRCS can determine if wetlands have been put into production and work with the landowner to restore the wetland's functions and values to help the farmer reinstate the benefits.	Delaware Natural Resource Conservation Service 302-678-4160 http://www.nrcs.usda.gov/wps/portal/nrcs/site/de/home/
Food, Agriculture, Conservations and Trade Act 1990	Department of Agriculture, Natural Resource Conservation Service	Discourage landowners from converting wetlands to agriculture use by making lands ineligible for agriculture benefit programs if wetlands are farmed, with the exception of prior converted wetlands.	NRCS can determine if wetlands have been put into production and work with the landowner to restore the wetland's functions and values to help the farmer reinstate the benefits.	Delaware Natural Resource Conservation Service 302-678-4160 http://www.nrcs.usda.gov/wps/portal/nrcs/site/de/home/

Wetland Mitigation

Mitigation: to make less severe

This guidebook illustrates ways in which we can all work together to avoid wetland impacts, but when impacts are legally permitted there are required steps to compensate for the wetland losses or alterations.

Clean Water Act Section 404 Compensatory Mitigation Requirements

The basic premise of the program is that no discharge of dredged or fill material (i.e., the filling of wetlands) may be permitted if:

1. a practicable alternative exists that is less damaging to the aquatic environment or
2. the nation's waters would be significantly degraded.

In other words when you apply for a permit, you must show that you have, to the extent practicable:

- Taken steps to avoid wetland impacts;
- Minimized potential impacts on wetlands; and
- Provided compensation for any remaining unavoidable impacts.

The key message for anyone scrutinizing a permit is to keep in mind that the applicant is **REQUIRED** to prove they **AVOIDED** and **MINIMIZED** impacts.

Consistent with the national goal of “no net loss of wetlands,” permits often require compensatory mitigation—typically, the restoration of former (historically degraded) wetlands to mitigate the effects of wetland loss.



DeIDOT wetland mitigation site and restoration techniques

Compensatory mitigation is typically accomplished in the following three ways:

1. **Mitigation Banks:** A permit applicant may obtain credits from a mitigation bank. A mitigation bank is a wetland, stream or other aquatic resource area that has been restored, established, enhanced, or preserved. This resource area is then set aside to compensate for future impacts to aquatic resources resulting from permitted activities.
2. **In-Lieu Fee Mitigation:** A permit applicant may make a payment to an in-lieu fee program that will conduct wetland, stream or other aquatic resource restoration, creation, enhancement, or preservation activities.
3. **Permittee-Responsible Mitigation:** A permittee may be required to provide compensatory mitigation through an aquatic resource restoration, establishment, enhancement and/or preservation activity. This compensatory mitigation may be provided at or adjacent the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The permittee retains responsibility for the implementation and success of the mitigation project.

Cited: Environmental Protection Agency, Wetlands, Compensatory Mitigation, May 29th, 2008

www.epa.gov/owow/wetlands/pdf/MitigationRule.pdf
www.epa.gov/owow/wetlands/pdf/Mit_rule_QA.pdf



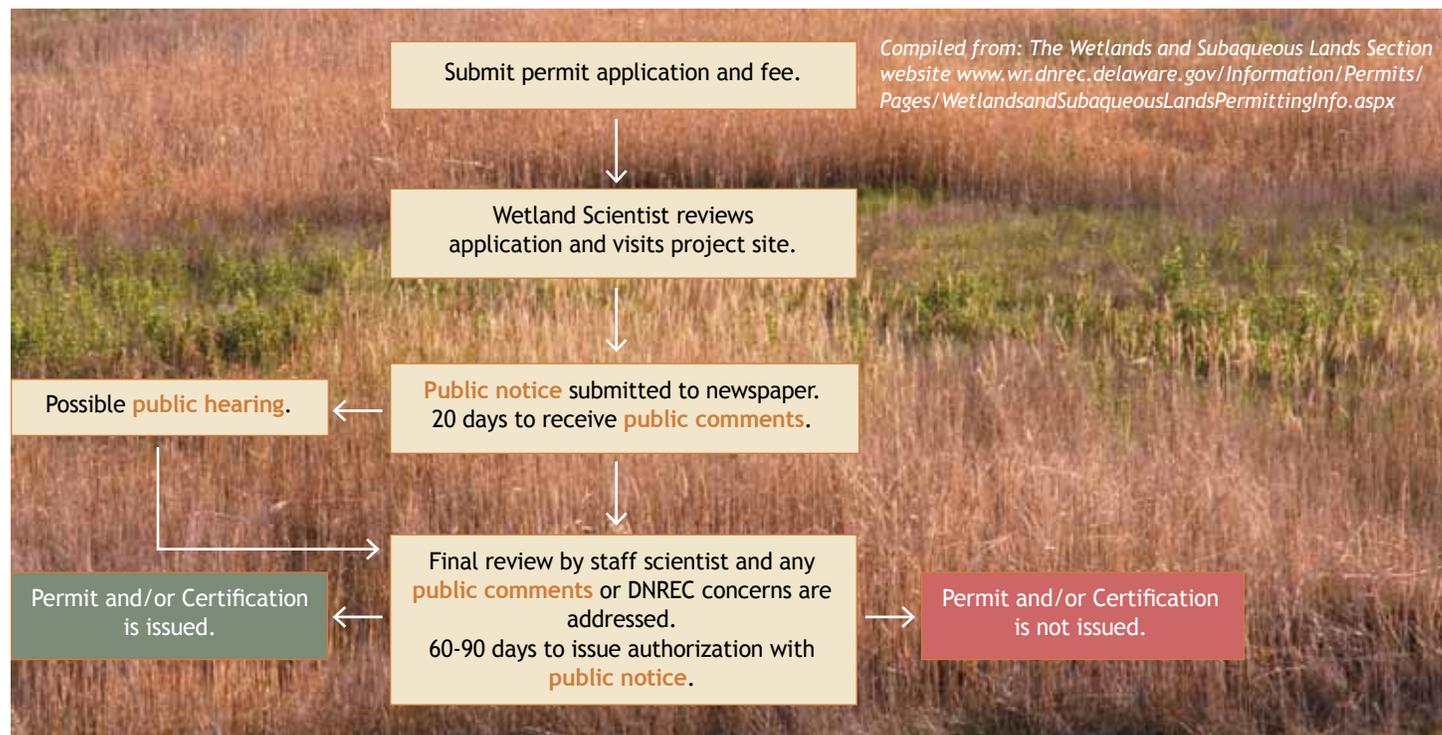
The Section 404 Process via Army Corps of Engineers

Note the opportunities for public comment. See regulations table for more information.



Permitting Process Through DNREC's Wetlands and Subaqueous Lands Section

Note the opportunities for **public comment**. See the regulations table for more information about DNREC's regulatory role.



Who to Call About a Suspected Violation

Q. How do I report a suspected wetlands violation? Say someone is filling in wetlands? Or dumping in a stream?

A. If you notice any activity that appears inappropriate and wish to report it, please be prepared to provide as much of the following information as you can before calling:

- What kind of activity is taking place? (i.e. Filling? Digging? Construction?)
- What is the date and time when you first observed the activity?
- Who is doing the work? Is it the property owner? A contractor? If so, can you disclose the name of the company?
- Is the activity taking place in vegetated wetlands? Or is it in a tidal waterbody, or a stream, ditch, pond, or lake? If in a water, do you know the name of the waterbody or the nearest waterbody to the site?
- Where is the property located? (Provide the county and nearest town or city, road names and/or numbers, landmarks, and the tax parcel number, if known).
- Have you contacted any other government agencies? (County, City, or Federal)

The Division of Water Resource's, Wetlands and Subaqueous Lands Section page has a link to a State Regulated Wetland Map Index. <http://maps.dnrec.delaware.gov/WetlandsMapIndex/map.aspx>

Contacts

State of Delaware Department of Natural Resources hotline:
DNREC's Wetlands and Subaqueous Lands Section at (302)739-9943 or DNREC's complaint hotline at 800-662-8802 to file an official complaint (especially at night or on weekends). All calls are considered confidential.
www.wr.dnrec.delaware.gov/Services/Pages/WetlandsAndSubaqueousLands.aspx

U.S. Army Corps of Engineers enforcement:
U.S. Army Corps of Engineers—Regulatory Branch
 Philadelphia, PA
 Regulator of the Day
 (215)656-6728
www.nap.usace.army.mil/

U.S. Army Corp of Engineers—Dover Field Office
 Dover, DE
 (302)736-9763



Making Better Decisions

Direct and Indirect Impacts to Wetlands

Citizens can participate in land use decisions in Delaware. In this section of the guidebook, we direct you to some of the locations you can find postings of public hearings and notifications. We also briefly summarize some of the types of decisions that are made in the state and at what jurisdictional level (i.e., State, County, Municipal) while including contact information for the primary agencies involved in the decision making processes. Citizen participation in these public processes is valuable, and does make a difference on the final decisions being made. Additionally, contacting your decision makers such as legislators and county or town council members is also essential as your representatives wish to hear from their constituents to shape better public policy.

During land use changes there may be direct or indirect impacts to wetland habitats. Direct impacts are primarily regulated by DNREC or the Army Corps of Engineers. Unfortunately, impacts often occur in wetlands that are not protected by regulations and impacts occur due to violations that are not detected because of enforcement staff limitations. Indirect impacts can be prevented through wise land use planning mostly related to stormwater management and buffer maintenance. Plans affecting indirect impacts are predominantly developed at the County and Municipal level.

The impacts below are only regulated if the wetland is regulated. Up to 30,000 acres of freshwater wetlands in Delaware may not be protected by regulations. See page 9 for more details.

Direct impacts that are regulated by the State and Federal government can include:

- Filling of the wetland
- Digging in the wetland
- Construction in the wetland
- Ditching in the wetland
- Creation of impoundments
- Removal of vegetation

Contact information for your State Senators and Representatives is available at:

Legislative Hall
(302) 739-9194, <http://legis.delaware.gov/>



House built on very edge of tidal creek.



Golf community on edge of marsh.

Indirect impacts (regulated and unregulated) can include:

- Polluted runoff
- Stormwater input to wetland
- Removal of buffer vegetation around the wetland
- Sediment input to wetland through runoff
- Construction of roads adjacent to the wetland
- Interference with natural drainage or diverting water away from a wetland
- Litter blowing or being washed into the wetland
- Disturbance of wildlife dependant on the wetland for feeding, breeding, and resting
- Introduction of invasive plant species
- Removal of trees

Public Processes and Land Use Planning Affecting Wetlands

Ways in which the **public** can contribute and speak on behalf of their concern for wetland protection and wise land use decision making include:

FEDERAL LEVEL

The U.S. Army Corp of Engineers

The U.S. Army Corp of Engineers permitting process as outlined on page B-5, notifications are posted and **public comments** are solicited. Notices are posted in local newspapers and individuals can request to be placed on an electronic mailing list to receive notices. Comments can be submitted online or in writing.

U.S. Army Corps of Engineers
Regulatory Branch
100 Penn Square East
Philadelphia, PA 19107-3390
(215)656-6728

Or visit the Corps' public notice website:
<http://www.nap.usace.army.mil/Missions/Regulatory/PublicNotices.aspx>



STATE LEVEL

Delaware Department of Natural Resources and Environmental Control

DNREC's permitting processes are open to the public and **public comments** are accepted. Notices are posted online and in local newspapers. Individuals can also request to be placed on an electronic mailing list to receive email notices. For more information, please contact the Office of Public Affairs at (302)739-9902 or visit the links below.

DNREC Meeting and Events

Select DNREC from the drop down list

The **public** may attend hearings listed and may submit comments in writing prior to the public hearing and/or comments may be presented either orally or in writing at the public hearing.

<http://egov.delaware.gov/pmc/>

DNREC Public Notices

[www.dnrec.delaware.gov/Lists/Public Notices/AllItems.aspx](http://www.dnrec.delaware.gov/Lists/Public%20Notices/AllItems.aspx)

DNREC Email list subscriptions

Includes public notices, enforcement actions, and coastal zone act permit requests.

<http://www.dnrec.delaware.gov/Pages/DNRECLists.aspx>

Office of State Planning Coordination

The Office of State Planning Coordination (OSPC) is a part of the Budget Development, Planning, and Administration Section of the Delaware Office of Management and Budget. OSPC staff work to improve the coordination and effectiveness of land use decisions made by state, county, and municipal governments while building and maintaining a high quality of life in the State of Delaware. Much information can be found on their website about the State's planning processes. (302)739-3090
<http://stateplanning.delaware.gov/>

The Preliminary Land Use Service (PLUS)

The PLUS process involves reviews by all applicable state agencies at the start of the land development process, adding value and knowledge to the process without taking over the authority of local governments to make land use decisions.

Land use change proposals are submitted to state agencies through the Office of State Planning Coordination and are the subject of monthly PLUS meetings, hosted by the Office, at which applicants meet with state agency resource experts to discuss their plans and identify possible problems, and solutions.

This up-front process has a three-fold purpose:

- To identify and mitigate potential impacts of development which may affect areas beyond local boundaries;
- To fully integrate state and local land use plans; and
- To bring state agency staff together with developers, and local officials, early in the process.

Applicants are able to fully explain their projects to a group of planners representing all state agencies and to interact with those planners in a constructive dialogue. State comments are received in time to be of use and more completely reflect state and local land use plans and regulations.

The **public** may attend PLUS meetings. The public may also read the comments given by all of the participating State agencies, including those related to wetlands, on the State Planning Office's website. Although the public is not permitted to comment at PLUS meetings, they may contact their local land use decision makers with their thoughts on projects undergoing the PLUS process.

For more information about PLUS, contact the State Planning Office. (302)739-3090
<http://stateplanning.delaware.gov/plus/>

Better Models for Development in Delaware *Ideas for Creating More Livable and Prosperous Communities*

Former Delaware Governor Ruth Ann Minner released a publication designed to provide guidance and inspiration to local government officials, citizen leaders, and developers as they consider development proposals throughout Delaware. Better Models for Development in Delaware was created for Governor Minner's Livable Delaware effort by The Conservation Fund, in partnership with the Livable Delaware Advisory Council's Community Design Subcommittee and the Office of State Planning Coordination.

To request a copy, please contact the State Planning Office. (302)739-3090
<http://stateplanning.delaware.gov/info/better.shtml>



COUNTY LEVEL

A significant amount of land use planning occurs on the county level and is guided by County Comprehensive Plans which are updated every five years. During the process of updating the County Comprehensive Plans, the **public** is invited to attend meetings, comment, and contribute.

The Office of State Planning Coordination works closely with land use planning agencies in all three Delaware counties. Updated comprehensive plans for all three of Delaware's counties have been approved by the counties and certified by the Governor as provided for under Delaware state law. The Office has signed memoranda of understanding with each county as called for as part of the Preliminary Land Use Service (PLUS).

Contact the State Planning Office for information about their role in county planning. (302)739-3090
<http://stateplanning.delaware.gov/information/counties.shtml>

See information on following pages for each county's contact information.

MUNICIPAL LEVEL

Delaware has 57 incorporated municipalities, all of which are required to keep their comprehensive plans up to date under Delaware State Law.

State law requires Delaware municipal governments to develop and regularly update land use plans. Smaller cities and towns (those with a population under 2,000) are required to develop a municipal development strategy. Larger cities and towns are required to develop more detailed Comprehensive Land Use Plans. The Office of State Planning Coordination's planners are available to help municipal governments through the planning process as are staff with the University of Delaware's Institute for Public Administration. There are also private-sector planning and consulting firms available to help develop Comprehensive Plans.

To help track local planning efforts, the Office of State Planning has created web pages for each municipality that include maps, links to municipal web pages, links to the Delaware League of Local Governments Directory, links to Census data for each municipality, links to Town Charters, and details on comprehensive planning efforts.

Contact the State Planning Office for information about municipalities. (302)739-3090
<http://stateplanning.delaware.gov/information/municipalities.shtml>

Government Programs and Watershed Management

The following selected government programs may help protect wetlands if the plans, controls, and regulations are properly carried out. Listed are the levels of government involved regarding planning, ordinances, and enforcement. These examples have been compiled from successful programs nationwide.

Planning or regulatory program affecting wetlands	Relationship to wetlands	Level of government responsible
Comprehensive land use plan	Plans usually contain an open space element and may specifically address wetland and floodplain areas.	Counties and Municipalities
Zoning	Many communities have adopted special wetland protection districts and overlays. These prohibit most activities in wetlands. Some contain density control, setbacks from waters, and transferable development rights for wetland areas.	Counties and some Municipalities
Subdivision controls	These often contain requirements that homes be “clustered” together, requirements that park and open space be dedicated, and stormwater detention requirements.	General guidelines county planning zoning level, possibly specific controls by each subdivision or home owners association
Sanitary codes	These usually prohibit septic tanks in high groundwater areas.	State and County
Floodplain regulations	These usually prohibit fills or other alterations in floodways or broader floodplains. Some prohibit fills in wetland and other flood storage areas.	Federal, State and County
Sediment and erosion control, grading ordinances	Some contain buffer and vegetation removal restrictions in or near wetlands.	State and County

Adapted from: The Environmental Law Institute’s Our National Wetland Heritage



Planning at the County Level

Many important land use decisions are made at the county level. The planning office in each county is responsible for the review of land use applications such as subdivision, rezoning, commercial site development, variances, and conditional uses and is involved in updating the County Comprehensive Plan.

Major land use development plans go through several review processes by the planning office. Planning Board meetings are posted and open to the public. Public notices are made upon receipt of complete submissions by the applicant seeking approval.

All Counties have a Comprehensive Plan that is updated every five years and submitted to the State for certification.

These plans are used by local governments to not only establish land use policies and identify growth areas, they also address various other community concerns, such as affordable housing availability, environmental conservation, agriculture preservation, open space protection, historic preservation, economic development and transportation mobility.

The Comprehensive Plan serves as the standard for how development will proceed and how land use will be governed over the course of the next five years. Each county's comprehensive plan is available upon request by phone or online.

Please see county contact information and web links on the following page.

After a Comprehensive Plan has been adopted by the County Council (New Castle and Sussex) or Levy Court (Kent), ordinances necessary to implement the plan's vision and give it the force of law are created. These ordinances are subject to public hearings. Citizens are encouraged to remain involved in this process as the ordinance development phase begins.

County codes are available by request or online at www.generalcode.com

What is a Comprehensive Plan?

- A set of goals and policies for county land use
- A framework for effective decision making
- A public planning process based on citizen participation
- Required by state law

Why is it important?

- It is a plan for the future of your community
- It will assess existing conditions
- It will form strategies to preserve and enhance quality of life
- It is the expression of the hopes and aspirations of our citizens
- Everyone can contribute to this effort

How you can participate?

- Stop by your County's planning office and visit with someone to discuss your comments and concerns with a staff member or to request more information.
- Attend county hearings and public meetings relating to the development of the Comprehensive Plan, subdivision applications and other land use applications.



County Land Use Agency Contact Information

Please contact their offices or visit their websites to find legal notices, plans under review, comprehensive plan information, and meeting schedules and calendars.

The New Castle County Department of Land Use

Department of Land Use
87 Read's Way
NCC Government Center, New Castle Corporate Commons
New Castle, DE 19720
(302) 395-5400.
<http://www2.nccde.org/landuse/default.aspx>
Questions and comments are also accepted via e-mail.
The address is: LandUse@nccde.org.

Kent County Department of Planning Services

Department of Planning Services
555 Bay Road
Dover, DE 19901
(302) 744-2471
<http://co.kent.de.us/planning-dept.aspx>

Sussex County Planning and Zoning

Sussex County Planning and Zoning Commission 2
The Circle, P.O. Box 589
Georgetown, DE 19947
(302) 855-7878
<http://www.sussexcountyde.gov/planning-zoning>

Links to County Comprehensive Plans

New Castle:
www2.nccde.org/landuse/Planning/ComprehensivePlan/default.aspx

Kent:
<http://co.kent.de.us/planning-dept/planning/comprehensive-plan.aspx>

Sussex:
<http://www.sussexcountyde.gov/comprehensive-plan>



Reviewing Plans and Submitting Comments—How to!

On the following pages are charts outlining common wetland impacts caused by construction and land use activities. The charts include:

- General standards to protect the services provided by wetlands
- Impacts to wetlands caused by certain activities
- Steps to reduce or prevent impacts to wetlands during construction or land alteration

These charts represent details the public may scrutinize in plans that are submitted to the PLUS process or on the municipal level. Suggested preventative measures could also be included in County Comprehensive Plans.

General Tips for Submitting Comments

Do your homework. Review copies of the regulations to be amended, land use plans that are being developed, or the construction plans or permit requests that are under review.

Public Hearings

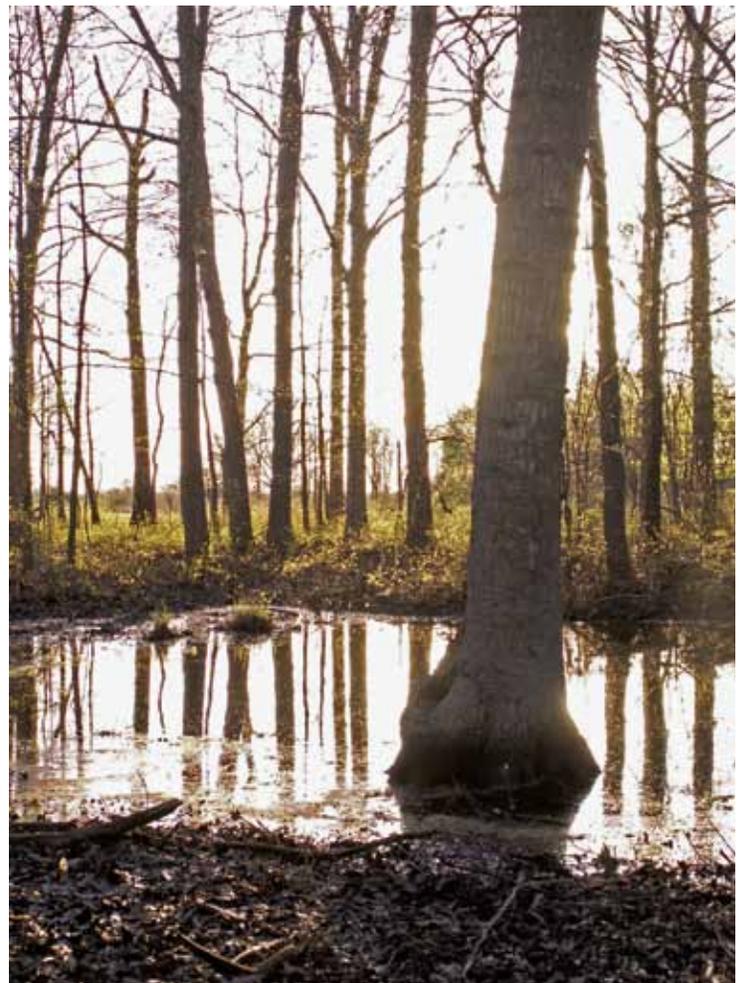
Direct your inquiry regarding a public hearing to the contact person named in the public notice. Statements and testimony may be presented orally or in written form at the hearing. Individuals interested in presenting statements are often requested to register in advance with the hearing officer. Often the deadline for inclusion of written comments in the hearing record, is the conclusion of the hearing.

Written Comments

- When submitting comments always include your address and substantive comments. State clearly why you support or object to the project and how you feel the project would affect matters of your concern. Where possible, include suggested modifications or amendments to the project.
- Address public officials with respect and keep the message rational and polite.
- Identify the permit, regulation, land use plan, project, bill, or construction plan etc. clearly.
- Identify yourself with full name and address.
- Keep your message concise and on topic. Provide key supporting data or facts to demonstrate your familiarity with the issue and that your comments are based on factual information.

Remember the 3 C's of a great message! Clear, Concise, and Compelling

Many more helpful tips can be found at the *Thank You Delaware Bay* website. Including commenting at a public meeting, calling your legislator, writing a decision maker, and emailing a decision maker. www.tydb.org/wyd_beheard.php



Actions to Protect Wetland Functions and Services

General standard	Common activities and processes requiring control	Impact of uncontrolled uses
Prevent filling of wetland by sand, gravel, solid wastes, structures	<ul style="list-style-type: none"> • Land fill operations • Dredge and spoil disposal • Construction of roads, dikes, dams, reservoirs • Activities on adjacent land or in the watershed causing sedimentation, such as agricultural operations, timber cutting, road building, urban runoff, channelization 	<ul style="list-style-type: none"> • Destruction of flood storage and flood conveyance • Accelerated runoff • Destruction of wildlife and vegetative values • Reduced groundwater infiltration • Destruction of scenic, recreational, education, pollution control functions
Protect wetland water supply (quantity)	<ul style="list-style-type: none"> • Construction of upland stream reservoirs • Agricultural and other types of drainage • Channelization of streams • Pumping of streams, lakes, groundwater supplies • Establishment of dikes, levees, sea walls, blocking exchange of tidal flows, flood waters • Mosquito control projects 	<ul style="list-style-type: none"> • Destruction or deterioration of wetland vegetation • Reduced aquifer recharge • Disturbance or destruction of wildlife species that depend upon wetland for breeding feeding, and nutrients • Increased salinity (in some instances) resulting in damage to wildlife, vegetation, recreation opportunities
Protect wetland soils	<ul style="list-style-type: none"> • Dredging, channelization • Topsoil removal 	<ul style="list-style-type: none"> • Disturbance or destruction of vegetation and wildlife habitat • Increased water turbidity • Decreased recreation, education, wildlife values
Maintain free circulation of wetland waters	<ul style="list-style-type: none"> • Dikes, dams, levees, seawalls, roads • Irrigation projects • Fills, grading, buildings 	<ul style="list-style-type: none"> • Deprived wetland plants and animal of nutrients from flood flows and other sources • Prevent the feeding and breeding of aquatic species in wetland areas • Buildup of salinity (in some instances)
Prevent wetland vegetation from cutting and grading	<ul style="list-style-type: none"> • Forestry (some instances) • Agriculture • Off-road vehicles • Filling, grading • Soil removal 	<ul style="list-style-type: none"> • Damage to wildlife habitat • Reduced pollution filtering capability • Increased water velocities, erosion • Destruction of scenic values

Adapted from: *T. Henderson, W. Smith, and D. Burke, Non-tidal Wetland Protection: A Handbook for Maryland local Governments (The Maryland Tidewater Administration, 1983).*

Wetland Impacts in Large Construction Project Plans

Step	Specific activities	Impact	Suggestions for reducing impact
Construction of access roads	<ul style="list-style-type: none"> Tree cutting, vegetation removal Excavating, filling 	<ul style="list-style-type: none"> Destruction of natural vegetation, wildlife, interference with natural drainage, sedimentation 	<ul style="list-style-type: none"> Location of roadways on upland sites Confinement of tree cutting and filling to immediate roadway Requirements that natural drainage and circulation be maintained through elevation of roadway on pilings, installation of culverts, requirement that measures be taken to reduce erosion and sedimentation
Establishment of construction camp (larger projects such as roads, bridges, dams)	<ul style="list-style-type: none"> Tree cutting, grading, filling Installation of electricity, water supply, telephone 	<ul style="list-style-type: none"> Destruction of natural vegetation, wildlife, interference with natural drainage, sedimentation 	<ul style="list-style-type: none"> Location of construction camp at upland site, maintenance of a wetland buffer strip
Materials storage	<ul style="list-style-type: none"> Grading, dumping, filling 	<ul style="list-style-type: none"> Interference with drainage, pollution, and sedimentation from stored material such as sand and gravel 	<ul style="list-style-type: none"> Material storage on upland sites Maintenance of wetland buffer Installation of measures to reduce erosion from stored materials
Clearing of site	<ul style="list-style-type: none"> Vegetation removal 	<ul style="list-style-type: none"> Destruction of wildlife habitat, destruction of storm and erosion barriers, destruction of scenic beauty, increased erosion, increased runoff 	<ul style="list-style-type: none"> Vegetation removal only where absolutely necessary Revegetation
Earth excavation and fill	<ul style="list-style-type: none"> Fill of wetland area, grading of natural wetland contours, removal of peaty soil 		<ul style="list-style-type: none"> Confinement of fill to wetland margins and less sensitive wetland area Maintenance of natural drainage through fill and grading contours, current Rip-rap and revegetation to stabilize fill, reduce erosion
Foundation preparation and construction	<ul style="list-style-type: none"> Dumping of crushed stone and other foundations material, installation of piling, mixing, and pouring of concrete, installation of public facilities (sewer, water) 	<ul style="list-style-type: none"> Water pollution from mixing and pouring concrete 	<ul style="list-style-type: none"> Cofferdams, settling ponds to temporarily confine runoff from concrete mixing and pouring
Disposal of excess excavated materials		<ul style="list-style-type: none"> Erosion, water pollution, additional filling of wetland with consequential impacts 	<ul style="list-style-type: none"> Disposal of excavated sites materials at upland Rip-rap and revegetation to quickly stabilize and fill denuded areas
Major construction activity	<ul style="list-style-type: none"> Erection of basic structure accessory uses, roofing, siding, installation of major fixtures 	<ul style="list-style-type: none"> Pollution of sediment, debris from construction site, oil and other residuals from installation of parking areas 	<ul style="list-style-type: none"> Use construction design and practices to minimize wetland impact such as elevation of structures on pilings Temporary settling ponds, other measures to reduce pollution
Site restoration and cleanup	<ul style="list-style-type: none"> Removal of litter, excess materials, back filling, landscaping, planting of trees and grasses, fertilization 	<ul style="list-style-type: none"> Pollution from litter, backfilling, landscaping operations, use of fertilizers Fill of wetland by landscaping 	<ul style="list-style-type: none"> Confinement of fill to upland areas Temporary settling ponds Measures to reduce erosion on denuded surface

Adapted from: *The Environmental Law Institutes Our National Wetland Heritage*

Note: Suggestions for moving fill or other construction related materials onto upland areas should not encourage destruction of valuable upland habitats—this should only occur on previously cleared or disturbed uplands.



Funding provided by:

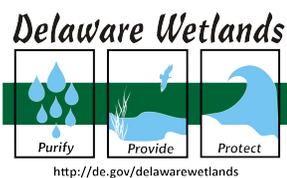
EPA Wetland Program Development Grant Assistance
WL-97329901-0

EPA funds also awarded through the Center for the Inland Bays
CE-99399009-1

If you have any questions or would like
more information please contact:

Delaware Department of Natural Resources and
Environmental Control

Wetland Outreach Specialist
Margaret.Pletta@state.de.us
(302)739-9939



CENTER FOR THE INLAND BAYS

Rehoboth Indian River Little Assawoman