



Investing in Delaware's Conservation Economy



*DNREC Capital Plan
2014-2017*



STATE OF DELAWARE
**DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL**

89 KINGS HIGHWAY
DOVER, DELAWARE 19901

Office of the
Secretary

Phone: (302) 739-9000
Fax: (302) 739-6242

March 6, 2014

Members of the Bond Bill Committee,

Investing in Delaware's Conservation Economy

Imagine the lengths that we would go if a multibillion-dollar industry supporting thousands of jobs said it was leaving the state. We would use every tool at our collective disposal to save those jobs.

Would it surprise you to learn that from our stunning beaches and waterways to our unrivalled parks and wildlife areas, Delaware's natural environment supports billions of dollars of economic activity and is a critical job generator in the state? While we don't often think or talk about our natural resources this way—protecting, restoring, and enhancing them is essential to our state's economic well-being and provides one of the greatest opportunities for job growth in the years ahead.

Thousands of Delaware jobs in businesses like hotels, restaurants, retail outlets, bait and tackle shops, recreational equipment stores, boat sales, as well as commercial watermen, farmers, and tour operators, depend upon a healthy environment. In addition, our natural resources provide hundreds of millions of dollars of irreplaceable economic value purifying air and water, mitigating flooding, and supporting diverse species, along with recreational amenities, such as biking and walking trails, that reduce health care costs as Delawareans adopt healthier lifestyles. Think of this as Delaware's Conservation Economy.

Too often, capital investments in Delaware's natural resources have been an afterthought and primarily funded when additional resources become available at the end of the capital budget process.

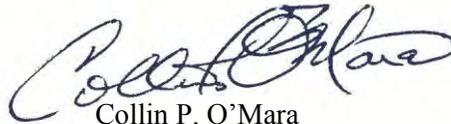
Governor Jack Markell, in partnership with the General Assembly, has begun to change this by recommending greater investment in environmental infrastructure that supports tourism, recreation, health, and public safety. While some still argue that we must choose between our environment and economy, more and more Delawareans recognize that a healthy environment plays an integral role in Delaware's economic success and that conservation can be a driver of growth. Visitors come to Delaware to experience that which they cannot enjoy at home: pristine beaches, navigable waterways, rustic landscapes, world-class birding, hunting, fishing, biking, and hiking. Clean air, clean water, safe soils, and memorable recreational experiences, are absolutely necessary to attract visitors and new companies, not to mention retain businesses and their top talent.

Members of the Bond Bill Committee
March 6, 2014
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This capital plan for DNREC lays out a series of key projects, each of which demonstrates that strategic environmental investments can help drive economic prosperity. By providing sustained funding for critical infrastructure needs we will help strengthen Delaware's economy and improve the health of our environment.

So as various investments compete for limited resources, we encourage investment in Delaware's extraordinary natural environment and the thousands of jobs and billions of dollars of activity that depend upon their stewardship. Let's give Delaware's conservation economy the same level of support and attention as we do every other vital sector of our economy—and create a stronger Delaware for generations to come.

Sincerely,

A handwritten signature in black ink, appearing to read "Collin P. O'Mara". The signature is fluid and cursive, with the first name "Collin" and last name "O'Mara" clearly distinguishable.

Collin P. O'Mara
Secretary



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Critical Infrastructure and Resiliency \$39.3M



DAMS AND DIKES

FY2015 REQUEST: \$1.9M

FY2015 RECOMMENDED: \$1.9M

TOTAL NEED 2015-2017: \$6.5M

FUNDING OPTIONS: Bond, Federal



COASTAL IMPOUNDMENTS

FY2015 REQUEST: \$5.5M

FY2015 RECOMMENDED: \$0

TOTAL NEED 2015-2017: \$13.8M

FUNDING OPTIONS: Federal, Bond



TAX AND PUBLIC DITCHES

FY2015 REQUEST: \$1.4M

FY2015 RECOMMENDED: \$1.14M

TOTAL NEED 2015-2017: \$4.2M

FUNDING OPTIONS: Bond, County, Local



21ST CENTURY DRAINAGE

FY2015 REQUEST: \$4.8M

FY2015 RECOMMENDED: \$0

TOTAL NEED 2015-2017: \$14.8M

FUNDING OPTIONS: Bond, County, CTF

Critical Infrastructure and Resiliency

Delaware Dams

Dams are an important but aging part of Delaware's infrastructure. Dams were originally constructed for milling grain in the southern part of the state and for industrial purposes, including making gunpowder, in the north. Today, dams provide recreational and fishing opportunities, however if dams fail, downstream communities and infrastructure could be threatened.

Delaware has 48 regulated dams - 42 of these are state-owned dams, while the others are owned by New Castle County and the cities of Wilmington, Newark and Dover. All state-owned regulated dams have been inspected regularly since 2009, and draft Emergency Action Plans have been prepared for all of them.



Concord Pond Dam

Delaware's Dam Safety Law was passed by the state legislature in 2004. The regulations adopted in 2009 require upgrades to ensure dam safety.

Dam Ranking:

- ◆ State-owned dams are classified based upon their threat to downstream communities and infrastructure in the event of a dam failure and not based upon the condition of a dam.
- ◆ DeIDOT and DNREC developed a dam deficiency ranking system which prioritizes state-owned dams for necessary upgrades and rehabilitation. A dam's ranking is based on factors such as condition, spillway capacity and population that could be at risk should a dam fail.



Craigs Mill Pond Dam storm damage, 2006

Investing in repairs and rehabilitation is necessary to protect lives and property threatened by dam failures.

DNREC receives a Dam Safety Grant of about \$50,000 annually from the U.S. Federal Emergency Management Agency.

Funding FY 2015 Request: \$1.5 Million

- ◆ Emergency planning and monitoring, dam engineering, maintenance repairs and rehabilitation for state-owned dams.
- ◆ Rehabilitation of Hearn's Pond Dam - the highest priority for dam safety.
- ◆ Other operations and repair projects at the following dams: Trap Pond, Chipmans Pond, Concord Pond, Craigs Mill Pond, Mudmill Pond, Hudson Pond, Garrisons Lake and Records Pond.

Current Projects: FY 2014



Trap Pond Dam low-level outlet construction

Dam Rehabilitation Projects:

- ◆ **Hearns Pond Dam**, Seaford: Construction begins spring 2015
- ◆ **Records Pond Dam**, Laurel: Construction expected 2017

Dam Operations/Repair Projects: Help manage water levels to prepare for storm events

Design of these projects is expected to be completed spring 2014. Projects will be prioritized, if necessary, based on construction costs and available funding.

- ◆ **Trap Pond Dam**, Laurel: Replace a low-level outlet gate
- ◆ **Chipmans Pond Dam**, Laurel: Install operable gates
- ◆ **Concord Pond Dam**, Seaford: Install operable gates
- ◆ **Craigs Mill Pond Dam**, Seaford: Install a low-level outlet gate and repair concrete
- ◆ **Mudmill Pond Dam**, Kent County: Install operable gates
- ◆ **Hudson Pond Dam**, Milford: Install operable gates; repair concrete; and stabilize embankment
- ◆ **Garrisons Lake Dam**, Smyrna: Replace failed low-level outlet culvert; install operable gates; and stabilize embankment.



Installing cofferdam at the low-level outlet at Trap Pond Dam

DNREC and DelDOT partner on:

Dam inspections, preparing Emergency Action Plans and coordinating maintenance, operations, and emergency management activities.

Leveraging state funding to perform dam break inundation mapping, engineering studies and the design and construction of improvement and rehabilitation projects.



Filling sinkhole at Garrisons Lake Dam 2012

FY 2016 - 2017 Funding Requests: \$2.5 Million/Year

Continue making investments to maintain and upgrade dams (in coordination with DelDOT).

Critical Infrastructure and Resiliency

Dikes

Five dikes, in and near the city of New Castle, are in various phases of reconstruction ranging from under construction to recently completed. The dikes consist of low-wall earthen embankments with tide gate structures designed to prevent flooding of adjacent properties and infrastructure, including Delaware's Bayshore Byway (Rt. 9) and adjacent properties. The dikes serve as barriers between surging tides of the Delaware River and nearby homes, businesses and infrastructure. Originally built by Dutch and Swedish settlers between 200 and 350 years ago, the dikes have been reinforced and repaired over the years. However, recent intense storms and waves have resulted in severe erosion and overtopping by waters from the Delaware River.



Red Lion Dike while under construction

DNREC is working with New Castle Conservation District to rebuild failing dikes.

Dikes Projects:

- ◆ **Red Lion Dike:** Completed in 2013
- ◆ **Buttonwood Dike and Broad Dike:** Expected to be completed in March 2014
- ◆ **Gambacorta Dike and Army Creek Dike:** Expected to be completed in April 2014

Funding for the New Castle dike repairs is more than \$7 million and includes 2012 - 2014 Bond Bill funding, and other funding, including Delaware's Hazardous Substances Control Act funds for Red Lion Dike and FEMA for repairs from Hurricane Sandy.



New Castle dikes along the Delaware River

A full dikes inventory is planned for 2014.

Newly reconstructed dikes provide increased protection – reducing the risks of flooding and the overtopping of waters from the Delaware River.

FY 2015 Funding Request: \$400,000

For engineering, design and essential apparatus for dike structure repairs.

FY 2016 - 2017 Funding Requests

Further construction funding needs will be identified after a full dikes inventory and investigation are completed.

DNREC Watershed Stewardship & Coastal Programs - Dams and Dikes

Capital Project Funding Priorities and Cash Flow Estimate FY2014-2017

Last Update: 02/24/2014

PROJECT	County	FY 2014 & Prior	FY 2015	FY 2016	FY 2017	Total by Project
- July 1, 2013, balance plus projected funds from future Bond Bills Cost Recoveries from FEMA/HSCA (on or before June 30)		\$ 9,314,058 1,573,065	\$ 1,900,000	\$ 1,900,000	\$ 1,900,000	
<u>Dike Rehabilitation:</u>						
Red Lion Dike - Completed	New Castle	1,341,956				\$ 1,341,956
Army Creek & Gambacorta Dikes - April 2014	New Castle	2,171,430				\$ 2,171,430
Buttonwood Dike - March 2014	New Castle	873,599				\$ 873,599
Broad Marsh Dike - March 2014	New Castle	918,556				\$ 918,556
<u>Dike Inventory and Assessment</u>						
	Statewide	300,000				\$ 300,000
<u>Dike Repairs and Maintenance</u>						
	Statewide	500,000				\$ 500,000
<u>Dam Rehabilitation and Repairs:</u>						
Hearns Pond Dam - to DeIDOT in January 2014	Sussex	3,429,000				\$ 3,429,000
Trap Pond Dam	Sussex	300,000				\$ 300,000
Records Pond Dam - to DeIDOT by December 2014	Sussex		1,000,000			\$ 1,000,000
Garrisons Lake Dam	Kent	97,340	1,500,000			\$ 1,597,340
Chipmans Pond Dam	Sussex		460,000			\$ 460,000
Concord Pond Dam	Sussex		550,000			\$ 550,000
Craigs Pond Dam	Sussex		470,000			\$ 470,000
Mudmill Pond Dam	Kent			325,000		\$ 325,000
Hudson Pond Dam	Sussex			675,000		\$ 675,000
Silver Lake Dam-Milford (still determining ownership)	Kent					\$ -
<u>Dam Planning, Design, and Engineering</u>						
	Statewide	306,000	400,000	400,000	400,000	\$ 1,506,000
<u>Dam Annual Maintenance</u>						
	Statewide		100,000	100,000	100,000	\$ 300,000
June 30 Projected Balance		649,242	(1,930,758)	(1,530,758)	(130,758)	

Note: These project estimates are based on engineering, design, site visits and input from DNREC, DeIDOT, and contracted engineering firms.

Critical Infrastructure and Resiliency

Coastal Impoundments and Mispillion Harbor Rehabilitation

Coastal impoundments are tidal marsh areas where tidal flow is restricted by levees to provide permanently pooled water for waterfowl, shorebirds and other wetland wildlife. Water levels are manipulated to encourage growth of vegetation beneficial to wildlife and to support other wetland habitat functions. Our ability to control water levels in coastal impoundments also provides mosquito control and flood control benefits to surrounding communities. The Division of Fish and Wildlife manages five major impoundment systems statewide: Augustine, Taylors Gut, Little Creek, Ted Harvey, and Assawoman.



Ted Harvey Wildlife Area south impoundment

Mispillion Harbor is renowned as globally significant for the extraordinary concentration of spawning horseshoe crabs and migratory shorebirds each spring. A public aquatic education facility in the harbor serves local school and youth groups, and public visitation exceeds 15,000 people annually. Two public boat ramps support key recreation boating and fishing access to Delaware Bay. Mispillion Harbor also supports a commercial marina and a maritime supply delivery service that delivers provisions and personnel to vessels using the Delaware Bay.

Urgency of Rehabilitation:

- ◆ Repair and rehabilitation are urgently needed to stabilize and increase the resiliency of impoundments and the harbor to coastal storms and sea level rise.
- ◆ Impoundments and the harbor are highly vulnerable to erosion under current degraded conditions; repairs will proactively extend key ecological and economic benefits.
- ◆ Delays will risk catastrophic loss of coastal wetlands and the loss of a critical maritime harbor.

Benefits of Coastal Impoundments and Mispillion Harbor Rehabilitation

- ◆ Increase coastal ecosystem resiliency by absorbing storm surges.
- ◆ Provide flood mitigation and control for Bayshore communities and Route 9 - a major coastal evacuation route.
- ◆ Increase opportunities for outdoor recreational pursuits and support local economies.
- ◆ Increase habitat for shorebirds and waterfowl, support muskrat and juvenile fish populations and reduce mosquito breeding areas.
- ◆ By increasing the resiliency of the harbor, multiple public assets will be protected and community and regional economic benefits will be realized.

FY 2015 Funding Request: \$5.5 million

- ◆ Rehabilitate Mispillion Harbor and four coastal wetland impoundments, including dike renovations, water-control structure replacement and retrofits, and marsh and shoreline restoration.
- ◆ Funding will leverage an additional \$10 million requested from the National Fish and Wildlife Foundation's Hurricane Sandy Coastal Resiliency Competitive Grant Program.



Ted Harvey Wildlife Area south impoundment breach emergency spillway

Impoundment maintenance and habitat work have been supported by federal funding, waterfowl conservation funds and funding from conservation partners, including Ducks Unlimited. However, grant funds must be matched with local funding, and declining license revenues fall far short of what is needed.



Woodland Beach Wildlife Area Taylor's Gut water control structure erosion March 2013

FY 2015 Projects:

Woodland Beach Wildlife Area Taylors Gut Impoundment –
 Replace a water-control structure severely damaged by repeated storm events. **Benefits:** Will increase resiliency of 250 acres of fresh/brackish impoundment marsh habitat that supports waterfowl hunting and is a popular wildlife-viewing area. In addition, will protect Rt. 9 from erosion.

Little Creek Wildlife Area North Impoundment –
 Refurbish the levee; replace a water-control structure; add a new water-control structure; create an emergency spillway; and replenish the shoreline along the bay-front levee. **Benefits:** Will help protect 450 acres of fresh/brackish marsh and provide a protective buffer for adjacent farmlands and the Town of Little Creek.

Little Creek Wildlife Area South Impoundment –
 Create more than 100 acres of salt-marsh habitat; replenish the shoreline along bay-front levee; and increase the capacity of two water-control structures to adapt to sea-level rise. **Benefits:** Will protect 480 acres of coastal impoundment marsh habitat and provide a buffer for the Little River and the Town of Little Creek.

Ted Harvey Wildlife Area South Impoundment –
 Refurbish the levee; retrofit the emergency spillway; modify two water-control structures to adapt to sea-level rise; and replenish the shoreline along the bay-front levee. **Benefits:** Will improve the resiliency of 880 acres of two impoundments, provide a protective buffer along the St. Jones River, and provide flood protection for the community of Kitts Hummock.

Mispillion Harbor Reserve –
 Restore and stabilize the sea wall protecting the harbor; install multiple, groins; and replenish sand to protect and maintain the harbor shoreline. **Benefits:** Will support a key spawning area for horseshoe crabs and a migratory area for shorebirds and also protect navigation channels for recreational and commercial fishing vessels. The Town of Slaughter Beach will also benefit from maintaining the hydrology of the creek and marsh systems connected to the harbor.

FY 2016 Funding Request: \$4 Million

FY 2017 Funding Request: \$4.5 Million

- ◆ Continue critical investments to stabilize and increase resiliency of coastal wetland impoundments and rehabilitate water control structures.

Critical Infrastructure and Resiliency

Tax Ditches and Public Ditches

Tax Ditches

In 1956, the General Assembly passed the Tax Ditch Law, which authorized the creation of tax ditch organizations by Superior Court Order. Currently, there are 240 organizations statewide that maintain more than 2,000 miles of tax ditches. These ditches are the backbone of drainage infrastructure and provide drainage to more than 50 percent of our state roads, 23 municipalities, three counties, 38,000 properties and 829 square miles, or about 1/3 of the state.

The Tax Ditch Law requires DNREC to provide technical and administrative assistance to the tax ditch organizations. Since severe flooding occurred in 2010, four new tax ditch petitions have been received, three of which have received planning orders from Superior Court.



Little Bay Tax Ditch near Ocean View

Public Ditches

In 1996, the Joint Committee for Capital Improvement authorized 21st Century Funds for resource, conservation and development projects for watershed and drainage improvements. These projects became known as “public ditches,” because public funding was used for construction. Today, the 21st Century Fund list includes more than 700 active projects statewide, with total project costs estimated at \$82 million. Currently about \$8 million is available to fund these projects.

Tax Ditch Administration is a partnership among:

DNREC Division of Watershed Stewardship

Sussex, Kent and New Castle Conservation Districts

Tax Ditch organizations

Funding FY 2015 Request: \$1.4 Million

- ◆ Continue providing technical assistance to the state’s 240 tax ditches.
- ◆ Funds will be used for the development of both tax and public ditch projects. Tasks include: drainage and watershed investigations; planning; surveying; engineering; permitting; and contract administration of these projects.
- ◆ Changes in 2008 to the Tax Ditch Law have dramatically increased the number of right-of-way requests and court order changes processed.
- ◆ Aging infrastructure is increasing the number of requests for technical and financial assistance.
- ◆ Severe flooding in 2010 and 2013 have resulted in a four new tax ditch petitions and millions of dollars of new 21st Century Fund project requests.

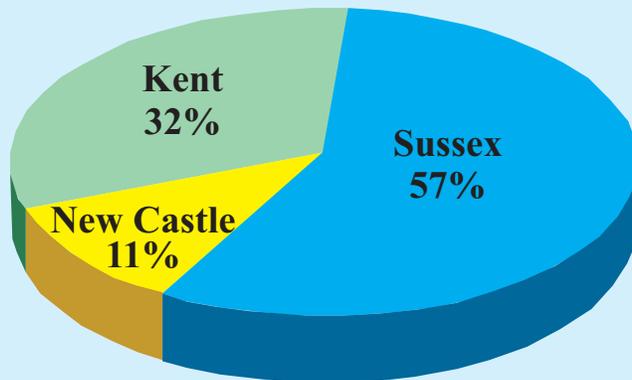


Plantation Crossing Phase I is a public ditch project in Kent County, west of Clayton.

Tax Ditch Assistance: FY 2013

- ◆ Provided right-of-way research to the owners of 1,200 parcels.
- ◆ Received requests for 70 court order changes (90% were to reduce rights-of-way resulting from inquiries).
- ◆ Filed 41 court order changes with Superior Court.
- ◆ Attended 40 annual meetings.
- ◆ Audited the financial reports of 70 tax ditches.
- ◆ Provided environmental permitting for 46 tax ditch projects.
- ◆ Provided updated tax ditch assessment information to county tax offices.
- ◆ Provide updated certified lists of tax ditch watershed parcels and rights-of-way to the Recorder of Deeds of each county.

Tax Ditches by County (total 240 ditches)



Current Tax Ditch Petitions Received:

- ◆ **Kitts Hummock Tax Ditch**, Kent County
- ◆ **Town of Houston Tax Ditch**, Kent County
- ◆ **Hudson Road Tax Ditch**, near Milton, Sussex County
- ◆ **Guinea Creek Tax Ditch**, near Long Neck, Sussex County

Public Ditch Accomplishments: FY 2013

- ◆ Drainage program and partners responded to 480 new drainage concerns.
- ◆ Drainage concerns resulted in 91 new 21st Century Fund projects.
- ◆ Completed landowner contacts, surveying, engineering, and environmental permitting on approved 21st Century Fund projects. These activities directly supported \$1.78 million in expenditures of 21st Century Funds.

FY 2016 – 2017 Funding Requests: \$1.4 Million/Year

- ◆ To continue planning, design, surveying, inspection and technical assistance for the tax ditch and public ditch programs.

Critical Infrastructure and Resiliency

21st Century Fund Water Resource Projects

Regional Resource Conservation and Development (RC&D)

The 21st Century Fund Investments Act of 1995 created the 21st Century Fund to make long-term investments that will enhance the state's infrastructure and economic development and improve our quality of life. A special fund appropriation account was created in DNREC, known as the Resource Conservation and Development Account that is dedicated to improving the health of communities by addressing statewide watershed and drainage issues.



Compost filter log on the Little Bay Tax Ditch Bank Stabilization Project, Ocean View

- ◆ Today, the RC&D 21st Century Fund list includes 621 active projects statewide, with total project costs estimated at almost \$77 million.
- ◆ DNREC's Resource Conservation and Development Account funds primarily small to mid-size drainage improvement projects. The Account currently holds \$8 million in funds, which have been appropriated to active projects statewide.
- ◆ FY 2015 funding is being sought for critical large projects that address current flooding, stormwater, and drainage problems.



Storm drain on the Plantation Crossing Drainage Improvement Project near Clayton (Kent County)

FY 2015 Funding Request: \$5 Million

Examples of projects ready for construction, pending available funding:

- ◆ Dragon Run, Delaware City
- ◆ Christina River Stabilization Project, Newark
- ◆ Hudson Road Tax Ditch Construction, Milton
- ◆ Baltimore Ave., Cheeks, Banks Acres Project, Ocean View
- ◆ Bridgeville Branch
- ◆ White Oak Road, Dover
- ◆ Duross Heights, New Castle

Examples of projects ready for engineering and design:

- ◆ Oak Orchard and Long Neck drainage studies, Millsboro
- ◆ Bay Beach/Back Bay flooding project, statewide



Flooding at Oak Orchard, Millsboro

FY 2016 - 2017 Funding Requests: \$4.5 Million/Year

- ◆ For engineering and construction of regional water resource management projects

Examples of projects ready for construction or engineering/design: (pending available funding)

- ◆ **Dragon Run, Delaware City (\$600,000)** A tide gate is located less than a quarter of a mile from the intersection of Monroe Street and Solomon Place in the northeastern corner of Delaware City. Following a preliminary engineering study (funded 2/3rds by Rep. Longhurst and 1/3rd by New Castle Conservation District), the recommended improvements consist of replacing the existing timber head wall with steel sheet piling, and installing three 48 inch sluice gate pipes at different elevations to address different flow and storm conditions, along with new check valves on the pipes.
- ◆ **Christina River (\$750,000)** Located west of Newark (West Branch, Christianstead, Pheasant Run and Timber Creek subdivisions), Phase I, which will be implemented in 2014, will address 1,200 linear feet of eroded river bank. Funding for Phase II is all that is needed to restore the remaining 2,475 linear feet. Severe bank erosion is occurring along most of the 35 properties of Phase II. The banks are being undercut, resulting in the loss of property. Tremendous sediment loads are being released into the waterway with every storm event, impairing habitat and creating high turbidity conditions.
- ◆ **Hudson Road Tax Ditch Construction, Milton (\$750,000)** The Hudson Road Tax Ditch in Milton will provide drainage to the approximately 180 acre watershed that has no outlet causing over 60 acres of agricultural and residential land to flood. The project has been in the planning and design phase for over 2 years. The project will consist of open and closed system drainage and will utilize an existing wetland complex for water quality treatment and an old borrow pit for quantity management. This project will represent the first new Tax Ditch project in Delaware in almost 10 years.
- ◆ **Baltimore Ave., Cheeks, Banks Acres Project, Ocean View (\$550,000)** This project is a storm drainage project near Ocean View in Sussex County that will provide a drainage outlet to the Bank Acres Subdivision. There are several homes in the subdivision that have repetitive damage from water that has nowhere to drain. This project is in an unincorporated community, making a loan through traditional means difficult.
- ◆ **Bridgeville Branch (\$500,000)** This project is a stream bank stabilization project on the Bridgeville Branch Tax Ditch using natural channel design. The channel instability has caused a major sanitary sewer line to be exposed to stream flow. This project is ready to go out for bids once funding is secured.
- ◆ **White Oak Road, Dover (\$500,000)** This is a storm drain project east of Dover in Kent County. This project will provide a drainage outfall to a section of White Oak Road that has had significant drainage issues and private property flooding for a number of years.
- ◆ **Duross Heights, New Castle (\$600,000)** Duross Heights is a small community located between a tidal section of the Christina River and Airport Road near New Castle. First recorded in 1943, Duross Heights has experienced severe drainage and flooding problems for many years. Duross Heights has very limited drainage infrastructure and lacks a community-wide engineered drainage system. The three priority projects are expected to benefit 58 properties through the design and construction of new or reconfigured stormwater management systems. This project has legislative support and funding from Rep. Mulrooney and Sen. McBride.
- ◆ **Oak Orchard and Long Neck drainage studies, Millsboro (\$300,000)** This project will fund an initial drainage study in the Long Neck area that experienced significant flooding during the summer of 2013. It will also fund the development of construction plans for projects identified by the Oak Orchard Drainage study, which is underway currently.
- ◆ **Bay Beach/Back Bay flooding project, statewide (\$500,000)** Funding is also requested statewide for engineering and design of several sub-projects for the Bay Beach/Back Bay flooding project. Funds will be used for the development of construction projects identified by the Bay Beach Community Coastal Drainage study that is currently underway.

Annual Report Highlights

Statewide **\$1,780,110** 21st Century funds were expended completing **56** Resource, Conservation & Development Projects and developing other active projects in fiscal year 2013. An additional **\$879,309** 21st Century Funds have been expended completing **31** projects to date in fiscal year 2014

Additional Project Information:

	Discontinued Projects	Active Projects	Proposed New Projects
New Castle County	5	274	43
Kent County	11	135	14
Sussex County	10	212	16
Statewide Total	26	621	72

Funding Summary Table

	Active Projects Est. Cost	FY14 New Projects Est. Cost	Est. Cost All Projects	21 st Century Funds Required	21 st Century Funds Unexpended	Fund Deficit
New Castle	\$37,175,110	\$1,657,150	\$38,832,260	\$34,949,034	\$3,338,096	\$31,610,938
Sussex	\$28,316,501	\$2,223,280	\$30,539,781	\$27,485,803	\$2,037,261	\$25,448,542
Kent	\$11,278,780	\$305,000	\$11,583,780	\$10,425,402	\$1,944,902	\$8,480,500
Total	\$76,770,391	\$4,185,430	\$80,955,821	\$72,860,239	\$7,320,259	\$65,539,980

Tourism Assets and Healthy Families \$130.9M



STATE PARKS AND FISH & WILDLIFE AREAS

FY2015 REQUEST: \$8.5M

FY2015 RECOMMENDED: \$3.5M

TOTAL NEED 2015-2017: \$85M+

FUNDING OPTIONS: Bond, Federal, Fees,
Dedicated Revenues



STATEWIDE TRAILS & PATHWAYS

FY2015 REQUEST: \$2.7M

FY2015 RECOMMENDED: \$2.7M

TOTAL NEED 2015-2017: \$11.3M

FUNDING OPTIONS: Bond, Federal, CTF



OCEAN AND BAY BEACHES

FY2015 REQUEST: \$1.5M

FY2015 RECOMMENDED: \$1.14M

TOTAL NEED 2015-2017: \$25M+

FUNDING OPTIONS: Bond, Federal,
Local, Expansion of Accommodations Tax



WATERWAYS

FY2015 REQUEST: \$3.0M

FY2015 RECOMMENDED: \$0

TOTAL NEED 2015-2017: \$9.6M

FUNDING OPTIONS: Bond, Federal, Local,
Marine Fuels Tax, Boat Registrations

Tourism Assets and Healthy Families \$133.7M



DELAWARE BAYSHORE

FY2015 REQUEST: \$0.5M

FY2015 RECOMMENDED: \$0.5M

TOTAL NEED 2015-2017: \$1.5M+

FUNDING OPTIONS: Bond, Federal,
Foundation



STRATEGIC SITES

NVF/FT. DUPONT

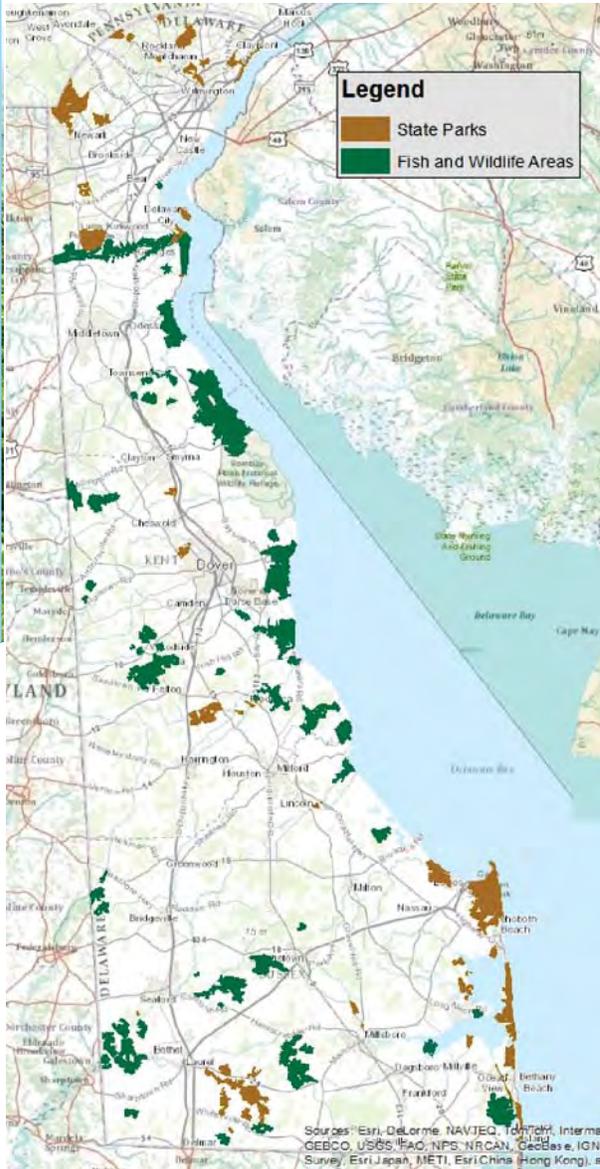
FY2015 REQUEST: \$2.9M

FY2015 RECOMMENDED: \$2.9M

TOTAL NEED 2015-2017: \$7.9M

FUNDING OPTIONS: Bond, Federal, HSCA,
Private Partners

Tourism Assets and Healthy Families



State Parks and Fish & Wildlife Areas

The Divisions of Parks and Recreation and Fish and Wildlife depend on the collection of fees and charges from licenses and services to maintain and improve infrastructure and protect the state's ecological, cultural and recreational resources. These fees are primarily set in Delaware Code and not adjusted for inflation or increased. Funding is needed for the growing maintenance and restoration needs of historic structures, recreation facilities and utility systems.

The State's Park and Fish & Wildlife areas include 92,209 acres and contain more than 700 buildings in 32 public-access areas and 10 preserves.

Delaware State Parks and Facilities

- Alacopas State Park
- Auburn Heights Preserve
- Baynard Stadium and Brandywine Zoo
- Bellevue State Park
- Brandywine Creek State Park
- Cape Henlopen State Park
- Delaware Seashore State Park
- Fenwick Island State Park
- First State Heritage Park
- Fort Delaware State Park
- Fort DuPont State Park
- Fort Miles Historical Area
- Fox Point State Park
- Holts Landing State Park
- Indian River Life-Saving Station
- Killens Pond State Park
- Lums Pond State Park
- Trap Pond State Park
- White Clay Creek State Park
- Wilmington State Parks

Fish and Wildlife Management Areas

- | | |
|---------------------------------|------------------------------|
| Assawoman Wildlife Area | Midlands Wildlife Area |
| Augustine Wildlife Area | Milford Neck Wildlife Area |
| Blackbird Reserve Wildlife Area | Nanticoke Wildlife Area |
| Blackiston Wildlife Area | Old Furnace Wildlife Area |
| C&D Canal Wildlife Area | Petersburg Wildlife Area |
| Cedar Swam Wildlife Area | Prime Hook Wildlife Area |
| Little Creek Wildlife Area | Ted Harvey Conservation Area |
| Marshy Hope Wildlife Area | Woodland Beach Wildlife Area |

FY 2015 Funding Request Parks/Fish and Wildlife: \$8.5 Million

FY 2016 - 2017 Funding Requests Parks/Fish and Wildlife: \$8.5 Million/Year

Delaware State Parks

- ◆ The Division of Parks and Recreation manages 30,811 acres, 158 miles of trails, 43 miles of roadways, 731 buildings in 16 state parks, the Brandywine Zoo and Baynard Stadium, 10 preserves and 92 conservation and other easements.
- ◆ More than 5.1 million people visited Delaware State Parks in 2012.
- ◆ Nearly 2/3 of Delaware residents think parks and recreation facilities are a necessity.



Cape Henlopen pier repair

The Parks Division has maintenance and project backlogs of critical infrastructure projects greater than \$52 million.



Phase I Cape Henlopen sewer repairs

Recent Accomplishments: FY 2012

- ◆ **Cape Henlopen State Park:** Emergency sewer repairs; fishing pier piling repairs; Biden Center Americans with Disabilities Act compliance and life and safety study
- ◆ Parks building, roofing and utility repairs on 20 individual projects

Current Projects: FY 2014

(Including pass-through/earmarked projects)

- ◆ **City of Wilmington:** Mack Park Street scape (DelDOT); Brandywine Zoo.
- ◆ **Killens Pond:** Water park improvements
- ◆ **Delaware Seashore State Park:** Indian River Inlet
- ◆ **Fort Miles:** Critical and immediate facility repairs.
- ◆ **Bellevue State Park:** Paving project
- ◆ **Bellevue Indoor Tennis Center:** Demolition
- ◆ **Cape Henlopen State Park:** Sewer repairs

FY 2015 Projects:

Funding is requested to:

- ◆ Maintain and replace the pools and slides at the Killens Pond Water Park.
- ◆ Make life and safety improvements to facilities statewide.
- ◆ Paint numerous barns and residences statewide.
- ◆ Expand the Fenwick Island State Park parking lot.
- ◆ Repair and replace existing recreational and athletic facilities statewide.
- ◆ Make improvements necessary for continued Americans with Disabilities Act (ADA) compliance.
- ◆ Repair or replace roofs on historic buildings at Fort DuPont and Fort Delaware.
- ◆ Repair or replace roofs at various youth camps and recreational facilities in Cape Henlopen and Delaware Seashore State Parks.
- ◆ Pave roadways at Cape Henlopen, Killens Pond, Lums Pond and White Clay Creek State Parks.
- ◆ Make parking lot improvements throughout Delaware State Parks.
- ◆ Renovate parking lot at Baynard Stadium in Wilmington.
- ◆ Upgrade electrical utility and wastewater collection utilities at Lums Pond.
- ◆ Upgrade sewer utilities and wastewater treatment plant at Cape Henlopen State Park, Phase II.

FY 2016 – 2017 Parks Projects:

- ◆ Continue repair and maintenance of parking lots and roadways.
- ◆ Make upgrades and boat dock repairs at Lums Pond State Park.
- ◆ Update Cape Henlopen State Park public facilities.
- ◆ Repair roof at Fort Delaware State Park.
- ◆ Repair roof and replace numerous buildings and facilities.
- ◆ Repair and restore guard house at Fort DuPont State Park.
- ◆ Repair bridges at Brandywine Creek and Alapocas Run State Parks.
- ◆ Secure Battery Smith at Cape Henlopen State Park.
- ◆ Repair roadway, curbs, walkway and fencing at Wilmington State Park.



Existing conditions Bellevue State Park indoor tennis center

Division of Fish and Wildlife

The Division of Fish and Wildlife has more than \$10 million in critical infrastructure projects, including: repair and rehabilitation of seven historic buildings; energy upgrades (new roofs, windows, insulation); mold remediation; and structural improvements to 11 buildings; improvements to parking lots, boat ramps and fishing access areas, roads, office buildings and equipment storage facilities; and demolition of unsafe structures.

The Division manages approximately 61,000 acres of land in 16 wildlife and 57 fishing and boating access areas that provide opportunities for hunting, fishing, boating and wildlife observation which benefit:

- ◆ 123,382 resident/non-resident anglers fishing in Delaware waters
- ◆ 29,366 resident/non-resident hunters who use protected lands or harvest managed species
- ◆ 900,000 resident Delawareans, 2 million+ visitors
- ◆ 1,000 managed wildlife species

FY 2015 Fish and Wildlife Projects:

- ◆ Repair and restore historic structures on state wildlife areas: replace roof and HVAC; repair windows, brick, and structural framing; make interior renovations; stabilize foundation; install drywall; and restore ruins.
- ◆ Repair and replace C&D Canal fishing piers for safety/ADA compliance.
- ◆ Demolish unsafe structures on wildlife areas open for public use.
- ◆ Upgrade structure and remove mold in New Castle County Wildlife Section headquarters.
- ◆ Upgrade and remediate Ommelanden Range and Hunter Education Trainer Center.
- ◆ Repair roads and parking lots in wildlife areas and boat ramps in New Castle, Kent and Sussex counties.
- ◆ Make energy and utility upgrades to wildlife area facilities in New Castle, Kent and Sussex counties.
- ◆ Replace the heating system at the Little Creek Enforcement Office.
- ◆ Add boat storage for Little Creek and Sussex Enforcement areas.

Recent Accomplishments: FY 2012

- ◆ **Wilder Wildlife Area Conservation and Recreation Center:** Constructed a new septic and well.
- ◆ **Mallard Lodge:** Converted office space to an Americans with Disabilities Act (ADA) accessible bedroom and bathroom.
- ◆ **Milford Mosquito Control Shop:** Upgraded shop bathroom and break room, windows replaced and facilities painted
- ◆ **Little Creek Stone Tavern:** Added new roof.

Current projects: FY 2014

- ◆ **Little Creek Wildlife Area:** Construct Wildlife/Bayshore dual-purpose facility. Establish a destination point/interpretive center that highlights hunting, trapping, fishing and coastal maritime heritage as part of the Delaware Bayshore Initiative. Replace inadequate, outdated facilities, consolidating Fish and Wildlife staff in a central location to reduce energy costs, operating expenses and improve work efficiency. Building designs are underway using FY 2013 Bayshore Bond Bill funding.
- ◆ **Little Creek Wildlife Area:** Construct new storage facility. Consolidate equipment storage from three different locations, enable sharing equipment including construction equipment, vehicles, boats, and ATV.
- ◆ **All State Wildlife Areas:** Repair and rehabilitate historic buildings.
- ◆ **Milford Mosquito Control Facility:** Continue to renovate and upgrade facilities.



Severe disrepair of significant historic structure at Thousand Acre Marsh

FY 2016 – 2017 Fish and Wildlife Projects:

- ◆ Continue to repair and rehabilitate historic buildings on wildlife areas.
- ◆ Repair roads and parking lots.
- ◆ Repair dike and water control structure at Augustine Creek.
- ◆ Repair bulkhead at Coursey Pond.
- ◆ Add courtesy docks in all division-maintained ponds.
- ◆ Demolish unsafe structures on wildlife areas open for public use.
- ◆ Repair and improve public boat ramps and fishing piers, including Churchmans Marsh, Woodland Beach, Broad Creek, Dobbinsville (New Castle) and Blairs Pond.
- ◆ Dredge for access at boat ramps including Becks Pond, Augustine Beach, Rosedale Beach, Records Pond, and Collins Beach.



Holes in roof the New Castle wildlife shed

Project Review Spring 2014

Design and Development Parks



Killen Waterpark Master Plan

- . Master Plan Meetings 28 Feb 14
- . Concept Plan Approval: 1 Mar 14
- . Public Meeting: 20 Mar 14
- . Present to Legislators: 1 Apr 14



Killens Waterpark Slide Replacement

- . Slide Removal: 1 Mar 14
- . Award Proposal: 25 Feb 14
- . Install Slide: 1 Apr 14
- . Install H2O: 30 Apr 14
- . Concrete Patch: 15 May 14



Bethesda Church

- . Parking Lot Start: 15 Mar 14
- . Parking Lot Complete: 15 Apr 14
- . Septic System: Design Phase
- . Restroom: Design Phase



Project Review Spring 2014

Design and Development Parks



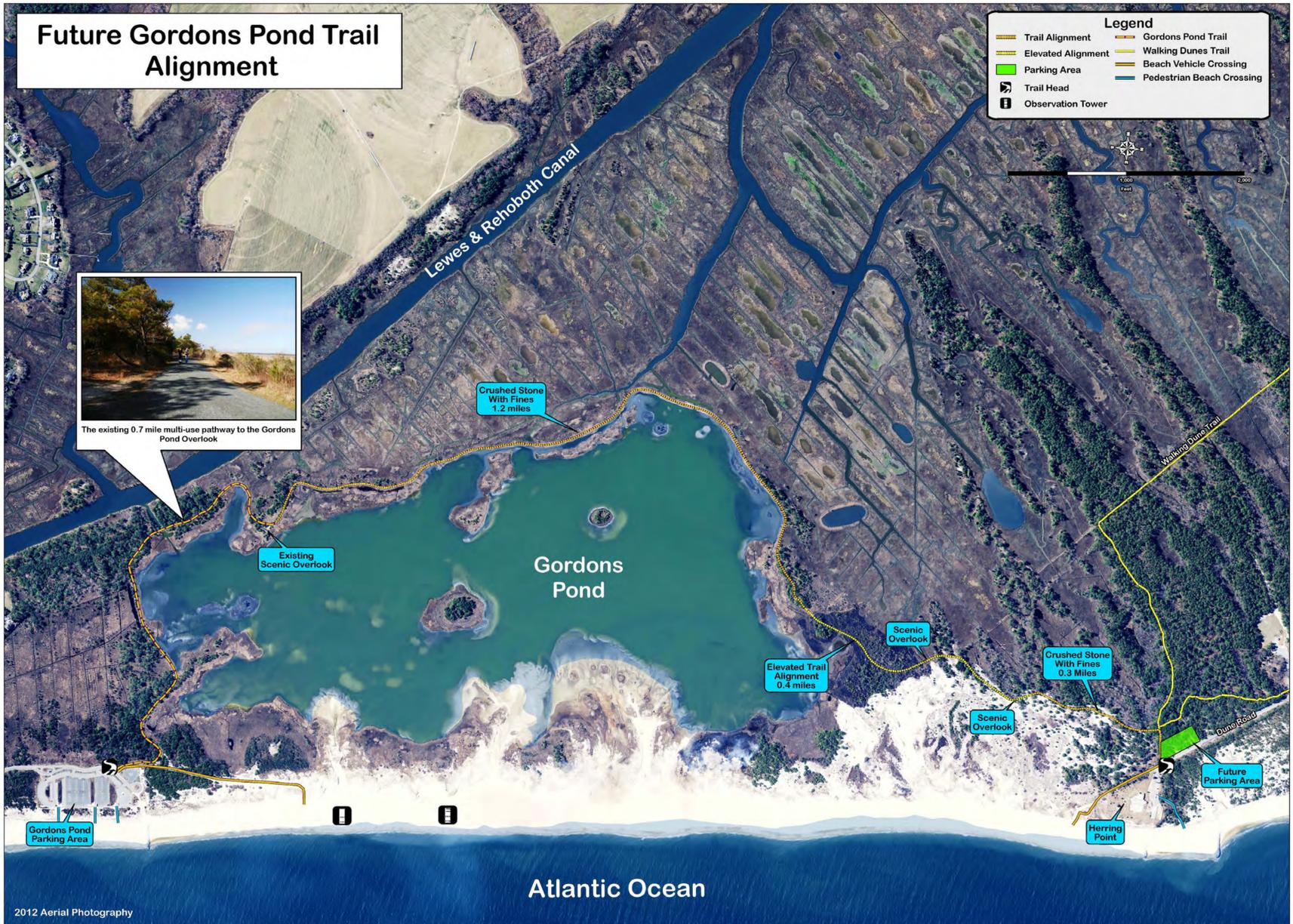
Delaware Seashore

- . Main Sign installed 25 Feb 14
- . S. Campground Complete: 23 Mar 14
- . Sewer Cost: 1 Apr 14
- . Trail Cost: 30 Apr 14
- . N. Campground Complete: 15 Nov 14



Project Review Spring 2014

Design and Development Parks



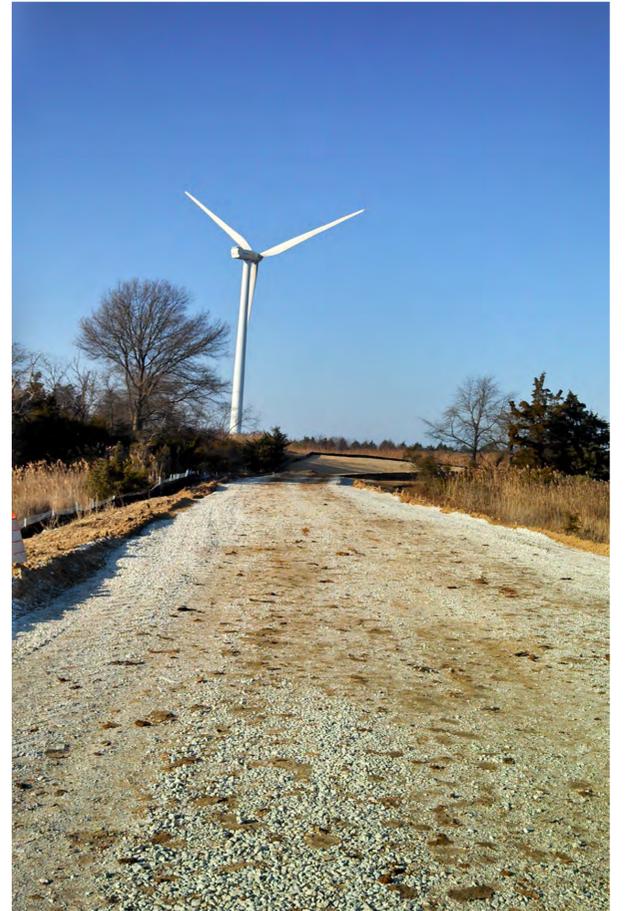
Gordons Pond Trail

- . Boardwalk Complete: 28 Feb 14
- . Parking Paving: 30 Mar 14
- . Herring Fence Cleanup: 2 Apr 14
- . Trail Complete: 15 May 14
- . Grand Opening: Jun 14



Project Review Spring 2014

Design and Development Parks



Park Road

Road & Trail Complete:
15 May 14



Project Review Spring 2014

Design and Development Parks



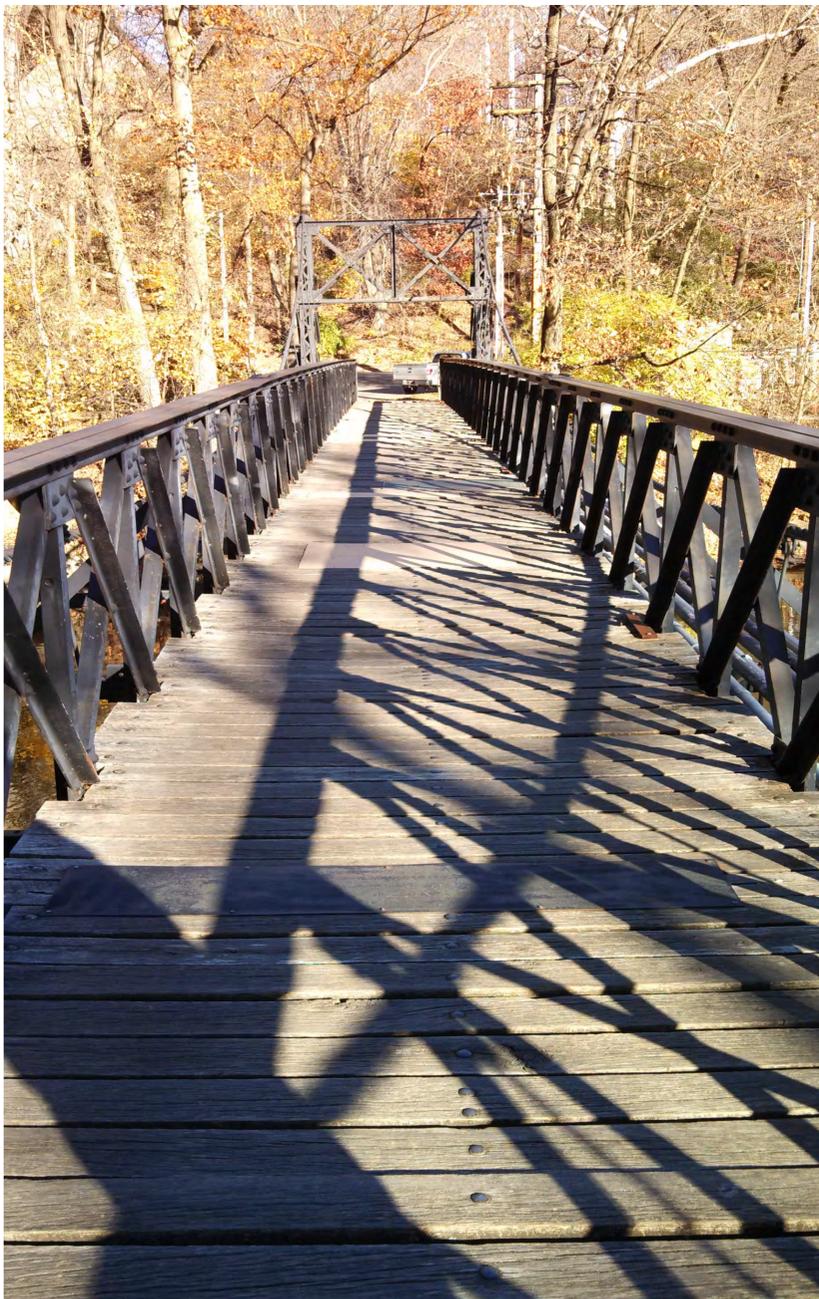
Zoo Master Plan

- . Charette: 24 Feb 14
- . Rain Forest Concept : 20 Mar 14
- . Monkey House Concept: 20 Mar 14
- . Public Meeting: 25 Mar 14
- . Concept to Legislators: 2 Apr 14



Zoo Master Plan

- . Tamarin House Design: 1 Feb 14
- . Tamarin Bid: 30 Mar 14
- . Tamarin Award: 1 Apr 14
- . Tamarin Complete: 15 Jul 14



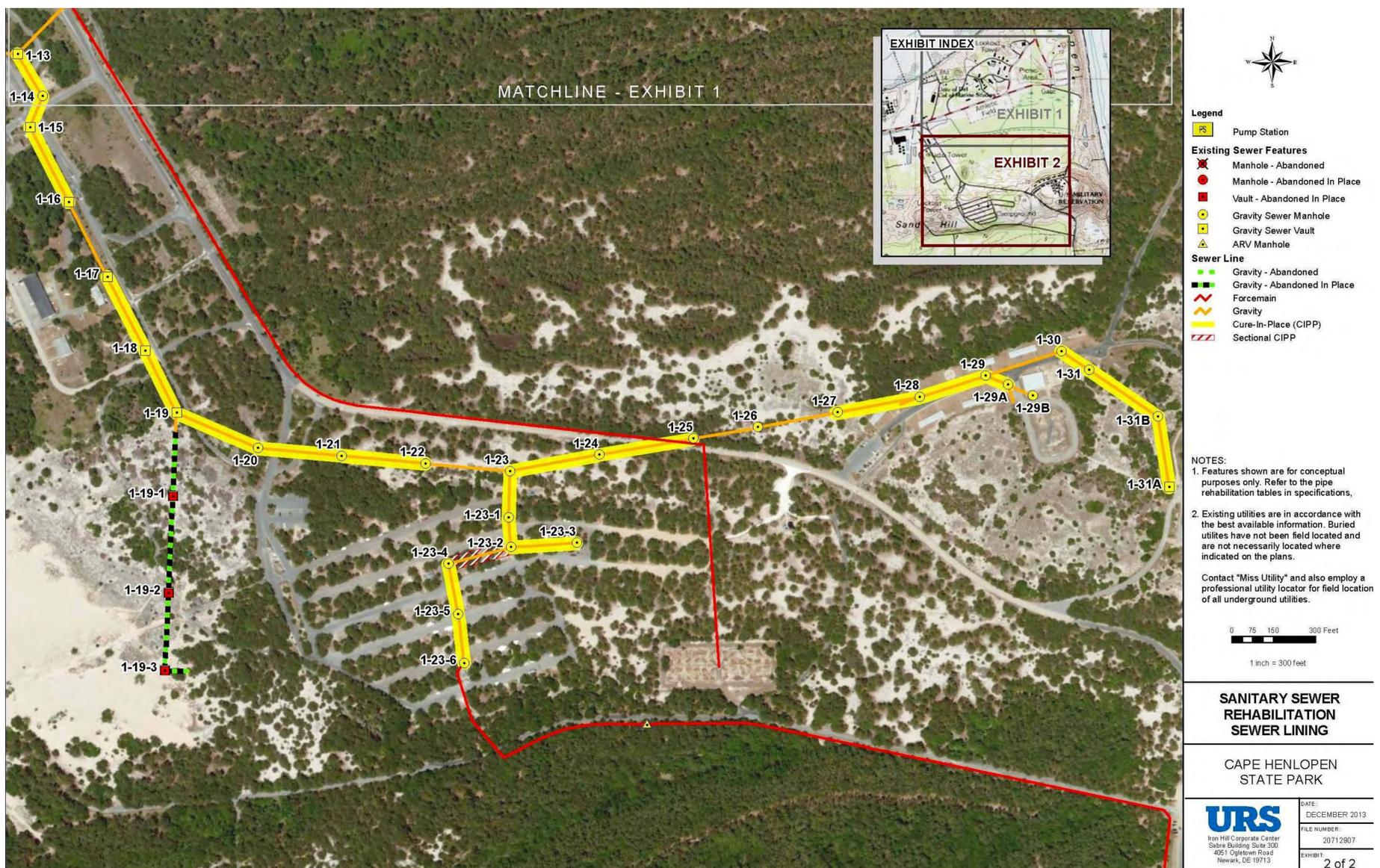
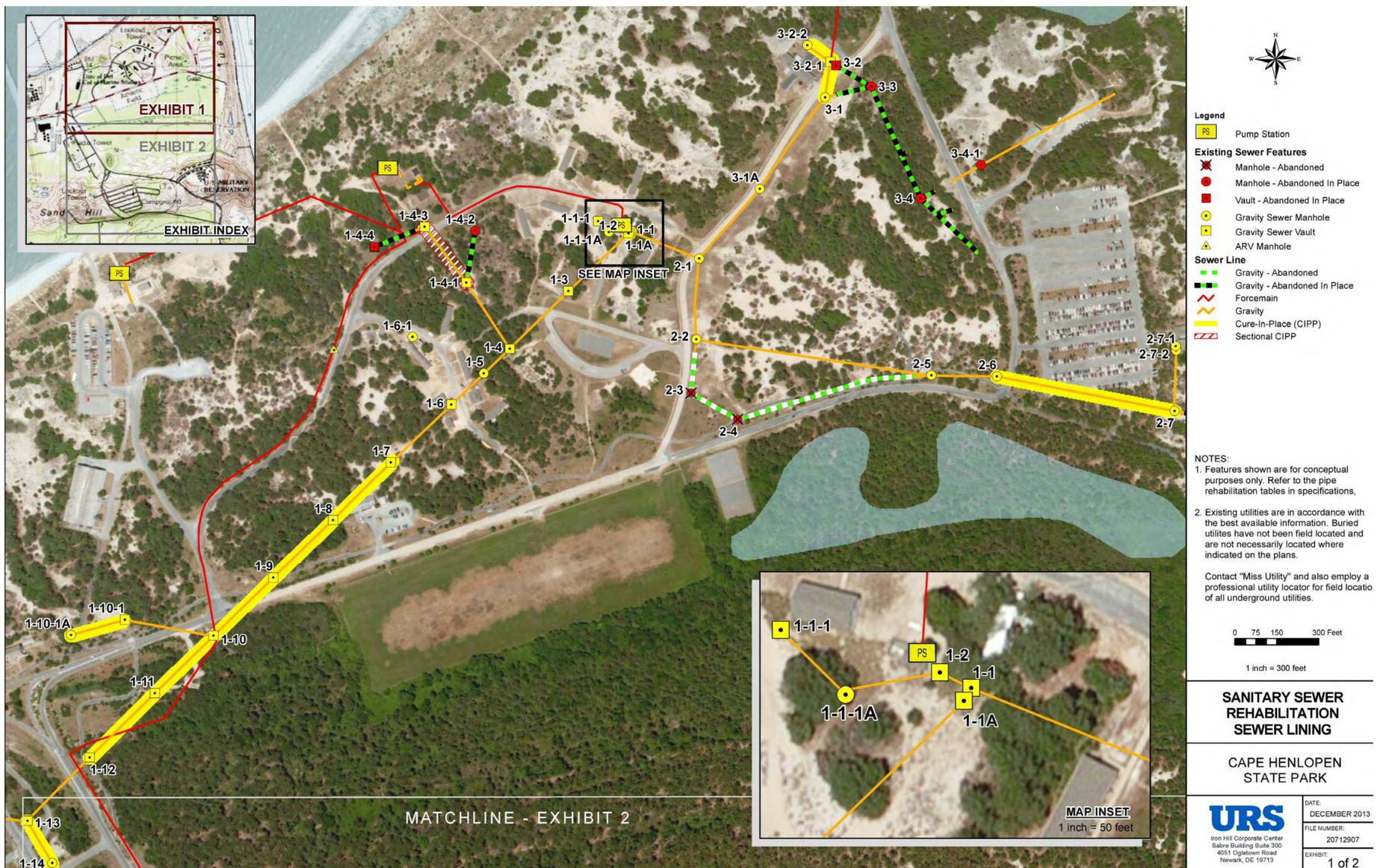
Swinging Bridge

- . Bid Advertisement: 1 Mar 14
- . Construction Commence: 1 Jul 14
- . Complete: 1 Nov 14



Project Review Spring 2014

Design and Development Parks



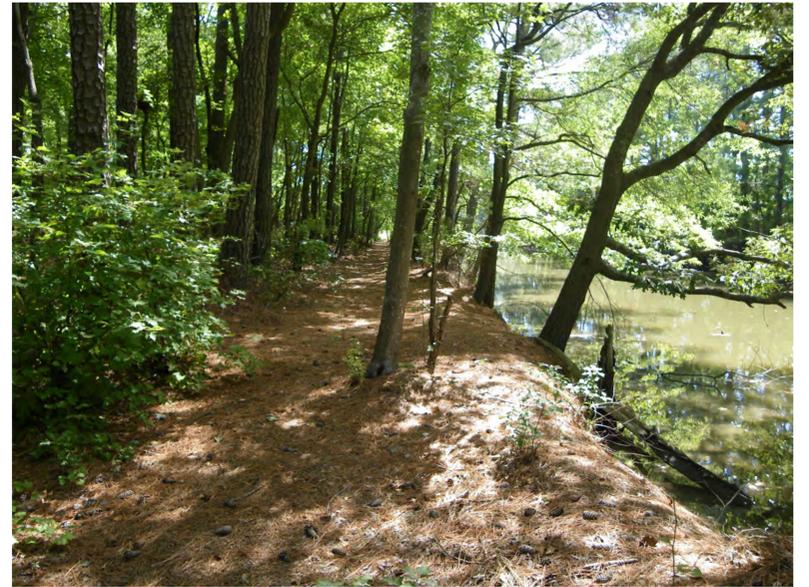
Cape Henlopen Sewer Lining

- . Bid Advertisement: 17 Apr 14
- . Construction Commence: 1 Jul 14
- . Complete: 1 Oct 14



Project Review Spring 2014

Design and Development Parks



Assawoman Canal Trail

- . Design Complete: 30 Apr 14
- . Bid Advertisement: 30 May 14
- . Award Construction: 1 Aug 14
- . Construction Commence: 1 Oct 14
- . Complete: 30 Mar 15



Project Review Spring 2014

Design and Development Parks



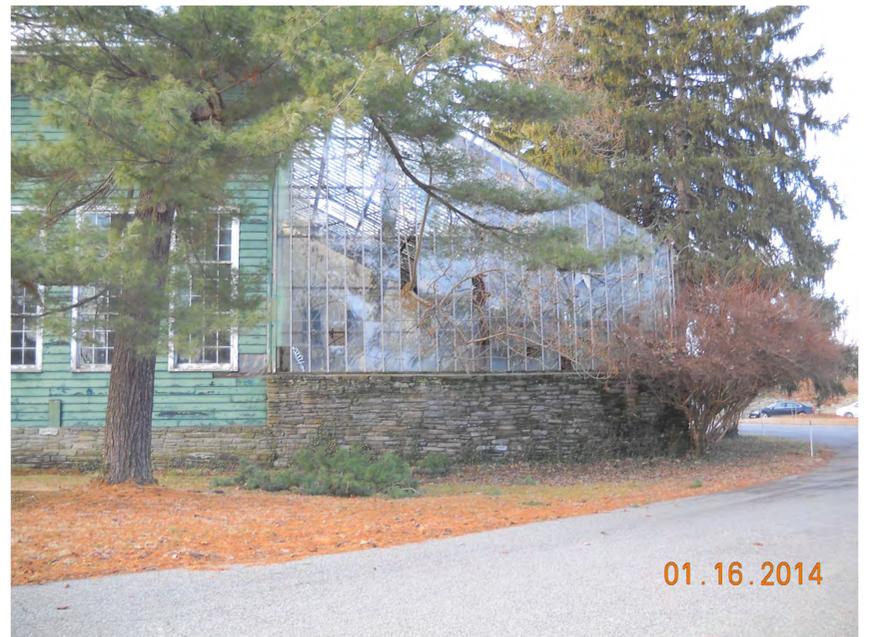
Tri-Valley Trail

- . Design Complete: 1 Jun 14
- . Bid Advertisement: 1 Jul 14
- . Award Construction: 1 Sep 14
- . Construction Commence: 1 Nov 14
- . Complete: 30 May 15



Project Review Spring 2014

Design and Development Parks



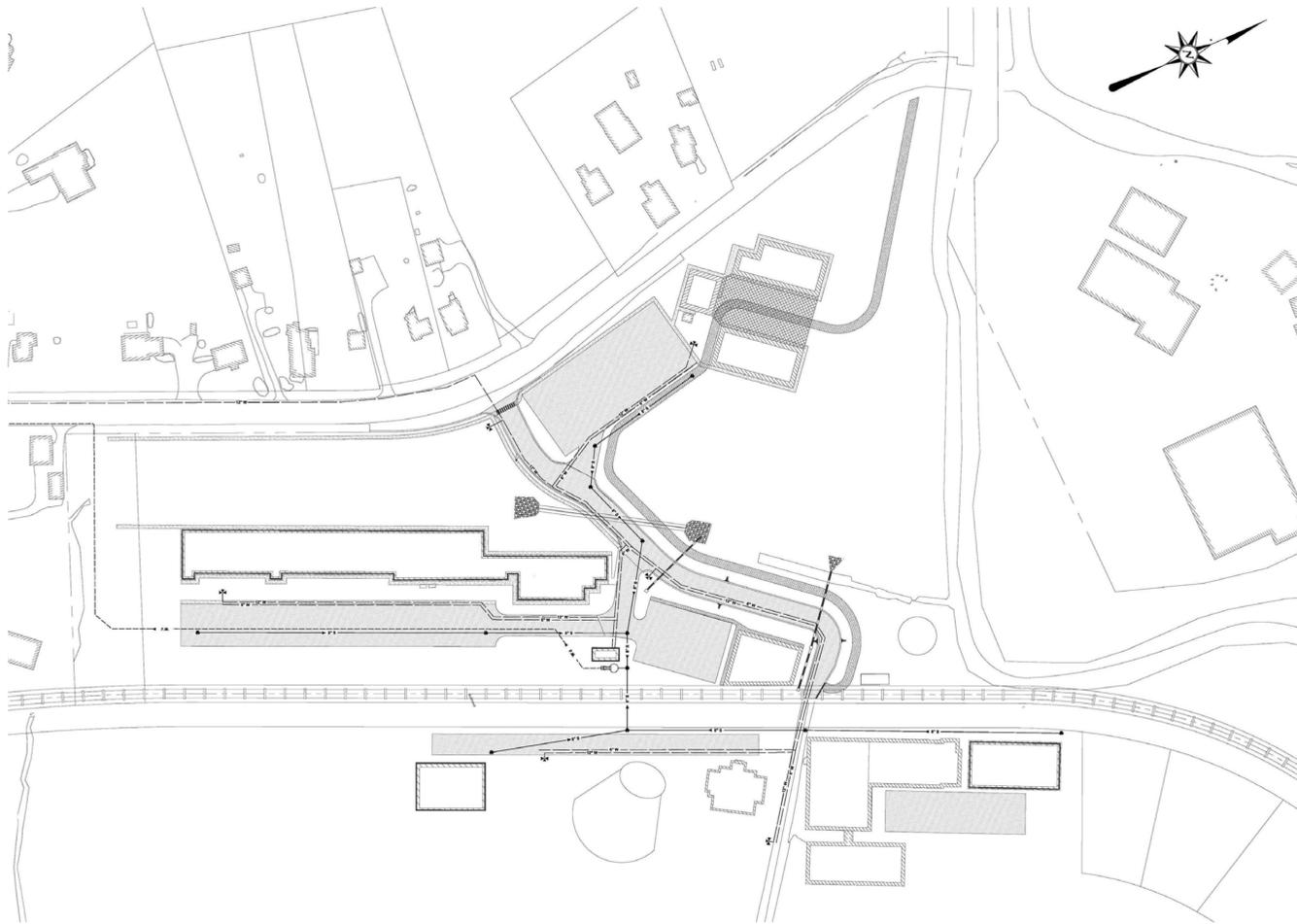
Bellevue Tennis Center

- . Design Complete: 30 Mar 14
- . Bid Advertisement: 30 Apr 14
- . Award Demo: 1 Jun 14
- . Construction Commence: 1 Jul 14
- . Complete: 30 Dec 14



Project Review Spring 2014

Design and Development Parks



Gun Club Road

- **Construction Award:** 25 Feb 14
- **Construction Commence:** 30 Mar 14
- **Complete:** 15 Feb 15



Project Review Spring 2014

Design and Development Parks



Fort DuPont Master Plan

- . Authority Creation: 1 Jul 14 - 31 Dec 14
- . Historic Building Stabilization (\$900K): 1 Jul 14 - 1 Jul 15
- . Phase I Residential RFP: 30 Sept 14 - 31 Dec 14
- . Parade Ground Facelift: 1 Mar 15 - 30 Jun 15
- . Phase II Marina Permitting: 1 Jan 15 - 1 Jan 16



Project Review Spring 2014

Design and Development Parks



Fort Miles Master Plan

- | | |
|--|---------------------------------|
| Phase I Conceptual Design-Site & Battery 519 Museum: | Completed in 2013 |
| Phase II A Bathhouse/Concession Building: | Design 2014 - Construction 2015 |
| Phase II B Entrance Road & Parking Lot: | Design 2014 - Construction 2015 |
| Phase II C Orientation Pavilion: | Design 2014 - Construction 2015 |
| Phase III A Big Gun Restoration & Mount | 2014-2017 |
| Phase III B Artillery Park | Design 2015 - Construction 2016 |
| Phase IV Cantonment Restoration | 2016-2018 |
| Phase V Battery 519 Museum | 2016-2018 |





Mallard Lodge



- \$15,000 budgeted
- Project Complete

- ADA Accessible Deck



- ADA Parking Pad





Little Creek Bayshore Visitor Center and Fish & Wildlife Field Office



\$2,300,000.00 budgeted

Pre Design:

- Project Scoping December 2013
- Archaeological Investigations February 2014

Schematic Design:

- Prepare SD Package February – March 2014

Construction:

- Plan, Review & Approval September – November 2014
- Material Order & Fabrication September – November 2014
- Construction October 2014 – July 2015
- Completion July 2015
- Punch List/Close-out July – September 2015





Ted Harvey Wildlife Area Emergency Spillway



- \$244,500 Budgeted
- Expenditures to begin Spring 2014
- Design completion Spring 2015
- Project submitted as Federal Sandy resiliency project
- Funding decision announced April 2014

Kingston Upon Hull

Security fence, Stabilization, and Interpretive Signs

- \$15,000 Budget
 - Fence installed
 - Minor building stabilization and interpretive signs completed
- Spring/Summer 2014





C&D Canal Pier Design



- Bids have been solicited
- Contract being prepared
- Design anticipated April 2014





Little Creek
Hunter Education Building
\$200,000 Budgeted

Construction started
May of 2013



Construction
completed
September 2013

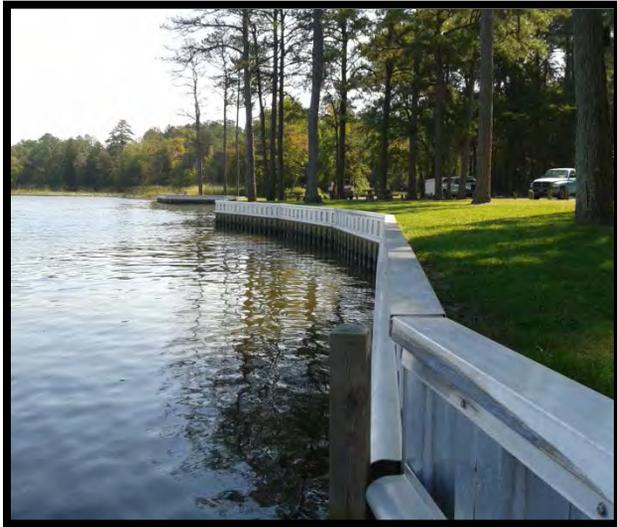




Phillips Landing Boat Ramp

\$950,000 Budgeted

Construction anticipated to start late 2014 or early 2015.



Phase 1

- Site Survey (completed)

Phase 2

Engineering Site Design (Anticipated completion June 2014)

- Design Drawings -60%
 - DFM Approval
 - Submission & approval of USACE and DNREC Permits
 - Construction Drawings – 90%
 - DNREC Soil Erosion Approval
- Completion of Bid Documents

Phase 3

- Bidding Phase (Anticipated completion August 2014)

Phase 4

- Construction (Anticipated completion February 2015)



DNREC - Parks and Recreation

Capital Project Priorities FY 2014 - 2019

Last Update: 3/4/2014

(\$ in thousands)

Ranking Priority Score	Proj ID#	Park Unit	County	Project Details	Ranking Criteria	Criteria2	Criteria3	Fiscal 2014-2015 Cost Estimate	Fiscal 2016 Cost Estimate	Fiscal 2017 Cost Estimate	Fiscal 2018 Cost Estimate	Fiscal 2019 Cost Estimate
26	75	Cape Henlopen State Park	Sussex	sewer upgrades	Safety, High	Legislative and Leverage	Property Pres High	\$ 2,000,000				
22	360	Killens Pond State Park	Kent	Water Park: Interim renovations: slide repair and/or replacement \$300k, re-plastering pools and coping repair, other system upgrades \$170k. Final Pool Renovation \$4M	Safety, High	Legislative and Leverage	Property Pres Low	\$ 470,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000
21	315	Fort Delaware State Park	New Castle	Island tram path: repair resurface path	Safety, High	Property Pres High	NA	\$ 100,000				
21	291	Wilmington State Parks	New Castle	Brandywine Park: swinging bridge; repaint steel structure and replace deck boards	Safety, High	Property Pres High	NA	\$ 550,000				
21	42	Auburn Heights Preserve	New Castle	museum: retrofit sprinkler system and freeze proofing	Safety, High	Property Pres High	NA	\$ 75,000				
21	19	Bellevue State Park	New Castle	Indoor Tennis Courts: Remove	Safety, High	Property Pres High	NA	\$ 800,000				
21	348	Brandywine Creek State Park	New Castle	Repairs to Rocky Run Bridge	Safety, High	Property Pres High	NA	\$ 56,000				
21	221	Auburn Heights Preserve	New Castle	NVF	Safety, High	Legislative and Leverage	Recreational Need	\$ 7,000,000				
19	239	Wilmington State Parks	New Castle	H. Fletcher Brown Park - Rotary park project, complete overhaul	Safety, Low	Property Pres High	Legislative and Leverage	\$ 1,500,000				
19	111	Fort DuPont State Park	New Castle	shop amenities -water, sewer and restrooms, fencing and regrade (possible relocation to grass dale??)	Safety, Low	Legislative and Leverage	Property Pres High	\$ 60,000				
17	143	Lums Pond State Park	New Castle	Phase II utility upgrades	Continuation	Property Pres High	Revenue Generation	\$ 2,000,000	\$ 2,700,000			
16	232	Killens Pond State Park	Kent	safe pedestrian connector between boat rental and boat ramp	Safety, High	Recreational Need	NA		\$ 2,000,000			
16	117	Fort Delaware State Park	New Castle	Landing Site	Continuation	Legislative and Leverage	Revenue Generation		\$ 1,000,000			
15	386	Fort Delaware State Park	New Castle	Ft DE masonry repairs	Safety, High	NA	NA		\$ 50,000			
15	384	Delaware Seashore State Park	Sussex	Holts landing courtesy dock replacement	Safety, High	NA	NA		\$ 42,000			
15	375	Fox Point State Park	New Castle	Elimination of standing water per SIRS	Safety, High	NA	NA		\$ 20,000			
15	355	Cape Henlopen State Park	Sussex	Engineering for stair repair at Tower 7	Safety, High	NA	NA		\$ 25,000			
15	225	Wilmington State Parks	New Castle	Brandywine Park: North Park Drive; replace curb,walkway and fence	Safety, High	NA	NA		\$ 50,000			
15	84	Cape Henlopen State Park	Sussex	Biden center renovations or replacement	Safety, High	NA	NA		\$ 2,000,000	\$ 2,000,000		
15	368	Cape Henlopen State Park	Sussex	Fishing Pier: Total replacement	Safety, High	NA	NA		\$ 5,000,000	\$ 5,000,000	\$ 5,000,000	
14	31	Bellevue State Park	New Castle	pond: repair retaining wall at bridge	Safety, Low	Property Pres High	NA		\$ 7,000			

DNREC - Parks and Recreation

Capital Project Priorities FY 2014 - 2019

Last Update: 3/4/2014

(\$ in thousands)

Ranking Priority	Proj ID#	Park Unit	County	Project Details	Ranking Criteria	Criteria2	Criteria3	Fiscal 2014-2015 Cost Estimate	Fiscal 2016 Cost Estimate	Fiscal 2017 Cost Estimate	Fiscal 2018 Cost Estimate	Fiscal 2019 Cost Estimate
13	257	Fort DuPont State Park	New Castle	Stabilization of historic structures as Fort Dupont per Sasaki Report	Safety, Low	Legislative and Leverage	NA		\$ 950,000			
13	79	Cape Henlopen State Park	Sussex	U of D Park Road	Continuation	Legislative and Leverage	Recreational Need		\$ 500,000	\$ 1,500,000		
13	285	Fort Delaware State Park	New Castle	repair leaks on terre plain- all roofs.	Continuation	Property Pres High	NA			\$ 1,500,000		
13	283	Delaware Seashore State Park	Sussex	old camp: bathhouse #4; install floor, wall and shower tile	Continuation	Property Pres High	NA			\$ 26,000		
13	280	Delaware Seashore State Park	Sussex	old camp: bathhouse #3; install floor, wall & shower tile	Continuation	Property Pres High	NA			\$ 296,000		
13	88	Fenwick Island State Park	Sussex	Fenwick island parking expansion	Safety, Low	Revenue Generation	Recreational Need			\$ 1,800,000		
13	81	Cape Henlopen State Park	Sussex	J& B trail improvements	Continuation	Property Pres High	NA			\$ 16,000		
13	18	Bellevue State Park	New Castle	Percheron Barn Roof- Structural repairs and roof shingles	Continuation	Property Pres High	NA			\$ 100,000		
12	369	Auburn Heights Preserve	New Castle	Construction of new maintenance building.	Continuation	Legislative and Leverage	NA			\$ 100,000		
12	298	Cape Henlopen State Park	Sussex	Chapel renovation: Summer day camp- Restroom replacement/upgrade	Safety, Low	Revenue Generation	NA			\$ 50,000		
11	402	Fort Delaware State Park	New Castle	Endicott Roof waterproofing and preparation for solar project	Property Pres High	Legislative and Leverage	NA			\$ 250,000		
11	124	Fort DuPont State Park	New Castle	1905 guard house restoration	Property Pres High	Legislative and Leverage	NA			\$ 65,000		
11	109	Fort DuPont State Park	New Castle	Roof Replacements	Property Pres High	Legislative and Leverage	NA			\$ 250,000		
10	372	Auburn Heights Preserve	New Castle	Oversee Farm new septic system and renovations	Property Pres High	Revenue Generation	NA			\$ 45,000		
10	353	Alapocas Run State Park	New Castle	Alapocas Woods: Alapocas Run waterfall bridge- stone walls stabilization(engineering review)	Safety, Low	Property Pres Low	NA			\$ 100,000		
10	341	Cape Henlopen State Park	Sussex	FMHA: Museum plan development and implementation	Legislative and Leverage	Revenue Generation	Recreational Need			\$ 500,000	\$ 2,000,000	
10	301	Brandywine Creek State Park	New Castle	Northern Delaware Greenway trail: repair drainage and erosion issues. Repairs to 4 pipe culverts/ swales/ trail surface along greenway; repair drainage issues at overlook	Safety, Low	Property Pres Low	NA			\$ 50,000		
10	151	Trap Pond State Park	Sussex	Bethesda Church: composting toilet, benches, parking	Revenue Generation	Legislative and Leverage	Recreational Need			\$ 150,000		
10	146	Lums Pond State Park	New Castle	Boat rental Area: boat dock repairs (\$10k/yr for 3 yrs.)	Property Pres High	Revenue Generation	NA			\$ 10,000		
10	292	Cape Henlopen State Park	Sussex	securing: battery smith and mine casement	Safety, Low	Property Pres Low	NA			\$ 15,000		
9	245	Wilmington State Parks	New Castle	Rockford Park: develop one-way traffic flow and provide parking	Safety, Low	Recreational Need	NA			\$ 50,000		

DNREC - Parks and Recreation

Capital Project Priorities FY 2014 - 2019

Last Update: 3/4/2014

(\$ in thousands)

Ranking Priority Score	Proj ID#	Park Unit	County	Project Details	Ranking Criteria	Criteria2	Criteria3	Fiscal 2014-2015 Cost Estimate	Fiscal 2016 Cost Estimate	Fiscal 2017 Cost Estimate	Fiscal 2018 Cost Estimate	Fiscal 2019 Cost Estimate
8	401	White Clay Creek State Park	New Castle	Deerfield sewer repairs/upgrades	Safety, Low	NA	NA			\$ 25,000		
8	357	Cape Henlopen State Park	Sussex	New bathhouse and campground store	Continuation	Recreational Need	NA				\$ 1,200,000	
8	331	White Clay Creek State Park	New Castle	Niven Property: structural repairs to Niven Barn or documentation of historic significance for demo	Safety, Low	NA	NA				\$ 50,000	
8	316	Fort Delaware State Park	New Castle	Mainland landing craft work dock: replace existing dock that is too short and not adequately anchored	Safety, Low	NA	NA				\$ 100,000	
8	238	Wilmington State Parks	New Castle	north park drive: Provide safe pedestrian crossing near condos; close off cut through	Safety, Low	NA	NA				\$ 200,000	
8	41	Auburn Heights Preserve	New Castle	Septic Tank replacement and/or connection to sewer on Bengie Road	Safety, Low	NA	NA				\$ 15,000	
8	255	Alapocas Run State Park	New Castle	Weldin Road: Provide safe pedestrian crossing between lot D and CanDo playground/ athletic fields	Safety, Low	NA	NA				\$ 10,000	
8	168	White Clay Creek State Park	New Castle	840 creek road: demolish house	Safety, Low	NA	NA				\$ 20,000	
7	392	Fort Delaware State Park	New Castle	Ft. DE repair and repaint windows	Continuation	NA	NA				\$ 25,000	
7	364	Bellevue State Park	New Castle	place stone near horse barn accessway	Legislative and Leverage	Property Pres Low	NA				\$ 10,000	
7	387	Fort Delaware State Park	New Castle	Ft DE dock repairs	Continuation	NA	NA				\$ 10,000	
7	262	Bellevue State Park	New Castle	Repair Percheron Barn and Office roads	Legislative and Leverage	Property Pres Low	NA				\$ 25,000	
7	53	Brandywine Creek State Park	New Castle	garden of eden road drainage study; possible replace culverts and catch basins	Legislative and Leverage	Property Pres Low	NA				\$ 25,000	
7	32	Bellevue State Park	New Castle	Park Office: ADA improvements to office door and ramp	Legislative and Leverage	Property Pres Low	NA				\$ 9,000	
7	334	Wilmington State Parks	New Castle	Rockford" tennis court area; repave existing parking area/ accessibility improvements	Legislative and Leverage	Property Pres Low	NA				\$ 80,000	
7	266	Bellevue State Park	New Castle	Repair damage to bike path (philadelphia pike)	Legislative and Leverage	Property Pres Low	NA				\$ 4,100	
6	351	Alapocas Run State Park	New Castle	Blue Ball Barn: window repairs/replacements	Property Pres High	NA	NA				\$ 40,000	
6	394	Delaware Seashore State Park	Sussex	IRM pilings sandblasted, sealed, and pile jackets	Property Pres High	NA	NA				\$ 450,000	
6	343	Alapocas Run State Park	New Castle	Blue ball barn: correct moisture issues in ventilation system	Property Pres High	NA	NA				\$ 50,000	
6	388	Fort Delaware State Park	New Castle	Ft. DE replacement of floating dock for Delafort	Property Pres High	NA	NA				\$ 23,000	

DNREC - Parks and Recreation

Capital Project Priorities FY 2014 - 2019

Last Update: 3/4/2014

(\$ in thousands)

Ranking Priority Score	Proj ID#	Park Unit	County	Project Details	Ranking Criteria	Criteria2	Criteria3	Fiscal 2014-2015 Cost Estimate	Fiscal 2016 Cost Estimate	Fiscal 2017 Cost Estimate	Fiscal 2018 Cost Estimate	Fiscal 2019 Cost Estimate
6	385	Delaware Seashore State Park	Sussex	DSSP Indian River Lifesaving Station roof replacment	Property Pres High	NA	NA				\$ 60,000	
6	382	Delaware Seashore State Park	Sussex	DSSP Tower Road Bathhouse roof replacement	Property Pres High	NA	NA				\$ 50,000	
6	381	Cape Henlopen State Park	Sussex	Cape youth camps I and II masonry repairs	Property Pres High	NA	NA				\$ 50,000	
6	380	Cape Henlopen State Park	Sussex	Cape youth camps I and II electric upgrades	Property Pres High	NA	NA				\$ 50,000	
6	307	Delaware Seashore State Park	Sussex	Camp store: repair flat roof	Property Pres High	NA	NA				\$ 18,400	
6	379	Cape Henlopen State Park	Sussex	Cape dorm addition of HVAC	Property Pres High	NA	NA				\$ 50,000	
6	378	Cape Henlopen State Park	Sussex	Cape Dorm restroom upgrades	Property Pres High	NA	NA				\$ 50,000	
6	377	Cape Henlopen State Park	Sussex	Cape Youth Camps I and II replace windows in youth camps	Property Pres High	NA	NA				\$ 40,000	
6	376	Bellevue State Park	New Castle	Cauffiel House HVAC system repair and/or replace	Property Pres High	NA	NA				\$ 25,000	
6	373	Bellevue State Park	New Castle	Green renovations for bathrooms	Property Pres High	NA	NA				\$ 40,000	
6	278	Bellevue State Park	New Castle	stables: replace shingles on wooden barn	Property Pres High	NA	NA				\$ 8,000	
6	276	Cape Henlopen State Park	Sussex	Fort Miles: Waterproof Bunker 519 roof	Property Pres High	NA	NA				\$ 50,000	
6	272	White Clay Creek State Park	New Castle	WSC: Replace roof on Wells barn	Property Pres High	NA	NA				\$ 7,000	
6	371	Auburn Heights Preserve	New Castle	Repair/replace window sills, frames and trim at AH Mansion sunporch	Property Pres High	NA	NA				\$ 10,000	
6	367	Trap Pond State Park	Sussex	Warrington house documentation	Property Pres High	NA	NA				\$ 20,000	
6	241	Wilmington State Parks	New Castle	18th Street Basket ball courts; asphalt overlay, surfacing, replace goals, repairs to concrete seating area	Property Pres High	NA	NA				\$ 100,000	
6	338	White Clay Creek State Park	New Castle	Pomeroy trail resurfacing	Legislative and Leverage	Recreational Need	NA				\$ 100,000	
6	305	Bellevue State Park	New Castle	pavilion #1 needs columns repair	Property Pres High	NA	NA				\$ 4,000	
6	281	Delaware Seashore State Park	Sussex	towers road ocean: bathhouse (lifeguard, mens, womens rooms); replace door & frame with fiberglass	Property Pres High	NA	NA				\$ 8,000	
6	223	Delaware Seashore State Park	Sussex	IRLSS Museum roof, replace cedar shingles	Property Pres High	NA	NA				\$ 50,000	

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6	230	Wilmington State Parks	New Castle	Brandywine Park: Lovering Avenue Tennis Courts; Renovate or Remove	Property Pres High	NA	NA				\$ 100,000	
6	60	Brandywine Creek State Park	New Castle	Fenton Barn documentation - possible demo	Property Pres High	NA	NA				\$ 50,000	
6	169	White Clay Creek State Park	New Castle	Old Coach road: demolish house	Property Pres High	NA	NA				\$ 40,000	
6	165	White Clay Creek State Park	New Castle	nature center: repair plaster and repaint interior	Property Pres High	NA	NA				\$ 5,000	
6	125	Port Penn Interpretive Center	New Castle	Cleaver: repair/replace roof	Property Pres High	NA	NA				\$ 100,000	
6	108	Fort Delaware State Park	New Castle	repair window sills at Fort	Property Pres High	NA	NA				\$ 5,000	
6	86	Cape Henlopen State Park	Sussex	youth camps air conditioning	Revenue Generation	Property Pres Low	NA				\$ 50,000	
6	77	Cape Henlopen State Park	Sussex	maintenance shop & Biden: fiber optic installation, phase II	Property Pres High	NA	NA				\$ 170,000	
6	44	Auburn Heights Preserve	New Castle	Auburb Heights: repair roof leak	Property Pres High	NA	NA				\$ 5,000	
6	34	Bellevue State Park	New Castle	pond: gate valve replacement	Property Pres High	NA	NA				\$ 5,000	
6	20	Bellevue State Park	New Castle	Horse Barn Roof: repair/replace metal roof	Property Pres High	NA	NA				\$ 270,000	
6	17	Bellevue State Park	New Castle	Copper/ Fiber Optic Lines	Property Pres High	NA	NA				\$ 102,000	
5	349	Killens Pond State Park	Kent	Intern Housing(\$50K available via Americorp)	Legislative and Leverage	NA	NA				\$ 50,000	
5	326	Lums Pond State Park	New Castle	Demolish old water storage and treatment building	Legislative and Leverage	NA	NA				\$ 36,850	
5	324	Killens Pond State Park	Kent	Campground: three-point hookups for host sites (3) \$?, (funded via enterprise account) and electrical upgrade \$9K/loop, 6 loops	Revenue Generation	Recreational Need	NA				\$ 54,000	
5	287	White Clay Creek State Park	New Castle	Robinson house: ADA upgrades to facility	Revenue Generation	Recreational Need	NA				\$ 20,000	
5	167	White Clay Creek State Park	New Castle	Judge Morris RFI for partner	Revenue Generation	Recreational Need	NA				\$ 20,000	
5	153	Trap Pond State Park	Sussex	2 new cabins	Revenue Generation	Recreational Need	NA				\$ 100,000	
5	152	Trap Pond State Park	Sussex	2 cabins	Revenue Generation	Recreational Need	NA				\$ 70,000	
5	104	Delaware Seashore State Park	Sussex	kayak rental facility	Revenue Generation	Recreational Need	NA				\$ 10,000	

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5	99	Delaware Seashore State Park	Sussex	IR Marina - Pavilion	Revenue Generation	Recreational Need	NA				\$ 25,000	
5	30	Bellevue State Park	New Castle	figure 8/ hunter barn restrooms	Revenue Generation	Recreational Need	NA				\$ 100,000	
4	290	Alapocas Run State Park	New Castle	Fee Collection at Can-Do playground parking lot (automated parking meter kiosk)	Revenue Generation	NA	NA				\$ 20,000	
4	398	Lums Pond State Park	New Castle	Lums replace yurts with cabins	Revenue Generation	NA	NA				\$ 60,000	
4	67	Cape Henlopen State Park	Sussex	campground: 20 electrical 3 point hook-ups	Revenue Generation	NA	NA				\$ 100,000	
3	226	Wilmington State Parks	New Castle	Brandywine Park: Baynard stadium; Repair/repave roadways & improve traffic flow/parking in general	Property Pres Low	Recreational Need	NA				\$ 100,000	
3	219	Statewide and Special	Statewide	Tree work & Landscaping	Property Pres Low	Recreational Need	NA				\$ 10,000	
3	178	White Clay Creek State Park	New Castle	Judge Morris: install new heaters in garage/office	Property Pres Low	Recreational Need	NA				\$ 15,000	
3	114	Fort Delaware State Park	New Castle	bake oven room restoration for increased programming use	Property Pres Low	Recreational Need	NA				\$ 50,000	
3	51	Brandywine Creek State Park	New Castle	YCC building/ spring house upgrades	Property Pres Low	Recreational Need	NA				\$ 30,000	
3	29	Bellevue State Park	New Castle	office - central a/c, heat	Property Pres Low	Recreational Need	NA				\$ 14,000	
3	24	Bellevue State Park	New Castle	School House Rehab	Property Pres Low	Recreational Need	NA				\$ 200,000	
2	366	Bellevue State Park	New Castle	Cauffiel: water tower exterior repairs	Property Pres Low	NA	NA				\$ 25,000	
2	359	Cape Henlopen State Park	Sussex	mechanics shop: exterior envelope maintenance	Property Pres Low	NA	NA				\$ 20,000	
2	356	Statewide and Special	Statewide	structural study of all fire control towers	Property Pres Low	NA	NA				\$ 150,000	
2	352	Alapocas Run State Park	New Castle	Blue ball barn: courtyard- stone wall masonry repairs	Property Pres Low	NA	NA				\$ 30,000	
2	335	Wilmington State Parks	New Castle	Baynard stadium: paint north bleachers(lead paint issues)	Property Pres Low	NA	NA				\$ 50,000	
2	327	Trap Pond State Park	Sussex	Boat rental Building: new siding, roof, doors, interior & exterior lights and plumbing fixtures	Property Pres Low	NA	NA				\$ 10,000	
2	318	Fort DuPont State Park	New Castle	millings to patch potholes in roadways	Property Pres Low	NA	NA				\$ 4,000	
2	317	Fort Delaware State Park	New Castle	POW barracks: replace skirting/ install drainage around building to prevent further deterioration	Property Pres Low	NA	NA				\$ 5,000	

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2	314	Fort Delaware State Park	New Castle	Ticket sales/gift shop: purchase hardy board to re-side back side of building (park staff to install)	Property Pres Low	NA	NA				\$ 5,000	
2	313	Fort Delaware State Park	New Castle	Island concession stand: replace rotten floor and wall boards	Property Pres Low	NA	NA				\$ 3,000	
2	312	Fort Delaware State Park	New Castle	Island pier:replace deckboards (including fuel dock)	Property Pres Low	NA	NA				\$ 5,000	
2	311	Fort Delaware State Park	New Castle	Island pier handrail: continue replacing handrail components	Property Pres Low	NA	NA				\$ 2,500	
2	308	Delaware Seashore State Park	Sussex	Life saving Station: replace boardwalk between gift shop and museum	Property Pres Low	NA	NA				\$ 10,000	
2	293	Cape Henlopen State Park	Sussex	road and parking improvements	Property Pres Low	NA	NA				\$ 1,500,000	
2	288	White Clay Creek State Park	New Castle	Creek Road: north of Hopkins road; grading/ drainage of this roadway entrance to the nature center	Property Pres Low	NA	NA				\$ 10,000	
2	282	Delaware Seashore State Park	Sussex	towers road ocean: concession stand; replace overhead door	Property Pres Low	NA	NA					\$ 4,000
2	270	Fox Point State Park	New Castle	Pave phase II road and parking areas	Property Pres Low	NA	NA					\$ 250,000
2	263	Bellevue State Park	New Castle	Reseal floors in main restrooms (Scrap House)	Property Pres Low	NA	NA					\$ 4,200
2	261	Bellevue State Park	New Castle	Reseal Maintenance Parking Lot	Property Pres Low	NA	NA					\$ 3,450
2	256	Fort DuPont State Park	New Castle	tennis courts: Resurface, patch cracks, restore asphalt on two (2) at Fort DuPont State Park	Property Pres Low	NA	NA					\$ 20,000
2	248	Lums Pond State Park	New Castle	Repair cracks in parking lots	Property Pres Low	NA	NA					\$ 35,000
2	243	Wilmington State Parks	New Castle	Rockford Park: First Presbyterian Church regrade slope between church and raceway to allow easier mower access	Property Pres Low	NA	NA					\$ 30,000
2	240	Wilmington State Parks	New Castle	Brandywine Park: Renovate/ repair Josephine fountain	Property Pres Low	NA	NA					\$ 50,000
2	227	Wilmington State Parks	New Castle	Rockford Park: Tennis Courts; Renovate	Property Pres Low	NA	NA					\$ 100,000
2	180	White Clay Creek State Park	New Castle	Judge Morris: refinish wood floors	Property Pres Low	NA	NA					\$ 20,000
2	179	White Clay Creek State Park	New Castle	WSC: stain bandstage	Property Pres Low	NA	NA					\$ 20,000
2	173	White Clay Creek State Park	New Castle	Judge Morris: finish exterior painting	Property Pres Low	NA	NA					\$ 8,000

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2	170	White Clay Creek State Park	New Castle	Judge Morris: interior painting	Property Pres Low	NA	NA					\$ 30,000
2	162	White Clay Creek State Park	New Castle	exterior paint all barns	Property Pres Low	NA	NA					\$ 30,000
2	161	White Clay Creek State Park	New Castle	park office :exterior painting/ stucco repair	Property Pres Low	NA	NA					\$ 10,000
2	158	White Clay Creek State Park	New Castle	replace post/ rail fence @ 896 and wedgewood	Property Pres Low	NA	NA					\$ 8,000
2	150	Lums Pond State Park	New Castle	resurface tennis courts	Property Pres Low	NA	NA					\$ 100,000
2	147	Lums Pond State Park	New Castle	boat ramp: replace ramp, parking	Property Pres Low	NA	NA					\$ 500,000
2	123	Fort DuPont State Park	New Castle	duplex 92A repairs	Property Pres Low	NA	NA					\$ 11,000
2	120	Fort DuPont State Park	New Castle	Grass Dale : repair foundation	Property Pres Low	NA	NA					\$ 40,000
2	393	Fort Delaware State Park	New Castle	Ft. DE coating/sealing metal roofs	Property Pres Low	NA	NA					\$ 50,000
2	391	Fort Delaware State Park	New Castle	Ft. DE POW barracks roof replacement	Property Pres Low	NA	NA					\$ 6,000
2	389	Fort Delaware State Park	New Castle	Ft. DE water tank replacement	Property Pres Low	NA	NA					\$ 5,000
2	98	Delaware Seashore State Park	Sussex	Tower Road parking lot repairs/ repaving	Property Pres Low	NA	NA					\$ 100,000
2	244	Wilmington State Parks	New Castle	Bancroft Mills: Repave parking area	Property Pres Low	NA	NA					\$ 70,000
2	74	Cape Henlopen State Park	Sussex	Youth camp 1, Mess Hall: replace floor	Property Pres Low	NA	NA					\$ 10,000
2	56	Brandywine Creek State Park	New Castle	barn painting	Property Pres Low	NA	NA					\$ 5,000
2	55	Brandywine Creek State Park	New Castle	main park: replace contact station	Property Pres Low	NA	NA					\$ 50,000
2	49	Brandywine Creek State Park	New Castle	Nature Center: Pave lot, entrance road, maintenance center and flint woods residence driveway	Property Pres Low	NA	NA					\$ 100,000
2	40	Auburn Heights Preserve	New Castle	Exterior Painting	Property Pres Low	NA	NA					\$ 4,000
2	39	Auburn Heights Preserve	New Castle	Asphalt resurfacing	Property Pres Low	NA	NA					\$ 10,000
2	27	Bellevue State Park	New Castle	Hunter Barn - Asphalt overlay	Property Pres Low	NA	NA					\$ 8,000

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1	362	Lums Pond State Park	New Castle	shade structure at maintenance complex for boat rental operation, to lessen UV deterioration	Recreational Need	NA	NA					\$ 50,000
1	361	Lums Pond State Park	New Castle	three point hookup for (3) host sites	Recreational Need	NA	NA					\$ 30,000
1	358	Cape Henlopen State Park	Sussex	U of D dorm: electrical upgrade	Recreational Need	NA	NA					\$ 50,000
1	344	Bellevue State Park	New Castle	Sidewalk/circulation plan between arts building and mansion	Recreational Need	NA	NA					\$ 80,000
1	333	Wilmington State Parks	New Castle	Brandywine Park: replace life course trail	Recreational Need	NA	NA					\$ 75,000
1	330	White Clay Creek State Park	New Castle	Nature center Parking: convert turf parking area to gravel(10-12 spaces)	Recreational Need	NA	NA					\$ 75,000
1	320	Lums Pond State Park	New Castle	concrete pitching area for cricket within Area One	Recreational Need	NA	NA					\$ 3,700
1	310	Fort Delaware State Park	New Castle	Ticket sales/gift shop: upgrade exterior(including marquee roof and overhang)	Recreational Need	NA	NA					\$ 40,000
1	300	Brandywine Creek State Park	New Castle	Maintenance area: construct 4 bay pole shed w/ security fencing	Recreational Need	NA	NA					\$ 100,000
1	299	Alapocas Run State Park	New Castle	extend water and electric to shop near 202	Recreational Need	NA	NA					\$ 30,000
1	297	Alapocas Run State Park	New Castle	pavilion across from Bancroft Mills bridge	Recreational Need	NA	NA					\$ 300,000
1	294	Wilmington State Parks	New Castle	Rockford: remove or renovate ball field in lower field	Recreational Need	NA	NA					\$ 100,000
1	268	Bellevue State Park	New Castle	Office: construct garage to replace existing shed (rental bike, GEM car and golf cart storage)	Recreational Need	NA	NA					\$ 12,000
1	267	Bellevue State Park	New Castle	Install biosun restroom near pavilions 1 & 3	Recreational Need	NA	NA					\$ 250,000
1	254	Fox Point State Park	New Castle	pave bike path from railroad tracks to entrance	Recreational Need	NA	NA					\$ 10,500
1	242	Alapocas Run State Park	New Castle	Blue Ball Barn: create stabilized turf overflow parking area adjacent to Barn	Recreational Need	NA	NA					\$ 250,000
1	184	Wilmington State Parks	New Castle	storage facility for interpretation	Recreational Need	NA	NA					\$ 50,000
1	182	Wilmington State Parks	New Castle	zoo: implement phase I master plan	Recreational Need	NA	NA					\$ 8,000,000
1	176	White Clay Creek State Park	New Castle	Judge Morris: fabricate and install decorative gates at main drive	Recreational Need	NA	NA					\$ 40,000
1	175	White Clay Creek State Park	New Castle	WSC; install chain link fence @ maint. Area shop/ pole shed	Recreational Need	NA	NA					\$ 50,000

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1	174	White Clay Creek State Park	New Castle	Possum Hill; replace clivus with Bio-Sun	Recreational Need	NA	NA					\$ 40,000
1	159	White Clay Creek State Park	New Castle	add playground equipment (2 - 5 yrs)	Recreational Need	NA	NA					\$ 75,000
1	141	Fork Branch Nature Preserve	Kent	Fork Branch site Plan; parking plan	Recreational Need	NA	NA					\$ 75,000
1	138	Killens Pond State Park	Kent	2 shade structures	Recreational Need	NA	NA					\$ 20,000
1	130	Killens Pond State Park	Kent	restrooms for primitive and family camping	Recreational Need	NA	NA					\$ 80,000
1	121	Fort DuPont State Park	New Castle	pole building	Recreational Need	NA	NA					\$ 25,000
1	116	Fort Delaware State Park	New Castle	new benches for grand casemate	Recreational Need	NA	NA					\$ 3,000
1	113	Fort Delaware State Park	New Castle	composting toilet - island	Recreational Need	NA	NA					\$ 120,000
1	112	Fort Delaware State Park	New Castle	soldier sleeping room renovation	Recreational Need	NA	NA					\$ 75,000
1	110	Fort Delaware State Park	New Castle	blacksmith shop reconstruction	Recreational Need	NA	NA					\$ 100,000
1	103	Delaware Seashore State Park	Sussex	new air station (fresh pond trust)	Recreational Need	NA	NA					\$ 25,000
1	102	Holts Landing State Park	Sussex	Holts entrance sign(21st Century)	Recreational Need	NA	NA					\$ 5,000
1	101	Delaware Seashore State Park	Sussex	IR Marina - shuffleboard courts	Recreational Need	NA	NA					\$ 50,000
1	97	Holts Landing State Park	Sussex	Holts Landing Playground replacement	Recreational Need	NA	NA					\$ 150,000
1	82	Cape Henlopen State Park	Sussex	fort miles restroom	Recreational Need	NA	NA					\$ 250,000
1	400	Lums Pond State Park	New Castle	Lums Ranger office addition	Recreational Need	NA	NA					\$ 150,000
1	78	Cape Henlopen State Park	Sussex	Parade Field irrigation	Recreational Need	NA	NA					\$ 50,000
1	76	Cape Henlopen State Park	Sussex	park office expansion	Recreational Need	NA	NA					\$ 75,000
1	73	Cape Henlopen State Park	Sussex	Primitive area restroom	Recreational Need	NA	NA					\$ 100,000
1	72	Cape Henlopen State Park	Sussex	Nature Center Expansion (design only)	Recreational Need	NA	NA					\$ 250,000
1	71	Cape Henlopen State Park	Sussex	herring point composting toilets	Recreational Need	NA	NA					\$ 40,000
1	69	Cape Henlopen State Park	Sussex	Herring Point Parking Lot	Recreational Need	NA	NA					\$ 250,000

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1	399	Lums Pond State Park	New Castle	Lums pole building for boat rentals	Recreational Need	NA	NA					\$ 20,000
1	63	Cape Henlopen State Park	Sussex	Gordons Pond; restrooms/ showers	Recreational Need	NA	NA					\$ 250,000
1	62	Cape Henlopen State Park	Sussex	Maintenance Pole Shed	Recreational Need	NA	NA					\$ 60,000
1	397	Lums Pond State Park	New Castle	Lums running 3 point hookups to future host site	Recreational Need	NA	NA					\$ 30,000
1	58	Brandywine Creek State Park	New Castle	Flint Woods: bus/ drop-off location	Recreational Need	NA	NA					\$ 20,000
1	54	Brandywine Creek State Park	New Castle	Thompsons Bridge: install steps and landscaping	Recreational Need	NA	NA					\$ 50,000
1	396	Lums Pond State Park	New Castle	Lums concrete paving for cricket field pitch	Recreational Need	NA	NA					\$ 3,700
1	52	Brandywine Creek State Park	New Castle	nature center: add lab/classroom wing, ranger office	Recreational Need	NA	NA					\$ 200,000
1	383	Delaware Seashore State Park	Sussex	DSSP new signature signs	Recreational Need	NA	NA					\$ 25,000
1	48	Brandywine Creek State Park	New Castle	Nature Center: upgrade restrooms to include outside access	Recreational Need	NA	NA					\$ 20,000
1	47	Brandywine Creek State Park	New Castle	maintenance shop: Security fence	Recreational Need	NA	NA					\$ 15,000
1	46	Brandywine Creek State Park	New Castle	maintenance shop - Replace, include restrooms	Recreational Need	NA	NA					\$ 200,000
1	374	Bellevue State Park	New Castle	Construct a new garage to replace existng shed	Recreational Need	NA	NA					\$ 12,000
1	370	Auburn Heights Preserve	New Castle	Upgrade of restrooms at Auburn Heights to make them ADA compliant and year round	Recreational Need	NA	NA					\$ 60,000
1	233	Fox Point State Park	New Castle	Construct 'Green' Pavilion	Recreational Need	NA	NA					\$ 200,000
1	25	Bellevue State Park	New Castle	Carriage House Restrooms	Recreational Need	NA	NA					\$ 3,000
1	23	Bellevue State Park	New Castle	Cabana Restroom renovation	Recreational Need	NA	NA					\$ 20,000
1	21	Bellevue State Park	New Castle	Arts Building: Install restrooms in	Recreational Need	NA	NA					\$ 7,500
0	390	Fort Delaware State Park	New Castle	Ft. DE pathways (barge and stone)	NA	NA	NA					\$ 35,000
TOTAL								\$ 14,611,000	\$ 15,344,000	\$ 14,898,000	\$ 14,952,850	\$ 15,527,050

DNREC - Div. of Fish and Wildlife Wildlife/Fisheries Capital Development Plan					
Project Name	\$ in thousands)	FY 2015	FY 2016	FY 2017	NOTE:
Delaware Bayshore - AREC/Visitor Center		200.0			BOND and Bayshore/Byways
Delaware Bayshore - Bayshore Visitor Center (Little Creek) Wildlife Facility		2,000.0			BOND/USFWS Grant (PR)
Storage at Little Creek (Wildlife and Construction staff)		150.0			BOND
Little Creek -Road repairs		100.0			BOND
Repair and Rehabilitate Historical Houses on Wildlife Management Areas		350.0	250.0	250.0	BOND
Road repairs F&W areas and parking lots (gravel)		200.0	200.0	200.0	BOND
Energy upgrades to F&W owned buildings		200.0			BOND
Woodland Beach Observation Tower Trail		75.0			NSF
Demolition of unsafe strcutures on F&W areas open for public use		100.0	50.0		BOND
Region 1 - upgrades to shop (uitlities, mold remediation, structural)		50.0			BOND
Poplar Thicket Erosion Project		1,500.0	1,250.0		BOND
Ommelanden Range Upgrade (Wildlife)		100.0			BOND
Yardley Dale Building upgrades, site development, signage, observation tower		267.5			NSF
Kingston Upon the Hull - stabelization, repointing brickwork and fencing		220.0			BOND/NSF
Ted Harvey WMA - observation towers		150.0			NSF
Ted Harvey - Emergency spillway refurbish		1,000.0			NSF/BOND
Woodland Beach/Taylors Gut Impoundment- water control structure		250.0	750.0		NSF/BOND
Dragon Run Marsh/Delaware City Partnership			500.0		BOND/NSF
Mispillion Harbor Reserve - harbor restoration		1,750.0	1,250.0	3,000.0	BOND/NSF
Little creek & Ted Harvey Impoundments - dike repairs & water control structure		2,500.0	1,500.0		BOND/NSF
Augustine Creek Wildlife Area - dike repairs & water control structure			2,000.0	2,000.0	BOND/NSF
Fishing Piers - Design/Engineering and Construction C&D Canal ADA accessible		1,000.0			BOND
Parking lot repairs for boat ramps		500.0	250.0	250.0	BOND
Milford Mosquito Control Facility - Design/Engineering/Construction		686.0			Bond
Milford Mosquito Control - Connect to city sewer			15.0		BOND
Boat Storage Sussex County Enforcement		140.0			BOND
Boat Storage Little Creek Enforcement		75.0			BOND
Heating System Little Creek Enforcement		50.0			BOND
Critical Equipment		606.0	500.0	250.0	BOND
Scotton Landing Boat Access Rehabilitation and Fish Pier (Fisheries)					ASF/NSF
Augustine Beach Fishing Access Area Reconstruction/Maintenance Dredging		250.0	500.0	1,250.0	ASF/NSF/BOND
Becks Pond Launch Area Dredging (Fisheries)				250.0	Bond
Phillips Landing Boat Ramp Rehabilitaiton (Fisheries)		1,500.0			ASF/NSF
Rosedale Beach Ramp Area Dredging (Fisheries)				500.0	ASF/NSF
Records Pond Launch Area Dredging (Fisheries)				75.0	ASF/NSF
Repaving Fishing Access Area Parking Lots (Fisheries)		600.0	600.0	300.0	ASF/NSF
Rosedale Fishing Area Upgrades (Fisheries)			200.0		ASF/NSF
Collins Beach Hydrographic (Fisheries)				25.0	ASF/NSF
Collins Beach Dredging (Fisheries)				100.0	ASF/NSF

DNREC - Div. of Fish and Wildlife Wildlife/Fisheries Capital Development Plan					
Project Name	\$ in thousands)	FY 2015	FY 2016	FY 2017	NOTE:
Abbotts Barrier-free Fishing Pier Installation (Fisheries)					ASF/NSF
Blair's Pond Barrier-Fishing Pier Installation (Fisheries)					ASF/NSF
Woodland Beach Bayfront Ramp (Fisheries)					ASF/NSF
Seaford Boating Access Docks Lighting (Fisheries)					ASF/NSF
Becks Pond Barrier - Fishing Pier Installations (Fisheries)				150.0	ASF/NSF
Cedar Creek Enforcement Dock Extension			500.0		NSF
Soil and Water/Lewes FD/Enforcement Dock Extension		250.0			NSF
Cedar Creek Enforcement Dock Roof Extension		250.0			ASF/NSF
Little Creek Enforcement Shop Dry Stack Storage		250.0			BOND/ASF/NSF
Old Furnace Enforcement Dry Stack Storage		250.0			BOND/ASF/NSF
Little Creek Enforcement Shop Painting and Exterior Repairs		50.0			BOND/ASF/NSF
Artificial Reef Program (Fisheries)		600.0	600.0	600.0	NSF - annual reef deployments ongoing
Dobbinsville (New Castle) Fishing Pier			500.0	800.0	ASF/NSF
Courtesy Docks in all F&W Ponds		250.0	250.0	250.0	ASF/NSF
Duck Creek Kayak Launch Facility			300.0		BOND
Maintenance of F&W state-owned dams and dikes					Bond - High Hazard Dam and Dike Repair/ Replacement. Project priorities assigned through the Division of Watershed Stewardship.
TOTAL		18,469.5	11,965.0	10,250.0	

Tourism Assets and Healthy Families

Statewide Trails and Pathways

The First State Trails and Pathways Initiative creates a statewide network of new and enhanced trails and pathways for residents and visitors for walking, biking, hiking and active living. The Initiative has far-reaching advantages – boosting Delaware’s economy, benefiting local businesses, and promoting the continued growth of the state’s recreation and tourism industries. By offering people places to walk, run or ride, trails and pathways allow them to connect with the outdoors and live healthier, more active lifestyles.

Governor Markell’s Initiative is a partnership led by DNREC and DelDOT with regional and local organizations and government partners.



Youth group rides the Pomeroy Trail in Newark and White Clay Creek State Park.

Completed Projects: FY 2013

Auburn Heights Preserve – 1.2-mile Auburn Valley Trail; 0.3-mile Trolley Trail

C&D Canal – 8.7 miles, Michael Castle Trail (Phase I)

DE Seashore State Park

- ◆ 0.75-mile Thompson Island Preserve Trail
- ◆ 1.9-mile Prickly Pear Trail – connects Route 1 south of the Indian River Inlet to Bethany Beach

- ◆ Trail-related activities are the number one outdoor recreation activity in Delaware; more than half of our residents want more trail-related opportunities. (source: State Comprehensive Outdoor Recreation Plan)
- ◆ Delaware’s 563 miles of trails serve both recreational trail users and the active transportation community. The trail network serves hikers, walkers, runners, mountain bikers, bicyclists, equestrians and nature enthusiasts.
- ◆ 42% of all trail miles are managed by DNREC; 159 miles in State Parks and 82 miles in State Wildlife areas.

State Park trail projects focus on completing trail network gaps and making connections to communities and local parks. Wildlife Area projects expand Bayshore nature-based recreation.

FY 2015 Funding Request: \$2.7 Million

- ◆ **White Clay Creek State Park** – 0.75-mile trail link to Paper Mill County Park and 2.1-mile link to Possum Park Road
- ◆ **Cape Henlopen State Park** – 1.25-mile trail from Cape May-Lewes Ferry to Park entrance
- ◆ **Lums Pond State Park** – 0.5-mile link to Michael Castle Trail at C&D Canal
- ◆ **Augustine Wildlife Area** – 1.9-mile trail for wildlife observation





In November 2013, the Wilmington Trail Club held its 20th Hike Across Delaware on the Michael Castle Trail.

Trail Benefits

Economic – A trail can bring at least \$1 million annually to a community, depending on how the area embraces a trail.

Health – In Delaware, 39.7% of children ages two to 17 are overweight or obese. Trails and parks provide a means for children and families to be physically active and live healthy lifestyles.

Jobs and Tourism – Trails generate revenue for small businesses, restaurants, gear/bike shops, and lodging, supporting local economies.

Environment – Bicycling and walking for recreation, work, and everyday activities save on fuel costs and improve air quality. By biking or walking one mile, instead of driving, nearly one pound of carbon dioxide emissions is eliminated.

FY 2016 - 2017 Funding Requests for New Trails: \$3 Million/Year

- ◆ White Clay Creek State Park - 3.5 miles
- ◆ Lums Pond State Park - 2.75 miles
- ◆ Assawoman Canal Trail - 1.5 miles
- ◆ Brandywine Creek State Park - 1 mile
- ◆ Little Creek Wildlife Area - 1 mile
- ◆ Alapocas Run State Park - 1 mile
- ◆ Ted Harvey Wildlife Area - 0.5 mile

Current Trail Projects: FY 2014

Auburn Heights Preserve – Phase II, half mile trail will be advertised for construction in fall 2013.

Northern Delaware Greenway Trail

- ◆ **Alapocas Run State Park** – Resurface 0.6 miles to improve accessibility in 2014; structural evaluation of storm water damaged bridge completed.
- ◆ **Brandywine Park** – The historic Swinging Bridge, a heavily used trail connection over Brandywine Creek, will be redecked in 2014.
- ◆ **Brandywine Creek State Park** – Structural evaluation of storm water damaged bridge completed.

White Clay Creek State Park

- ◆ **Tri-Valley Trail** – 2.1-mile addition, with new access and parking area in design; construction fall 2014.
- ◆ **Pomeroy Trail** – 1 mile will be resurfaced to improve accessibility.

Lums Pond State Park – A 0.75-mile trail segment is under reconstruction, part of the 6.4-mile Swamp Forest Trail that loops the park. 5.5 miles have been reconstructed.

C&D Canal Conservation Area

- ◆ **Michael Castle Trail** – In partnership with DelDOT and Fish and Wildlife, design Phase II (4.75 miles) linking the DE/MD state line and extension east to Delaware City. Construction expected in 2014.

Fort DuPont State Park/Bayshore site – 1.5 miles of trail linking Delaware City, Fort DuPont, and C&D Canal is in the early planning stage.

Augustine Wildlife Area/Bayshore site – 1.9 miles of trail and observation platforms are in the early planning stage.

Cape Henlopen State Park

- ◆ **Gordons Pond Trail** – 3-mile extension is under construction; opening June 2014. When complete, the trail will link the northern and southern portions of the park and be part of a 15-mile loop connecting Lewes and Rehoboth.

Delaware Seashore State Park

- ◆ **Assawoman Canal Trail** – 1.1-mile trail connects Ocean View and Bethany area communities; construction expected fall 2014.
- ◆ **Indian River Inlet Pathways** – 2 miles of new pathways linking beaches, fishing, and campgrounds; opening spring 2014.

DNREC Trails Project Development Projections - Parks/ F&W

Last Updated: Mar-14		Project Stage	Projected Bond \$ (thousands)	Other Funds	Match Source or Other Funds	Calendar Year Schedule	
FY13 (\$3M BB)							
Cape - Gordons Pond Trail - with new trailhead at Herring point (2 mi)		construction	\$2,722.0			Fall 2013-May 2014	original contract amount and contract amendment
Cape - Bike Trail extension Herring Pt to Transmitter Rd (0.56 mi)		construction	189.0			Spring 2014	
Herring Point - T-Building parking lot		Overlay	100.0			Spring 2014	
Assawoman Canal Trail		Design		244.5	DTF	Winter 2014	
FY13 Total			\$3,011.0	\$244.5			
FY14 (\$2.925M BB)							
Brandywine Park - 1) Swinging Bridge deck replacement for accessibility, paint bridge; 2) N.Del Greenway Trail surface upgrade for accessibility/sustainability		Construction	750.0			Spring 2014-Summer 2014	oak deck; shotcrete tread on trail
White Clay - Tri-Valley Trail & Possum Hill trailhead (2.1 mi)		Design	162.0			Winter 2014	scope needed to complete design
White Clay Creek State Park - Possum Hill to Corner Ketch Rd community connector (0.75mi /1.25 mi)		In house alignment design - Survey & Engineering	130.0			Winter 2014	David assigned coord alignment design
Brandywine Park - pathway connector along Park Dr to Swinging Bridge (0.25 mi)		in house design Construction	TBD			Fall 2014	
Brandywine Creek - bridge and surface repairs on N.DE Greenway Trail		Evaluated	TBD	29.0	Sandy Funds	Fall 2013	historic bridge
Alapocas Run - bridge repairs on N.DE Greenway Trail		Evaluated	TBD	28.0	Sandy Funds	Fall 2013	
DSSP Inlet Pathways (2.0 mi)		Construction		230.0	FHWA/DelDOT	Spring 2014-Summer 2015	6" concrete pathway to match existing path widths
Fort DuPont - Delaware City connector trail, Fort DuPont to Grassdale to C&D Canal (1.5mi)		Design	60.0	240.0	Fed Byway	Winter 2014	
Lums Pond - Buck Jersey Pathway thru park (2.75 mi)		Wetland delineation		30.0	CIAC	winter 2013 - Winter 2014	
NVF - Phase 2 Benge to Gun Club Rd (5.0 mi)		Construction	1,000.0			Winter 2014	Pending response at bid alternate
Augustine Wildlife Area - Yardly Dale Trail & viewing platform (0.9 mi)		Design	5.0	25.0	Fed Byway	Winter 2014	
Augustine Wildlife Area - Wildlife Viewing Trail Port Penn office (1.0 mi)		In house design				Winter 2014	
Cape Henlopen - easternmost segment of Georgetown-Lewes-Cape Trail, Freeman Hwy to park entrance (1.25mi)		In house layout - Survey & Engineering	220.0			Spring 2014	
FY14 Total			\$2,327.0	\$582.0			
FY15 (\$2.7M BB request)							
White Clay - Tri-Valley Trail (2.1mi)		Construction	1,800.0	500.0	RTP	Fall 2014	
White Clay - Possum Hill to Corner Ketch community connector trail (0.75 mi)		Construction	507.0	100.0	RTP	Fall 2014-Spring 2015	
White Clay - Carpenter Loop Trail and trail link to Creek Rd Trail (2.4mi)		Design	200.0			Fall 2014	
Alapocas Run - new surface to meet ADA requirements		Construction	500.0			Fall 2014	
Alapocas Run - bridge repairs on N.Del Greenway Trail		Construction	TBD	TBD	TBD		
Lums Pond - Buck Jersey Road Trail (2.75mi)		Design	200.0	100.0	RTP	Summer 2014	
C&D Canal - Lums Pond SP to Castle Trail (0.5)		In house design Construction	20.0	80.0	RTP	Spring 2015	coincide with main trail construction
Brandywine Creek SP - bridge and surface repairs on N.Del Greenway Trail		Construction	TBD				
Cape Henlopen - easternmost segment of Georgetown-Lewes-Cape Trail, Freeman Hwy to park entrance (1.25mi)		Construction	900.0			Fall 2015 - Spring 2016	David assigned to coord. alignment design

DNREC Trails Project Development Projections - Parks/ F&W

Last Updated: Mar-14		Project Stage	Projected Bond \$ (thousands)	Other Funds	Match Source or Other Funds	Calendar Year Schedule	
Assawoman Canal Trail (1.0 mi)		Construction	525.0	595.0	Fed RTP	Fall 2014 - Winter 2015	
Augustine Wildlife Area - Yardly Dale Trail & viewing platform (0.9 mi)		Construction	40.0	160.0	Fed Byway	Fall 2014	4' wide stone \$4/sq ft
Augustine Wildlife Area - Wildlife Viewing Trail Port Penn office (1.0 mi)		Construction	25.0	101.0	Fed Byway	Fall 2014	6' wide stone \$4/sq ft
Augustine Wildlife Area- Cooper Cross Trail & observation platform		Design / Construction	12.0	60.0	Fed Byway	Fall 2014	6' wide stone \$4/sq ft
FY15 Total			\$4,729.0	\$1,221.3			
FY 16 (\$3M BB request)							
White Clay - Pomeroy Trail, Hopkins to Park Office (1.0 mi) & 90 ft bridge - partial design complete		Bridge design	100.0	10.0	RTP	Summer 2015	
White Clay - Carpenter Loop Trail (2.4mi)		Construction	1,620.0			Fall 2015	8 ft asphalt
Lums Pond - Buck Jersey Pathway (2.75mi)		Construction	1,390.0		CTF?	Fall 2015	6' asphalt
Fort DuPont - Delaware City connector trail, Fort DuPont to Grassdale to C&D Canal (1.5mi)		Construction		1,010.0	TBD	TBD	
Delaware Seashore - Assawoman Canal Trail, Phase 2 (1.5mi)		Design	200.0			Summer 2015	
NVF - Phase 4, Red Clay Creek to Oversee Preserve (1.2 mi)		Design	TBD			Summer 2015	
AREC Bayshore Byway Information Center- Taylors Gut Wildlife viewing Trails and Observation Blind (0.25 mi)		Design / Construction	6.3	25.3	Fed Byway	Winter 2015	6' wide stone \$4/sq ft
Ted Harvey Wildlife Area - Morris Tract viewing trail and observation platform (1.0 mi)		Design / Construction		150.0	Bayshore BB	Summer 2015- Spring 2015	6' wide stone \$4/sq ft
Little Creek Wildlife Area Bayshore Visitor Center and viewing trail (0.5 mi)		Design / Construction	14.0	56.0	Fed Byway	Fall 2015	6' wide stone \$4/sq ft
Little Creek Wildlife Area - wildlife viewing trail loop-contingent and Town of Little Creek connector trail (0.5 mi)		Design / Construction	14.0	56.0	Fed Byway	Fall 2015	6' wide stone \$4/sq ft
FY16 Total			\$3,344.3	\$1,307.3			
FY17 (\$3M BB request)							
White Clay - Pomeroy Trail, Hopkins to Park Office (1.0 mi) & 90 ft bridge - partial design complete		Construction	1,000.0			Winter 2016	6" stone
Brandywine Creek SP - Creek Rd Trail, Thompson Station area to Ramsey Rd. Project in conjunction with NPS, First State National Monument		Design/construction	1,000.0			Winter 2016	
Assawoman Canal Trail - phase 2 (1.5mi)		Construction	1,010.0			Winter 2016	8ft asphalt
Alapocas Run - connector trail from 141 to N.DE Greenway Trail (1mi)		Design	169.0			Winter 2016	
Augustine Wildlife Area - Lang Marsh Loop (1.0 mi)		Design / Construction		126.0	Bayshore BB	Fall 2016	6' wide stone \$4/sq ft contingent upon levee and water control structure repairs
Ted Harvey Wildlife Area to St Jones Reserve Trail Connector enhancements and extention (0.5 mi)		Design / Construction	18.0	72.0	Fed Byway	Spring 2017	6' wide stone \$4/sq ft
FY17 Total			\$3,197.0	\$198.0			

Footnote: Formula - \$16/sqft construction; \$4/sqft design; other cost formula noted based on Trail Crew's experience material costs

CMAQ – Congestion Mitigation Air Quality

CTF – Community Transportation Fund

DTE – Delaware Land and Water Conservation Fund

HSCA – Hazardous Substance Cleanup Act

RTP – Recreational Trail Program

TE/TAP – Transportation Enhancement / Transportation Solutions Program

Tourism Assets and Healthy Families

Delaware Ocean and Bay Beaches

Delaware's ocean and bay beaches are among the most prized in the nation. In 2012 and 2013 our 26 miles of ocean beaches were ranked 1st in the nation for beach water quality. Two beaches – Rehoboth and Dewey – were awarded 5-star ratings as superstar beaches for the past 4 years. Delaware Bay beaches are a vital component of the Delaware Bayshore Initiative, as a world-class conservation and low-impact recreation area.



With our beach water quality and nationally-recognized beach nourishment projects, Delaware has emerged as one of the nation's most pristine beach destinations.

Beach nourishment protects our citizens, infrastructure and property from flooding and storms and ensures that Delaware is prepared for the impacts of future storms.

Economics:

- ◆ Delaware's coastal economy has a significant impact on our overall economy – generating almost \$7 billion annually.
- ◆ Our coastal economy generates \$711 million in tax revenue and supports almost 60,000 jobs.
- ◆ Beach tourism provides more than 10 percent of the state's total employment taxes and business production.

Nourished beaches are vital to tourism, job growth and Delaware's economy.



Beach nourishment at Dewey Beach

FY 2015 Funding Request: \$1.5 Million

- ◆ \$1.5 million is necessary to support the State's minimum commitment for shoreline protection for state and federal cost share projects.
- ◆ Federal beach nourishment projects are undertaken on a cost sharing, federal/state basis on a 3-5 year cycle for 50 years.
- ◆ Adequate funding must be maintained to provide the non-federal share portion of this work.
- ◆ The funds requested will also support the implementation of Phase I of the 10-year Delaware Bay Beach Management Plan.



Hurricane Sandy damage near Indian River Inlet



Walking on Bowers Beach

Delaware’s Beach Preservation Program includes:

- ◆ Beach nourishment
- ◆ Structural erosion control measures
- ◆ Public dune maintenance
- ◆ Emergency storm repair and cleanup

Work is done only on publicly accessible beaches and may involve cost sharing with the federal government.



Delaware was awarded \$30 million in federal Hurricane Sandy relief funding to restore ocean beaches to pre-Sandy conditions.

Current Projects: FY 2014

- ◆ **Beach nourishment** (*ocean and bay beaches*): During this fiscal year, beach nourishment funding has been obligated to bay and ocean beach projects, as federal nourishment projects were needed.
- ◆ **Indian River sand bypass and crane replacement/rehabilitation:** Protects Rt. 1 and the Indian River Inlet Bridge.

Accomplishments: FY 2014

Hurricane Sandy federal relief funding

- ◆ 2 million cubic yards of sand was pumped back on ocean beaches from Lewes to Fenwick Island.
- ◆ 500,000 cubic yards of sand was pumped onto the north shore of the Indian River Inlet to provide a greater level of protection for Rt. 1 and the Indian River Inlet Bridge.

Delaware Bay Beaches

- ◆ With storms and erosion threatening several bay communities, reaching an agreement on investment policy for beach replenishment and road repair is vitally important.
- ◆ An analysis and valuation of infrastructure and ecosystem assets is underway to inform state and local governments on short and long-term policy questions associated with making public investments in bay beach communities.
- ◆ Legislation may be necessary to determine funding enhancements of existing revenue streams.

FY 2016 - 2017 Funding Requests: \$1.5 Million/Year

- ◆ Current revenue stream is insufficient
- ◆ Unmet capital needs over the next 5 years:
 - ◆ Ocean beaches: \$13 million in state share is needed for \$37 million in federal projects over the next 3 to 5 years
 - ◆ Bay beaches: \$28 million is needed
 - ◆ State needs an additional \$6 million per year for both ocean and bay beaches



DNREC Watershed Stewardship - Shoreline and Waterway Management

Capital Project Priorities FY2014-2019

Last Update: 03/05/2014

Funding Sources	1-Jul-2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
	Balance						
(federal share)							
Annual DCPD Sand Bypass Grant - 40633 (5-Year Average of Federal Reimbursement)		390,000	390,000	390,000	390,000	390,000	390,000
(state share)							
Bond Appropriation Beach - 10251 ⁽¹⁾	1,700,000	1,700,000	1,140,500	-	-	-	-
Bond Appropriation Waterway - Dredge & Navigation	627,000	1,600,000	-	-	-	-	-
Annual GF Sand Bypass - 00374	-	80,000	80,000	80,000	80,000	80,000	80,000
Annual GF Shoreline & Waterway - 00150/00160	-	268,600	268,600	268,600	268,600	268,600	268,600
Hotel Accomodation Tax - 76500/30065	4,426,780	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Schedule of Recycling Loan Repayment - 76500 ⁽²⁾	-	2,157,154	-	-	-	-	-
Total Estimated Funding	6,753,780	8,195,754	3,879,100	2,738,600	2,738,600	2,738,600	2,738,600
Project Expenditures/Encumbrances		FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
(state share)							
<u>NOURISHING OCEAN BEACHES:</u> ⁽³⁾							
Rehoboth-Dewey		81,000	81,000	4,300,000	81,000	81,000	81,000
Lewes		45,000	45,000	45,000	45,000	45,000	1,145,000
Bethany-South Bethany		81,000	81,000	4,100,000	81,000	81,000	81,000
Fenwick Island		81,000	81,000	81,000	1,700,000	81,000	81,000
Indian River Sand Bypass Operations, Crane & Facility Improvements (5-Year Average of Federal-40.75 and State-59.25 Shares)		950,000	950,000	950,000	950,000	950,000	950,000
Annual Shoreline & Waterway Operations Contractual Maintenance, Equipment, Supply, and Personnel		700,000	700,000	700,000	700,000	700,000	700,000
<u>NOURISHING BAY BEACHES</u> ⁽⁴⁾							
Pickering Beach (plan./eng., truckfill/prop. access, 20% beachfill, truckfill)		121,200	350,000		400,000		225,000
Kitts Hummock (plan./eng. & truckfill, truckfill/prop. access, 20% beachfill,)		121,200		375,000	600,000		
Bowers (plan./eng., jetty construction, 20% beachfill)		309,200	1,300,000	400,000			
South Bowers (plan./eng., jetty construction, 20% beachfill)		139,475	1,200,000	500,000			
Slaughter Beach (plan./eng., 20% beachfill)		121,200	1,320,000				
Prime Hook (plan./eng., 20% beachfill)		121,200		660,000			
Broadkill Beach (truckfill, fed project maintenance- e.g. crossovers)		647,000	2,000,000				
Lewes (truckfill)			500,000				
Cape Shores (truckfill)						500,000	
<u>NAVIGATION / DREDGE PROJECTS</u> ⁽⁵⁾							
Murderkill River (construction completion)		627,000					
Massey's Ditch (planning/engineering, construction)		550,000	2,300,000				
Little River (planning/engineering, construction)		300,000	1,200,000				
Lewes-Rehoboth Canal (planning/engineering, construction)				300,000	1,250,000		
Herring Creek (planning/engineering, construction)					300,000	1,300,000	
Mispillion River (planning/engineering, construction)							
Indian River (planning/engineering/in-house construction)		750,000					
Augustine Boat Ramp (in-house construction)			75,000				
Holts Landing State Park (in-house construction)		300,000	100,000				
Delaware City Mooring Basin (in-house construction)			100,000				
Indian River Inlet Marina (in-house construction)				75,000			
U of D/CMS Harbor (in-house construction)					50,000		
Total Estimated Expenditures		4,995,475	12,108,000	12,411,000	6,107,000	3,738,000	3,263,000
Balance of Funding for Planned Projects	6,753,780	9,954,059	1,725,159	(7,947,241)	(11,315,641)	(12,315,041)	(18,316,641)

⁽¹⁾ Appropriation is based on actual award balance, recommended, or requested bond funding.

⁽²⁾ To implement the Universal Recycling legislation and in accordance with Section 89 of the FY2011 Bond Bill (HB500), a loan of \$6,500,000 was made to the Universal Recycling Grant and Low Interest Loan Program from the Beach Preservation appropriation. Revenues collected from the Bottle Fee provides for repayments beginning January 2012 with a scheduled repayment in full by June 30, 2014.

⁽³⁾ DNREC's investment in Ocean Beach projects is expected to leverage 2014-2019 US Corp of Engineers (US ACOE) funding of \$42.99 million. US ACOE match ratios can vary depending on the beach site with an average cost share ratio of 35:65. Consequently, these Ocean Beach project estimates may be modified as a result of Hurricane Sandy Storm damage/mitigation funding through the Federal Supplemental.

⁽⁴⁾ Bay Beach Projects include consulting services for planning and engineering, estimated truckfill needs, property acquisition for access, and beachfill (at 20% state share) in accordance with the PBJ&S template. Also annual Bay Beach Maintenance for Broadkill Beach to complete appurtenances for dune, crossovers, etc. as part of the USACOE Main Channel Deepening.

⁽⁵⁾ Contractual Navigation Projects include consulting services for planning and engineering and estimated construction costs.

Project Cost Basis: (1) DNREC Annual GF Shoreline & Waterway Budget (dunes, dredge, harvest, channel marking, and facility operations/maintenance); (2) US Army Corp of Engineers 2014-2019 Delaware Ocean Beach Project Schedule; and (3) DNREC 10-Year Bay Beach Management Plan (in accordance with PBJ&S construction template).

Tourism Assets and Healthy Families

Waterway Management Operations

DNREC has been responsible for performing waterway management operations statewide since 1970. To ensure safe navigation for the boating public, the agency maintains adequate depths in waterways through dredging and sediment management, places aids for navigation to properly mark channels, and removes obstructions such as debris and derelict structures.

Mechanically harvesting nuisance build-ups of macro-algae in the Inland Bays helps to improve water quality, aesthetics and boating access. A major emphasis is being placed on using dredged material for beneficial purposes, including nourishing eroded shorelines and restoring wetlands.



Macro-algae harvester operating in South Bethany lagoon

Economics

- ◆ Improving navigation of our waterways supports our economy, tourism and commercial and recreational fishing.
- ◆ The beneficial reuse of clean dredged material from navigation projects is the most cost effective way to nourish eroded beaches.
- ◆ In recent years insufficient funding of federally authorized waterway management projects has resulted in many of these projects being defaulted to the state.
- ◆ Since the beginning of Waterway Management Operations, there has been a need for a steady, reliable and dedicated source of revenue.
- ◆ With more than 60,000 boats registered in Delaware, boat owners rely on safe and navigable channels and waterways.



Installing channel markers in the Inland Bays

FY 2015 Funding Request: \$3.75 Million

- ◆ \$3.75 million necessary to support waterway management operations.
- ◆ \$2.3 million needed for maintenance dredging of federal channel in Massey's Ditch and restoration of island habitat at nearby Middle Island.
- ◆ \$1.2 million needed for maintenance dredging of federal channel in Little River to improve local response capabilities to emergency situations in the Delaware Bay and improve access to the Delaware Bayshore.
- ◆ \$200,000 needed for ongoing waterway management operations throughout the state, including \$75,000 for the University of Delaware Citizen Monitoring Program in the Inland Bays.

Waterway Management Operations include:

- ◆ Navigational channel dredging, including beneficial reuse of dredged material
- ◆ Placement of aids to navigation primarily in the Inland Bays
- ◆ Macro-algae harvesting in the Inland Bays
- ◆ Abandoned vessel/derelict structure removal



Dredge operating in Pepper Creek with beneficial re-use marsh restoration project in the background. Material being dredged is applied by thin-layer aerial application to the sinking marsh to raise elevation.

Current Projects:



Waterway crew removing downed trees and debris from waterway.

Navigational Channel Improvements:

- ◆ Bond Bill funds were used to dredge the federal navigation channel in the Murderkill River at Bowers Beach in Jan./Feb. 2014. The project included the beneficial reuse of clean, dredged sand to widen the beach at South Bowers.
- ◆ In FY 2014, \$1.3 million has been obligated to Massey's Ditch, Little River, Indian River and Holt's Landing for engineering, design, including beneficial reuse options, and permitting.

Waterway Management Operations:

- ◆ \$138,000 has been obligated in FY 2014 for navigational channel marking, macro-algae harvesting, abandoned vessel/derelict structure and debris removal, and the University of Delaware Citizen Monitoring Program.

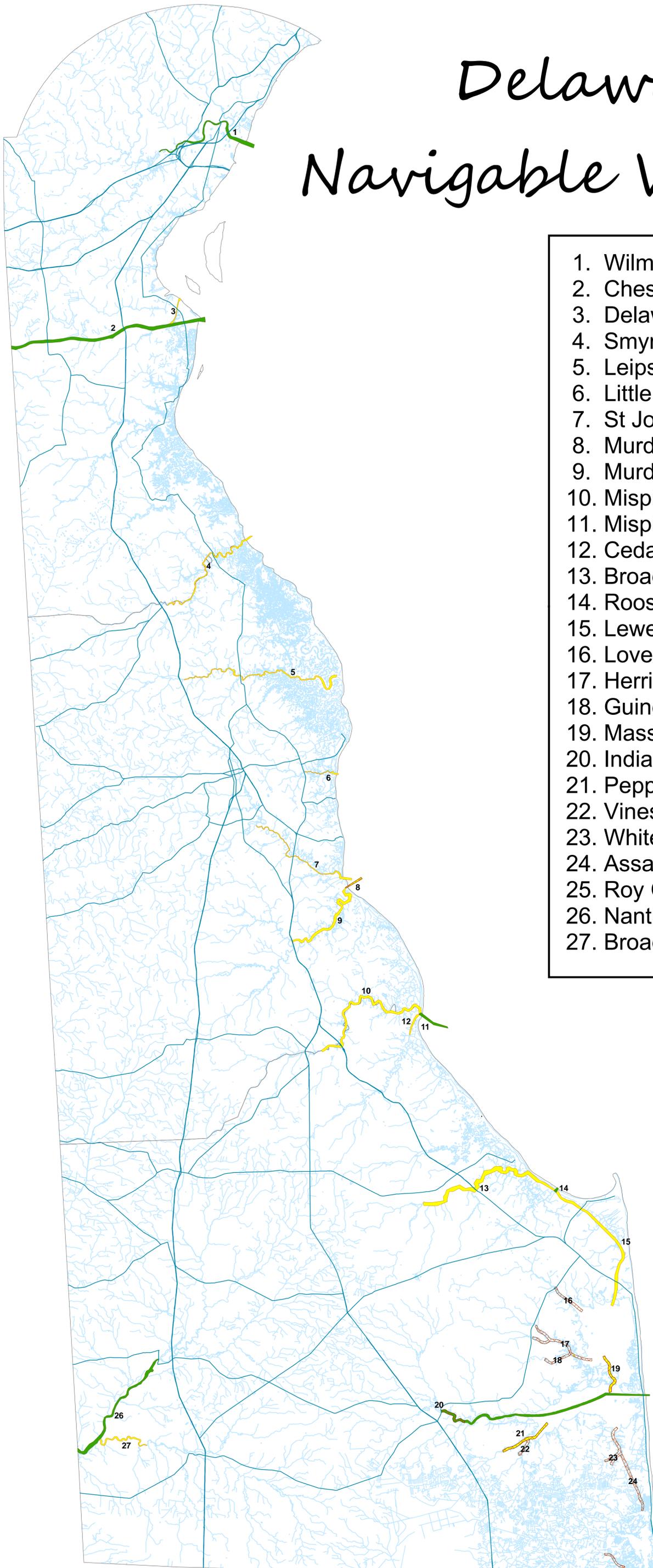
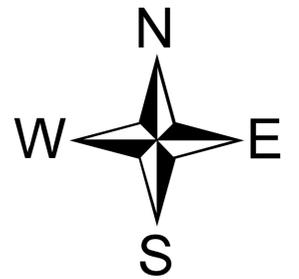
FY 2016 - 2017 Funding Requests: \$4.5 Million/Year

- ◆ Unmet capital needs over the next five years for Waterway Management

Current revenue stream is insufficient.

- ◆ \$3.2 million needed to plan, engineer and construct projects in Lewes-Rehoboth Canal and Herring Creek.
- ◆ \$1 million needed to develop regional sediment management plan for Indian River Bay, engineering analysis/options to reduce shoaling in Massey's Ditch, and conduct assessment reports in Love Creek and White Creek (to anticipate future dredging needs).
- ◆ \$200,000 needed annually for operations and maintenance for channel marking, macro-algae removal, abandoned vessel/derelict structure and debris removal, and the University of Delaware Citizen Monitoring Program.

Delaware's Navigable Waterways



1. Wilmington Harbor
2. Chesapeake and Delaware Canal
3. Delaware City Branch Channel
4. Smyrna River
5. Leipsic River
6. Little River
7. St Jones River
8. Murderkill River Entrance
9. Murderkill River
10. Mispillion River
11. Mispillion River Entrance
12. Cedar Creek
13. Broadkill River
14. Roosevelt Inlet
15. Lewes and Rehoboth Canal
16. Love Creek
17. Herring Creek
18. Guinea Creek
19. Massey's Ditch
20. Indian River
21. Pepper Creek
22. Vines Creek
23. White Creek
24. Assawoman Canal
25. Roy Creek
26. Nanticoke River
27. Broad Creek River

State Maintained

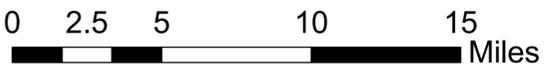


Federally Authorized

 Likely

 Unlikely

NOTE: The Corps of Engineers will investigate emergency maintenance channel dredging of low use federal projects (indicated on the map as "Unlikely") only after the State of Delaware has determined it does not have the resources necessary to do so.



Prepared by Maria Sadler

<u>Waterway Projects</u>	<u>County</u>	<u>Feasibility Investigation</u>	<u>Planning</u>	<u>Consultant</u>	<u>Survey, Design, & Engineering</u>	<u>Permitting</u>	<u>Bid Process & Award</u>	<u>Construction Start</u>	<u>Construction Completion Date</u>	<u>FY14</u>	<u>FY15</u>	<u>FY16</u>	<u>FY17</u>	<u>FY18</u>	<u>FY19</u>
Contractual Dredging Projects															
Murderkill River - Dredging of 42,000 cubic yards of material from entrance channel and beneficial re-use of suitable material as beach-fill on S. Bowers. Unsuitable material to be placed in off-shore site. (FY13 Bond Bill appropriation of \$627K for project. Balance of project costs will be paid for with Beach Bond Bill/Appropriations Tax)	Kent	In-house	Consultant	\$451,674	Consultant	Consultant	Consultant			\$627,000 (FY13 BB)					
Masseys Ditch - Dredging of 50,000 cubic yards of material from channel and beneficial re-use of material to restore eroded island (Middle Island). Costs include consulting services and dredging. (Project costs \$1.3M - \$2.5M based on preliminary estimates done by AMA) Requested \$550K in FY14 budget to initiate project planning.	Sussex	In-house	In-house	\$250,000	In-house & Consultant	Consultant	Consultant			\$550,000	\$2,300,000				
Little River - Dredging of 65,000 cubic yards of material from channel and placement of material in upland storage facility and/or beneficial re-use. Costs include consulting services, dredging, and construction of storage facility and/or beneficial re-use.	Kent	In-house	In-house	\$300,000	In-house & Consultant	Consultant	Consultant			\$300,000	\$1,200,000				
Lewes-Rehoboth Canal - Dredging of southern reach of canal and placement of material to restore eroded wetlands at south end of waterway. (Estimated project costs \$1.15M)	Sussex	In-house	In-house	\$200,000	In-house & Consultant	Consultant	Consultant					\$300,000	\$1,250,000		
Herring Creek - Dredging of 100,000 cubic yards of material from channel and beneficial re-use of material along banks of waterway. (Estimated project costs \$900K)	Sussex	In-house	In-house	\$200,000	In-house & Consultant	Consultant	Consultant						\$300,000	\$1,300,000	
In-house Dredging Projects															
Pepper Creek - Completion of project involving the dredging of 35,000 cubic yards of material from channel and placement in upland storage facilities. Costs include maintenance and/or replacement of equipment, upland storage facility restoration, supplies, and materials. Minimal mobilization costs due to dredge already being onsite.	Sussex	In-house	In-house	N/A	In-house	In-house	N/A								
Indian River - Dredging of 50,000 cubic yards of material from channel and placement in upland storage facility and/or beneficial re-use. Costs include dredging and consulting services. Costs include consulting services, dredging, restoration of storage facility and/or beneficial re-use.	Sussex	In-house	In-house	?	In-house & Consultant(?)	In-house & Consultant(?)	In-house & Consultant (?)			\$750,000					
Augustine Boat Ramp - Dredging of 3,000 cubic yards of material from boat ramp and placement of material in upland storage facility. Costs include maintenance and/or replacement of equipment, upland storage facility construction/restoration, mobilization and demobilization of equipment, supplies and materials.	New Castle	In-house	In-house	N/A	In-house	In-house	N/A				\$75,000				
Holts Landing State Park - Dredging of 6,000 cubic yards of material from boat ramp access channel and placement of material in upland storage facility and/or beneficial re-use. Costs include dredging and consulting services.	Sussex	In-house	In-house	\$200,000	In-house & Consultant	In-house & Consultant	N/A			\$300,000	\$100,000				
Delaware City Mooring Basin - Dredging of 24,000 cubic yards of material from basin and placement in upland storage facility. Costs include maintenance and/or replacement of equipment, upland storage facility restoration, mobilization and demobilization of equipment, supplies and materials.	New Castle	In-house	In-house	N/A	In-house	In-house	N/A				\$100,000				
Indian River Inlet Marina - Dredging of 20,000 cubic yards of material from marina basin and placement in open-water disposal site. Costs include maintenance and/or replacement of equipment, mobilization and demobilization of equipment, supplies and materials.	Sussex	In-house	In-house	N/A	In-house	In-house	N/A					\$75,000			
U of D/CMS Harbor - Dredging of 24,000 cubic yards of material and placement in upland storage facility to maintain adequate depths for UD research vessel and Del. River and Bay Cooperative Oil Spill Emergency Response/Cleanup vessel moored in harbor. Contractually done either with State or NCCD dredge and UD. Costs shown include maintenance and depreciation on state owned equipment. All other costs assumed by UD.	Sussex	In-house	In-house	N/A	In-house	In-house	N/A						\$50,000		

Waterway Projects	County	Feasibility Investigation	Planning	Consultant	Survey, Design, & Engineering	Permitting	Bid Process & Award	Construction Start	Construction Completion Date	FY14	FY15	FY16	FY17	FY18	FY19
Other (Non-Dredging) Waterway Management Operations															
Channel Marking - Maintenance and/or replacement of 184 channel markers in the Inland Bays. Costs include maintenance and/or replacement of equipment, mobilization and demobilization of equipment, supplies and materials.	Sussex	In-house	In-house	N/A	In-house	In-house	N/A			\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	
Macroalgae Harvesting - Seasonal harvesting of nuisance macro-algae in spring and summer months in Inland Bays. Costs include maintenance and/or replacement of equipment, mobilization and demobilization of equipment, supplies and materials.	Sussex	In-house	In-house	N/A	N/A	N/A	N/A			\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	
Abandoned Vessel/Derelict Structure/Debris Removal - Removal of vessels, structures, and debris from waterways done on an as needed basis. Costs include maintenance and/or replacement of equipment, mobilization and demobilization of equipment, supplies and materials, and/or performing work contractually.	Statewide	In-house	In-house	In-house	N/A	N/A	In-house			\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	
Contractual Support for Waterway Management Operations - Contract with NCCD to assist with waterway management projects and initiatives. Includes salary and other employment costs for District contractual positions.	Statewide	N/A	N/A	N/A	N/A	N/A	N/A			\$83,000	\$100,000	\$100,000	\$100,000	\$100,000	
Funding Options for Waterway Management Operations - Contract to conduct a water use assessment/analysis to determine a sustainable funding source for waterway management operations in State.	Statewide	In-house	In-house	\$325,000	N/A	N/A	In-house				\$325,000				
Regional Sediment Management Plan - Expansion of the Sediment Management Plan that was previously prepared for Rehoboth Bay into Indian River Bay. Involves identifying beneficial re-use options for dredged material, waterway enhancements to reduce dredging needs, and alternative dredging opportunities. Requires extensive modeling of waterway systems.	Sussex	In-house	In-house	\$150,000	Consultant	N/A	In-house				\$250,000				
Love Creek Assessment Report - Contract consultant to conduct environmental assessments and other studies necessary to prepare for dredging of Love Creek, including the design of beneficial re-use opportunities.	Sussex	In-house	In-house	\$200,000	Consultant	N/A	In-house					\$200,000			
Massey's Ditch Assessment Report - Contract consultant to provide engineering and design services for alternative sediment management strategies to reduce shoaling in channel. (Flow-train structures.) Construction in FY18	Sussex	In-house	In-house	\$300,000	Consultant	N/A	In-house					\$300,000		\$3,000,000	
White Creek Assessment Report - Contract consultant to conduct environmental assessments and other studies necessary to prepare for dredging of White's Creek, including the design of beneficial re-use opportunities.	Sussex	In-house	In-house	\$200,000	Consultant	N/A	In-house						\$200,000		

Shoreline Projects	County	Feasibility Investigation	Planning	Consultant	Survey, Design, & Engineering	Permitting	Bid Process & Award	Construction Start	Construction Completion Date	FY14	FY15	FY16	FY17	FY18	FY19
Corps Partnership Replenishment Projects															
<u>Rehoboth/Dewey Beach Replenishment</u>										\$81,000	\$81,000	\$4,300,000	\$81,000	\$81,000	\$81,000
<u>Bethany/South Bethany Beach Replenishment</u>										\$81,000	\$81,000	\$4,100,000	\$81,000	\$81,000	\$81,000
<u>Fenwick Beach Replenishment</u>										\$81,000	\$81,000	\$81,000	\$1,700,000	\$81,000	\$81,000
<u>Lewes Beach Replenishment</u>										\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$1,145,000
<u>Indian River Inlet Sand By-Pass</u>															

Shoreline Projects	County	Feasibility Investigation	Planning	Consultant	Survey, Design, & Engineering	Permitting	Bid Process & Award	Construction Start	Construction Completion Date	FY14	FY15	FY16	FY17	FY18	FY19
Bay Coast Dredge Replenishment Projects															
Broadkill - Sand fence, dune grass, and crossover construction to bring Corps beneficial re-use project to federal standards and eligibility for future Corps replenishment. (Estimated project costs \$2M)											\$2,000,000				
Slaughter - Opportunity to couple with USFWS project at Prime Hook. Placement of approximately 476.5 cubic yards of material to construct to 10yr template. (Estimated project costs \$6.6M)										\$121,200	\$6,600,000				
Prime Hook Community - Placement of approximately 176K cubic yards of material to construct to the PBS&J 10yr template. (Estimated project costs \$2.69M)										\$121,200		\$3,300,000			
North Bowers - Jetty rehabilitation and placement of approximately 76K cubic yards of material to construct to the PBS&J 10 yr template. (Estimated costs \$2M)										\$309,200	\$1,300,000	\$2,000,000			
South Bowers - Jetty rehabilitation and placement of approximately 65.8K cubic yards of material to construct to the PBS&J 10 yr template. (Estimated project costs \$2.5M)										\$139,475	\$1,200,000	\$2,500,000			
Kitts Hummock - Placement of approximately 196K cubic yards of material to construct to the PBS&J 10yr template (Estimated project costs \$3M)										\$121,200			\$3,000,000		
Pickering - Placement of approximately 138.5K cubic yards of material to construct to PBS&J 10yr template. (Estimated project costs \$2M)										\$121,200			\$2,000,000		

Shoreline Projects	County	Feasibility Investigation	Planning	Consultant	Survey, Design, & Engineering	Permitting	Bid Process & Award	Construction Start	Construction Completion Date	FY14	FY15	FY16	FY17	FY18	FY19
Truck-Haul Replenishment Projects															
<u>Lewes Beach</u> - 25K cubic yards of material to be placed via truck-haul method.											\$500,000				
<u>Cape Shores</u> - 25K cubic yards of material to be placed via truck-haul method.															
<u>Broadkill Beach</u> - 35K cubic yards of material to be placed via truck haul method.										\$647,000					
<u>Kitts Hummock</u> - 7500 cubic yards of material to be placed via truck haul method.										\$150,000		\$375,000		\$200,000	
<u>Pickering</u> - 12.5K cubic yards of material to be placed via truck haul method.											\$350,000				\$225,000
Planning timeframe and costs, including feasibility investigation, planning, survey, design & engineering, permitting, and bid process and award										FY14 TOTAL	FY15 TOTAL	FY16 TOTAL	FY17 TOTAL	FY18 TOTAL	FY19 TOTAL
Construction time frame and costs										\$4,101,475	\$16,438,000	\$17,776,000	\$8,907,000	\$4,988,000	\$1,613,000

Tourism Assets and Healthy Families

The Delaware Bayshore Initiative

The Delaware Bayshore is widely recognized as an area of outstanding national, hemispheric, and global ecological significance. Recently, the Delaware Bayshore was recognized by the U.S. Department of Interior as a keystone conservation and outdoor recreation project area under the Americas Great Outdoors program. The Initiative is protecting and restoring habitat, enhancing recreation and education opportunities that foster support for conservation, and working to involve Bayshore residents in ways that will help strengthen their communities.



Today, more than half of the Bayshore region extending from the City of New Castle to Cape Henlopen State Park is protected as national wildlife refuges, state wildlife areas, parks and reserves, farmland preserves, and private conservation lands.

Bayshore Community Partners: Delaware City; Port Penn; Woodland Beach; Leipsic; Little Creek; Pickering Beach; Kitts Hummock; Bowers Beach; South Bowers Beach; Slaughter Beach; Prime Hook Beach; Broadkill Beach; and Lewes.

Goals of the Bayshore Initiative: Conservation; Outdoor Recreation; and Stronger Bayshore Communities.

Outdoor Recreation:

- ◆ Delaware's conservation economy - fishing, hunting, wildlife-watching - is nearly a \$315 million industry.
- ◆ Wildlife watching in Delaware generates more than \$131 million in retail sales and \$19.5 million in state and local tax revenues.
- ◆ Almost 2,000 Delaware jobs are supported with \$77 million in salaries, wages and business owner income.



Healthy wildlife and habitats bring ecotourism dollars to Delaware.

FY 2015 Funding Request: \$500,000

In support of key priorities for:

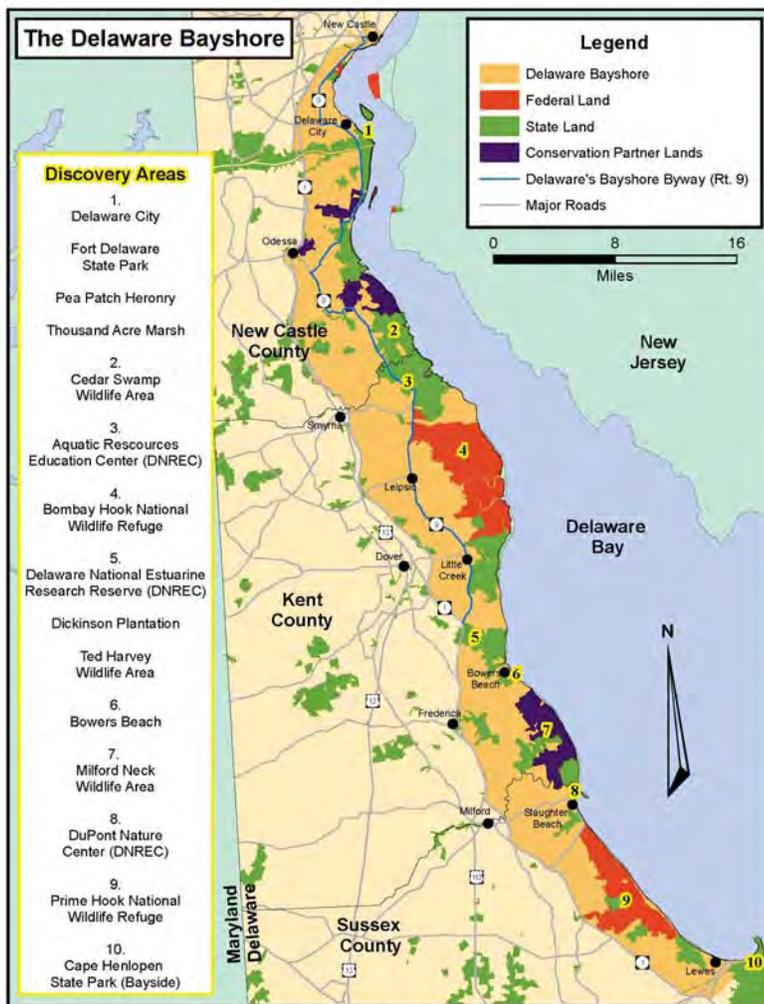
- ◆ Restoration of wetlands, fields and forests
- ◆ Resource protection
- ◆ Recreational amenities to improve hunting, fishing and wildlife viewing opportunities that will drive significant tourism
- ◆ Support local Bayshore communities and provide technical assistance

FY 2016-2017 Funding Requests: \$500,000/Year

- ◆ Continue to support key priorities as per FY 2015 request



Picturesque town and surrounding lush coastal marshes, shoreline, agricultural lands and forests of the Bayshore



Delaware has been awarded nearly \$6 million in federal, state and private partner funds for Bayshore projects.

Leveraging Funding:

Existing and new resources from: Open Space Program; U.S. Fish and Wildlife Service's Wildlife and Sport Fish Restoration Program; North American Wetland Conservation Act; National Coastal Wetland Conservation Program; Federal Highway Byways Program; other federal grant programs; department fees and incentive programs; penalty funds and Coastal Zone Act offsets; and private investments.

Current Projects: FY 2013 – 2014

Augustine Wildlife Area - Yardley Dale Public Access and Wildlife Viewing Enhancements:

Access road with security gate; parking area with Americans with Disabilities Act compliant spaces; trail; wildlife-observation platform; information kiosks; and upgrades to existing building.

Aquatic Education Center Bayshore Visitor Center - Woodland Beach Wildlife Area:

Outdoor interpretive exhibit area; public restrooms; parking; Taylors Gut; and wildlife viewing.

Ft. DuPont State Park/Grassdale: Trail connector; interpretive signs; and restrooms.

Little Creek Bayshore Visitor Center:

Indoor interpretive exhibit and visitor information area; public restrooms; parking; and trail/wildlife-viewing enhancements.

Ted Harvey Wildlife Area - Kingston Upon Hull:

Security fencing around the structure; stabilize historic building and add interpretive signs.

Ted Harvey Wildlife Area Emergency Spillway:

Emergency spillway repairs at Ted Harvey Wildlife Area for impoundment habitat improvements.

Delaware Bayshore Information Resources:

Bayshore branding/marketing campaign; signage and information kiosks; "Thank You Delaware Bay" campaign website; and public access guides.

Accomplishments: FY 2012 - 2013

- ◆ Since 2012, about 1,000 acres of Bayshore lands have been protected, bringing the total protected lands to more than 115,000 acres.
- ◆ Delaware's Bayshore Byway (Route 9) Corridor Management Plan, was recently completed by DNREC in partnership with Delaware Greenways and DeIDOT. The Plan targets key areas along the byway needing improvements and sets a course for developing branding and marketing to increase tourism.
- ◆ The American Birding Association is relocating their North American Headquarters to the Historic Central Hotel in Delaware City.
- ◆ Delaware City Gateway Connector Trail under construction.

Tourism Assets and Healthy Families

NVF and Auburn Valley Master Plan for Yorklyn

Yorklyn has been an active mill area since the early 18th century. A variety of mills have come and gone – with the largest products being snuff, paper and fibre.

Yorklyn now resembles a ghost town of abandoned mill buildings. The last mill, NVF or National Vulcanized Fibre Corporation, closed in 2009. A public-private partnership has mapped out the future of Yorklyn, which will transform the area into a vibrant, lively and scenic town, while still retaining its mill industry roots.



NVF abandoned mill

History:

- ◆ NVF declared bankruptcy in 2009 and the contaminated and floodplain sections of the site were going to be abandoned by the company.
- ◆ The state would have been responsible for the cleanup and demolition costs of the site. All desirable properties would have been sold to developers.
- ◆ During the NVF bankruptcy, a plan to purchase the NVF property was developed using federal flood mitigation grant funds, state Open Space funds and private funds.
- ◆ Auburn Heights Preserve was created through a generous donation of 192 acres of conservation lands from Tom and Ruth Marshall.
- ◆ As a result of state and community's efforts, more than 500 acres of contiguous open space have been preserved.

Redevelopment:

- ◆ The Auburn Valley Master Plan was created by a partnership of private developers, neighboring organizations and several divisions of DNREC –Parks and Recreation, Waste and Hazardous Substances and Water.
- ◆ The public/private partnership will clean up contaminated areas, restore floodplains and expand recreational, educational, shopping and dining opportunities.
- ◆ A unique trail system will connect these new commercial sites with historic and natural areas, including existing attractions - the Marshall Steam Museum, the Delaware Nature Society, the Center for Creative Arts, and the town of Hockessin.

FY 2015 Funding Request NVF: \$2 Million

- ◆ Restore the floodplain through the former NVF property by removing impervious surfaces and regrading/replanting areas.
- ◆ Revitalize the site – restoring historic buildings and redesigning for mixed uses to include retail, restaurant and housing.

NVF Project Accomplishments FY 2013 - 2014:

- ◆ First two phases of the demolition, which included demolishing the NVF Corporate Office, the Zinc and Water treatment facilities and several mill buildings.
- ◆ Asbestos removed in the first two phases of demolition.
- ◆ Design of the new road way through the main NVF complex.
- ◆ Opening of the first phase of the Auburn Heights Trail.

NVF Projects Underway: FY 2014

- ◆ Sampling for soil contaminants
- ◆ Bids for new roadway and second phase of trails
- ◆ Design and permitting of bridges connecting the property and trail segments
- ◆ Historic documentation and stabilization of the Marshall Brothers Paper Mill
- ◆ Design and bidding of on-site utilities

Fort DuPont/Governor Bacon complex:

The Fort DuPont/Governor Bacon complex of 443 acres near Delaware City is designated as a National Historic District. The complex includes Fort DuPont State Park, Governor Bacon Health Center and a group of state-owned buildings and residences, many of which are vacant.

The property has enormous potential as a sustainable, mixed-use community that could produce revenue, jobs, housing choices, and recreational and other amenities while preserving its historic character. The concept will integrate well with the future growth of Delaware City and with state and federal investments that support the Bayshore initiative.

FY 2015 Funding Request Fort Dupont: \$900,000

Support of the Fort DuPont Master Plan and to stabilize historic structures at the site

- ◆ The major components of the Fort DuPont Master Plan are expected to be completed within 5 to 10 years.



Fort DuPont Officers Club

Fort DuPont Project Accomplishments FY 2013:

A Fort DuPont Master Plan has been developed by a diverse group of state and local stakeholders and community members.

Project consultant, Sasaki Associates, has solicited public comment and held several meetings with stakeholders and the community.

FY 2016 - 2017 Funding Requests NVF and Fort DuPont: \$2 Million/Year

- ◆ Transform the Auburn Mill (originally the Marshall Brothers Paper Mill) into a museum that highlights how paper is made, the history of the mill site and the Yorklyn region.
- ◆ Continue to expand the network of trails that will link redeveloped areas and include a six-mile loop connecting Auburn Heights, the Auburn Mill, the main NVF mills, the Delaware Nature Society's Ashland Nature Center and the Center for Creative Arts in Yorklyn.
- ◆ Continue to implement the Fort DuPont Master Plan through public and private partnerships.



Delaware River

Branch Canal

ILLUSTRATIVE MASTER PLAN

- Renovated Historic Structures
- New Development
- Marina Village

Clean Water Infrastructure \$515M



CLEAN WATER

FY2015 REQUEST: \$3.4M

FY2015 RECOMMENDED: \$0

TOTAL NEED 2015-2017: *\$800M+

- * \$500M+: Wastewater/drinking water upgrades
- * \$150M+: Stormwater management upgrades
- * \$75M+: Toxics removal & stream restoration
 - * \$75M+: Industrial upgrades
 - * \$30M+: Agriculture cost share
 - * \$30M+: Conservation/restoration

FUNDING OPTIONS: Bond, Federal, 21st Century, Private, Clean Water for Delaware's Future Initiative

CONSERVATION COST SHARE

FY2015 REQUEST: \$2.0M

FY2015 RECOMMENDED: \$0

TOTAL NEED 2015-2017: \$6.0M

FUNDING OPTIONS: Bond, Federal,
Clean Water, Private

Clean Water Infrastructure

Clean Water State Revolving Fund

The Clean Water State Revolving Fund was authorized by Congress through the Clean Water Act Amendments of 1987. The program is a federal/state partnership that helps communities finance the cost of infrastructure needed to achieve compliance with the Clean Water Act.

Delaware's Clean Water State Revolving Fund (CWSRF) program was created by the General Assembly in 1990 and is administered by DNREC's Financial Assistance Branch. The program provides low-cost financing for a wide range of projects that repair and expand wastewater facilities, help homeowners replace failing septic systems, and farmers implement non-point source best management practices. Funds also support construction projects that: control flooding and reduce stormwater runoff and erosion in communities; protect drinking water wells from pollution; protect the water quality of our bays, rivers and streams; and improve energy efficiency at wastewater facilities, saving taxpayers money.



Wilmington Wastewater Treatment Plant Renewable Energy Biosolids Facility under construction

Water Infrastructure Advisory Council

Projects are reviewed and recommended for funding by the Delaware Water Infrastructure Advisory Council (WIAC). The state's newly renamed Council has advisory oversight for the CWSRF and the Drinking Water State Revolving Fund (DWSRF) programs. The 13-member Council appointed by Governor Markell advises the Governor and Secretaries of DNREC, Delaware Health and Social Services and Finance regarding the operations of the CWSRF and DWSRF programs.



Smyrna Green Meadows force main replacement

How CWSRF works:

- ◆ The CWSRF program is capitalized by annual EPA grants and the required 20 percent state matching funds.
- ◆ Funds are loaned out at below-market interest rates, providing a more affordable way for communities and eligible entities to finance high-cost infrastructure.
- ◆ Loan repayments are recycled back into the program to be loaned out for other eligible projects.
- ◆ The CWSRF program serves as a revolving funding source that will last into the future.

FY 2015 Funding Request: \$3.4 Million

- ◆ \$1.4 million to provide state matching funds for the federal CWSRF capitalization grant. Delaware's grant is anticipated to be the same or less than the FY 2014 funding level of \$7 million.
- ◆ Request supports the WIAC and its long-term Wastewater Facilities Funding Plan.
- ◆ \$2 million for the Wastewater Management Account to provide revolving loans and grants that supplement public and private wastewater facilities' financing, particularly for low-income communities. This funding is also needed to help communities plan for wastewater utility needs that will ensure compliance with water quality standards and will ensure necessary sewer rehabilitation projects remain on schedule.

Current Projects:

CWSRF Loan	Amount	Project
New Castle County		
City of Wilmington	\$36,060,000	Convert digester gas from wastewater treatment plant and landfill gas from Cherry Island Landfill to electric and thermal energy through a congeration process to generate 4 MW of Power.
Town of Middletown Greenlawn Stormwater Retention Pond Improvement Project	\$26,000,000 <i>Supplemental</i> \$99,000	Upgrade an existing stormwater management facility in the Greenlawn development to improve water quality prior to discharge to a tributary of Drawyer Creek.
Kent County		
Kent County Levy Court Wetlands Creation Project near Milford	\$633,000	Re-establish more than one acre of wetlands within an adjacent floodplain of Double Run, a tributary to the Murderkill River.
East Dover Septic Elimination Project	\$1,098,107 <i>Principal Loan Forgiveness:</i> \$676,000	Construct a new gravity wastewater collection system to serve three mobile home park communities and nearby isolated occupied lot parcels.
Land Conservation Loan Program (LCLP)	\$1,200,000	Community can use existing or proposed wastewater loans to finance land conservation that have water quality improvement benefits.
◆ LCLP Project		Purchase and permanently restore about 255 acres to its natural habitat.
◆ Other related projects in the Murderkill Watershed		
Double Run Wetlands Restoration Project		Create a 2-acre wetland within the upper reaches of the Murderkill Watershed.
MeadowBrook Acres		Eliminate septic systems.
Sussex County		
Town of Millsboro Kentmere Parkway Sewer Separation Project	\$6,336,800 <i>Principal Loan Forgiveness:</i> \$676,750 <i>USDA loan and grant funds:</i> \$14 million	Extend of a beneficial reuse main to an aquifer recharge site. The reclaimed water is used to recharge an aquifer in seven rapid infiltration basins. The farm will use a spray irrigation pivot to irrigate crops with groundwater.
City of Rehoboth Beach Sanitary Sewer Line Replacement	\$450,000	Replace a sanitary sewer line.

Delaware's CWSRF By the Numbers:

- ◆ Since the program's inception, Delaware has received \$243,333,594 in seed capital; \$205,984,510 in EPA funds and \$37,349,084 in state funds.
- ◆ 72 municipal loans totaling almost \$300 million have been closed.
- ◆ The program has created and sustained thousands of jobs, supporting local economies.
- ◆ Communities statewide that depend on wastewater systems have benefitted from the CWSRF.



Wilmington Wastewater Treatment Plant under construction

Benefits of the CWSRF Projects:

- ◆ Reduce the cost of financing infrastructure projects
- ◆ Provide long-term water quality benefits
- ◆ Create and support local jobs, supporting local economies
- ◆ Repair and improve aging water infrastructure
- ◆ Protect public health and the environment

FY 2015 CWSRF loan applications requested:

\$62 million

Wastewater Projects:

Sussex County

- ◆ Goslee Creek pumpstation and forcemain
- ◆ Love Creek Woods collection/transmission system

City of Rehoboth Beach

- ◆ Wastewater Treatment Plant upgrade 1
- ◆ Ocean outfall project

DNREC – Division of Parks and Recreation

- ◆ Lums Pond utility improvements phase II
- ◆ Auburn Heights Preserve master plan sewer upgrade
- ◆ Cape Henlopen State Park sewer upgrades
- ◆ Fort Dupont Master Plan sewer upgrades
- ◆ Delaware Seashore State Park campground sewer improvement

Green Project Reserve Projects:

DNREC – Division of Parks and Recreation

- ◆ Auburn Heights Preserve master plan stormwater management

City of Seaford

- ◆ Renewable energy solar generating system for wastewater treatment plant

Wastewater Facilities Assessment Report

The Council recently completed a Statewide Wastewater Facilities Assessment Report. The study examined the adequacy of existing facilities, the need for improvements and upgrades, estimated costs of capital improvements, system revenues, and user rates from 2011 through 2016.

The report found that the total capital costs needed for wastewater facilities was estimated at \$654 million. Funding to meet these estimated infrastructure needs was reported to be provided from various funding sources, of which communities are expected to request approximately \$79 million from the CWSRF program. Communities did not report a source of funds for approximately \$88 million of their total estimated infrastructure needs.

5-Year Goals:

- ◆ Ensure the long-term viability of the Water Pollution Control Revolving Fund (WPCRF) program, while providing necessary project subsidization.
- ◆ Optimize the WPCRF program to address changing loan demand for non-point source concerns and other difficult to finance water quality improvement issues.
- ◆ Identify and fund eligible projects located within Delaware's National Estuary watersheds that are consistent with the State's Comprehensive Conservation Management Plans.
- ◆ Periodically evaluate additional funding opportunities to meet emerging water quality and public health needs.



Rapid Infiltration Basins (RIBs) under construction in Millsboro



Beneficial reuse pipeline under construction near Millsboro.

5-Year Funding Needs:

- ◆ Delaware's future capital project needs (wastewater infrastructure) are estimated at \$654 million (5-year period; 2011 – 2016).
- ◆ This need is based upon the estimated costs for public wastewater systems in New Castle, Kent and Sussex counties.
- ◆ During the same time period, the estimated borrower needs from Delaware's CWSRF is \$79 million.
- ◆ In addition to the foregoing, Delaware's Future Capital Project needs include \$150 million for stormwater improvements and \$75 million for toxics removal.

Estimated Wastewater
Project Needs
(\$500M+), 2014-2017

	Coll. & Conv. (\$M)	Treatment (\$M)	Disposal (\$M)	Total (\$M)
New Castle	\$281.1	\$23.7	\$0.2	\$305.0
Kent	\$27.9	\$35.4	-	\$63.3
Sussex	\$85.8	\$28.2	\$26.9	\$140.9
State	\$394.8	\$87.3	\$27.1	\$509.2

New Castle County:

Estimated Wastewater Project Needs (\$M), 2014-2017

Wastewater System	Estimated Capital Project Costs (\$M), 2014-2017			
	Coll. & Conv.	Treatment	Disposal	Total
New Castle County owned systems	\$249.9	\$1.7	-	251.6\$
Town of Middletown - Frog Hollow and Middletown WWTFs	\$3.3	\$21.0	\$0.2	\$24.5
Wilmington	\$25.9	\$1.0	-	\$26.9
City of Newark Sewer Authority	\$2.0	-	-	\$2.0
New Castle County Total	\$281.1	\$23.7	\$0.2	\$305.0

Kent County:

Estimated Wastewater Project Needs (\$M), 2014-2017

Wastewater System	Estimated Capital Project Costs (\$M), 2014-2017			
	Coll. & Conv.	Treatment	Disposal	Total
Kent County	\$4.5	\$34.4	-	\$38.9
City of Harrington WWTP	\$3.5	\$1.0	-	\$4.5
Camden-Wyoming Sewer and Water Authority	\$5.3	-	-	\$5.3
Dover Sewer Authority	\$5.0	-	-	\$5.0
Milford Sewer Authority	\$2.8	-	-	\$2.8
Town of Clayton	\$4.0	-	-	\$4.0
Town of Smyrna	\$2.8	-	-	\$2.8
Kent County Total	\$27.9	\$35.4	-	\$63.3

Sussex County:

Estimated Wastewater Project Needs (\$M), 2014-2017

Wastewater System	Estimated Capital Project Costs (\$M), 2014-2017			
	Coll. & Conv.	Treatment	Disposal	Total
Sussex County owned facilities	\$63.5	\$15.4	\$3.0	\$81.9
City of Lewes STP	\$4.3	-	-	\$4.3
City of Rehoboth Beach STP	-	\$10.5	\$23.9	\$34.4
City of Seaford WWTP	<\$0.1	<\$0.1	-	<\$0.1
Delmar WWTP	\$4.0	-	-	\$4.0
Town of Georgetown WRF	\$2.8	-	-	\$2.8
Town of Bridgeville WWTF	\$0.1	\$0.7	-	\$0.8
Town of Greenwood	-	-	-	-
Town of Laurel STP	\$10.0	-	-	\$10.0
Town of Millsboro WWTF	\$1.0	-	-	-
Town of Selbyville WWTF	-	\$1.5	-	\$1.5
Sussex County Total	\$85.8	\$28.2	\$26.9	\$140.9

NEW CASTLE

Feb-14

Municipality	Project	Updated Capital Project Costs Needed		
		2014-2015	2016	2017
New Castle County	Wilmington, BRANDYWINE HUNDRED SOUTH REHAB PHASE 2	\$	27,250,000	\$6,000,000
	Wilmington, SOUTH CHRISTIANA INTERCEPTOR ANALYSIS		\$3,500,000	\$6,000,000
	Wilmington, BRANDYWINE HUNDRED NORTH REHAB PHASE 2		\$20,580,000	\$6,700,000
	Wilmington, ELECTRICAL POWER DISTRIBUTION UPGRADES		\$250,000	\$0
	Wilmington, RICHARDSON PARK PUMP STATION UPGRADE	\$	1,000,000	
	Multiple, SOUTHERN SEWER SERVICE AREA		\$9,000,000	\$26,950,000
	Multiple, PUMP STATION REHABILITATION		\$5,500,000	\$800,000
	Wilmington, CHRISTIANA RIVER FORCE MAIN		\$3,000,000	\$500,000
	Wilmington, SEPTAGE RECEIVING STATION UPGRADE		\$1,300,000	\$0
	Multiple, COUNTYWIDE MANHOLE REHAB		\$4,500,000	\$1,000,000
	Multiple, ASSET MANAGEMENT		\$1,750,000	\$0
	Multiple, DELDOT COORDINATION PROJECT		\$9,600,000	\$2,000,000
	Multiple, SEWER REPAIRS & REHABILITATION		\$10,800,000	\$2,300,000
	Multiple, COUNTYWIDE TRENCHLESS REHAB		\$5,000,000	\$1,000,000
	Wilmington, GLASGOW AREA SEWER IMPROVEMENTS		\$1,400,000	\$0
	Multiple, BACKWATER VALVE IMPROVEMENT		\$400,000	\$100,000
	Wilmington, MOT AREA MAINTENANCE BASE		\$500,000	\$0
	Multiple, WASTEWATER TREATMENT PLANTS/DISCHARGE ELIMINATION AND CLEAN WATER ACT EVALUATIONS		\$150,000	\$50,000
	Wilmington, MILL CREEK INTERCEPTOR RELIEF		\$4,000,000	\$1,500,000
	Wilmington, BRANDYWINE HUNDRED CLEARWATER PROGRAM		\$2,500,000	\$0
	Wilmington, WHITE CLAY SEWER BASIN REHAB		\$26,400,000	\$0
	Wilmington, NORTH DELAWARE INTERCEPTOR SYSTEM		\$33,740,000	\$5,900,000
	Wilmington, PIKE CREEK IMPROVEMENTS		\$5,250,000	\$0
	Multiple, GENERAL SEWER IMPROVEMENT		\$2,100,000	\$450,000
	Delaware City, DEL CITY SEWER REHAB.		\$3,000,000	\$0
	Wilmington, KIRKWOOD TRUNK LINE		\$6,600,000	
Delaware City, DEL CITY TREATMENT PLANT REHAB.		\$1,250,000		
Town of Middletown	Frog Hollow sludge removal from aeration lagoon (cost a prelim. estimate)		\$200,000	\$0
	Modification to existing test RIBS on Ford and VonCroy Farms for University Study		\$100,000	\$0
	RIBS at existing Ford and VonCroy Farms		\$0	\$2,405,000
	Various upgrades, rehabilitation, and new installations to laterals, force mains, pump stations, and filters		\$3,000,000	\$0

NEW CASTLE

Feb-14

Municipality	Project	Updated Capital Project Costs Needed			
		2014-2015	2016	2017	
	PLC implementation on 3 regional lift stations that flow to headworks of Middletown Wastewater Treatment Plant		\$50,000	\$0	
	Two filters at existing Industrial Drive filter plant location		\$0	\$1,500,000	
	SBR plant at existing Industrial Drive location; possible alternate treatment method with baffle system		\$0	\$16,500,000	
	Vehicle Replacements (Collection and Transport)		\$60,000	\$60,000	
	Saint Anne's Spray Facility permitting		\$20,000	\$0	
	Headworks capacity increase / improvements		\$0	\$500,000	
	SCADA upgrades		\$108,000	\$0	
City of Wilmington	GO, Annual Minor Sewer Construction (GO Bond)	\$ 1,500,000	\$ 1,500,000		
	GO, Major Sewer Improvements (GO Bond)		\$533,700	\$2,000,000	
	GO, Sewer Separation & Flow Monitoring (GO Bond)	\$ 3,500,000			
	GO, Stormwater Drainage Project - New (GO Bond)	\$ 1,800,000	\$ 1,800,000		
	SRF, 11th St Pumping Station Upgrade (Clean Water SRF)		\$ 4,500,000		
	GO, Urban Forest Mgmt Program (GO Bond)	\$ 500,000	\$ 500,000		
	OTHER, 2018 Sewer Placeholder (Cash Financing)			\$8,000,000	
	GO, Stormwater Mitigation (Water Quality) - New (GO Bond)	\$750,000			
City of Newark	S0904, Sanitary Sewer Study	\$ 308,000	\$ 900,000	\$ 800,000	
		TOTAL \$	8,358,000	\$ 203,591,700	\$ 93,015,000

KENT COUNTY
Feb-14

Municipality	Updated Capital Project Costs Needed		
	2014-2015	2016	2017
Kent County	Treatment Plant Upgrades		
	TMDL Study for development of water standards	\$800,000	
	Spray Irrigation, Land Acquisition and Permitting	\$3,850,000	
	Replace Pumps and Valves Recycle PS 1 & 2	\$240,000	
	Bio Solids Capacity Expansion	\$2,400,000	\$2,000,000
	Replace Clarifier 1 & 2 Superstructure	\$500,000	
	Spring Creek Conservation Project	\$1,475,000	
	Air Blower System Optimization	\$215,000	\$2,895,000
	Guaranteed Energy Efficiency Project	\$13,333,400	\$6,666,600
	Conveyance System Upgrades		
	Murderkill Crossing Parallel Conveyance		\$1,000,000
	DSWA Leachate Trans. Sys.	\$1,550,000	
	Pump Station Upgrades	\$353,300	
	Relocate Septage Screen and Build Retreatment Sys.	\$1,600,000	
City of Harrington	Decommission Old Wastewater Lagoons	\$ 1,000,000	
	Sewer Rehabilitations	\$ 1,000,000	\$ 700,000
	I&I Study and Projects	\$ 1,500,000	\$ 1,000,000
Camden-Wyoming Sewer & Water Authority	Septic elimination, Existing homes, Route 10, and existing Tamarac/Burwood development	\$350,000	
	Sanitary Sewer Survey, Flushing, video taping, and smoke testing of the sanitary sewer system.	\$50,000	
	Replacement of Old North Road gravity sanitary sewer system, Approx. 1,400 LF sanitary sewer main and 9 manholes	\$162,500	
	Rehabilitation of existing manholes, Especially in flood prone areas	\$150,000	

KENT COUNTY

Feb-14

Municipality	Updated Capital Project Costs Needed		
	2014-2015	2016	2017
Large-scale replacement of existing sanitary sewer collection system, Approx. 47,200 LF of vitrified clay sanitary sewer main, 130 manholes	\$3,800,000		
Replacement of Mechanic Street gravity sanitary sewer system, Approx. 3,000 LF sanitary sewer main, 12 manholes, and 75 laterals	\$823,500		
CITY OF DOVER			
Mckee Road Pump Station Communicator Replacement	\$55,000		
Inflow/Infiltration Removal/System Improvements	\$5,000,000		
Milford Sewer Authority			
Fisher Ave Pump Station Rehab	\$750,000	\$0	
Misc Pump Station Rehabs	\$0	\$800,000	
Shawnee Acres Pump Station Replacement	\$1,000,000		
SCADA Integration	\$0	250000	
Town of Clayton			
I&I - Studying now, cost unknown	\$ 2,000,000		
Minor Planned repair/Upgrades	\$ 2,000,000		
Town of Smyrna			
North Main Street Sewer Replacement, Replacement of approximately 386 linear feet of old sewer main and all service connections along N. Main.	\$ 500,000		
Greens Branch Pump Station Upgrades, Replacement of the existing failing shaft-driven dry pit pumps in Greens Branch Pump Station and upgrades of electrical controls at the pump station.	\$ 750,000		

KENT COUNTY

Feb-14

Municipality	Updated Capital Project Costs Needed		
	2014-2015	2016	2017
West Cummins Street Sewer Replacement, Replacement of approximately 618 linear feet of old sewer main and all service connections along W.Cummins St.	\$ 500,000		
Water and Sewer Replacement (S Main St)	\$ 1,000,000		
	TOTAL \$ 48,707,700	\$ 15,311,600	\$ -

SUSSEX COUNTY

Feb-14

Municipality	Project	Updated Capital Project Costs Needed		
		2014	2016	2017
Sussex County				
	JOY BEACH SEWER		\$3,904,000	
	HOLT'S LANDING EXPANSION - MALLARD CREEK			\$ 1,249,083
	MAGNOLIA SHORES		\$700,000	
	HERRING CREEK SEWER DISTRICT		\$11,634,000	
	CLAYTON AVENUE PUMP STATION AND FORCEMAIN			\$ 4,275,000
	ANGOLA SEWER - NORTH EXPANSION		\$3,800,000	
	MILLER CREEK EXPANSION - TANGLEWOOD & Oak Acres		\$2,783,000	
	PUMPING EQUIPMENT		\$2,720,000	
	IBRWF -Class A Sludge		\$3,000,000	
	MILLVILLE EXPANSION - BEAVER DAM		\$2,095,984	
	CONCORD SEWER EXPANSION		\$1,800,000	
	HOLT'S LANDING SEWER EXPANSION			\$ 6,000,000
	GENERAL PLANT CAPITAL		\$1,898,962	
	PINEY NECK RD - SEWER EXPANSION		\$2,684,000	
	Goslee Creek Expansion of West Rehoboth		\$10,000,000	
	DEWEY/HENLOPEN TREATMENT CONTRIBUTION		\$13,500,000	
	VINES CREEK SEWER DISTRICT			\$ 6,000,000
	New Route 54 Extension (NOI)	\$1,200,000		
	New Branch, Autumn and Tucks Road (Long Neck)(NOI)	\$736,000		
	New Love Creek Woods (NOI)	\$1,890,000		
City of Lewes				
	Donovan Smith 4" & 6" lines		\$309,500	
	New WWTP Outfall Pipe Renewal		\$350,000	
	Manhole Replacement/Rehab		\$221,025	
	Sewer Lift Station Renewal		\$202,000	
	New George HP Smith Park Walking Path Replacement (NOI)	\$190,000		
	New Highland Acres Wastewater Collection System (NOI)	\$1,310,000		
	New Little League Pervious Parking (NOI)	\$31,000		
	New Savannah Place Wastewater Collection System (NOI)	\$1,640,000		

SUSSEX COUNTY

Feb-14

Municipality	Project	Updated Capital Project Costs Needed		
		2014	2016	2017
City of Rehoboth Beach				
	Ocean Outfall, Construct ocean outfall from beach to diffuser located approximately 6,000 ft offshore		\$18,600,000	
	Pump Station and Force Main , Construct new effluent pump station at WWTP and force main to new ocean outfall at beach		\$5,250,000	
	Treatment Plant Upgrade		\$10,500,000	
City of Seaford				
	Oxic tank membrane replacement		\$32,000	
	Lift station RTU replacement		\$7,000	
Town of Delmar				
	Bi-State/Connelly Mill Pump Sta.		\$1,719,611	
	Lab Cabinets - Restored		\$4,020	
	Line Replacement / Slip Lining Pipe		\$1,575,000	
	Stage Rd #2 Pump Station		\$700,786	
	Winch to Raise Basket Pine St. /PS		\$2,300	
Town of Georgetown				
	I&I Related Sewer Project (Not Funded)			\$ 300,000
	Pump Station Upgrades and Force Main Improvements	\$	2,500,000	
Town of Selbyville				
	Miscellaneous WWTP Headworks Upgrades	\$	1,500,000	
Town of Bridgeville				
	HVAC- Main Building, Unkn Qty		\$100,000	
	Raw Pump Wet Well, Pump Only		\$30,000	
	Effluent Pump Contact Tank, Pump Only		\$30,000	
	Sludge Pump Clarifier, Pump Only		\$30,000	

SUSSEX COUNTY

Feb-14

Municipality	Project	Updated Capital Project Costs Needed		
		2014	2016	2017
	Comminutor, Assume 1 unit		\$50,000	
	RBC Gearbox Replacement (2), Assume \$200K each		\$400,000	
	Digester Mixer, Assume motor/mixer only		\$100,000	
	Utility Mapping/Schedule, Unkn Qnty		\$100,000	
Town of Laurel				
	6th and Green St Combined Sewer Separation		\$ 900,000	
	Miscellaneous Sewer Rehabilitation		\$ 250,000	
	Miscellaneous Sewer Extensions		\$ 8,800,000	
Town of Millsboro				
	Pump Station Rehabs		\$ 250,000	
	Stormwater Line Replacement		\$ 30,000	
	I&I Study		\$ 500,000	
	Sewer Line and MH Replacement		\$ 60,000	
	Forcemain Replacement			\$ 150,000
TOTAL		\$ 6,997,000	\$ 115,623,188	\$ 17,974,083

TETRA TECH, INC.

Delaware Statewide Assessment of Wastewater Facilities

Current Status and Future Needs

2011 - 2016

Tetra Tech, Inc.

**240 Continental Drive, Suite 200
Newark, DE**

and

**10306 Eaton Place, Suite 340
Fairfax, VA**

May 2012

Delaware Wastewater Study – Facilities Assessment 2011-2016

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Acronyms and Abbreviations

ANSWRF	Artesian North Sussex Regional Wastewater Recharge Facility
Artesian	Artesian Wastewater Management, Inc.
BNR	Biological Nitrogen Removal
BOD	Biological Oxygen Demand
CIP	Capital Improvement Plan
CPCN	Certificates of Public Convenience and Necessity
CSO	Combined Sewer Overflows
CWA	Clean Water Act
CWAC	Clean Water Advisory Council
DNREC	Department of Natural Resources and Environmental Control
DRBC	Delaware River Basin Commission
ENR	Enhanced Nitrogen Removal
EDUs	Estimated Dwelling Units
EPA	Environmental Protection Agency
GIS	Geographical Information System
GO	General Obligation
gpd	Gallons Per Day
I/I	Infiltration and Inflow (groundwater and stormwater entering collection systems)
LA	Load Allocations
M	Million
MG	Million Gallons
MGD	Million Gallons per Day
MHPs	Mobile Home Parks
MIH	Median Household Income
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and Maintenance
PCBs	Polychlorinated Biphenyls
PSI	Phosphorus Site Index
RBCs	Rotating Biological Contactors
RIBs	Rapid Infiltration Basins
SEFO	Septic Extended Funding Options
SRF	State Revolving Fund
STP	Sewage Treatment Plant
Tidewater	Tidewater Environmental Services, Inc.
TMDLs	Total Maximum Daily Loads
TN	Total Nitrogen
TP	Total Phosphorous
TSS	Total Suspended Solids
UD	University of Delaware
USDA-RUS	Department of Agriculture - Rural Utility Services
UD	University of Delaware
WIP	Watershed Implementation Plan
WLA	Wasteload Allocation
WRF	Water Reclamation Facility
WTP	Water Treatment Plant
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

Executive Summary

Overview

This study assessed Delaware's wastewater treatment facilities at the state and county levels to determine their current status from technical and economic perspectives. The report is intended to encourage dialogue between the Clean Water Advisory Council (CWAC), Department of Natural Resources and Environmental Control (DNREC), county governments, municipalities and utilities by identifying immediate, short-term and long-term needs, the costs associated with those needs and the funding sources available to meet the needs. The study is also intended to point out trends and emerging issues, including promoting wastewater reuse and other innovative opportunities, with the goal of cost-effectively balancing human health and environmental protection in Delaware.

Wastewater System Infrastructure

There are 32 publicly owned wastewater systems in Delaware. Twenty-two of the public wastewater systems include a treatment plant and 10 of the public wastewater systems are collection-only systems. Of these 22 treatment plants, 15 facilities have surface water discharge permits and nine facilities have groundwater permits. Also surveyed are 12 operating and two proposed privately owned systems. The 22 public and 12 private wastewater treatment plants (WWTPs) provide centralized collection and treatment to a population of nearly 800,000. About 60 percent of those with centralized collection are serviced at the Wilmington WWTP. The Wilmington WWTP provides secondary treatment to an average daily flow of 75 million gallons per day (MGD) before surface water discharge. About 32,000 individuals are serviced by the other treatment plants in New Castle County with a total average daily flow of 2 MGD. About 35 percent of those with centralized collection are serviced at public treatment plants in Kent and Sussex County with average daily flows of 23.3 MGD.

In addition to the Wilmington WWTP, there are another 15 treatment plants that discharge to surface waters, serving a population of 225,000 (28 percent). The average daily flow at these 15 facilities is 21.3 MGD. Seven of these 15 facilities provide nitrogen removal and, with the exception of one plant, provide phosphorus removal. About two-thirds of the facilities already have nitrogen and/or phosphorus limits, and two facilities are expecting phosphorus and nitrogen limits within the next five years—five facilities do not anticipate nutrient limits. Three facilities indicated problems meeting their nutrient limits but have implemented or have plans to address these issues. Bridgeville's current facility is not designed to remove nitrogen sufficiently to meet anticipated future nitrogen limits, and phosphorus removal will be difficult with the current facility. Although Bridgeville has added spray irrigation, it is likely that the community would need to upgrade its current facility with biological nitrogen removal to meet its surface water discharge requirements or switch to spray irrigation completely or in conjunction with other reuse options.

There are seven public and 11 private WWTPs that provide groundwater discharge and provide treatment for about 11.5 percent of those with centralized collection. Seventeen of these facilities have nitrogen limits, and seven facilities have, or expect to have, phosphorus limits. The Lea Eara Farms WWTP indicated problems with nitrates; and the Inland Bays Regional facility indicated problems with meeting its nitrogen limits. New Castle County indicated that it may abandon the Lea Eara facility in the future. The Inland Bays Regional facility received an amended permit in 2009 adding another spray field, and a new Biolac™ system should resolve the nitrogen and anticipated phosphorus limits.

The 2030 projections of population increases and plant enlargements are generally modest for wastewater systems in New Castle County and Kent County. On the other hand, several public facilities

in Sussex County identified substantial potential for increases in population served. While it is unclear when these projections will be realized given the current economic environment and nutrient reductions called for in the Chesapeake Bay and Inland Bay TMDLs, the CWAC and DNREC should monitor this situation as significant capital investment might be necessary.

The study found that most wastewater service providers are concerned about the costs associated with managing their long-term investments while trying to meet increasingly stringent performance standards due to the Chesapeake Bay TMDL or other effluent requirements. Wastewater system owners and operators often need to decide between plant abandonment (regionalization) versus existing plant upgrades or new plant installations; and these decisions are made more difficult with the recent economic slowdown and reduced build-out rate. Collection systems require continued maintenance and upgrades. Most combined sewer systems have been eliminated or have completed a long-term control plan. Many, but not all, older collection systems have I/I issues that can cause flow issues downstream. Some plants and critical pump stations do not have a backup power supply.

Ultimately, these challenges are solved at the community level; however, CWAC and DNREC can facilitate these solutions by working with communities to i) develop long-term projections of effluent requirements and treatment levels, ii) encourage communities to reevaluate the plant capacities and revise growth projections for oversized/overdesigned plants, iii) promote water conservation to postpone or delay some capital investments, iv) investigate the opportunity for optimizing public-private partnerships to better use existing infrastructure, v) encourage projects to reduce I/I and vi) adopt backup power supplies at all treatment plants and other critically important wastewater system components.

User Rates and Revenue Generation

The average annual household sewer rate at public systems in New Castle, Kent and Sussex counties varied from \$185-\$350, \$303-\$571, and \$277-\$795 per household, respectively, when averaged to the wastewater system level. The average household sewer rates for private systems generally ranged from \$850 to \$1,245/household, although the Milton Regional facility's average household sewer rate is \$350/household. At the sewer district level, the annual household sewer rate at public facilities in Sussex County were more variable and ranged from \$179-\$1,453 per household. Some of these differences can be attributed to different rate structures for residents inside versus outside city limits as well as a relationship to sewer district size. Interestingly, private sewer rates appear comparable to those of similarly-sized public sewer districts in Sussex County.

The average household sewer rate, when expressed as a fraction of median household income (MHI), ranges from 0.34 percent to 1.84 percent of the MHI for public wastewater systems. Three public wastewater systems have average household sewer rates already greater than 1.5 percent of the MHI. All but two private systems have user rates greater than 1.5 percent of the MHI, with a range from 0.87 percent to 2.61 percent.

All but three public facilities indicated that they were generating sufficient annual revenue to meet the cost of their wastewater enterprise without transfer from other enterprises. Wilmington indicated that it expects to be on track by FY12. Middletown and Millsboro indicated that additional growth is needed to generate sufficient revenue. Ten of the 11 private plants indicated that they were running a deficit primarily due to lower than expected build-out rates. All but three public wastewater systems maintain a reserve account, and those three wastewater systems, Wilmington WWTP, Clayton collection system, and Georgetown water reclamation facility (WRF), are considering or moving toward establishing a reserve account.

Total annual revenue from residential customers was \$40.2 million (M), \$14.8M, \$37.0M, and \$1.6M for public facilities in New Castle County, Kent County, Sussex County, and private facilities, respectively (Table ES-1). Note that this survey did not include, at the CWAC's guidance, non-residential revenue and could give an incomplete view of a system's financial status. If all wastewater systems increased their average annual household sewer rates to 1.5 percent of the MHI, additional residential revenue of \$97.8M, \$14.7M, \$12.0M, and \$0.3M would be realized for public facilities in New Castle County, Kent County, Sussex County and private facilities, respectively.

Future Capital Improvement Plans and Financing Options

The total capital project costs from 2011-2016 for the State of Delaware are estimated at \$653.7M. These estimates are based on estimated costs of \$288.5M, \$95.9M, and \$269.3M for public wastewater systems in New Castle, Kent, and Sussex counties, respectively (Table ES-2). Private wastewater systems reported another \$9.1M in capital costs. Numerous additional private wastewater system projects were identified, but no cost estimates were available. About three-fourths of these project costs are related to collection and conveyance while 20 percent are related to treatment. Two wastewater systems did not report any capital costs for 2011-2016; and numerous systems did not report information for 2015 and 2016. Extrapolating the average annual capital project costs to the un-reported years suggests a potential under reporting of approximately \$45.6M (7 percent).

For New Castle County-owned systems, capital project costs from 2011-2016 are \$245.4M. Projects include \$101.5M for the Brandywine Hundred North and South sewer rehabilitation Phase 1 and 2 projects, \$33.7M for the North Delaware interceptor system, and \$26.4M for the White Clay sewer basin rehabilitation. The City of Wilmington's 2011-2016 capital project costs are \$36.2M with about 60 percent (\$21.4M) of these projects related to sewer rehabilitation and improvements.

In Kent County, \$39.1M is planned for upgrades to the Kent County Regional WWTP from 2011-2016. An additional \$13.3M is planned in upgrades to the Kent County Regional collection system, which includes conveyance from satellite collection systems. Dover, Milford, Harrington, Camden-Wyoming, Clayton and Smyrna report projects totaling \$31.7M, of which \$24.2M is related to sewer rehabilitation and replacement.

Facilities owned by Sussex County report \$189.8M in capital project costs from 2011-2016. Those needs include \$136.9M for sewer collection and conveyance and \$52.6M for treatment plant costs. Bridgeville, Laurel and Delmar include treatment plant upgrades totaling an estimated cost of \$12.7M primarily dealing with TMDL/compliance issues. Millsboro includes \$19.6M for reuse transmission and aquifer recharge costs. The City of Rehoboth 2011-2016 capital project costs includes \$19.1M for the construction of a pump station, force main and ocean outfall 6,000 feet offshore along with \$6M for various treatment plant upgrades and replacements including provisions for emergency power. Laurel and Delmar report \$6.4M for pump station replacements, I/I studies and for sewer replacement and rehabilitation projects.

Wastewater systems project that about one-half (51.7 percent, \$337.7M) of the capital project costs will be financed through issuance of bonds (Table ES-3). Nearly equal shares of these costs are expected to be financed through requests to the Clean Water State Revolving Fund (12.1 percent, \$78.8M) and through municipal sinking funds, asset replacement costs savings and current municipal budgets (13.2 percent, \$86.3M). Municipal requests to USDA are expected to account for 7.7 percent (\$50.3M) of the 2011-2016 project costs. No funding sources were reported for \$88.1M (13.5 percent) of the 2011-2016 project costs. Of the projects expected to be funded through the Clean Water State Revolving Fund, the yearly funding requests range from \$11.3M to \$21.2M from 2011-2014. Expected funding requests to

the Clean Water State Revolving Fund are \$5.7M and \$3.2M during 2015 and 2016, respectively. The potential under reporting of project costs in 2015-2016, the non-reported funding source for \$88.1M, and drop off in expected Clean Water State Revolving Fund requests in 2015-2016 result in uncertainties in the expected funding requests to the Clean Water State Revolving Fund during the 2011-2016 time period.

Table ES-1. Wastewater System Current Residential Revenue and Potential Increased Revenue.

	Present Annual Residential Revenue (\$M)	Additional Residential Revenue (\$M)		
		1.5% MHI increase	2.0% MHI increase	2.5% MHI increase
New Castle County	\$40.2	\$97.8	\$143.7	\$189.7
Kent County	\$14.8	\$14.7	\$24.5	\$34.4
Sussex County	\$37.0	\$12.0	\$28.0	\$44.3
Private	\$1.6	\$0.3	\$0.7	\$1.3
State	\$93.7	\$124.8	\$197.0	\$269.7

Table ES-2. Reported Capital Project Costs (\$M) at Public Wastewater Systems, 2011-2016.

County	Reported Capital Project Costs (\$M), 2011-2016				
	Collection	Conveyance	Treatment	Disposal	Total
New Castle	\$105.9	\$161.4	\$16.0	\$5.1	\$288.5
Kent	\$19.9	\$35.6	\$39.8	\$0.7	\$95.9
Sussex	\$62.3	\$96.6	\$77.0	\$33.4	\$269.3
State	\$188.1	\$293.6	\$132.8	\$39.2	\$653.7

Table ES-3. Reported Financing Options (\$M) at Public Wastewater Systems, 2011-2016.

County	Municipal Bank Financing	Municipal Bond Issue	Municipal Request to the Clean Water State Revolving Fund (SRF)	Municipal requests to USDA	Municipal Sinking Fund, other asset replacement cost savings	No funding source indicated	Other Financing Method	Total
New Castle	\$0.1	\$268.5	\$15.9	-	\$3.8	-	\$0.2	\$288.5
Kent	\$0.5	-	\$43.2	\$5.9	\$22.8	\$18.6	\$5.0	\$95.9
Sussex	\$3.2	\$69.3	\$19.7	\$44.4	\$59.8	\$69.5	\$3.4	\$269.3
State	\$3.7	\$337.7	\$78.8	\$50.3	\$86.3	\$88.1	\$8.7	\$653.7

Water Reuse

The State of Delaware promotes sustainable water management by directing infrastructure funding to targeted priority development areas and facilitating water reclamation and reuse via regulations, policy, guidance and education/outreach. The State promotes reuse for a variety of excellent reasons – water conservation, reducing nutrient discharges and recycling nutrients, recharging aquifers, maintaining agricultural land and other open space, helping farmers, and so forth.

Thirty-one of the 36 WWTPs surveyed currently include some kind of reuse feature or are planning a reuse feature, including all 14 privately operated plants along with a majority of the plants in Sussex and New Castle Counties and one of the two plants in Kent County. Most of the current applications are for

reusing treated biosolids (sludge), which is either already being done or is planned (for developments being constructed) for all but one of the privately operated plants.

With respect to water reuse, agricultural irrigation is the most common reuse option in Delaware, with significant additional interest and/or planning efforts underway to expand agricultural reuses. The State has promoted agricultural reuses and in fact, is well suited for agricultural reuse given significant agricultural land uses, particularly in Kent and Sussex Counties. In a companion study, the University of Delaware has developed a preliminary map showing potential spray irrigation sites.

Commercial and industrial reuse applications (with the exception of agricultural reuse) appear limited to a few plants with water-intensive industries nearby, and residential reuse is only being planned for two plants—one in New Castle and one in Kent County. Most of the “other” reuse category involves aquifer recharge via rapid infiltration basins (RIBs) or, in a few cases, drip or subsurface irrigation. Millsboro has partially constructed a reuse project that will involve spray irrigating athletic fields. Of these 10 collection system-only utilities, none had yet implemented reuse, which is understandable, given that these systems do not currently include their own treatment plants, but rather convey wastewater to another treatment plant, which may or may not include a reuse element. Several of these 10 collection systems did indicate an interest in implementing some kind of reuse system, including smaller-scale localized (e.g., satellite) reuse systems, industrial pretreatment and source separation, and other nontraditional options to help conserve water and reduce receiving WWTP loadings.

The major barriers to increased wastewater reuse is the limitation of land in urban areas; farmer/property owner concerns; and limited guidance, policy, and incentives. University of Delaware researchers stated in their study that representatives for the Division of Fish and Wildlife, Division of Parks and Recreation, and Coastal Management were not in favor of wastewater reuse on state lands although there are no known prohibitions. To increase reuse, it may be appropriate to i) undertake studies and market analyses to ascertain the viability of various reuse alternatives, ii) establish/standardize State policies and/or regulations regarding water reuse; iii) provide applicable incentives such as tax credits or nutrient credits; and iv) alleviate potential concerns about risks and liability by enhancing education, outreach, guidance and case studies for agricultural constituencies. It might also be appropriate to evaluate the opportunity for innovative reuse options for collection system-only utilities.

Mobile Home Parks, Clustered Individual Systems, and Community Systems

Delaware has more than 80,000 septic systems. There are more than 200 “large systems” (~3,000 gpd or greater), which include shared community cluster systems, municipal systems and commercial/industrial groundwater or spray discharge systems. This study included visiting and reporting on a representative set of 14 on-site (individual) septic systems in clustered areas and cluster (shared community) systems. It was found that the technical, managerial, financial, legal, program and enforcement issues facing individual and decentralized systems in Delaware are similar to elsewhere in the mid-Atlantic Region. Some MHPs are well-operated, but a glaring issue with some systems is the lack of proper management (e.g., homeowner associations that operate systems, lack of clear ownership or legal access to on-lot system components). Appendix D includes typical recommendations for decentralized systems and provides program-level guidance and recommendations to assist in making various case-by-case decisions, such as connection of a decentralized system to central sewer, implementing community systems and advancing treatment of individual septic systems.

Clean Water Infrastructure

Conservation Cost Share

Delaware's Conservation Cost Share Program promotes conservation practices that improve soil and water quality by preventing agricultural and urban pollutants from reaching surface and ground waters. The program provides funding to landowners and producers by paying a portion of the cost to design, install and maintain conservation practices or systems. Conservation cost share programs include planting cover crops and other conservation practices - important components of a successful nutrient reduction plan.



Field of cover crop sequestering underutilized nutrients

Cover crops are one key to reducing agricultural runoff that contributes nitrogen and phosphorus to our streams, rivers and bays. Producers plant cover crops, including grains like wheat, rye and barley, in the fall after the autumn harvest. The growing cover crops absorb the underutilized nutrients in the soil and reduce erosion from rain, snow and wind. Cover crops also help producers by inhibiting noxious weeds and increasing organic matter in the soil.

Conservation Cost Share is a partnership among:

DNREC Division of Watershed Stewardship

U.S.D.A. Natural Resources Conservation Service

Sussex, Kent and New Castle Conservation Districts

Delaware Department of Agriculture

FY 2015 Funding Request: \$2 Million

- ◆ \$2 million in state cost share funds will leverage an additional \$2 million in federal funds, contributed by the Natural Resources Conservation Service, U.S. Fish and Wildlife Service, Environmental Protection Agency's Non-Point Source and Chesapeake Bay Programs, and the Delaware Department of Agriculture.
- ◆ 70% of the funding will be divided equally among the three counties to expand their programs. The remaining funds will be used for conservation work in targeted watersheds.
- ◆ In addition to cover crops, conservation cost-share funding is used for a number of other practices that prevent nutrient runoff. Some of these practices are:
 - ◆ Manure storage sheds
 - ◆ Animal waste systems
 - ◆ Heavy use area protection
 - ◆ Poultry windbreaks
 - ◆ Composters
 - ◆ Water control structures
 - ◆ Manure handling equipment
 - ◆ Large animal mortality rendering
 - ◆ Urban conservation practices



Concrete heavy use pads at the end of a chicken house help prevent nutrient runoff.

In 2013 Delaware producers planted 58,000 acres of cover crops that reduced total nitrogen by about 545,200 lbs. and total phosphorus by 1,160 lbs., significantly reducing nutrients from reaching our waterways.

Meeting Pollution Reduction Goals and Cover Crops:

- ◆ The Chesapeake Bay Watershed Implementation Plan (WIP) and the Pollution Control Strategy for the Inland Bays Watershed call for significant increases in cover crop acreage.
- ◆ 149,500 acres of cover crops is the minimum acres recommended annually to meet water quality goals in watersheds across the state; 92,765 of those acres are needed in the Chesapeake Bay Watershed.
- ◆ Without the support of the Conservation Cost Share Program, Delaware can not fully implement the WIP or Pollution Control Strategy goals for most of its impaired watersheds.

Current Projects: 2013

- ◆ Cover Crops **Planted:** 58,000 acres - Cost approximately \$2.6 million (cost shared)
- ◆ Cover Crops **Requested:** 160,000 acres - Cost approximately \$7.2 million.
- ◆ Requests for cover crop funding were almost triple the amount of funding that was available in 2013.

Cost/Benefit of Cover Crops:

Through the Conservation Cost Share Program, producers receive an average of \$45 per acre for cover crops planted, depending on species of crop, timing and application method.



Poultry waste storage structure provides dry area to store poultry litter, eliminating the potential for nutrient runoff.

FY 2016 - 2017 Funding Requests: \$2 Million/Year

- ◆ Cost share funding for cover crops and other practices that prevent nutrient runoff.
- ◆ The demand for cost share funding is increasing, and Delaware producers are supporting the Cover Crop Program as a best management practice.