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State Wetland Protection

Status, Trends, & Model Approaches

A 50-state study by the
Environmental Law Institute

With support from the
U.S. Environmental Protection Agency

2008

Appendix: State Profiles

Delaware

I. Overview

Delaware contains approximately 225,000 acres of freshwater and 125,000 acres of tidal wetlands.[1] However, since European settlement the state has lost approximately 54 percent of its historic wetlands, and much of the remaining wetland habitat has been degraded.[2] To address this loss, the state has adopted law designed to preserve and protect public and private wetlands.[3] In addition §401 water quality certification under the Clean Water Act (CWA), Delaware regulates tidal wetlands under the Wetlands Act. The Delaware Department of Natural Resources and Environmental Control (DDNREC), Division of Water Resources(DWR), Wetlands and Subaqueous Lands Section operates the state's wetland regulatory and protection programs. The state's Ecological Restoration and Protection Team (ERPT), a coalition of state and federal agencies and organizations, conducts coordinated restoration and protection efforts. Finally, state agency scientists and managers are also developing a comprehensive state wetland strategy to better integrate the state's wetland programs.

II. Regulatory Programs

Wetland definitions and delineation

Delaware defines "State waters" or "Waters of the State" as:

> water, on the surface and under the ground, wholly or partially within, or bordering the State, or within its jurisdiction including but not limited to: (a) Waters which are subject to the ebb and flow of the tide including, but not limited to, estuaries, bays and the Atlantic Ocean; (b) All interstate waters, including interstate wetlands; (c) All other waters of the State, such as lakes, rivers, streams (including intermittent and ephemeral streams), drainage ditches, tax ditches, creeks, mudflats, sandflats, wetlands, sloughs, or natural or impounded ponds; (d) All impoundments of waters otherwise defined as waters of the State under this definition; (e) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in (a)-(d).[4]

For the purposes of the (Tidal) Wetlands Act, Delaware defines "wetlands" as:

> those lands above the mean low water elevation including any bank, marsh, swamp, meadow, flat or other low land subject to tidal action in the State along the Delaware Bay and Delaware River, Indian River Bay, Rehoboth Bay, Little and Big Assawoman Bays, the coastal inland waterways, or along any inlet, estuary or tributary waterway or any portion thereof, including those areas which are now or in this century have been connected to tidal waters, whose surface is at or below an elevation of 2 feet above local mean high

[1] R.J Tiner,. Delaware Wetlands Status and Trends (2002), *noted in* DEP'T OF NATURAL RES. AND ENVTL. CONTROL, STATE OF DELAWARE 2002 WATERSHED ASSESSMENT REPORT (305(B)) (2002), *available at* http://www.dnrec.state.de.us/water2000/Sections/Watershed/TMDL/2002_305b.pdf.

[2] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, ECOLOGICAL RESTORATION & PROTECTION STATUS REPORT 2003 – 2006 (2006), *available at* http://www.swc.dnrec.delaware.gov/NR/rdonlyres/7C53E10A-664A-4019-9858-489A461B69C0/0/StatusRpt200306FINAL.pdf.

[3] DEL.CODE ANN. tit. 7, § 6603.

[4] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, REGULATIONS GOVERNING THE CONTROL OF WATER POLLUTION (2006), *available at* http://www.dnrec.state.de.us/water2000/Sections/SurfWater/Library/RGCWP.pdf.

> water, and upon which may grow or is capable of growing [any but not necessarily all of a series of wetland plants][5]

"Wetlands" also include:

> those lands not currently used for agricultural purposes containing 400 acres or more of contiguous nontidal swamp, bog, muck or marsh exclusive of narrow stream valleys where fresh water stands most, if not all, of the time due to high water table, which contribute significantly to ground water recharge, and which would require intensive artificial drainage using equipment such as pumping stations, drain fields or ditches for the production of agricultural crops.[6]

Delaware Regulations Governing the Control of Water Pollution define "wetlands" as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."[7]

Jurisdictional wetland delineation under the Wetlands Act is based on a series of regulatory wetlands boundary maps that have been adopted by the state pursuant to the statute. The maps, created from aerial photographs, depict the extent of wetlands that are regulated by the state.[8] Wetland areas jurisdiction under the state water quality regulations (and CWA §401) are delineated according to state regulations and the U.S. Army Corps of Engineers' 1987 *Wetlands Delineation Manual*.[9]

Wetland-related law and regulation

In addition to protections offered under §401/404 of the CWA, Delaware protects tidal wetlands under the Wetlands Act and submerged lands and tidelands under the Subaqueous Land Act. Delaware issues approximately 400 permits annually under these two laws.[10]

Wetlands Act.[11] The Wetlands Act, enacted in 1973, recognizes the importance of wetlands for the protection of the critical coastal areas of Delaware and establishes a permitting program for

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[5] For example, Eelgrass (*Zoxtera marina*), Wedgeon Grass (*Ruppia maritima*), Sago Pondweed (*Potamogeton pectinatus*), Saltmarsh Cordgrass (*Spartina alterniflora*), Saltmarsh Grass (*Spartina cynosuroides*), Saltmarsh Hay (*Spartina patens*), Spike Grass (*Distichlis spicata*), Black Grass (*Juncus gerardii*), Switch Grass (*Panicum virgatum*), Three Square Rush (*Scirpus americanus*), Sea Lavender (*Limomium carolinianum*), Seaside Goldenrod (*Solidago sempervirens*), Sea Blite (*Suaeda maritima*), Sea Blite (*Suaeda linearis*), Perennial Glasswort (*Salicornia virginica*), Dwarf Glasswort (*Salicornia bigelovii*), Samphire (*Salicornia europaea*), Marsh Aster (*Aster tenuifolius*), Saltmarsh Fleabane (*Pluchea purpurascens var. succulenta*), Mock Bishop's Weed (*Ptilimnium capillaceum*), Seaside Plantain (*Plantage oliganthos*), Orach (*Atriplex patula var. hastata*), March Elder (*Iva frutescens var. oraria*), Goundsel Bush (*Baccharis halmifolia*), Bladder Wrach (*Fucus vesiculosis*), Swamp Rose Mallow, Seaside Hollyhock or March Mallow (*Hibiscus palustris*), Torrey Rush (*Scirpus torreyi*), Narrow-leaved Cattail (*Typha angustifolia*), and Broad-leaved Cattail (*T. latifolia*)

[6] DEL.CODE ANN. tit. 7, § 6603(h); 59 Del. Laws, c. 213, § 1; 64 Del. Laws c. 293, § 1.

[7] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 4.

[8] DEL.CODE ANN. tit. 7 § 6607; Personal communication with Laura Herr, Div. of Water Res., Wetlands and Subaqueous Lands Section (Feb. 21, 2007).

[9] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 4.

[10] Personal communication with Laura Herr, Div. of Water Res., Wetlands and Subaqueous Lands Section (Feb. 21, 2007).

[11] DEL.CODE ANN. tit. 7, § 6601.

impacts to tidal wetlands. Under the Act, a permit is required for dredging, filling, bulkheading, plowing or construction of any kind in delineated wetlands.[12]

Regulatory jurisdiction extends to those lands that are subject to tidal action lying above the mean low water elevation and two feet or less above mean high water elevation, and that are capable of supporting the growth of wetland plants. Large nontidal wetlands (greater than 400 acres) that contribute significantly to groundwater recharge are also regulated under the law. Jurisdictional areas are delineated on a series of boundary maps (as described above).[13]

Subaqueous Lands Act.[14] The Subaqueous Lands Act, enacted in 1969, establishes a permitting program to protect the public's interest in subaqueous lands. Subaqueous lands are classified as "submerged lands and tidelands." Submerged lands include: (1) lands lying below the line of mean low tide in the beds of all tidal waters within the boundaries of the state; (2) lands lying below the plane of the ordinary high water mark of nontidal rivers, streams, lakes, ponds, bays and inlets within the boundaries of the State as established by law; and (3) specific manmade lakes or ponds as designated by the Secretary. Tidelands are defined as "lands lying between the line of mean high water and the line of mean low water."[15]

Permits are required for deposit of materials or removal or extraction of materials, as well as construction, repair or reconstruction of structures.[16] Under the law, permittees may be required to mitigate impacts to substantial resources.

Coastal Zone Act.[17] The Coastal Zone Act prohibits new heavy industry uses anywhere in Delaware's Coastal Zone, as well as offshore bulk product transfer facilities in the Zone outside the Port of Wilmington. For the purposes of the State Coastal Zone Act, the Coastal Zone is an

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[12] Exceptions include certain mosquito control, construction of navigational aids, duck blinds, foot bridges, wildlife nesting structures, grazing, haying, hunting, fishing and trapping. DEL.CODE ANN. tit. 7, § 6606.
[13] DEL.CODE ANN. tit. 7, § 6607.
[14] DEL.CODE ANN. tit. 7, § 7201.
[15] DEL.CODE ANN. tit. 7, § 7202.
[16] Exceptions include: "(a) This chapter shall not apply to any work performed by any state, county, municipal government or conservation district, or their designated contractor, when that work occurs in nontidal submerged lands in the Delaware Atlantic Coastal Plain Province with a contributing drainage area of less than 800 acres. (b) This chapter shall not apply to maintenance, reconstruction or retrofitting work performed by or with the assistance of any state, county, municipal government or conservation district when that work occurs in any nontidal submerged lands. Such maintenance, reconstruction or retrofitting work shall comply with the standards and specifications associated with best management practices in the Delaware Erosion and Sediment Control Handbook, 1989 or as revised (68 Del. Laws, c. 268, § 2). (c) This chapter shall not apply to any work in agricultural drainage ditches created from nonsubaqueous lands that are designed according to reasonable drainage standards, when performed by or with the assistance of any state, county, municipal government or conservation district. (d) This chapter shall not apply to ponds constructed in uplands when those ponds are constructed by or with the assistance of any state, county, municipal government or conservation district. (e) This chapter shall not apply to stormwater ponds that are permitted in accordance with Chapter 40 of this title or to farm ponds or other ponds whose only source of hydrology is groundwater. (f) The lease provisions of this chapter shall not apply to any wastewater conveyance or treatment works system owned or operated by the State or any county or municipal government with the State. (g) This chapter shall not apply to subaqueous archaeological resources and unmarked human burials and human skeletal remains, which are regulated by the Department of State, Division of Historical and Cultural Affairs pursuant to Chapters 53 and 54 of this title. (68 Del. Laws, c. 268, § 2; 72 Del. Laws, c. 474, § 4; 75 Del. Laws, c. 153, § 12.)" 7 Del.C. Chapter 72.
[17] DEL.CODE ANN. tit. 7, § 7001.

approximately four-mile wide strip along Delaware's coastline.[18] The Act also establishes the Coastal Zone Act permit program for industrial development other than that of heavy industry in the coastal zone of Delaware.

Organization of state agencies

Within the Delaware Department of Natural Resources and Environmental Control numerous divisions conduct wetland-related activities, including the Division of Water Resources (DWR), Division of Fish and Wildlife (DFW), and Division of Soil and Water Conservation (DSWC).

Division of Water Resources. DNREC-DWR's Wetlands and Subaqueous Lands Section (WSLS) serves as the primary regulatory authority for Delaware's wetlands. The section is responsible for all wetlands, subaqueous, and marina permitting and §401 certification. Applicants may submit a joint application to the WSLS for impacts regulated under the permitting and certification programs.[19] The section has ten full time equivalents (FTEs) and operates on an annual budget of approximately $550,000. General appropriations account for approximately $350,000 of the total budget; the remainder is funded through fees.[20]

DNREC-DWR's Watershed Assessment Section (WAS) manages the state's water quality monitoring program and is working to integrate wetlands and watershed management into program activities. WAS has developed a standardized protocol for nontidal wetlands and is developing a standardized protocol for tidal wetland monitoring that will be used to assess wetland conditions and prioritize restoration and protection on the watershed scale.[21]

Division of Fish and Wildlife. DNREC-DFW partners with state and federal agencies, private landowners, and other organizations on voluntary wetland management and restoration programs. The Division promotes conservation and restoration of wetland habitat as part of its private and public land wetland restoration program, *Phragmites* control cost-share program, and other invasive species control programs. DFW employs two full-time biologists on their private lands program, which is funded by both general state appropriations and federal Landowner Incentive Program funds.[22]

Division of Soil and Water Conservation. DNREC-DSWC's Coastal Management Program (CMP) issues consistency determinations for all federal actions, federal licenses or permits, and projects proposed in the coastal area. CMP also conducts coastal restoration and education programs and provides special area management planning and assistance to state and local governments for local land use planning. The program employs two FTEs for federal consistency determinations.[23]

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[18] Email from Tricia Arndt, Del. Coastal Mgmt. Program (June 27, 2007)
[19] Personal communication with Laura Herr, *supra* note 10.
[20] *Id.*
[21] Email from Any Jacobs, Del. Dep't of Natural Res., Div. of Water Res., Watershed Assessment Section (June 26, 2007).
[22] Email from Shelley Tovell, Del. Dep't of Natural Res., Div. of Fish and Wildlife (June 21, 2007).
[23] Personal communication with Sarah Cooksey, Del. Coastal Zone Mgmt. Program (Mar. 9, 2007).

§401 certification

Delaware requires §401 certification for all activities that require a federally issued permit, such as a §404 permit, to ensure that projects will not violate Delaware's surface water quality standards (WQS). Certifications require a description of the feasible alternatives considered to avoid, minimize or compensate for impacts to or loss of State waters.[24] The WSLS issues approximately 50 §401 certifications per year,[25] a significant portion of which involve Delaware Department of Transportation projects. WSLS denies a small number of authorizations each year,[26] but more typically, section staff work with applicants to redesign projects that meet approval. WSLS staff rely on qualitative assessment to make certification decisions, as determined by the state's water quality regulations.[27]

Nationwide permits

Section 404 nationwide permits (NWPs) are reviewed by WSLS as they are issued by the U.S. Army Corps of Engineers ("Corps") every five years.[28] For the 2002 NWPs, §401 certification and Coastal Zone Consistency were denied for NWP #40 (Agricultural Activities), NWP #41 (Reshaping Existing Drainage Ditches), NWP #43 (Stormwater Management Facilities), and NWP #44 (Mining Activities). The Corps suspended NWP #29 (Single Family Housing) in Delaware. In addition, §401 certification and Coastal Zone Consistency were conditionally denied in "critical resource waters" for NWP #3 (Maintenance), NWP #7 (Outfall Structures and Maintenance), NWP #12 (Utility Line Activities), NWP #14 (Linear Transportation Projects), NWP #27 (Stream and Wetland Restoration Activities), NWP #39 (Residential, Commercial, and Institutional Developments) and NWP #42 (Recreational Facilities).[29] CMP also reviews the NWPs. For the 2002 NWPs, CMP included restrictions for state natural heritage plants or animals and critical waters.[30] Delaware's action on the 2007 NWPs could not be reviewed within the reporting period.

State Program General Permit. Two state program general permits (SPGP) apply in Delaware for §10 waters, but there are no SPGPs for activities regulated under §404. SPGP #18 permits a range of activities, including docks and shoreline stabilization, inside substantially developed artificial lagoons.[31] SPGP #20 regulates bulkheading, docks and piers.[32]

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[24] For example, clustering development on upland parcels, considering alternative layouts that avoid or minimize impacts to waters of the State, replacement of State waters lost due to activity where such loss can neither be avoided nor minimized. DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 4.

[25] Personal communication with Laura Herr, *supra* note 10.

[26] WSLS estimates that a total of 9 – 10 denials are made each year for all types of authorizations including water quality certifications and other permits. Email from Laura Herr, Del. Div. of Water Res., Wetlands and Subaqueous Lands Section, (Apr. 2, 2007).

[27] Personal communication with Laura Herr, *supra* note 10.

[28] Email from Laura Herr, *Supra* note 26.

[29] These NWPs were approved for all other waters. Email from Laura Herr, *supra* note 26.

[30] Personal communication with Sarah Cooksey, *supra* note 23.

[31] DEP'T OF THE ARMY, U.S. ARMY CORPS OF ENG'RS, PA. DIST., DEPARTMENT OF THE ARMY GENERAL PERMIT DELAWARE -SPGP-18, *available at* http://www.nap.usace.army.mil/cenap-op/regulatory/spgp18.pdf (last visited July 26, 2007).

[32] DEP'T OF THE ARMY, U.S. ARMY CORPS OF ENG'RS, PA. DIST., CENAP-OP-R-DELAWARE STATE PERMIT GENERAL PERMIT 20 (SPGP-20), *available at* http://www.nap.usace.army.mil/cenap-op/regulatory/spgp20.pdf (last visited July 26, 2007).

Mitigation
Delaware requires mitigation for wetlands and subaqueous lands permits and water quality certifications.[33] Delaware's Regulations Governing the Control of Water Pollution outline guidelines for compensatory mitigation under the water quality certification program.[34] The regulations allow creation and restoration, as well as compensation through the purchase of mitigation bank credits. Preference is stated for advance compensation that is on-site and within the same watershed as the impacted water.[35] Preferred compensation ratios are not to exceed 3:1. Conservation easements, monitoring, functional assessment, maintenance and reporting programs may be required on mitigated wetlands.

Compliance and enforcement
WSLS has one scientist who serves as the enforcement lead for violations and permit non-compliance under the Wetlands Act and the Subaqueous Lands Act.[36] WSLS coordinates with agency staff from other DNREC divisions and/or federal or local agencies as necessary and appropriate.[37] The majority of violations (approximately 85 percent) are resolved through voluntary compliance and very few penalties or prosecutions are necessary.[38] However, there are currently several pending violations. In the past, enforcement was primarily complaint driven, but the program is increasingly performing more inspections (including over flights) to detect violations.

Delaware law outlines enforcement actions for violations to the state's water quality standards. As a first step, the state may seek voluntary compliance by way of order, warning, notice or other educational means. If the complaint is not resolved through voluntary means, the state may impose a civil or administrative penalty; issue a temporary restraining order, injunction or other appropriate remedy; seek criminal penalties; issue a cease and desist order; or seal any source required to have a permit.[39] Under the Wetlands Act, the state may issue a cease and desist order, impose civil penalties, and/or hold violators liable for the cost of restoration.[40]

Tracking systems
DNREC manages a searchable state tracking system, Delaware Environmental Navigator, for information collected on permits, §401 certifications, enforcement actions, and environmental monitoring.[41] Data is available for viewing both as a map and as text.[42]

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[33] Personal communication with Laura Herr, *supra* note 10.
[34] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 4.
[35] The state is becoming more flexible about these criteria in order to improve the quality of the resulting compensation project. Personal communication with Laura Herr, *supra* note 10.
[36] DEL.CODE ANN. tit. 7, § 6003; DEL.CODE ANN. tit. 7, § 6614.
[37] Email from Laura Herr, Division of Water Resources, Wetlands and Subaqueous Lands Section (June 13, 2007).
[38] Personal communication with Laura Herr, *supra* note 10.
[39] DEL.CODE ANN. tit. 7, § 6003; DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 4.
[40] DEL.CODE ANN. tit. 7, §6617.
[41] Data on wetlands mitigation will be added in the future. Personal communication with Laura Herr, *supra* note 10.
[42] Delaware Deptartment of Natural Resources and Environmental Control, *Delaware Environmental Navigator*, *at* http://www.nav.dnrec.delaware.gov/dnreceis/ (last visited July 26, 2007).

III. Water Quality Standards

Delaware has not adopted have water quality standards or designated uses specific to wetlands.[43] However, WQS and designated uses apply to all "waters of the state," which include wetlands. Surface WQS are narrative and numeric in nature and include criteria related to temperature, dissolved oxygen, bacteria, nutrients and toxic substances. State WQS designate wetland-related uses, including fish, aquatic life and wildlife habitat and primary and secondary contact recreational activities.[44] Anti-degradation standards are not specifically identified for wetlands, and so the provisions that apply to all "waters of the state" also apply to wetlands.

IV. Monitoring and Assessment

WAS maintains a Surface Water Quality Monitoring Program for all waters of the state. The program collects data on the chemical, physical, and biological characteristics of Delaware waters. This information is entered into a national database called STORET (storage and retrieval system) and is used in assessing the water quality of each basin for the state's Watershed Assessment Report (CWA §305(b) Report).[45]

WAS is looking to expand the water monitoring program to include wetlands. The Section's Wetland Monitoring and Assessment Program has developed standardized protocols for nontidal wetlands and is developing standardized protocols for tidal wetlands and restoration sites.[46] Protocols are based on assessing the condition of wetlands and determining the dominant stressors that are lowering wetland condition on the watershed level.[47] Methodologies include the Delaware Comprehensive Assessment Protocol (DECAP) and the Delaware Rapid Assessment Protocol (DERAP).[48] DECAP is an assessment of a wetland based on the vegetation, hydrology, soils, surrounding land use, and topography of the site. DERAP is a rapid assessment methodology based on identifying the presence or absence of stressors to wetland sites in three categories: hydrology; habitat and plant community; and surrounding buffers. The program is also prioritizing land for restoration and protection.[49]

The program is also developing a tidal assessment protocol for the state that may eventually be used for regulation and is collaborating with Virginia and Maryland on the development of tidal assessment methodologies for the Mid-Atlantic region. In addition, the program performs research on topics related to wetland restoration and protection. The wetland monitoring

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[43] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, STATE OF DELAWARE SURFACE WATER QUALITY STANDARDS (2004*), available at* http://www.dnrec.state.de.us/DNREC2000/Divisions/Water/WaterQuality/WQStandard.pdf.

[44] *Id.*

[45] DEP'T OF NATURAL RES. AND ENVTL. CONTROL, DIV. OF WATER RES., WATERSHED ASSESSMENT BRANCH, SURFACE WATER QUALITY MONITORING PROGRAM (2007), *available at* http://www.dnrec.state.de.us/DNREC2000/Library/Water/swmonpro.pdf.

[46] Personal communication with Amy Jacobs, Del. Dep't of Natural Res., Div. of Water Res., Watershed Assessment Section (Mar. 5, 2007).

[47] DEP'T OF NATURAL RES. AND ENVTL. CONTROL, DIV. OF WATER RES., WATERSHED ASSESSMENT BRANCH, *supra* note 45.

[48] DEL. DEP'T OF NATURAL RES. AND ENVTL. CONTROL, *supra* note 2.

[49] Personal communication with Amy Jacobs, *supra* note 46.

program is funded through grants from the U.S. Environmental Protection Agency (EPA) along with some state funds.[50]

DNREC coordinates the volunteer Adopt-A-Wetland Program.[51] The program's goals are to increase wetlands awareness, provide education about the value of wetlands and recruit volunteers to assist in monitoring and restoring these resources. The program is focusing on identifying priority sites for adoption into the program, including wetlands restoration sites that are not being monitored and sites where volunteers can provide data useful to WAS and Natural Heritage initiatives. The state currently has more than 80 volunteer groups enrolled in the program.[52] The program, funded by grants from the U.S. Fish and Wildlife Service (FWS) and EPA, has produced two educational videos, a comprehensive guidebook for adopters, and series of loan kits for monitoring different components of the wetlands.[53]

V. Restoration and Partnerships

Through the Chesapeake Bay program, Delaware has committed to restoring 1,500 acres and enhancing 1,500 acres of wetlands in the Chesapeake Bay watershed by 2010. A group of state agency scientists and managers is also developing a comprehensive state wetland strategy to better integrate all of the state's wetlands programs.

The Ecological Restoration and Protection Team (ERPT) was created by DNREC in 2003 to establish and improve wildlife habitat, enhance water quality and provide stream-bank protection, and reduce erosion throughout the state.[54] ERPT, which includes scientists, managers, and environmentalists from more than 32 state and federal agencies and organizations, conducts coordinated restoration and protection efforts focused on streams, drainage ditches, wetlands, and riparian corridors. Since 2003, ERPT's efforts have resulted in the establishment of over 480 acres of grasses, forests, wetlands, and riparian corridors, the restoration of 7,225 feet of streams and shoreline, and the treatment of more than 36,000 acres of *Phragmites*.[55]

In 2005, ERPT, WAS, and DWF (Adopt-A-Wetland Program) were awarded a cooperative grant from EPA to expand their efforts in three areas: restoration, monitoring and assessment, and education. Under the grant, monitoring and assessment programs are being used to target degraded wetlands and streams for restoration, and watershed scale restoration plans are being developed to identify and address impacts.

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[50] *Id.*
[51] Department of Natural Resources and Environmental Control, *Adopt-A-Wetland Program, at* http://www.dnrec.state.de.us/DNREC2000/Divisions/FW/Adopt-A-Wetland.htm (last visited July 26, 2007).
[52] Personal communication with Gary Kreamer, Del. Dep't of Natural Res., Div. of Fish and Wildlife (Feb. 20, 2007).
[53] *Id.*
[54] The Del. Dep't of Natural Res., *Ecological Efforts Restore 20 Sites in Delaware in 2006; Projects included upland, wetland and stream restorations, shoreline stabilization and steam-side plantings*,DNREC News, Jan. 22, 2007, *available at* http://www.dnrec.state.de.us/dnrec2000/admin/Press/Story1.asp?PRID=2352.
[55] DEL. DEP'T OF NATURAL RES. AND ENVTL. Control, *supra* note 2.

DFW's Delaware Landowner Incentive Program provides 75 percent cost-share for the restoration of farmed and prior converted wetlands and enhancement of existing rare and unique wetland ecosystems. Landowners receive a flat-rate payment for construction and planting of a wetland and associated 35-foot buffer and may receive an annual rental payment to compensate for income lost by taking the land out of agricultural production. Under this program, DFW develops habitat management plans for each property, oversees construction and restoration, and is beginning to monitor the sites enrolled in the program. The landowner is required to manage and maintain the land for five to ten years. Both upland and wetland habitats are created depending on the desires of the landowner and available funding. In total, the program has enrolled 115 landowners and restored 958 acres.[56]

DFW also coordinates with the U.S. Fish and Wildlife Service (FWS) on the Partners for Wildlife program. The program primarily provides funds for ecosystem-based restoration of impaired waters and private lands that are in close proximity to wildlife management areas and refuges. In addition, DFW runs the *Phragmites* spraying cost-share program, which is intended to improve wildlife habitat in wetlands degraded by the invasive weed. In partnership with the Natural Resources Conservation Service's Wildlife Habitat Incentive Program, the program is able to cover approximately 88 percent of the cost of landowners' *Phragmites* treatment.

Several other state agencies are involved in wetland restoration efforts across the state. DDNREC-DSWC provides brochures for landowners on restoration efforts in Delaware and works with partners on ecological restoration and protection efforts. DDNREC Division of Parks and Recreation runs an open space program for purchasing environmentally sensitive areas and has easements on properties containing wetlands. CMP coordinates a restoration program focused on both urban and coastal projects.[57] Additionally, the DDNREC-DSWC Coastal Programs Section implements the Coastal and Estuarine Land Conservation Program, an acquisition program designed to protect coastal and estuarine lands considered important for their ecological, conservation, recreational, historical or aesthetic values.[58]

VI. Education and Outreach

DFW's Office of Education and Outreach publishes wetlands information and runs several wetland education programs. DFW's Aquatic Resources Education (ARE) Center, funded with grants from FWS,[59] hosts wetland-related teacher and youth group education trainings at the Center's overnight lodge. The Eco-Explorers Program, started with a grant from the Delaware Department of Education, is a hands-on education field-trip program that allows fifth grade students to learn about tidal salt marsh plants and animals. In addition, DFW has helped to integrate wetlands into the seventh grade watershed curriculum through a presentation on Delaware wetlands and other activities.

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[56] Personal communication with Shelley Tovell, Del. Dep't of Natural Res., Div. of Fish and Wildlife (Mar. 7, 2007).
[57] Personal communication with Sarah Cooksey, Del. Coastal Zone Mgmt. Program (March 9, 2007).
[58] Email from Tricia Arndt, *supra* note 18.
[59] The Education Center receives Aquatic Resources Education Funds from FWS every year. The money is from the sporting industry so most of the programs are fishing related. Personal communication with Gary Kreamer, *supra* note 52.

Through its ARE Center, DFW has also developed, in collaboration with local high school students, Wetland Activities for Delaware Educators (WADE) kits. The kits, a series of eight interactive "curriculum-standard-correlated" learning stations, are loaned out to middle school teachers across the state. DFW runs WADE kit trainings to introduce teachers to the kit and show them how to use it. ARE has also assisted in adapting and producing copies of the WADE kits for use by educators in New Jersey.[60]

Several other state agencies are involved with wetland-related education programs. DDNREC Division of Parks and Recreation operates a number interpretive trails and centers and educational programs that incorporate information on wetlands at several of Delaware's 15 state parks. In addition, Delaware's National Estuarine Research Reserve manages two reserves for research and education purposes. The Research Reserve program is a collaboration of the DNREC-DSWC, CMP, and National Oceanographic and Atmospheric Administration.[61]

VII. Coordination with State and Federal Agencies

Delaware's state agencies regularly coordinate with each other as well as federal agencies. WSLS has monthly joint permit processing meeting with the Corps, EPA, FWS, National Marine Fisheries Service, state historic preservation office, and CMP. The section has also signed a mitigation banking agreement with Delaware Department of Transportation (DelDOT).[62] WSLS also worked with the DelDOT on developing their mitigation bank. A group of state agency scientists and managers is developing a comprehensive state wetland strategy to better integrate the state's wetlands programs.[63] Regionally, WAS is working with Virginia and Maryland on tidal wetlands monitoring protocols through the Chesapeake Bay Program.

VIII. Acronyms and Abbreviations

ARE – Aquatic Resources Education
CMP – Coastal Management Program
Corps – U.S. Army Corps of Engineers
CWA – Clean Water Act
DDNREC – Delaware Department of Natural Resources
DECAP – Delaware Comprehensive Assessment Protocol
DelDOT – Delaware Department of Transportation
DERAP – Delaware Rapid Field Assessment Protocol
DFW – Division of Fish and Wildlife
DSWC – Division of Soil and Water Conservation
DWR – Division of Water Resources

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[60] *Id.*
[61] Delaware Department of Natural Resources, Delaware National Estuarine Research Reserve, *at* http://www.dnrec.state.de.us/DNREC2000/Divisions/Soil/DNERR/ (last visited July 26, 2007).
[62] Personal communication with Laura Herr, *supra* note 10.
[63] Personal communication with Amy Jacobs, *supra* note 46.

EPA – U.S. Environmental Protection Agency
ERPT – Ecological Restoration and Protection Team
FTE – Full Time Equivalent
FWS – U.S. Fish and Wildlife Service
MBRT – Mitigation Banking Review Team NWP – Nationwide Permit
NWP – Nationwide Permit
SPGP – State Program General Permit
WADE – Wetland Activities for Delaware Educators
WAS – Watershed Assessment Section
WSLS – Wetlands and Subaqueous Land Section
WQS – Water Quality Standards