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Environmental Programs

Concern about the environment grew to unprecedented heights in the United States during the 1960s and 1970s. The growing influence of the environmental movement had a direct impact on the Philadelphia District, as the district assumed new responsibilities in response to these concerns. Since 1972, the district's environmental work has been expanded to include regulatory and permitting operations; remediation of Environmental Protection Agency (EPA) Superfund sites; other hazardous, toxic, and radiological waste cleanup operations, including EPA Resource Conservation and Recovery Act projects and the Formerly Utilized Sites Remedial Action Program; and ecosystem restoration. Among these

responsibilities, regulatory and Superfund work were the largest in terms of budget and number of personnel employed, while ecosystem restoration projects represent the district's newest endeavor in the environmental arena. Most of these programs emerged in response to the flurry of environmental protection laws Congress enacted in the early to mid-1970s.

In the late 1960s and 1970s, Congress passed legislation aimed at protecting the environment that had an enormous impact on Corps of Engineers work around the country. One of the most important new laws, which altered Corps project planning and operations in general, was the National Environmental Policy Act (NEPA) of 1969, which President Richard

Facing page: The Cooper River Fish Ladder in Camden County, N.J., winner of the Coastal America Award in 2001

Nixon signed on January 1, 1970. One of the key features of the law was its requirement that federal agencies prepare environmental impact statements (EISs) whenever they conducted activities “significantly affecting the quality of the human environment.” The EIS process required public input on proposed projects before officials made final decisions to implement them.

The advent of NEPA prompted the Philadelphia District to develop a new organizational framework to coordinate the district’s various realms of environmental work. In late 1971, the district created the Environmental Resources Branch in the Engineering Division to address environmental aspects of the Corps’ missions, including support to the Regulatory Branch. This branch was responsible for the environmental planning aspects of civil works studies and projects, in particular the NEPA environmental assessment process. When the branch was formed, there was already a sizable EIS backlog for both ongoing and new district projects; in time,

the branch was staffed to meet this challenge. In “the high water days,” according to former branch chief John Burnes, there were as many fourteen employees.¹

Although not as all-encompassing as NEPA, other new environmental laws of that era reshaped the district’s approach to project planning and implementation. Among the most notable were the National Estuarine Protection Act of 1968; the Coastal Zone Management Act of 1972; the Marine Protection, Research, and Sanctuaries Act of 1972; the Clean Water Act of 1972; the Endangered Species Act of 1973; the Water Resources Development Act of 1974; and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Although not an environmental law, the National Historic Preservation Act of 1966 also affected project planning to incorporate standards set by the secretary of the interior for the preservation of historic sites. Many of these laws led to the creation of new program areas and prompted

the expansion of existing programs in the Philadelphia District.

Regulatory Branch Operations

Throughout the twentieth century, the Corps of Engineers was responsible for regulating the construction of water-control structures and for collecting and dumping dredged materials from the country's navigable rivers and waterways, pursuant to Section 10 of the Rivers and Harbors Act of 1899. Before 1972, the Corps

worked within a narrow definition of navigable waters, which meant only those water bodies used to transport interstate or foreign commerce. Within the Philadelphia District, the staff of the Permits Section (forerunner of the Regulatory Branch) was responsible for evaluating applications for dumping or fill operations and issuing dredging permits for those activities. The Permits Section was part of the Engineering Branch until a 1968 reorganization moved it into the Navigation

Wetlands under the jurisdiction of the Philadelphia District



and Engineering Branch. At that time, five employees worked in the Permits Section, handling two to three hundred dredge and fill applications a year. Forty years later, the Regulatory Branch had approximately thirty staff members who reviewed and processed approximately 2,500 permit applications annually.²

By the late 1960s, environmental activism and legislative responses to environmental threats had begun to transform the operational stance of federal land management agencies, including the Corps. The first major shift occurred with a 1967 memorandum of agreement among the Army, the secretary of the interior, and the U.S. Fish and Wildlife Service (FWS) that authorized the FWS to review Corps dredge and fill permits. In accordance with this agreement, the Corps' central office regulatory staff established a new review policy that would assess each permit's potential effects on the project environment.³ Second, the U.S. Court of Appeals decided in *Zabel v. Tabb* that the Corps, because of

its long-established authority to review waterway dredging and fill operations, could refuse to grant permits for dumping material if permitting staff determined that the projects would be harmful to water quality.⁴ In response to these new responsibilities, the staff of the Philadelphia District's Permits Section had grown from five to fifteen by 1972.⁵

But the expansion of the district's regulatory and permitting functions was just beginning. In 1972, Congress enacted the Federal Water Pollution Control Act (subsequently called the Clean Water Act), which handed most of the responsibility for studying, restoring, and protecting the nation's water quality to the newly created Environmental Protection Agency. However, Section 404 of the act mandated that the Corps would retain responsibility for permitting and monitoring dredging and dumping activities in state and federal waterways.⁶

For several years after the passage of the Clean Water Act, there was uncertainty about how the Corps would implement its

responsibilities under the legislation. Internal debates in the Corps and lobbying by the dredging industry on one side and environmental groups on the other focused on what the term “waters of the United States” meant in the legislation.⁷ For a time, the Corps continued to adhere to the strict definition of “navigable waters” that typically meant navigable rivers and shipping lanes only. But eventually the National Wildlife Federation and the National Resources Defense Council (NRDC) filed suit against the Department of the Army for failure to comply with the “intention of the Clean Water Act.”⁸

In 1975, the Federal District Court for Washington, D.C., heard the case *National Resources Defense Council v. Callaway* and ruled that the Corps should employ a broader interpretation of “waters.” District Court Judge Aubrey Robinson ordered the Corps to “expand the coverage of the 404 program to include all waters that the Federal Government could constitutionally regulate under the commerce



clause.”⁹ Accordingly, Corps officials rewrote the permitting policy regarding dredge and fill materials, setting the Corps on a new jurisdictional course of protecting federal coastal waters, streams, lakes, ponds, and wetlands, in addition to its traditional role of regulating material deposits in navigable rivers and waterways. The Corps thus became the lead federal agency in the protection of wetlands, defined as “any area that (a) is periodically or permanently inundated by surface or ground water and (b) support[s] vegetation adapted for life in saturated soil.”¹⁰ This

Wetlands areas such as this fell under the Corps’ jurisdiction after the decision in National Resources Defense Council v. Callaway

broad definition included “not only swamps and marshes, but also many forests and meadows that are wet only during part of the year.”¹¹

In 1977, amendments to the Clean Water Act clarified and strengthened the Corps’ role in the permitting and regulatory process. The amendments put more teeth in the Corps’ regulatory actions, providing the agency with “explicit authority to seek judicial sanctions against violators of 404 permits.” The Corps also worked with the EPA to identify and sanction contractors or individuals who discharged materials without a permit.¹²

Tidal wetlands along the Atlantic Coast of New Jersey



Even before the district court handed down its decision in *National Resources Defense Council v. Callaway*, the Philadelphia District had begun preparing for the expected influx of new permit applications by making the Permitting Section into a full-fledged branch, renamed the Regulatory Branch in the mid-1970s.¹³ Not only did the staff handle a greater number and broader range of permit applications, they had to conduct reviews in light of new environmental guidelines that the Corps and EPA had crafted in response to the Section 404 authorities. Among other things, the new guidelines gave the EPA the authority to veto Corps permit decisions.¹⁴ Frank Cianfrani, chief of the Regulatory Branch as of this writing, recalled how the district permitting program “grew geographically.” According to Cianfrani, “Our jurisdictional responsibilities grew immensely, from a rather small geographic area” encompassing navigable waterways to “essentially every aquatic area.”¹⁵ At the same time, the educational background

of personnel in the Regulatory Branch changed. Before the Clean Water Act, most of the Permitting Section staff were engineers; after implementation, according to Cianfrani, the “type of expertise that was required” to evaluate permit applications led to the hiring of more physical scientists and biologists. By 2009, Cianfrani and one of his section chiefs were the only engineers left among the thirty-two employees of the branch.¹⁶

The Corps’ permitting responsibilities continued to evolve throughout the 1970s, making the administration of the program “much more complex” than it had been in the past. Section 404, for example, required coordination with the FWS and the National Marine Fisheries Service in the permitting process, emphasizing that the Corps “must consider the effect of its permit decisions on fish and wildlife.”¹⁷ Meanwhile, another piece of environmental legislation—the Marine Protection, Research, and Sanctuaries Act of 1972—gave the Corps responsibility for issuing and enforcing

permits for the dredging industry and government agencies to dump dredged material into the ocean. Section 103 of the Marine Protection Act authorized the Corps to assume regulatory tasks similar to its tasks under Section 404 of the Clean Water Act, except that Section 103 jurisdiction encompassed the open ocean beyond the “low water line,” while Section 404 pertained to the salt and fresh waters above that line.¹⁸

The Regulatory Branch demonstrated flexibility as it adhered to other federal statutes, most notably the Endangered Species Act and Section 106 of the National Historic Preservation Act. Cianfrani explained that “those particular acts require us . . . to ensure that what we’re allowing is consistent with those laws” and in keeping with the “public interest.”¹⁹ Because of the complexity of the permit review process, the Regulatory Branch, although a “small part of the District’s overall mission, . . . consumed a very big portion of our time just because permitting issues were so public, and we had a lot of public

hearings and a lot of debates, and a lot of alternatives” to consider.²⁰ According to Cianfrani, the public interest review was the “keystone” of the district’s permitting process, as it forced the Corps to consider an ever-increasing range of potential effects, whether in terms of air quality, noise issues, or “the impact on [the] aquatic environment.”²¹

The district’s permit application and review process typically unfolded in three steps. First, the project manager would hold one or more preapplication consultation meetings with the applicant, other federal and state resource management officials (such as the EPA, FWS, or state departments overseeing environmental quality), and local citizens who might have a stake in the project. The meetings were designed to expedite the permitting process by allowing applicants to adjust their requests to avoid potential conflicts that could hold up the process once the formal review was under way.²² In the next step, a contractor or individual would submit a permit application to the Regulatory Branch for review. A Corps project

manager would guide the permit through additional steps: posting a public notice of the proposed action, assessing the project’s potential effects on the environment and the local economy, and preparing a decision document approving or denying the permit. To make the final decision (the third step of the permitting process), the project manager, with the assistance of other federal and state agencies, evaluated how the project would affect “conservation, economics, commerce, cultural values and any other factors considered in the public interest.”²³ When the evaluation was completed, the district engineer made the formal decision of acceptance or denial.

In 1972, the Philadelphia District denied a permit application to fill wetlands in a project known as Loveladies Harbor. This rejection became a test case for the Corps’ new Section 404 authorities under the Clean Water Act. In 1958, a development group called Loveladies Harbor Inc. purchased 250 acres of land for residential and commercial real

estate development that included some sections of wetlands on Long Beach Island. During the 1960s, the company developed 199 of the 250 acres, filling some of the wetlands in the process. Because the Clean Water Act did not exist at the time, the company did not have to obtain a permit for the filled parcels. But in 1972, when Loveladies Harbor applied for a permit to fill and develop the remaining fifty-one acres of its property, it encountered the new requirements to file for a permit with the Corps of Engineers.

Loveladies first applied to the state of New Jersey for the requisite dredge and fill permits, but the state refused to grant them. After Loveladies sued the state, the two sides compromised, allowing Loveladies to develop 12.5 acres of the property in exchange for an agreement to preserve the remaining 38.5 acres under a conservation easement. Loveladies then applied to the Corps for the necessary federal dredge and fill permits. At that point, New Jersey officials reversed their decision on the compromise and decided to



Aerial view of Loveladies Harbor

oppose the permits. Accordingly, the Philadelphia District denied the permit applications in May 1982.²⁴

Loveladies sued the Corps in Federal District Court to reverse the decision, but the judge upheld it in 1984. In the meantime, the company filed a suit in the Court of Federal Claims, seeking damage payments from the federal government for the projected loss of income from the undeveloped property. In 1990, the Court of Claims awarded \$2,658,000 plus interest to Loveladies as compensation for the potential income lost as a result of the permit denial. In essence, the court ordered the

government to purchase the 12.5 acres from Loveladies, because the permit denial had amounted to a federal “taking” of the private land. The government appealed the decision in the Federal Circuit Court of Appeals, embroiling the Corps legal staff in hearings, trials, and findings. Finally, in 1994, the Circuit Court ruled in favor of Loveladies. It ordered the government to purchase the property and denied a Corps request for additional hearings.²⁵

In these court cases, the question of property rights and “takings doctrine” had overshadowed the original issue of permit denial because of the adverse effect it would have on the wetlands. However, the Federal Court of Appeals ruling did not overturn the district’s decision to deny the permit. The court explicitly stated that its ruling in favor of Loveladies did not preempt the Corps’ Section 404 authorities. “What is not at issue,” the court stated, “is whether the Government can lawfully prevent a property owner from filling or otherwise injuring or destroying vital

wetlands.” According to the court, “The importance of preserving the environment, the authority of state and federal governments to protect and preserve ecologically significant areas, whether privately or publicly held, through appropriate regulatory mechanisms is not here being questioned.” The court said it upheld the takings decision because “the cost of obtaining that public benefit” (meaning the protection of wetlands), should not “fall solely on the affected property owner.”²⁶

Although legal proceedings affirmed the Corps’ Section 404 authorities, the appeals court decision in *Loveladies Harbor v. U.S.* nonetheless altered the Corps’ Section 404 permitting procedures. As Cianfrani reported, “When that case was decided, it had a ripple effect across the country with [the] regulatory program.” Because of the *Loveladies* decision, he said, “Any time we deny a permit we have to do what is known as a taking analysis.” That analysis “doesn’t alter the decision,” he explained, but it had to be done to see “whether there’s a potential

for that to occur.”²⁷ In essence, the decision meant that the permitting process would require more time, labor, and analysis to complete.

In the 1980s, a permit decision regarding the extension of Interstate 476, known as the “Blue Route,” became another high-profile project for the Regulatory Branch. Permitting for road construction projects was almost always time-consuming. Because of their linear nature, roads affected large areas that could contain multiple ecosystems that required evaluation. These difficulties were compounded by additional factors in the Blue Route permit, including the fact that the road had already been “a very contentious project for many, many years before it even came to the Corps.”²⁸ The original planning for an interstate highway to connect I-95, the primary north-south highway along the eastern seaboard, with the Pennsylvania Turnpike, the state’s main east-west thoroughfare, began in the late 1950s. The three proposed corridors were color coded; in 1963, the U.S. Bureau of Public Roads selected the Blue



Route as the best alternative, primarily because it “provided the most traffic relief and least community disruption among the three alternatives.”²⁹ As with Loveladies Harbor, the project began before passage of the Clean Water Act; and although the Pennsylvania Department of Transportation (PennDOT) completed construction

The “Blue Route,” Interstate 476, at its southern terminus with Interstate 95

of a portion of the interstate in the 1960s, a section of the corridor in Delaware and Montgomery counties remained unfinished into the 1970s. That portion had to meet NEPA environmental guidelines before it could be completed. Among other things, NEPA required PennDOT to complete an EIS detailing the potential effects of the project on the natural and human habitats within or adjacent to the right-of-way.³⁰

Just as PennDOT completed the final EIS in 1978 and prepared to resume construction on the unfinished portion of the highway, a collection of local residents, community organizations, and representatives of a private college along the planned route sued the state to block construction. Opponents of the road argued that the EIS failed to take into account noise and other effects of the interstate highway. Although the noise issue and the overall thoroughness of the environmental assessment remained central aspects of what became a decades-long conflict, the real issue, according to Cianfrani, was that the groups “just didn’t

want this highway running through [their] very exclusive areas,” increasing the potential for development in those locations.³¹ In August 1982, the Federal District Court for the Eastern District of Pennsylvania ruled in favor of the plaintiffs and ordered a halt to all construction work on one section of the route until PennDOT submitted “a supplemental EIS and a more thorough analysis” of the project’s environmental impacts. When the two sides resolved the lawsuit, PennDOT applied for a permit from the Corps of Engineers to complete the project. This set off another lengthy and litigious process, this time with the Philadelphia District, which was at the center of the maelstrom. When District Engineer Lt. Col. G. William Quinby finally issued a permit for construction in November 1987, many of the same parties involved in the earlier legal proceedings sued the Corps and PennDOT. In this lawsuit, the court did not “question whether or not the decision” to deny the permit was “right or wrong.” Instead, it “questioned whether or not the

process was followed,” ultimately determining that the district was correct in issuing the permit.³² With that decision, the remainder of the Blue Route was finally built.

In addition to issuing permits for construction by outside agencies, the Regulatory Branch periodically had to issue permits to the Philadelphia District itself, most often for dredging operations. For example, when the district needed to dredge Wilmington (Delaware) Harbor, it had to apply for a Section 404 permit to build a new disposal area for the dredged material. In that situation, as one district employee noted, “We had to permit ourselves.”³³

By the early 1990s, the Regulatory Branch had expanded to three sections and added two field offices. In 1989, the district opened the Pocono Field Office in Tobyhanna, Pa., to monitor permits for the northeastern corner of Pennsylvania and three counties in northwestern New Jersey. The second field office, in Dover, Del., opened in May 1992, to serve the area south of the Chesapeake and Delaware Canal and the Delaware



counties of New Castle and Kent. Dover Field Office staff performed “wetland delineations, surveillance and enforcement of permitted and non-permitted activities in federally-regulated waterways and wetlands.”³⁴ Both field offices operated with small staffs (two or three employees) and functioned as “extensions of [the] Surveillance and Enforcement Section, although they also engage in some wetland jurisdictional determinations and other Regulatory matters.”³⁵

At times, the district’s permitting process, as with the Corps in general, came under criticism from environmental groups that

Motorists travel the completed “Blue Route” around the west side of Philadelphia—its construction involved one of the district’s largest permit actions to date

contended that the Corps did not take adequate steps to protect wetlands and other aquatic ecosystems in the United States. Environmental organizations protested that the Philadelphia District's Regulatory Branch had, on occasion, "rubber stamped" permit approvals for construction projects. In the late 1990s, for instance, opponents of PennDOT's plans to reroute Route 220/Highway 99 over Bald Eagle Mountain and make it a four-lane highway contended that the district had "blown off" FWS's appeal of the permit decision. Conservation groups argued that an alternative route closer to the old highway would create less environmental damage to wetlands and would require less mitigation.³⁶ The decision put the district in the political spotlight, because Congressman E. G. "Bud" Shuster (R-Pa.), influential chair of the House Transportation Committee, had pushed PennDOT to situate the route over Bald Eagle Mountain when he obtained federal funding for the project via a legislative rider to an enormous

transportation appropriations bill.³⁷ Eventually, an alliance of environmental and sports-enthusiast groups sued the Corps, the Federal Highway Administration, and PennDOT to have the permit revoked.

According to the local branch of the Sierra Club, the plaintiffs argued that the Corps' decision to issue the permit for Route 220 expansion over Bald Eagle Mountain violated the Clean Water Act by issuing a permit "approving this ridge route despite the existence of a feasible alternative route through Bald Eagle Valley . . . that would cause less damage to wetlands and streams."³⁸ The court eventually dismissed the suit against PennDOT and the Corps, allowing the permit decision to stand and the road project to go forward. The contentious Route 220 permit decision revealed the complex issues the Regulatory Branch often faced in reviewing permit applications and the criticism that could follow. In many ways, the branch faced a "damned if you do, damned if you don't" situation in issuing permits. If it

granted permits for construction, environmental and local interest groups often expressed opposition; if it denied permits, land developers and the business community were likely to object.

In the early 1980s, Regulatory Branch staff had faced a similarly contentious permitting process regarding the Point Pleasant Water Diversion Project in Bucks County, Pa. The Neshaminy Water Resources Authority, representing residential and commercial water users in Bucks and Montgomery counties, applied for a permit to build a water intake structure and pumping station that would

divert water from the Delaware River at a location called Point Pleasant. The Point Pleasant system would provide ninety-five million gallons of water a day to residential and business customers in Bucks County, including the Philadelphia Electric Company's Limerick nuclear power plant. Cianfrani noted that it became "an example of how a project that on the surface didn't look like a big deal to us . . . was like dynamite to the local residents." Local homeowners protested that increasing the available water supply would spur development of what Cianfrani called "a very pristine

The Delaware River at Point Pleasant, Pa., where homeowners staunchly opposed the proposed water diversion project



area” and that the resulting commercial and housing developments would “change their whole way of life.” Environmental activists from around the region, claiming that the project would cause irreparable ecological damage, joined local residents in resisting project construction for the better part of a decade. As a result, a permit for what the district initially viewed as “just a little pipe [with] . . . no impact in terms of the Delaware River, . . . turned out to be a very, very controversial, very contentious permit application.”³⁹

As the permitting process went forward, a number of other issues

surfaced, including the potential detrimental effect the pumping station would have on the river’s short-nose sturgeon population, the possibility that noise from the pumping station would degrade the recreation experience of river users, and claims that tubers might get “sucked into” the water intake pipe. The proposed project became a high-profile target for local legislators, political activists, and the news media. Regulatory staff became aware of just how high-profile the project had become when the district held a public hearing on the project. According to Cianfrani, “We were anticipating a couple hundred people,” but “over a thousand people showed up.” Although the meeting “came off pretty well,” it was a harbinger of the volatile protests that would follow.⁴⁰

After reviewing the extensive public comments and investigating the potential effects on area resources, including historic resources along the Delaware Canal, the Regulatory Branch issued a permit for construction of the water intake and pumping

The short-nose sturgeon
(SOURCE: U.S. Fish and Wildlife Service)



plant in October 1982. Project opponents then turned to other means to halt the water diversion. Following a countywide referendum on the water supply plant in May 1983, the Bucks County Commissioners announced that they were terminating the water sales agreement with the Neshaminy Water Supply System and withdrawing their approval of the Point Pleasant construction contract.⁴¹ In June 1983, attorneys representing a coalition of environmentalists opposed to the water project wrote to Philadelphia District Engineer Lt. Col. Roger Baldwin to request that the district revoke the Point Pleasant permit, citing the court-ordered work stoppage at one of the nuclear power plants targeted to receive water from the Point Pleasant supply and a recent mudflow caused by slope erosion near the construction site.⁴² Regulatory Branch staff reviewed the letter but saw no reason rescind the permit or halt construction.⁴³

After that, project opponents moved the battle to the state courts and to demonstrations at

the pumping station site, where hundreds of protesters were arrested between 1983 and 1987.⁴⁴ In early 1987, the Pennsylvania Department of Environmental Resources reissued Point Pleasant construction permits, and the state Supreme Court ordered construction of the water intake system to resume. After some additional delays owing to delinquent payments and protests at the site, construction recommenced and the Point Pleasant water supply system became operational in the summer of 1988.⁴⁵

In addition to issuing permits, the Regulatory Branch's mission under the Section 404 authorities included enforcing permit rules and responding to regulatory violations. The Surveillance and Enforcement Section of the Regulatory Branch monitored permits, assessed possible violations, and issued penalties. This establishment of a separate section that focused on compliance was unusual in the Corps, but the district did not want enforcement to play "second fiddle" to permitting. As Cianfrani explained, "If



The historic Delaware Canal, Bucks County, Pa.

you don't have a separate enforcement section . . . your enforcement and your surveillance would suffer.⁷⁴⁶

Consequences for disregarding permit regulations—or for engaging in dredging and dumping without a permit—took a variety of forms, including fines up to \$25,000, larger compensatory donations to conservation organizations or communities, and mitigation to offset damages incurred at the original project site. In 2007, for example, the Cutler Group, a residential developer in

Montgomery County, Pa., failed to follow the terms of its permit when it began work on a housing project before it had obtained approvals of deed restrictions that would prevent disruption of wetlands near the construction site. To resolve the regulatory violation, the Cutler Group negotiated with the district and agreed to donate \$70,000 to the nonprofit Montgomery County Lands Trust to support wetlands protection work in that area.⁴⁷

In another case, a more serious violation resulted in a much larger negotiated settlement. In

2000, the Columbia Transmission Communications Corporation agreed to donate \$1.2 million to the local branch of the Nature Conservancy as recompense for federal regulatory violations during the company's construction of a right-of-way for new communications lines in Pennsylvania's Chester, Bucks, and Montgomery counties. Faulty construction management resulted in the unauthorized deposition of mud and debris into forty separate wetland sites that were designated as potential habitat for an endangered species, the bog turtle. Barry Gale, an attorney for the district, called it "one of the most serious violations we've ever had in the Philadelphia District from the standpoint of the number of violations and the potential for environmental harm."⁴⁸ Accordingly, the settlement amount was also "significantly greater" than the usual regulatory penalties; the corporation agreed to pay it to avoid prosecution. As part of the settlement, Columbia agreed to hire "endangered-species specialists" to identify sensitive and/or protected

habitats and to include an environmental manager at its construction sites to ensure that no other violations occurred.⁴⁹ The Nature Conservancy used the sizable donation to purchase and preserve additional bog turtle habitat in southeastern Pennsylvania.

Not all violators were private developers. In 1992, the Regulatory Branch issued a citation to the city of Philadelphia for dumping dredged material from the Delaware River at Fort Mifflin, a violation of Section 301 of the Clean Water Act, which pertained to the dumping of fill material on federally owned wetlands. The

The bog turtle
(SOURCE: U.S. Fish and Wildlife Service)



district issued a cease and desist order in March 1992 and negotiated a settlement to mitigate the damages. Instead of a monetary settlement, the city hired an environmental engineering firm to design methods to remove the fill and restore the site. The city completed the removal phase, at an estimated cost of \$40,000, in the

Delineating wetlands for a Jurisdiction Determination (JD)



fall of 1992, and finished the restoration work in 1993.⁵⁰

As the Regulatory Branch evolved, it settled into a unique place in the district organization. According to Cianfrani, the branch “probably ha[d] the most public interface on a day-to-day basis of any organization within the Corps of Engineers and certainly at the district level.” Because of the high-profile, public nature of the permitting process, the branch and three section chiefs had to maintain communication with the Public Affairs Office and the District Engineer. The Regulatory Branch also worked closely with a number of other district divisions and branches. For example, regulatory staff consulted with the Engineering Division when a permit review required “special engineering expertise, such as groundwater information or hydrology.”⁵¹ And when a permit application involved federal property, they dealt with the Baltimore District’s Real Estate Division, which was responsible for real estate matters in the Philadelphia District.

Despite the heavy and complicated regulatory workload, the district proved itself to be highly efficient in handling permitting responsibilities. A 1999 statistical survey revealed that the Philadelphia District completed 99 percent of all permit actions within the mandated sixty-day period, compared with a Corps-wide completion rate of 94 percent. The Philadelphia District's Regulatory Branch processed individual permits in an average of fifty-three days, compared with seventy-four days across all Corps districts.⁵² Because branch personnel worked closely with applicants and other agencies throughout the permitting process, the district typically denied only a small percentage (roughly 3 percent) of applications.⁵³

Hazardous, Toxic, and Radioactive Waste Remediation

After the regulatory arena, the Philadelphia District's second largest area of environmental responsibilities encompassed work with the EPA in cleaning up industrial sites contaminated by



Remediation at the Bridgeport Rental & Oil Services Superfund Site, Bridgeport, N.J.

hazardous and toxic waste. The district's environmental remediation activities were in three categories: (1) Superfund cleanup project support for EPA Region 2; (2) all other hazardous and toxic waste cleanup work in support of EPA and other federal agencies; and (3) work under the auspices of the Corps' Formerly Utilized Sites Remedial Action Program.

Superfund work was by far the largest area in terms of the number of personnel and the size of budgets involved. According to retired program chief John Bartholomeo, when the district's Superfund program was "in full swing" during the late 1980s and

1990s, the district received roughly one-third of all the funding EPA had earmarked for the entire Corps of Engineers.⁵⁴ (The district's role in the Superfund program and other remediation projects for EPA is discussed at length in conjunction with its work for other agencies in Chapter Nine.)

Another element of the Philadelphia District's environmental cleanup program was the Formerly Utilized Sites Remedial Action Program (FUSRAP). Created in 1974 by the U.S. Department of Energy (DOE), the program was aimed at studying and cleaning up former atomic energy program sites contaminated by radiological elements, primarily uranium, thorium, and radium. Although the majority of FUSRAP locations were cleaned up and decontaminated when they closed, subsequent research revealed that even low-level radiological contamination posed hazards to the public. In addition, Congress created much stricter environmental guidelines for removal and disposal of radiologic contaminants. With the passage of the

Energy and Water Development Appropriations Act for fiscal year 1998, Congress transferred FUSRAP cleanup work from DOE to the Corps.⁵⁵ The Philadelphia District became one of seven Corps districts to participate in these cleanup activities.⁵⁶ Unique among the district's environmental remediation efforts, its FUSRAP project was funded not through reimbursement from another agency but directly under the auspices of the Corps' Civil Works program.

As with the district's Superfund program, Corps staff members who planned and oversaw cleanup work at FUSRAP sites had to follow the guidelines established in CERCLA, in coordination with the EPA. DOE also had a role in the process—it maintained administrative responsibility for the property and determined which sites were eligible for federal cleanup. A memorandum of understanding with DOE allowed the Corps to take on the study and cleanup work at FUSRAP sites. The Philadelphia District's primary FUSRAP project was located entirely within the 1,455-acre

DuPont Chambers Works complex in Deepwater, N.J., home to an active chemical manufacturing facility of E. I. du Pont de Nemours and Company.⁵⁷

According to Philadelphia District personnel, “Operations involving uranium processing began at DuPont Chambers Works in 1942.” The plant was responsible for “convert[ing] uranium oxide to uranium tetrafluoride and small quantities of uranium metal.” In 1948 and 1949, the Atomic Energy Commission “conducted radiological surveys and decontamination of the building surfaces,” then transferred the buildings back to DuPont.⁵⁸ However, a 1977 radiological survey revealed that concentrations of uranium were present at the DuPont site, leading to its inclusion in the FUSRAP program in 1980. Testing by DOE in 1983 identified six locations within the DuPont property that showed evidence of elevated soil or structural contamination.⁵⁹ In addition to uranium and uranium byproduct, studies revealed chemical contamination, the most



hazardous of which was tetraethyl lead in “soil vapor.”⁶⁰

In October 1998, the Philadelphia District signed a general release agreement with DuPont Corporation, clearing the way to begin work at the Chambers Works site.⁶¹ Later that year, the district team performed its first work, supervising the removal of nine drums of waste and forty bags of protective gear stored in one of the contaminated buildings. DuPont demolished the building in 1999, and the Corps’ contractor removed and transported all the structural steel to a Texas disposal facility.⁶² The DuPont FUSRAP project team members completed

The DuPont Chambers Works complex, site of the District’s FUSRAP project

the first elements of the remedial investigation—a geophysical survey, walkover surveys, and aerial photography—during the summer of 2002.⁶³ Remedial investigation reports for two of the three areas of concern were completed in 2003, and the first round of investigations at the third area began in 2004.⁶⁴

Following completion of remedial investigation and risk assessment reports in 2008, work began on a site feasibility study and cleanup plan.⁶⁵ The investigation and risk assessment at the DuPont site consisted of “a combination of on-site direct radiation measurements using handheld radiation detectors, on-site laboratory sample analyses, and off-site laboratory sample analyses.” Remedial investigation and risk assessment activities also included removing the uranium-contaminated soil and disposing of it at a designated repository on the site. During that process, DuPont researchers collected samples of contaminated soil and provided the material to representatives of Oak Ridge National Laboratory “to evaluate radiological concerns.”⁶⁶

At the end of the project, Philadelphia District staff would identify the most appropriate offsite storage facility for disposal of all solid contaminated material, which included soil samples, disposable sampling equipment, and personal protective gear worn during the investigations.

At this point, the district engaged the technical assistance of the Baltimore District, which housed the Hazardous, Toxic, and Radioactive Waste Center of Expertise for the Corps’ North Atlantic Division. The Philadelphia and Baltimore districts were joint participants in preparing the remedial investigation report, with Philadelphia maintaining project management responsibilities. Joint operations involving two or more Corps districts were somewhat unusual, but not unheard of for EPA cleanup work. Philadelphia District staff served as members of the project technical/design team, as groundwater modeling specialists, and also provided Geographic Information System (GIS) support. Other key project partners were EPA Region 2, the New Jersey

Department of Environmental Protection, DuPont, and the prime contractor.⁶⁷

Representatives of the participating agencies, companies, and members of the local communities established a Restoration Advisory Board for the DuPont FUSRAP project. Board meetings to discuss cleanup/restoration progress took place at regular intervals and were always open to the public “as a forum for community input on restoration issues” and a venue to “provide accurate information” regarding the cleanup.⁶⁸ Richard Maraldo, former deputy district engineer for programs and project management, explained that the public meetings and frequent progress updates were particularly important for the work at DuPont because people in the local communities were, not surprisingly, quite concerned about the risks involved in removing and transporting radioactive materials.⁶⁹ In part to address this concern, the Philadelphia District would continue to monitor the site for possible groundwater contamination after the project was complete.

Ecosystem Restoration

Much of the district’s environmental program involved either permit regulation or environmental cleanup, but another aspect was restoring damaged ecosystems to states of health. This ecosystem restoration work, which began in the 1990s, was a new endeavor in the environmental arena. But although it was a relatively new realm for the Corps, it quickly became a prominent aspect of the Corps’ Civil Works program. By 2005, according to a Corps policy statement, ecosystem restoration—defined as a “return of natural areas or ecosystems to a close approximation of their conditions prior to disturbance”—had become “a primary mission of the Corps’ Civil Works program.”⁷⁰ Philadelphia District staff quickly adapted their knowledge and expertise to overseeing successful species and ecosystem restoration projects, including four that won presidential Coastal America awards given to ventures that demonstrated “extraordinary partnerships that enhance the coastal

environment.”⁷¹ Between 2001 and 2008, the White House bestowed Coastal America awards for the district’s Delaware Bay Oyster Restoration, Cuddebackville Dam Removal, Batsto Fish Ladder, and Cooper River Fish Ladder projects.

Nationwide, Corps of Engineers involvement in restoration projects dated to the National Estuarine Protection Act of 1968, which gave FWS the authority to survey and develop plans for the Corps to implement to protect and restore coastal estuaries. The Coastal Zone Management Act of 1972 and the

Water Resources Development Act of 1974 provided additional authorities for the Corps to engage in environmental projects aimed at restoring particular populations or entire ecosystems. However, the Corps engaged in little ecosystem restoration work until the late 1980s and early 1990s, when the idea began to gain larger credence nationally.

In response to the nation’s concerns about the necessity for ecosystem restoration in certain locations, such as the Everglades in Florida, Congress passed laws

The District joined with its partners from the U.S. Fish and Wildlife Service and the New Jersey Department of Environmental Protection in October 2005 to receive the Coastal America Award for the Batsto River Fish Ladder Project



giving the Corps the authority to conduct such projects. These laws included a series of Water Resources Development Acts from 1996 to 2000 that made environmental protection, the beneficial use of dredged material, creation of wildlife habitats, and ecosystem restoration significant components of Corps work. Under the Water Resources Development Act of 1992, Congress also gave the Corps, as part of its Continuing Authorities Program (CAP), authority to protect, restore, and create aquatic and ecological habitats in connection with federal navigation projects. If these projects did not exceed \$15 million, the Corps could complete them without specific congressional authorization.⁷² In 2000, Congress passed the Estuaries and Clean Waters Act, which provided direction for the Corps in undertaking and performing estuarine restoration projects.⁷³ To provide guidance on how these authorities were to be used, Corps Headquarters published Engineer Regulation 1165-2-501 in September 1999. According to this regulation, there

were two different types of environmental restoration projects: environmental restoration studies and actual “study, design, and implementation of environmental projects.”⁷⁴

With these authorities and regulations, the Philadelphia District conducted several ecosystem restoration projects in the 1990s and 2000s. One project—Lower Cape May Meadows and Cape May Point—became the showpiece of the district’s restoration work and illustrated the success of the Corps’ new emphasis on ecosystem restoration throughout the United States. The project embraced about 350 acres of shoreline, dunes, and marshland at the far southern tip of New Jersey. The western half of the Meadows was part of Cape May Point State Park, while the eastern half encompassed the Nature Conservancy’s Cape May Meadows Migratory Bird Refuge.

The project had its genesis in the New Jersey Shore Protection Study of the 1990s, emerging via interim feasibility study as the southernmost of seven coastal projects recommended for



The piping plover
(SOURCE: U.S. Fish and Wildlife Service)

The erosion-threatened Lower Cape May Meadows, N.J., before beach nourishment



Philadelphia District partnered with the New Jersey Department of Environmental Protection (the nonfederal sponsor) and the city of Cape May, Cape May County, the Nature Conservancy, and the towns of Cape May Point and West Cape May.⁷⁵

Cape May and the surrounding vicinity was a popular recreational destination for the millions of Pennsylvania, Delaware, and New Jersey residents who lived within thirty miles of the cape. Lower Cape May Meadows was considered a natural area of national and global significance, because it contained a sizable wetland astride the Atlantic flyway that migratory birds traveled between North and South America. The wetland also served as breeding grounds for several endangered species, including the piping plover. Lower Cape May Meadows had received recognition for the environmental values found there; the area was included in the Western Hemisphere Shorebird Reserve Network and on the Ramsar List of Wetlands of International Importance.⁷⁶

construction. But unlike the others (and unique among Corps beach nourishment projects around the nation), it had a dual purpose: aquatic ecosystem restoration in the Meadows and coastal storm damage reduction for the adjacent borough of Cape May Point. To complete this project, the

The problems at Cape May Meadows were both of natural origin and caused by humans. Cape May had always been vulnerable to erosion because of its extension into the Delaware Bay on one side and the Atlantic Ocean on the other, with no island barrier or peninsula to block the paths of Atlantic storms and hurricanes moving up the eastern seaboard. However, erosion was also facilitated by the construction of the Cape May Inlet Federal Navigation Project in 1911. Over time, both of these factors reduced the width of the beach and the size of the dunes, leaving Cape May Meadows even more vulnerable to storm damage.⁷⁷ Between 1936 and 1998, more than 1,000 feet of Cape May Meadows shoreline had eroded. A Corps project feasibility study estimated that if no action was taken, half of the entire Meadows area would disappear by 2050 and the remainder would be inundated by saltwater.⁷⁸

The work at Lower Cape May Meadows and Cape May Point would involve constructing a continuous beachfill-and-dune

system (in front of both the town and the wildlife area) to provide a measure of protection against coastal erosion, and then restoring the freshwater wetlands so important to wildlife by removing undesirable aquatic vegetation

The seriously eroded shoreline at Cape May Point before beach nourishment (top) and after (bottom)



in the wetland, replanting native wetland vegetation, constructing water control structures in the area (including “deep water fish reservoirs within existing ponds” and “a self-regulating tide gate to allow for a 25-acre tidal marsh”), and restoring “hydrologic linkages within the wetlands.”⁷⁹ One of the biggest challenges of the restoration was that waves from a 1991 storm had breached the intertidal and dune areas and inundated the freshwater wetlands with seawater. Thus, the district had to erect a new sea barrier (Phase I of the project) before it could perform the ecological restoration (Phase II).

Self-regulating tide gate within the Meadows



To restore freshwater wetland habitat, the district had to recreate the original water flow patterns disrupted by the 1991 storm breach that carried sand and seawater into the marshland. Construction crews scoured out sand and other debris from the clogged ditches and dug a deeper main canal, which was the key conduit for moving water into Cape Island Creek and then out to sea. Project work also involved raising paths that acted as dikes and building “weir flow control structures” to improve the hydrology of the Meadows. The weir structures allowed the Nature Conservancy to control the water level on its portion of the meadow to improve habitat for threatened species when necessary.⁸⁰ Project planners added viewing platforms along the dikes to enhance opportunities for bird watching and photography. Bob Allen, director of conservation science for the Conservancy’s New Jersey chapters, explained that the additional waterways and enhanced supply of fresh water “should have a phenomenal effect on providing

good stopover habitat for migratory birds."⁸¹

Reestablishing healthy water flows through the Meadows ensured the success of a number of other key project elements, many aimed at restoring habitat for specific species. To provide better feeding habitat for the endangered piping plover, project crews dug three small ponds in the meadow area immediately behind the dunes, along with "plover crossover paths" to facilitate the birds' movement between the beach and the ponds. The fenced-off ponds gave piping plover chicks a sheltered area for protection from people, dogs, and other animals. In the first two years following construction of the ponds, research observers recorded that plovers were using the ponds for almost all their foraging and that chick survival had significantly increased compared with prerecovery survival rates.⁸² Project crews also dug deeper pools in preexisting ponds to act as reservoirs for fish; built five small, shallow ponds especially suited for frog spawning; and created



a snake hibernaculum (winter habitat).⁸³

In addition, the project team focused on restoration of native plant species and removal of invasive exotics, which produced one of the most visible changes to the Cape May Meadows landscape. Over the course of the previous several decades, a non-native marsh reed, *Phragmites australis*, had taken over approximately two-thirds of Lower Cape May Meadows wetlands. *Phragmites* flourished after saltwater intrusion in the 1990s killed the native marsh vegetation. Removing the plant was a prerequisite for

Birding enthusiasts take in the sights at the Meadows, one of the chief migratory stopovers along the entire North Atlantic Flyway



Work at Lower Cape May Meadows included reditching to restore natural stream flows (above) and replanting of native vegetation (below)



restoring the native ecosystem, but the task became one of the few controversial components of the project. Prescribed burning and application of herbicides were necessary to eliminate the aggressive vegetation, because it reproduced and spread so quickly, but these actions posed risks for certain native species. Furthermore, removal of the reed was disconcerting for some local residents who had fond memories of walking through the tunnel-like paths, which easily grew to ten feet tall or more.⁸⁴ In September 2004, project staff began their eradication activities by applying a special herbicide, then mowing the stalks throughout the Meadows. Staff and volunteers then planted approximately 70,000 seedlings of native marsh species.⁸⁵

The district completed the restoration in 2007, although site monitoring and revegetation by local organizations may continue for many years. Because the work helped restore an important habitat, the district received accolades and appreciative comments from the Cape May community. Richard Maraldo recalled

his experience at the dedication ceremony:

When we finished the Cape May Beach job, we got invited for a dedication ceremony and they had closed off a whole section of the town by the beach. They had banner planes flying saying, “Come to Cape May. We’ve got our beaches back.” They had a festival in the streets, free hotdogs, and we were treated like kings when we were down there. . . . It’s always good when . . . you can see that they appreciate what you do for them.⁸⁶

Upon completing the project, the district turned its management over to New Jersey State Parks, the local branch of the Nature Conservancy, and the towns abutting the area. The Corps retained responsibility for conducting periodic beach nourishment for the next fifty years.

The structural elements of ecosystem restoration work at Cape May Meadows involved reconstructing and building up the protective beach and dunes. Another district restoration project—involving two dams on the Neversink River in Orange County, N.Y.—did just the



opposite, albeit on a smaller scale. The Cuddebackville Dam Removal Project removed crumbling dam structures as a means of restoring the river ecosystem. The foundations of the dams dated to earlier structures erected in 1902 and 1908, respectively. In 1915, power

Cape May Meadows State Park, with historic Cape May Point Light in background

The project at Lower Cape May Meadows became a showcase for aquatic ecosystem restoration both within and outside the Corps of Engineers





*Sunrise at Cape May Meadows
State Park*

companies rebuilt both structures in order to convert them to hydropower production. Construction crews reinforced the southwest pier stop log dam and rebuilt the northeast one to make it a concrete gravity dam. In 1948, following damage to one of the dams, the companies halted hydropower production and transferred ownership of the dams to Orange County. In the 1970s, concerns about the structural integrity of the northeast dam prompted the state of New York to cut a notch in it, lowering the level of the reservoir behind it by four feet.⁸⁷

In the 2000s, environmental proponents clamored for the

removal of the Cuddebackville dams. Doing so, proponents said, would achieve two goals. First, it would restore a free-flowing Neversink River, thereby restoring upstream access to suitable spawning habitat for anadromous fish. In addition, biological studies showed that “the world’s largest and healthiest population of the dwarf wedge mussel, listed as endangered both in New York State and under the Federal Endangered Species Act,” lived just below the dam but were prevented by the structure from populating additional suitable river habitat. Removing the dams would allow the dwarf wedge mussel to expand its range to the area above the dams.⁸⁸ Finally, removal of the dams would eliminate safety concerns about their deteriorated state.

A survey of the southwest dam (the smaller of the two) indicated that it was unsafe because it facilitated the pile-up of debris, which people then used to cross over to an island in the river. Dam failure and the resultant flood of water and debris during a high-water



event were also considered potential risks. The larger northeast dam, meanwhile, had an eroded apron at its base. According to the Nature Conservancy, dam failure was “a major concern due to the heavy undercutting that can be seen below the dam.”⁸⁹

The Philadelphia District took on the Cuddebackville Dam Removal Project under its CAP, with the Eastern New York Chapter of the Nature Conservancy as project sponsor and the district’s nonfederal partner in the removal

process. In February 2003, the district signed a cooperative agreement with the Nature Conservancy for the Cuddebackville Dam removal, committing the group to supplying 35 percent of the project costs. The nonprofit organization eventually supplied “\$150,000 in materials and \$449,000 in other project requirements” out of the final \$1.3 million contract total.⁹⁰

After evaluating proposals for the removal of both dams, the district concluded that possible adverse effects on the historic

The Cooper River Fish Ladder Project



Removal of the old Cuddebackville Dam (above) and subsequent restored flow on the Neversink River (below)



Delaware and Hudson Canal meant that only the southwest dam should be removed.⁹¹ The northeast dam was left standing at the request of Orange County, so that its reservoir would provide a regular water flow to a feeder canal that helped maintain the water level of the Delaware and Hudson Canal, a portion of which was designated a national historic landmark.⁹²

The Philadelphia District awarded a construction contract for this project in June 2003, and work commenced soon after. Specifics of the dam removal involved construction of a temporary bridge across the river below the dams and installation of a cofferdam below the southwest dam to provide a dry worksite and to collect sediment flowing downstream during excavation. Demolition was accomplished by placing explosives at locations calculated to break the concrete into large pieces, which the contractor then removed from the river. After demolition was completed, crews removed the temporary bridge and initiated revegetation of damaged areas.⁹³ The project was completed

in November 2004, and the following year the district received a Coastal America partnership award for the project team's "outstanding efforts to restore and protect the coastal environment."⁹⁴

The Philadelphia District used its CAP to construct three other environmental restoration projects involving fish passages. One of these—the Batsto River Fishway Restoration—involved construction of a fishway on a dam on the Batsto River in New Jersey's Burlington County. This was not the first time the district had restored a fishway on a dam. In 2001, the district completed a fishway restoration project on the Cooper River near Cherry Hill, N.J., that garnered a Coastal America award. Drawing on its experience with this project, the district worked on the Batsto Dam, which had blocked passage of upstream spawning habitat for two anadromous fish species. District personnel collaborated with staff from FWS, the New Jersey chapter of the Corporate Wetlands Restoration Project, and the New Jersey State Historic Preservation Office to plan and

build a fish passage structure that bypassed the dam's spillway, with the state of New Jersey serving as the nonfederal sponsor. Because the project site was in historic Batsto Village, planning had to ensure that "the design was compatible with the historic nature of the site," in addition to incorporating the required engineering and biologic expertise.⁹⁵

Project construction on the Batsto Fishway began in November 2004 and was completed in October 2005, within the projected budget of \$600,000. The fishway consisted of three 10-foot-long concrete ramps covered with removable wooden roof segments that helped the structure blend in with the historic features of the village.⁹⁶ The Batsto River Restoration Project successfully restored access to an additional eight miles of upriver spawning habitat for the migratory alewife and blueback herring, and provided greater ecological diversity to the Batsto River. Design features of the fishway and its location in historic Batsto Village gave park visitors opportunities



The Batsto River fishway restoration under construction (above) and an inside look at the removable wooden structures enclosing the fish ladders (below)



for “environmental education regarding the ecological importance of anadromous fish.”⁹⁷

The third project, completed in 2008, involved upgrading an existing fish ladder alongside Philadelphia’s historic Fairmount Dam on the Schuylkill River. Partnering with the Philadelphia Water Department, the district used state-of-the-art design methodologies to make the structure more negotiable to native fish working their way upstream around the dam.⁹⁸

The Fairmount Fish Ladder was located in a scenic and prominent setting, along a linear park that had been built under a previous CAP project. In 2005, the district had partnered with the city of Philadelphia, the Schuylkill River Development Corporation, and Fairmount Park Commission to renovate and beautify a mile-long corridor of the river’s east bank between the Philadelphia Art Museum and South Street. The project incorporated grading, topsoil, planting, and groundcover, and was designed to make the area “a more natural recreational



resource for center city visitors and area neighborhoods.”⁹⁹ As reported in the district newsletter, Schuylkill River Park was “the first construction project within walking distance of the Wanamaker Building home office.”¹⁰⁰

These projects all brought accolades to the district for its ecosystem restoration work, as did other projects that were ongoing in 2008, such as the Delaware Bay Oyster Restoration initiative. Work in ecosystem restoration as a stand-alone project (as opposed to as a byproduct of navigation or of flood or storm risk reduction) did not begin in the Philadelphia

The Fairmount Dam Fish Ladder Project upgraded an existing structure in the heart of Philadelphia, helping restore native fish migration up the Schuylkill River



The Schuylkill River Park Trail represented the cooperative efforts of the City of Philadelphia, the Schuylkill River Development Corporation, the Fairmount Park Commission and the Philadelphia District

Ground-up shells being deposited in the Delaware Bay in 2005 to promote oyster habitat and help restore the native oyster population



District until the 1990s, but it has continued to be an important part of the district's workload in the 2000s. The success of these projects guaranteed that this kind of work would increase in importance in the years after 2008.¹⁰¹

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As the Philadelphia District headed into the second decade of the twenty-first century, the number and technical range of its environmental projects had expanded far beyond what the staff could have imagined in 1972. In addition to the growth of the Regulatory Branch into one of the district's biggest program elements, emerging environmental work in other realms led to the creation of new programs in Superfund cleanup, other site remediation tasks, and ecosystem restoration. The district performed admirably on all these projects, both in technical expertise and in its ability to work with all interested parties to guarantee the success of a project. The environmental function had thus become one of the focal points of the district by the twenty-first century. 🏰

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- ⁸² “Project Spotlight, Ecosystem Restoration,” 9; and “Plover Patrol: Army Corps Restores Endangered Bird Habitat,” 14.
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- ⁸⁷ Colin Apse, “Results of the Neversink River Rare Mussel Survey: Part of the Cuddebackville Dam Removal Project,” prepared for the Nature Conservancy, 31 October 2001, Appendix A, 1-2, File EA/Design, Cuddebackville Box, Planning Division Office Files, Philadelphia District (hereafter Philadelphia District-Planning Division), 2.
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