

ENVIRONMENTAL WORK



CHAPTER THREE

ENVIRONMENTAL WORK

“There is a heightened environmental ethic here [in Portland] and has been for sometime; it has maybe put us in the forefront in dealing with environmental issues.”

Davis Moriuchi, Deputy District Engineer for Project Management, 2001



The U.S. Government Mooring becomes part of a Superfund site.



Testing soil samples at a cleanup site for hazardous material.



Redirecting water flow at a wetland restoration area.

NEW DIRECTIONS FOR THE CORPS

The environmental movement profoundly influenced federal water resources development in the late 20th century, resulting in major changes in the Corps’ work and in the agency’s public image. Few forces were more influential in the Portland District during the period 1980-2000. While the Corps’ navigation, flood control, and hydropower missions continued, the era of big-dam building had ended in the Pacific Northwest. In the late 20th century, Congress began moving away from structural solutions to water resources problems, in favor of managing watersheds, restoring wetlands, and cleaning up hazardous waste sites. It is important to recognize that these concerns emerged recently. Throughout much of the 20th century, the United States focused on technological and economic advancement, and federal policy reflected those objectives. The story of the Portland District exemplifies how the Corps responded to the new concerns that environmentalism introduced, and how the agency incorporated them into its mission.

The environmental movement, which emerged during the 1960s and 1970s, was very different from Progressive-Era conservation, which dated back to the late 19th and early 20th centuries. Unchecked exploitation of the nation’s resources in part prompted the conservation movement a century ago. So rampant were the logging, fishing, hunting, and mining activities during this period that historians have dubbed it “the Great Barbecue.”¹ Stands of timber and populations of fish and wildlife declined with alarming rapidity, prompting some Americans to advocate protection of the nation’s natural resources. The extinction of the passenger pigeon and the near-extinction of the buffalo – both targets of commercial hunting – served to point out the need for regulations. The early conservationists that advocated state and federal legislation had little appreciation of complex ecosystems or habitat requirements; their objective was to protect natural resources for efficient use and continued productivity. Conservation legislation ensured that the nation’s water, timber, fish, and wildlife resources would not be destroyed by unchecked harvesting.²



III ENVIRONMENTAL WORK

Many conservationists also promoted wise use of the nation's waterways. They advocated reclamation projects that promised to harness rivers and streams, providing flood control, irrigation, navigation, and electricity. The Reclamation Act of 1902 was a product of the conservation movement, and the Corps and the Bureau of Reclamation became the primary agencies for carrying out federal water resources responsibilities. Dams constructed in the Pacific Northwest during the early 20th century allowed for efficient utilization of the region's resources, in keeping with the principles of conservation.³

Environmentalism had a very different philosophical basis, representing new intellectual forces that developed rapidly in the late 20th century. As Chief of Engineers Lieutenant General John W. Morris observed in 1978, "environmentalism has become a truly powerful force in the United States only in relatively recent times."⁴ The environmental movement developed during a period of social unrest, drawing inspiration from the counterculture's questioning of traditional values. It emerged during an era of political activism, and proponents became adept at publicizing their concerns and mobilizing citizens to work for changes in federal laws and policies.⁵

In addition to its political underpinnings, environmentalism had a scientific basis. While conservationists emphasized efficient use of resources and the need for outdoor recreation, environmentalists initially focused on concern about the effects of pollutants and hazardous materials. Rachel Carson vocalized this issue during the early 1960s, alerting the nation to the potential threat of radiation fallout and toxic chemicals – a threat that had proliferated since World War II. Her popular book, *Silent Spring*, published in 1962, outlined the effects of contamination on the country's fish and wildlife species, and, by implication, on human health. Carson's lyrical writing style reached a generation of readers and the appearance of her book marked the beginning of an era of concern

about pollution as well as political activism promoting cleanup of the nation's air, land, and waterways.⁶

During the 1970s, the environmental movement evolved with changing scientific precepts. These included a recognition of the complexity of ecosystems and the need to manage resources in relation to the surrounding environment. Whereas conservationists called for the wise use of resources, often focusing on a single resource or a single species, environmentalists promoted a holistic approach to protecting the natural world.⁷ Ecosystem management was a new concept – one that might have astonished natural resource managers 50 years earlier.

To be sure, environmentalists were not single-minded and not all Americans considered themselves to be environmentalists. Even so, the concerns of the movement became pervasive in American culture and politics. As Lieutenant General Morris explained in 1978, "In the United States today most of our citizens have developed at least a degree of concern for environmental quality." Terms like "environment," "habitat," and "ecosystem" became household words, and Congress responded to this new awareness with legislation that established new procedures for projects.⁸

The National Environmental Policy Act (NEPA) was one of the most prominent statutes, bringing the protection of natural and cultural resources into the forefront of the federal planning process. Signed into law in 1970, NEPA required federal agencies to employ an interdisciplinary approach to project evaluation, which resulted in the hiring of new staff, including fisheries and wildlife biologists as well as archaeologists. It also required agencies to complete an Environmental Impact Statement (EIS), which included public input into the decision-making process. Moreover, the act was retroactive, directing agencies to prepare environmental impact statements for then current projects, regardless of the stage of planning, design, or construction. In addition to NEPA,

Congress passed the Federal Water Pollution Control Act amendments (FWPCA) of 1972.⁹

The Endangered Species Act (ESA) of 1973 was another landmark statute that affected the Corps and other federal agencies. Although Congress passed endangered species legislation in 1966 and 1969, these earlier acts were weak and ineffective, while the amended statute of 1973 proved to be one of the nation's strongest (and most controversial) environmental measures. The ESA resulted from a growing awareness of the importance of biodiversity – and it was the nation's first comprehensive attempt to protect fisheries, wildlife, and plant species from extinction.¹⁰ The ESA directed the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (NMFS) to list species as endangered or threatened, and to identify critical habitat necessary for continued survival. The ESA brought considerable changes to the Portland District's work.

The ESA greatly affected the Corps and other federal agencies charged with managing the nation's natural resources. The Corps had entered the 1970s "as an agency steeped in tradition."¹¹ Its original water resources development mission dated back to the early 19th century – long before the environmental movement. Historically, the Corps has proven to be a resilient agency, adapting to the nation's changing needs. During the early 20th century, the Corps had adopted the "wise use" philosophy of the conservation movement, which emphasized efficient utilization of the nation's natural resources. In the late 20th century, the Corps' leaders similarly understood the need to continue adapting.¹²

Change, however, was not immediately apparent among many federal agencies, including the Corps. One initial, highly visible result of the new environmental legislation was that it embroiled agencies in litigation throughout the nation. If an agency failed to consider the impact on the environment in the planning process, the courts had



the power to stop the project. The Corps, like other federal agencies, soon became the target of lawsuits largely initiated by environmental groups. As litigation increased, the Corps' public image eroded, and the agency found itself caught between competing interests, especially environmentalists and developers.¹³ Environmentalists proved to be vocal, persistent critics, concerned about the impact of the "hard Corps" on our "soft environment."¹⁴

The Corps' response to environmental directives evolved over time. Initially, the District complied with the new regulations but showed little initiative or innovation in its approach, continuing to view itself primarily as a dam-building agency.¹⁵ An influx of new staff helped change this perspective, as the Corps began to attract a more culturally and technically diverse workforce, adding fisheries and wildlife biologists and other personnel from disciplines outside engineering. The Water Resources Development Act of 1990 further helped changed perceptions, marking a new policy direction for the Corps. This legislation established environmental protection "as one of the primary missions of the Corps of Engineers in planning, designing, constructing, operating, and maintaining water resources projects." In October of 1990 Lieutenant General Henry Hatch explained the Corps' new mission as follows: "No public works project should be undertaken that is not environmentally sustainable. If a particular project has avoidable impacts, they must be avoided. Then, in turn all *unavoidable* impacts need to be minimized, mitigated, or compensated for. This *must* be included as part of the cost of doing business."¹⁶

Responding to these changes required a philosophical shift in the Corps. "The Corps thinks of itself as a 'nation-building' organization," Lieutenant General Hatch explained in 1991, "But nation building means something quite different

today than it did 150 years or even 50 years ago. Nation building no longer automatically means large construction and maintenance projects."¹⁷ The Portland District exemplified this change in mindset. As Davis Moriuchi, Deputy District Engineer for Project Management, observed, the District faced the



challenge of "trying to figure out how to transform ourselves from an organization that is used to doing huge multi-million dollar projects down to one that does smaller scale projects." To his mind, the transition might have been easier for Portland than other districts. "I think there is a heightened environmental ethic here and has been for sometime," he explained. "It has maybe put us in the forefront in dealing with environmental issues."¹⁸

Accordingly, the District adopted new approaches to environmental issues, including building alliances between the Corps and environmental organizations. Portland District personnel met with staff from American Rivers and River Networks, for example, "to talk about legislative strategies." Moriuchi also encouraged District employees to represent the Corps at meetings of local civic and environmental organizations, where they could interact with people outside the agency. He believed this approach had a positive effect on the relations between the Corps and local communities, including environmentalists. "Once they know about our willingness and interest in working in this area and our technical



abilities," he commented, "and once they stop thinking of us only as the dam builders and fish killers, they see all sorts of opportunities."¹⁹

By the early 21st century, the Corps had adapted its engineering expertise to new directions in federal policy, and the Portland District had evolved into an environmental engineering organization. As Moriuchi concluded, "the changes we've gone through are really phenomenal."²⁰ The following chapter describes how environmental concerns permeated nearly all aspects of the agency's work in the Portland District.

THE CORPS' REGULATORY PROGRAM

INTRODUCTION

Over the last two decades of the 20th century, the Corps' regulatory program underwent significant changes. The agency spent most of the 1980s attempting to refine



its understanding of its regulatory responsibilities, particularly the extent of its jurisdiction and its obligations to wetlands protection. During this period, the Corps Institute for Water Resources developed a manual titled *Wetland Values: Concepts and Methods for Wetland Evaluation*, defining wetlands and procedures that field offices could use for delineating them. In addition to growing concerns over wetland protection, the agency experienced significant pressure from increased numbers of applications for Section 404 permits, described below, and the growing complexity of the permitting process. Despite these challenges, by the end of the decade the Corps had transformed from an agency unsure of its role in the regulatory field to one more confident about its regulatory mission, particularly in the area of wetlands protection. No longer seen as being on the defensive, the Corps was more proactive in environmental matters pertaining to regulation.²¹

In the 1990s, the Corps' regulatory program maintained a heavy workload. The agency increasingly focused on enforcement activities, while still working to administer the program in a balanced manner. The goal remained to protect the aquatic environment and still provide a fair and efficient process for applicants. It was during this period that the agency made considerable strides in the area of mitigation, especially in the development of mitigation banks for wetlands. The Corps also refined the operation and management of the Section 404 program and worked to improve its relationship with other federal resource agencies involved in the regulatory program. Despite a series of court decisions in the late 1990s challenging the Corps, the agency's regulatory program continued to play a key role in balancing the interests of those seeking environmental protection for wetlands and other natural areas and those pursuing development.²²

DEVELOPING A REGULATORY PROGRAM

The Corps' regulatory program is one of the oldest in the federal government. Initially created to protect and maintain the navigable waters of the United States, it derived authority from the River and Harbors Act of 1890 and 1899. The Act of 1899 authorized the Corps to regulate activities that could obstruct navigable waterways, defined as those waters below the ordinary or mean high-water level or tide level. Discharges of refuse were prohibited without a permit from the Corps.²³

Until the late 1960s, the Corps made its permitting decisions based on the potential impact of proposed activities on navigation. As the environmental movement and its new values began to permeate the nation's consciousness, the Corps expanded the factors it considered in evaluating permit requests. In 1968 permit criteria were broadened to include evaluation of fish and wildlife, conservation, pollution, aesthetics, ecology, and the general public interest. Later these criteria were extended to address additional factors such as economics, historical values, flood damage prevention, recreation, energy needs, and food production.²⁴

The passage of the Federal Water Pollution Control Act (FWPCA) of 1972 continued to expand the scope of the Corps' regulatory program. This legislation added to the Secretary's authority what is commonly referred to as Section 404 authority. Section 404 prohibited the discharge of any dredged or fill materials into waters of the United States without a permit from the Corps.²⁵ The Clean Water Act (CWA) of 1977 amended the FWPCA to strengthen the federal commitment to



“restore and maintain the chemical, physical, and biological integrity of the nation's waters.”²⁶

Over time, the regulatory jurisdiction of the Corps evolved under Section 404. Originally its jurisdiction was limited to navigable waters. A series of court decisions, however, expanded the scope of coverage to encompass all waters of the United States, including most wetlands. While the legislation was not a comprehensive wetlands program, it was the major authority for the federal government to halt the loss of wetlands.²⁷

Congressional amendments to the CWA, and Corps regulations for implementing the act, set limits to the jurisdiction of the 404 program. The 1977 amendments to the CWA exempted a number of activities, including farming, silviculture, and ranching activities. It also exempted emergency repairs to dikes, dams, and other related structures; construction or maintenance of farm, stock ponds, or irrigation/drainage ditches; construction of temporary sedimentation basins on a construction site; construction or maintenance of farm or forest roads; and congressionally approved projects that had filed an EIS.²⁸

While Congress assigned the Corps primary administrative responsibility for carrying out the program, several other federal agencies also were involved with



Section 404. The Environmental Protection Agency (EPA), NMFS, and U.S. Fish and Wildlife Service (USFWS) reviewed permit applications and provided comments and recommendations on whether permits should be issued by the Corps. Both USFWS and NMFS also had agreements with the Corps that allowed them to request that district engineer permit decisions be reviewed at upper levels in the agency if there was disagreement. The Assistant Secretary of the Army for Civil Works could, however, refuse the request. The EPA had the authority to veto any application or overrule any disposal site designated on a permit reviewed by the Corps if it found the project impacts unacceptable. The agency also developed criteria for discharges and State assumption of the 404 program.²⁹

States also had a role in the 404 program. Section 401 of the CWA required state water quality certification before issuing a Section 404 permit, essentially enabling states to veto permit applications. States were also able to administer portions of the 404 program if they met criteria established by the EPA. In general, however, most states lacked both the capability and desire to assume sole responsibility for regulating wetland use without additional resources from the federal government.³⁰

The primary objective in the permitting process was to reduce the potential impacts of projects on the aquatic environment. Within the Corps, the processing of permit applications varied depending on the type of permit. The major types included individual, general, and letters of permission. Individual permits covered unique projects or those with larger impacts and were the basic form of authorization used by the Corps' districts. Processing individual permits involved three steps: pre-application consultation, formal project evaluation after a completed application was received, and decision-making by a district engineer. The formal project evaluation step included a public notice and comment period,

preparation of permit decision documents including a discussion of the environmental impacts of the project, the findings of the public interest review process, and any special evaluation required by the type of activity.³¹

During the public interest review stage, the Corps considered many factors, such as conservation, economics, aesthetics, cultural resources, fish and wildlife values,

and water supply. A permit was generally granted unless it was found to be contrary to the public interest. In evaluating individual applications, the Corps used three general criteria. These included the following: the relative extent of the public and private need for the proposed structure or work; the desirability of using appropriate alternative locations and methods to accomplish the objective of the proposed

PERMIT ACTIONS

The following numbers represent the number of permits issued by the Portland District. (The anomaly in 1996 - 97 reflect actions taken in response to the flood impacts during that period.)

Year	Permit Actions	Year	Permit Actions
1980	349	1991	410
1981	218	1992	496
1982	275	1993	509
1983	259	1994	671
1984	173	1995	586
1985	333	1996	1227
1986	456	1997	1232
1987	454	1998	899
1988	437	1999	789
1989	392	2000	762
1990	495	2001	843

“In the Pacific Northwest, our biggest challenge has been changes brought on by the Endangered Species Act (ESA). The Corps is prohibited from issuing a permit before we complete consultation with either of the federal resource agencies whenever a proposed activity might affect a listed species or its habitat. In this region most of our project evaluations involve this ESA review. When the Act was first passed and listings took effect, our average processing time went up significantly (for even minor project activities). In the last few years our efforts have been focused on working with our federal resource agency partners to develop new, and more efficient, procedures that allow us to meet our ESA responsibilities while still providing a timely review for our customers. An example of this partnering relationship is the Programmatic Biological Opinion the Portland District developed in collaboration with the NMFS, Portland. This document allows efficient evaluations to be completed by Corps regulatory staff for projects that fall into any one of 16 categories of work, i.e. shoreline stabilization. Our challenge in the next few years will be to expand on these types of process initiatives, e.g. General Fastabend’s regional regulatory initiative, and continue to improve our service to the public.

-Lawrence Evans



III ENVIRONMENTAL WORK

structure or work; and the extent and permanence of the beneficial or detrimental effects that the proposed structure or work may have on the public and private uses to which the area is suited.³²

One of the primary concerns of the Section 404 program was the need to streamline the permitting process to minimize regulatory burdens. Developers, in particular, complained about delays in their project schedules. In response, the Corps developed several types of general permits. Nationwide permits, for example, were issued at the national level by the Chief of Engineers.

They were the most commonly used form of authorization; by 1997, 65 percent of all Corps permit actions were authorized under nationwide permits.³³ These permits covered activities the Corps identified as substantially similar in nature and causing only minimal individual and cumulative impacts. Nationwide permits were issued for projects such as utility line installations, bridges, and agricultural activities. Another type were regional general permits, which covered projects that were similar in nature and subject to specific regional conditions. A number of stream and habitat restoration projects fell into this category. All permits, whether individual or general, initially required public notice and the opportunity for comment.³⁴

For projects involving a minor amount of work, the Corps used letters of permission. These were projects that resulted in no significant environmental impacts, and no appreciable opposition was expected. For this type of permit the proposal was coordinated with all concerned resource agencies and adjoining property owners who may have been impacted, but the public at large was not notified.³⁵

Many of the permits approved by the Corps entailed some form of compensatory mitigation to replace



Regulatory tools, guides and resources

ecosystems that were destroyed or impaired by an authorized activity. The loss of wetlands and other aquatic ecosystems was mitigated through a variety of actions, including restoration, enhancement, creation, and preservation. The regulations for wetlands mitigation provided no established national ratio that set the amount of mitigation required. Instead, agency officials considered many site specific and watershed factors, including the type of wetland impacted and its relative values, the extent of temporal losses, and historic wetland losses in the watershed.³⁶ “If you’re going to be destroying a wetland, or part of it,” explained Dave Kurkoski, a water resources planner in the Regulatory Branch, “you need to determine what function that wetland serves, what values it has, and try to replace those functions and values somewhere else, preferably at the site, at a nearby site, or at least in the same watershed.” A wetland’s function was determined by what the ecosystem contributed to the environment, such as floodwater retention, groundwater recharge, wildlife habitat, aquatic habitat, and water quality. The value of a wetland was established by the wetland’s contributions to human activities

and interests, including aesthetics, recreation, bird and wildlife watching, hiking, and open space.³⁷

Under certain conditions, mitigation banking could also be used. Mitigation banking was designed to coordinate mitigation at one location for habitat losses allowed under federal programs at other sites. Essentially mitigation banking occurred when a client was required to obtain wetland units with similar functions and values at a nearby site to satisfy federal permit or program requirements. The process began when a bank sponsor created a mitigation bank – any private land where wetlands were saved, restored, or created. Sponsors were corporate, non-profit, or government entities. A bank sponsor then created credits by restoring, enhancing, or creating wetlands at the bank site. These credits were either debited or purchased by clients who were required to compensate for wetland losses. When clients obtained these credits they were withdrawn from the bank, becoming unavailable for future transactions. Mitigation banking differed from the normal wetland permitting process in two significant ways. First, it provided compensation in advance of projects that would adversely impact



wetlands, in theory allowing a simple one-to-one acreage and functional trade in “real time.” Second, banks were typically large enough in area to provide this trading service for numerous potential impacts, as opposed to the typical impact-by-impact process associated with regular permitting.³⁸

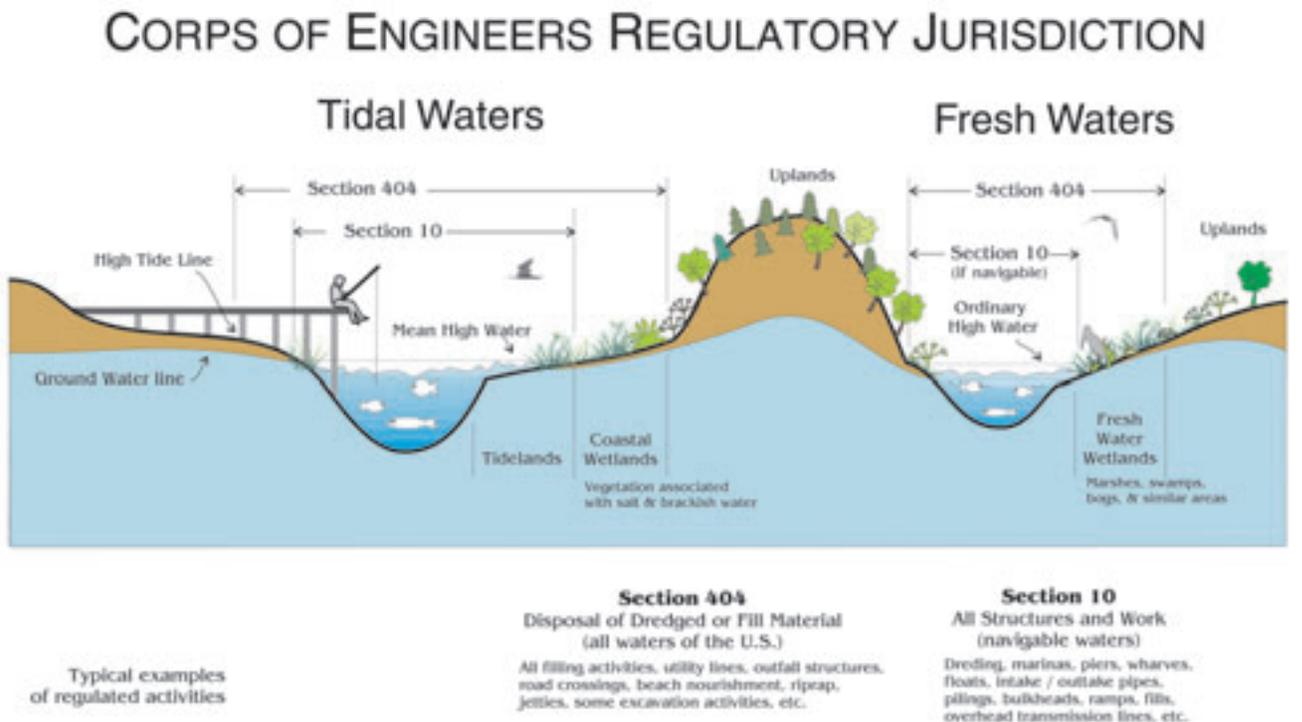
Critics of the practice argued that natural and manmade wetlands were not equal in biological richness. “They may have an emergent wetland that’s a wet area with a lot of plants and they want to scoop it out and make it a pond,” said Kurkoski. “They like to have ducks come and land on their pond. But it’s not the same thing.”³⁹ Michael Bowen, a Corps ecologist, asserted that mitigation banking was not a solution when it merely reduced wetlands to equivalent acres. Even when the equivalent acres of habitat were located near the project site, local animal populations usually failed to populate the new area. “All we will build,” Bowen wrote, “are large, wet, ‘dead’ areas containing fewer species than the original ‘protected’ wetland.” He contended that acreage

figures were useful only for justifying projects. From an environmental standpoint they were “largely meaningless.”⁴⁰ Yet, mitigation banking still offered some hope, even to its critics. If used properly it offered the promise of environmental protection, and in most cases it was preferable to mitigation efforts by the local landowner or developer, which were often ineffective and costly. As EPA’s Robert H. Wayland testified before a congressional subcommittee, mitigation banks were “an innovative, market-based way for landowners to effectively and efficiently compensate for unavoidable wetland impacts.... Through mitigation banking, the responsibility for providing mitigation is transferred to an entity that has the financial resources, scientific expertise, and incentives necessary to ensure that the mitigation will be ecologically successful.”⁴¹

One successful example of mitigation banking was found in West Eugene, Oregon. The West Eugene Wetland Mitigation Bank, operated by the City of Eugene,

funded and implemented wetland mitigation projects in combination with the *West Eugene Wetlands Plan*. The plan, which was adopted locally in 1992 and formally in 1994, was Oregon’s first wetland conservation plan. It established standards for preservation, restoration, and fill of wetlands and described the processes required for implementation. This revolutionary plan relied on a partnership between federal, state, and local agencies, including the Corps, as well as non-profit organizations. In essence, the plan marked the city of Eugene as the first in the United States to receive local authority to issue state wetland permits for developmental proposals. Additionally, the Corps authorized the city to use an abbreviated permit process, or Letter of Permission, that relied on local review of applications to ensure they met the local wetland plan requirements.⁴²

The plan also called for the creation of a mitigation bank to help fund restoration and enhancement in conjunction with a program to protect valuable wetlands. Bank sites were located within a connected system





One of the public meetings held by the Corps of Engineers in Eugene, Oregon to discuss the proposed construction of the Hyundai Semiconductor plant.

of existing wetlands managed by the West Eugene Wetland Partnership, of which the Corps was a member. The mitigation bank had three major goals: lead the implementation of plans to restore and enhance wetland communities, provide certified mitigation credits to the development community seeking to develop wetlands located within the bank's service area, and collect fees generated from the sale of mitigation credit. Unlike traditional mitigation, which often resulted in incremental and disconnected wetland pockets, the West Eugene Wetland Bank allowed the protection of a broader ecological community by restoring the functions and values of an entire wetland system. Furthermore, by making the wetland permitting process easier and relieving developers of the responsibilities associated with mitigation, the bank proved to be a tremendous benefit to the development community.⁴³

In addition to working as a partner on mitigation banking projects, the District's Regulatory Branch identified additional ways to help restore and enhance wetlands in Oregon. In 1995, for example, the District proposed a new regional permit to authorize most restoration projects. The regional permit avoided unnecessary duplication of regulatory

control exercised by the Oregon Division of State Lands (ODSL), which has regulatory authority over waters in Oregon under the state's Fill and Restoration Law. Under the new permit, information about proposed work was supplied to ODSL. Within 15 days, ODSL would determine whether the project qualified for the regional permit and notify the project's proponents and the Corps.⁴⁴

Once a permit was approved, the next task became monitoring and enforcing its requirements. The Corps and the EPA were jointly responsible for this work. While they could take criminal or civil action, the Corps preferred to seek administrative remedies. The agency's basic policy was, "Strive to gain compliance with the least amount of conflict and seek stronger enforcement options only when a violator is willful, flagrant or knowing, or the violation is severe." In FY 94, for example, the Corps resolved permit problems using civil and criminal penalties in only 1.5 percent of the cases. Thus, the Corps settled the vast majority of violations without litigation or penalties, relying instead on voluntary actions by the landowner, such as restoration or mitigation, or issuing after-the-fact permits.⁴⁵

In the District, enforcement was an ongoing component of the regulatory program. Regulatory personnel in the District continually inspected and evaluated permit holders. In 1993, for example, the Regulatory Enforcement Team suspended a 1985 permit of the Coos Bay Water Board because operations were interfering with the salmonid fish passage. That same year, the team also began inspection and evaluation of irrigation pump intakes and effectiveness of fish passage screens. District personnel sent questionnaires to permit holders, requesting information on the type and condition of their fish screens.⁴⁶

Nationwide, the Corps regulatory program annually processed approximately 70,000 permits of all kinds, involving both section 10 and 404 approval. In 1988 the cost of administering this program was \$106 million and took roughly 1,100 employees.⁴⁷ That year, the Portland District's regulatory program included 17 people and a budget of \$1.2 million. Regulatory personnel processed individual permits in 84 days on the average. Furthermore, 86 percent of the permit applications were processed within 60 days.⁴⁸

A single month in the Portland District exemplified the vast number of permits and the broad scope of



Bradshaw's lomatium



Kincaid's lupine

the regulatory program's work. In November of 2000, the Corps approved 40 wetland and waterway applications for Oregon. Of those 40 permits, 36 were issued under existing nationwide permits. The agency also issued one individual permit, one general permit, one after-the-fact permit, and approved modifications to an existing project.⁴⁹

The type of projects approved by the District generally included road improvements, bank stabilization efforts, endangered species habitat improvement, commercial and residential developments, and other activities. In April 2000, for example, the District evaluated a permit application from the City of Rainier to construct a new public boating access facility on the Columbia River. The proposed ramp would be built on a former Corps dredge disposal site near the City's River Front Park. Another project in the Rainier area was a permit application to perform annual dredging in the Columbia River near Goble.⁵⁰ In Springfield, the agency examined an application to build a high-density housing development, which would negatively impact wetlands in the area. Accordingly, the developer proposed creating an equal amount of wetlands in another portion of the site.⁵¹

While many of the permits were processed without much debate, occasionally an application would become contentious. In the city of Eugene, for example, plans by Hyundai Electronics to build a large computer memory chip factory sparked heated arguments in the community. The issue centered around the fate of wetlands on the proposed site. In 1995 Hyundai submitted a three-phase plan for constructing a plant and related structures. Phase one of the plan would entail filling approximately 34 acres of wetlands. Phases two and three would require additional wetland conversion. Located on the wetlands were two rare plant species – Bradshaw's lomatium, an endangered plant found only in the Willamette Valley, and Kincaid's lupine.⁵²

Opponents of the plan argued that the factory should not be built on wetlands that supported endangered or threatened plant species. "The plant is going to cause a lot of environmental damage," said Anne Olsen, a student at the University of Oregon. "If you really care about our future, that doesn't mean pure jobs."⁵³ Others expressed concerns about the factory's impact on the community's small-town atmosphere, as well as its potential to discharge

toxins and other chemicals into on-site streams flowing directly into some of the Willamette Valley's most valuable wetlands.⁵⁴ Meanwhile, supporters of the project cited the plant's economic benefits to the region. Hyundai officials projected that the project would generate 1,000 jobs.⁵⁵

The EPA also weighed in on the project. In a letter sent to the Corps, the agency recommended a study of the plant's environmental impact and questioned whether the developers examined enough alternatives to building the factory in a wetland. Although the Corps had agreed to limit the search for alternative sites to Eugene, the EPA pushed for consideration of a broader geographic area. Diana Brimhall, Chief of Public Affairs, assured the public that the Corps would look at the EPA's letter "very seriously."⁵⁶

In December 1995, the Corps approved the permit, with several modifications. Instead of the 34 acres originally proposed, Hyundai would be allowed to fill 10.4 acres of wetlands. Hyundai also agreed to remove the third development phase from the permit. Because the company reduced the amount of wetlands to be filled and agreed to mitigate against the loss, the Corps did not require Hyundai to complete an EIS. Colonel Tim Wood, Portland District Commander, explained that, "We considered all the comments and looked at the information before drafting the conditions we felt would best protect the resources affected." Environmentalists, however, threatened to file lawsuits in federal court to block the project. "This is our home here," said Tom Pringle, a Eugene wetlands consultant. "We won't spare the horses in defending it. All of the agencies, in my view, have made tremendous procedural errors in approving this."⁵⁷

Protests continued throughout the construction phase of the project, with members of Earth First, an environmental group, attempting to physically block construction workers. "We're willing to put our bodies on the line to stop this project," said one woman. "Over my dead body this plant will get built."⁵⁸



Despite attempts to block the project both on the ground and in the courts, the \$1.4 billion plant officially opened in May 1998. The massive structure, which was the single largest private construction project in Lane County history, employed 660 people.⁵⁹

Critics of the project, who were deeply disappointed in not halting the project in its initial stages, vowed to press ahead with appeals that would deny Hyundai the redesignation of wetlands on the site it would need to gain clearance for its third phase, which would necessitate filling more wetlands. “We have no intention of cutting them any slack,” said Pringle in 1997. “This thing is a fish out of water and it should never have been allowed.”⁶⁰

Supporters of the expansion were equally adamant that the third phase of the project be approved. Many argued that the filling of a portion of the wetlands was worth the estimated 1,200 jobs and \$5 billion in capital investments associated with Hyundai’s phases two and three. Furthermore, some workers feared that the jobs of the employees at the company’s phase one factory were at stake if Hyundai was not allowed to expand. One Hyundai employee wrote that before working for the company he carried his six-year old son, who had diabetes, on an individual health insurance policy, costing him hundreds of dollars a month to cover medical costs. After being hired at Hyundai, he wrote that, “my income doubled, I immediately received insurance and my family was taken care of.” Tammy Reynolds, a manufacturing technician, thanked Hyundai for taking care of her and her family “like no other company could.” She wrote that, “I plan to make my career here. I plan to retire from Hyundai Semiconductor America. I owe them my loyalty – and so will this community!”⁶¹

In the fight over the Hyundai plant in Eugene, the Corps found itself in the middle of a debate not just about wetlands, but about larger issues, such as balancing economic development with environmental protection and preserving a

community’s character. Many critics of the project attacked the Corps for allowing the development to proceed – especially without an EIS. On a broader level, many federal agencies, such as USFWS, NMFS, and EPA, as well as environmental organizations have long felt that the Corps viewed its primary function, in administering the Section 404 program, as protecting the quality of the water. They argued that habitat and other wetland values, although considered in the agency’s decisions, were usually of secondary concern. These groups felt that the mandate of the CWA obliged the Corps to protect the integrity of wetlands, including their habitat.⁶²

Yet, in deciding whether to approve permits, the Corps found itself in the unenviable position of attempting to balance development pressures with environmental concerns about habitat, endangered species, and clean water. Not all of the Corps projects, however, were so contentious. In fact, over the last several decades, the agency has become increasingly involved in a number of restoration and enhancement projects, including work on wetlands. Ushered in by Section 1135 of the Water Resources Development Act, these environmental improvement projects provided the Corps an opportunity to use its skills and expertise in exciting new ways.

ENHANCING WETLANDS

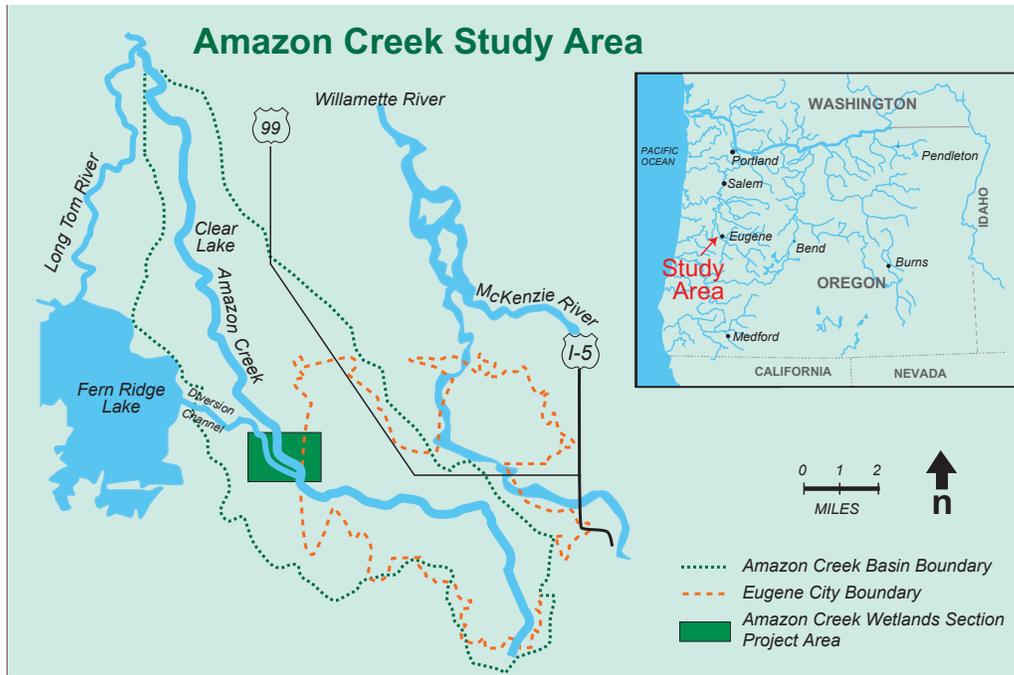
While flood control, hydropower, and navigation have long been central components of the Corps’ mission, environmental improvements were not part of the agency’s work until the 1980s, reflecting a major philosophical shift. Congress gave the Corps authority for environmental restoration through the Water Resources Development Acts of 1986 and 1996, as amended. Section 1135 of the 1986 act enabled the agency to modify existing structures to restore the environment and construct new projects to restore areas degraded by Corps projects. Section 206 of the 1996 act gave

the agency the authority to restore aquatic ecosystems. Under these authorities, the Corps oversaw a number of projects to benefit or improve wetlands, fisheries, wildlife habitat, endangered species, and rivers and streams.⁶³

Both Section 1135 and Section 206 relied on cost-sharing measures through local sponsorship of projects. Local sponsors included local or state governments, associations, service districts, or, for 1135 projects only, non-profit organizations. These local sponsors had to fund 25 percent of Section 1135 projects and 35 percent of Section 206 projects. In addition, the local sponsor acquired lands, easements, and rights-of-way and paid for “in kind” services. After completion of the project, the local sponsor assumed operation and maintenance responsibilities. In both programs the federal expenditure was limited to \$5 million per project.⁶⁴

Environmental restoration projects through Section 1135 and 206 were initiated in response to local interests. Once a local sponsor requested a potential project, the Corps conducted a preliminary study – at the expense of the federal government – to determine if a federal interest existed. If the agency determined a federal interest, and if funds were available, the local office began a feasibility study to define the problem, identify possible solutions, and determine the costs, benefits, and environmental impacts of the alternatives. Following the completion of the feasibility study, the Corps selected a final plan.⁶⁵

Once a plan was chosen, the Corps designed the plans and specifications for the construction phase of the project. Implementing Section 1135 and 206 projects required an entirely different time scale and pace of operations. Unlike traditional large Corps projects, 1135 and 206 activities had a far quicker turn around time and were not required to follow the same elaborate steps to completion. The target time frame from start to completion for these projects was two years.⁶⁶ Furthermore, projects with an estimated federal cost of less than \$300,000 could be expedited,



Amazon Creek wetlands restoration project was designed also to maintain flood control in the area.



Pre-construction



Post-construction

allowing them to be completed in 18 months or less. Both the feasibility study and the construction phase of the projects were covered under the partner cost-share agreement, and construction would not begin until local sponsors met their required contribution amount.⁶⁷

Since the mid-1980s, the Corps has undertaken a variety of Section 1135 projects. One of these, the Amazon Creek Wetlands Project, entered its final phase in 2001. Located just west of Eugene, it was one of the Corps' largest environmental restoration projects outside of the Florida Everglades. The project was part of a larger effort by the City of Eugene to manage the Amazon Creek drainage basin. Oregon's second largest city, Eugene is located in the heart

of the Willamette Valley, with access to major highways and rail lines. Businesses and residential developments increased rapidly in the 1970s, causing increased pressure on sensitive wetlands west of Eugene.⁶⁸

With approximately 62 square miles of drainage area, the Amazon Creek Basin is located in the Long Tom River Subbasin of the Willamette River Basin. The waterway originates in the steep, wooded hillsides surrounding Eugene on the east and south sides and flows through residential, commercial, and industrial sections of Eugene and across the Willamette Valley. The 24-mile Amazon Creek eventually joins the Long Tom River near Junction City, Oregon. Before joining the Long Tom River, the creek widens to

form Clear Lake, a narrow lake about one mile long. A low ridge from its mouth to a point approximately 12 miles upstream, separates the Amazon from the Long Tom River and Fern Ridge Lake. Fern Ridge Lake is a multi purpose flood control project, constructed by the Corps in 1941.⁶⁹

During the 1950s, the Corps dramatically altered a series of natural streams and wetlands when it constructed the Amazon Canal to provide flood control for local farms and homes. Levees were built on both sides of the creek, and the channel was deepened to prevent overflow. More than five miles of the channel flowing through Eugene were lined with concrete, and an additional two-and-a-half mile channel was created, which



III ENVIRONMENTAL WORK



flowed from Eugene to a diversion structure.⁷⁰ While these changes prevented floods, they also cut off water from areas that had previously supported a rich mix of native plants and animals. As these areas began to dry out, wetland flora and fauna disappeared.⁷¹

As part of the larger effort to restore wetlands to the area, local interests began lobbying the Corps to modify the project under Section 1135. Corps studies showed the creek had good potential for restoration, and a project cooperation agreement was signed with the City of Eugene in 1998. Under the agreement, the City was responsible for 25 percent of the project's \$5.32 million cost, with the Corps paying the remainder.⁷²

The modification project was designed to restore these wetlands, while maintaining flood control. It consisted of three phases. The first phase, construction, began in the summer of 1999. The Corps removed levees along approximately 10,000 feet of Amazon Canal and several smaller drainage channels, and it graded these channels to mimic a more natural stream configuration. To protect nearby developments from flooding, workers relocated the levees farther away from the channels. They also replaced an existing diversion weir and added other structures. The new weir was slotted and could divert water based on the level of flow. Other weirs

Drainage channels were graded and new culverts were installed to help maintain wetland conditions and natural stream flows.

and culverts provided greater flexibility to help maintain wetland conditions.⁷³

The second phase of the project, which began in the summer of 2000 and continued through 2002, restored wet prairie habitat. Native plants replaced non-native plants and seeds on the 45 acres directly impacted by construction, as well as 96 acres that will be occasionally flooded once the creek returns to its natural pattern. The planting required more than 350,000 native plants and thousands of seeds – a far greater number than in any other prior District project. Biologists and botanists collected these plants and seeds at nearby sites – most within five miles of the project – to maintain the genetic integrity of the plants. The third phase brought recreational facilities to the project and was added under a new Corps cost-sharing agreement, which split costs 50-50 between sponsors. During the summer of 2001, workers began constructing a project overlook and viewing station, parking, restrooms, interpretive displays, and trails linking the project to a regional bike system.⁷⁴



The success of the project was due in large part to the formation of remarkable partnerships. In addition to the City of Eugene and the Corps, other primary partners included the Bureau of Land Management, the Nature Conservancy, Lane Council of Governments, and local Youth Corps agencies. The Natural Resources Conservation Service, USFWS, and Oregon Department of Fish and Wildlife (ODFW) also provided assistance. "A project like this – one that deals with the environment, water quality, science, animals and plants – depends on people at the federal, state, and local level working together," observed Steve Gordon, natural resources program manager at Lane Council of Governments. "At Amazon Creek, everyone has worked hard to avoid turf battles and maintain a positive focus."⁷⁵ Matt Rea of the Corps also expressed enthusiasm for the project, stating that the benefits of the project "are great both for the environment and the local population."⁷⁶



The Fern Ridge Marsh project converted a reed canary grass dominated marsh area into a habitat where native emergent plants are the primary vegetative cover. This allows water from the flood control reservoir to follow a more natural cycle.



In addition to Amazon Creek, the District was involved in a number of other Section 1135 projects. On the Long Tom River in the southern Willamette Valley, for example, a Corps project provided improved habitat for ducks, shorebirds, and other wetland species. The District also jointly sponsored the Fisher Butte Waterfowl Impoundments Project with the ODFW, who paid 25 percent of the project's \$537,600 cost.⁷⁷ In 1993 these agencies had initiated a project to counteract habitat loss in the Willamette Valley. Over the last century, agricultural conversion and urban/industrial development significantly reduced both the quantity and quality of waterfowl habitat in the region. In addition, the Corps' flood control projects almost completely reversed the natural wetland cycle. "We run our reservoirs opposite of the time you would expect to find wetlands," said Rick Hayes, a park ranger at the Fern Ridge Project office. He noted that valley bottomlands were historically drier in the summer and wetter in the winter. District-operated lakes, however, were kept high in the summer and low in the winter for flood control and other purposes. As Hayes explained, by creating wetlands during the winter – the peak time of arrival for migrating

waterfowl – the impoundments on the Long Tom River "provide the opportunity to turn that around."⁷⁸

Protecting the Fisher Butte impoundments was a significant step toward counteracting habitat loss in the Willamette Valley. Located along the Pacific Flyway, the impoundments provide critical habitat for migrating waterfowl. Spread across 155 acres of land, the area is an important transition point for waterfowl and acts "like an airline hub" for migrating birds. Wetlands were created by flooding the impoundments with water from Fern Ridge Lake. Water dikes, levees, and ditches, plus a water supply pump and pipeline from the lake to the ponds, made this possible. When the impoundments were completed in 1994, project leaders hoped that ultimately the project would result in up to 2.25 million waterfowl use days.⁷⁹

Section 1135 and 206 projects signaled a substantial change in the Corps' mission and philosophy. While local sponsors also contributed funds toward restoration, these programs were established specifically to accomplish environmental improvements and modifications to Corps projects. The Amazon Creek project, for example, showed just how much the agency

evolved in the second half of the 20th century. When the project was originally conceived in the 1950s, flood control was of the utmost importance to both the Corps and the public. Little or no thought was given to rich and complex wetlands that were destroyed by the project. In fact, appreciation of the role of wetlands as both productive habitat and providing clean water is a very recent phenomenon. Today the almost 400 acres of restored wetlands and gently meandering waterway exemplify the nation's incorporation of the environmental values and the Corps' response and adaptation.

CULTURAL RESOURCES MANAGEMENT

The Portland District's Cultural Resources Management (CRM) represented another non-traditional component of the Corps' work that emerged during the environmental era. In 1966, the National Historic Preservation Act sought to protect, restore, and maintain historical and archaeological resources affected by federal projects. This legislation created a federal-state partnership to identify districts, sites, objects, buildings, and structures significant



North Bonneville excavation site



in American history, archaeology, and culture. It also established the Advisory Council on Historic Preservation, requiring federal agencies that had direct and indirect jurisdiction over proposed federal projects to take into account the effect of those projects on cultural resources eligible for listing in the National Register of Historic Places. Congress provided funding for CRM projects through the Archaeological and Historic Preservation Act of 1974, which granted federal agencies the authority to devote up to one percent of a project's total construction cost to archaeology.⁸⁰

Legislation in 1979 further expanded the federal government's role in evaluating and protecting cultural resources. That year, the Archaeological Resources Protection Act established a permit procedure for investigations of archaeological resources on public lands, prohibiting the removal, sale, receipt, and interstate transportation of these resources obtained without a permit from public or Indian lands. This legislation ensured that individuals and organizations wishing to investigate or excavate and remove archaeological resources from federal lands had the necessary professional qualifications, and that federal guidelines for research and curation were followed. Congress also passed the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990, in response to Native Americans' concern about the loss of human remains and cultural items. This legislation directed federal agencies to inventory their

collections of human remains and associated funerary objects and to identify the descendants entitled to claim them.⁸¹

These new laws drew the Corps into cultural resources management work during the late 20th century. The Portland District began hiring archaeologists during the 1970s, and by the late 1990s, the staff included five of these professionals. Many of the District's proposed hydrological projects included assessments of the archaeological and historical resources affected by water resources development. Two prominent examples are provided below.

EXCAVATING AND DOCUMENTING THE NORTH BONNEVILLE SITE

The District's construction of the second powerhouse at Bonneville resulted in significant archaeological finds. The aboriginal village that archaeologists excavated for the project revealed exciting new information for many avenues of scientific research. Furthermore, the large number of artifacts found at the site resulted in the creation of a state-of-the-art curation facility for the North Pacific Division.

When Congress approved the construction of a second powerhouse at Bonneville, the Corps asked the National Park Service (NPS) to conduct surveys to identify any valuable archaeological sites in the affected area. In 1974 archaeologists from the University of Washington, who were working under contract with the NPS, located five sites that they considered archaeologically

significant. Four of those sites could be avoided by a change of construction plans, but one site on the Columbia River at North Bonneville would be covered by water. In 1976, University researchers organized an archaeological testing program at the site that was to be flooded. Based on the results of the testing program, the Corps, along with the Advisory Council on Historic Preservation, the Washington State Historic Preservation Officer, and the NPS, agreed to sponsor large-scale archaeological investigations to recover scientific information contained in the site before it was destroyed.⁸²

To begin the process of investigation, the Corps hired Environmental Consultants, Inc., from Dallas, Texas, to excavate the site. With a crew of 30 excavators, the contractors worked from December 1977 through May 1979, unearthing more than half-a-million artifacts.⁸³ More than 600,000 artifacts recovered at the site documented the remains of a major aboriginal village once visited by explorers Lewis and Clark in 1805-1806. Archaeologists categorized the artifacts into groups, including stone, wood, bone, metal, glass, floral and faunal remains, and perishable items (leather, cloth, and wood). They also discovered remnants of two types of Indian homes – pit houses and plank houses. William Clark had described these structures in his journal. "Usually a pit was dug one



Large numbers of artifacts were studied and catalogued, then stored in the curation center at the Administration building of Bonneville Dam until being turned over to the Yakama Nation.



to four feet deep,” he wrote in 1805, “the wall planks set vertically to the eaves, a small hole left in one end for a door, and an opening in the roof for the smoke to escape – several families occupied one house.” Researchers believed that the house pits located at the North Bonneville site were the same ones that the Lewis and Clark Expedition observed in their trip down the Columbia River. “I passed four large houses on the Star side a little above the last rapid and opposite a large Island which is situated near the Lar side,” wrote William Clark in October of 1805. “The [inhabitants] of those houses had left them closely shut up. They appeared to contain a great deal of property and Provisions such as those people use... The bottom is high stoney and about two miles wide covered with grass, here is the head of a large Island [Hamilton Island] in high water, at this time no water passes on the Star Side.”⁸⁴

The large number of artifacts preserved at the site was unique. “Artifact collectors ... were unable to get to the site because in constructing the Bonneville Dam, the area was covered with a great deal of fill and that preserved it until it was excavated for construction of the second powerhouse in the late 1970s,” explained Bill Willingham,

North Pacific Division historian. “So, the fact that all of these material remains were kept undisturbed is what is significant because most other sites in the Northwest have been pillaged by pot hunters [or] artifact collectors.” While occasional looting, erosion from the river, and construction from the original dam did affect the site, the impacts were minimal.⁸⁵

The site at North Bonneville was also special because of its size and location. “The collection at Bonneville is one of the largest ever uncovered in the Northwest,” observed Willingham.⁸⁶ Typically archaeologists and anthropologists dug up only a section of a site, but at North Bonneville they excavated most of the two-acre site, resulting in an “ideal data bank.”⁸⁷ Furthermore, being situated on the Columbia River, the site was a major fishing village and a critical link on the Columbia River trade route. “During the fur trading days, the Chinook and the Cascade Indians actually had a toll road there, [they] collected a fee for people passing over their site or around their avenues, and prior to that, they used the area as a major fishing location,” explained John Fagan, a Corps archaeologist who supervised the dig.⁸⁸

As the only known undisturbed site on the lower Columbia that contained evidence of occupation from prehistoric to recent historic times, the North Bonneville dig had the potential “to provide broad insights into the cultural uses of the area.”⁸⁹ Relics from the site dated back 700 years to the prehistoric period and continued through the recent historic past. Scientists focused their excavation efforts on the 17th through 19th centuries, a period when Euroamerican culture began to influence Native Americans in the Northwest. Indeed, the primary importance of the site was that it spanned the period of early cultural contact without interruption, providing an opportunity to study the process of acculturation along the Columbia River. “It’s going to give a better understanding,” said Richard Pettigrew, an associate researcher at the University of Oregon specializing in anthropology and archaeology. “The record at that time is totally biased because it was written by one side.” At this site, however, the contact period was “very well represented.”⁹⁰

Before researchers could interpret the artifacts, they needed to go through a process of initial curation. For the North Bonneville site, the Corps contracted with



III ENVIRONMENTAL WORK



Elk Creek excavations found pottery and projectile points.



Heritage Research Associates of Eugene, Oregon to prepare the artifacts – a process that took approximately two-and-a-half years and required a number of labor-intensive, delicate tasks.⁹¹ “The whole point of the initial curation process is to get the materials in a position where they can be researched. And this is a very painstaking and time consuming process in which all the materials are ... cleaned and stabilized and packaged and described and catalogued. And then [they are] placed in a facility where researchers can go and study them over time,” explained Willingham.⁹²

Following the initial curation stage, the Corps had to decide where the artifacts would be housed. The agency usually made arrangements with public and private institutions, such as museums and universities, to store relics obtained on Corps sites. In the case of the North Bonneville site, which revealed an enormous quantity of artifacts, the Corps determined that no adequate facilities were available. Furthermore, other districts within the North Pacific Division faced similar problems.⁹³

North Bonneville provided the impetus for the Corps to establish a division-wide curation facility dedicated to preserving and maintaining regional resources. Rather than creating a new facility, however, the agency chose to retrofit an existing structure – the

Bonneville auditorium. Located on the grounds of the Bonneville Lock and Dam project, this single-story brick structure was built in 1934, and subsequently it was listed on the National Register of Historic Places in 1987 and declared a national landmark. In addition to furnishing a home for artifacts, reusing the auditorium for curation “assured continued life for a significant historic, architectural and visual resource of the Bonneville project.”⁹⁴

The Corps dedicated the curation center on April 24, 1989. “We’re here to dedicate ourselves to preserving the past,” stated Lieutenant Colonel Richard Goodell, Deputy District Engineer, in his opening remarks.⁹⁵ Described as a “state-of-the-art” facility, architects converted the auditorium’s basement into three secure rooms for general storage and research. High-density mobile storage units with open shelving provided space for the hundreds of thousands of artifacts. To access these artifacts, researchers used a computerized catalog that divided the collection by major material categories and then into subcategories by artifact type for each excavation unit. The innovative use of space at the auditorium resulted in several awards, including the Chief of Engineers Environmental Design Award (1989)

and the 1991 Government Workplace Benchmark Honoree Award. The Portland District operated the center, and Bonneville park rangers experienced in collection care and management oversaw the site’s daily operational needs.⁹⁶

The artifacts, however, did not remain in the curation center. In the 1990s, the Corps turned them over to the Yakama Nation in south central Washington, as a result of a cooperative agreement between the District and the Nation. The agreement called for the Yakamas to curate the artifacts, with the Corps continuing to pay for any general management costs. The Yakama Nation continued to allow researchers to access the artifacts for their work. According to Michael Martin, a community planner in the Environmental

Resources Branch, the arrangement was a natural fit because the Yakama Nation had the staff and facilities that met National Park Service standards and the Bonneville Lock and Dam project was located on lands ceded by the Yakama.⁹⁷ Through its mitigation work for the second powerhouse, the Corps revealed an exciting glimpse into the material culture of these groups.

EXAMINING CULTURAL RESOURCES AT ELK CREEK LAKE

When the Portland District began moving ahead with construction plans for a dam at Elk Creek in the 1970s, it initiated a series of field investigations of cultural resources in the project area. Although the Corps did not complete Elk Creek Dam [See Chapter One], in the planning process it evaluated a number of historical sites in the region. The project area is located in southwestern Oregon, approximately one mile above the confluence of the Rogue River and Elk Creek, extending five miles to the mouth of Flat Creek.

The NPS conducted the initial investigations of cultural resources in the Elk Creek project area. In 1979 and 1982 the Corps contracted with the Department of Anthropology at



Oregon State University (OSU) to obtain a more thorough appraisal. The objective of the second phase of this investigation, which occurred in 1982, was to acquire sufficient data to determine eligibility for the National Register of Historic Places and to recommend site management options for the significant archaeological sites. To accomplish this work, researchers from OSU designed a testing program to determine horizontal and vertical site parameters, site content (function and antiquity), and contextual integrity.⁹⁸

After completing the 1979 and 1982 field investigations, researchers determined that 13 of the 23 sites they examined were significant. Because the 13 sites were situated in close proximity to one another and were all temporally and/or functionally interrelated, scientists recommended that the Corps nominate the entire area as a district to the National Register. The sites at the Elk Creek Lake project area spanned the last 7,000-8,000 years and presented a picture of human adaptive strategies in the lower eight miles of Elk Creek drainage. Taken together, the 13 sites were well integrated and provided the basic data for a working chronology.⁹⁹

Researchers also identified changes in the cultural patterns through artifacts on the sites. One of the major changes in the Elk Creek drainage was the introduction of new projectile point forms and pottery around 500 B.P (before present). Archaeologists and anthropologists believed that changes in projectile point styles may have implied changes in the weapon system and hunting strategies and/or changes in trade networks.¹⁰⁰ Thus the archaeological work at Elk Creek revealed interesting findings about early settlement patterns and documented the material remains of early human inhabitants of southern Oregon.

HTRW work through Support for Others program



ADDRESSING HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

No one could have predicted 50 years ago that the Corps would have an entire program dedicated to the removal and treatment of hazardous and contaminated materials. Historically, the nation gave little thought to the disposal of waste or industrial discharges. These products were often dumped into landfills or directly into waterways with few regulations. As understanding of the impacts these materials had on human health and the environment grew, the public pushed for legislation to control future disposals and address contaminated sites, resulting in the passage in 1980 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

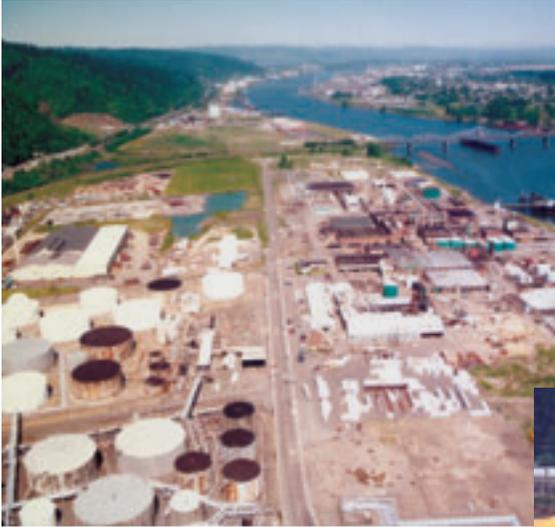
Congress intended CERCLA, which was administered by the EPA, to deliver comprehensive coverage, encompassing both prevention of and response to uncontrolled hazardous

substance releases. This legislation provided the necessary authority and a funding mechanism for reacting to both emergency situations and to chronic hazardous materials releases. CERCLA identified two types of responses – removal actions and remedial actions. Removal actions stabilized or cleaned up a hazardous site that posed an immediate threat to human health or the environment; remedial actions provided permanent remedies. In many cases, removal actions did not eliminate the need for remedial actions because, while immediate protection was furnished, chronic problems were ignored.¹⁰¹

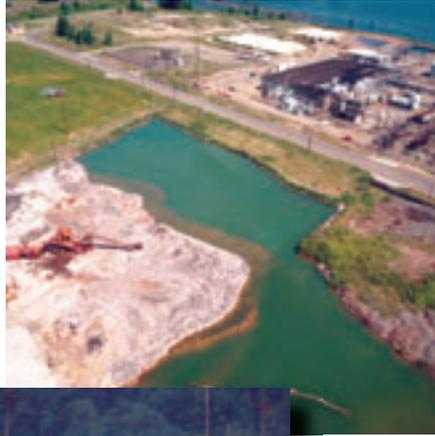
Determining appropriate funding sources was a major challenge associated with this program. As part of the 1980 legislation, Congress established the Hazardous Substances Response Trust Fund, or Superfund, to finance its emergency response and remedial activities and recover costs. The fund itself totaled \$1.6 billion, of which 87.5 percent came from a tax on the chemical and petroleum industries. General federal revenues generated the remaining 12.5 percent. The EPA was allowed to use these funds to cover its own costs or the costs involved with



III ENVIRONMENTAL WORK



The Gould, Inc. site on the Willamette River in northwest Portland.



work it ordered in response to an immediate threat. The fund, however, was intended to be rotating; the idea was to recover cleanup costs from the responsible parties. In 1986, Congress increased the Superfund to \$8.5 billion as part of the Superfund Amendments and Reauthorization Act (SARA). While the petroleum and chemical industries continued to finance the bulk of this fund, corporate income taxes also contributed a significant amount. The remainder of the fund came from general federal revenues, interest, and recovery of cleanup costs.¹⁰²

Additional important features of CERCLA included the following: it established prohibitions and requirements concerning closed and abandoned hazardous waste sites; it provided for liability of persons responsible for releases of hazardous waste at these sites; and it allowed the National Contingency Plan (NCP), which provided guidelines and procedures for responding to releases of contaminants, to be revised. The NCP also established the National Priorities List (NPL). The NPL was a system whereby the EPA could prioritize among sites potentially needing remediation. To create the list, the EPA had a Hazard Ranking System (HRS) that evaluated sites on the basis of relative risk to human health and the environment. In the process the

EPA determined four scores based upon potential exposure via the four major exposure routes: surface water, groundwater, air, and soil contamination. The agency placed sites scoring above a certain level on the NPL. The EPA could only take remedial action for sites listed on the NPL, but the act did not require the agency to pursue sites on the list in any particular order. Thus the EPA's site selection process was as much a political debate as a technical one.¹⁰³

Once a site was listed on the NPL, the EPA generally followed several subsequent steps. First, the agency conducted a Remedial Investigation/Feasibility Study (RI/FS) to determine the nature and extent of contamination. Then came a Record of Decision, explaining the various cleanup alternatives to be used at the site. Next, the agency prepared and implemented plans and specifications for applying site remedies through a Remedial Design/Remedial Action (RD/RA). The following step was construction completion and identifying completed cleanup activities. Operation and Maintenance personnel then conducted investigations to ensure that all actions were effective and properly

operating. In the final step, the EPA deleted the site from the NPL.¹⁰⁴

Today CERCLA forms the legislative backbone of the Corps' Hazardous, Toxic, and Radioactive Waste (HTRW) program. The Corps initially developed the HTRW program to support the EPA's work; later the program's mission expanded. In the 1980s, when the Corps began the program, the District's

role in dealing with hazardous waste at its own facilities "was pretty low," according to Michael Gross, Portland District environmental engineer. Over the next several decades, the Corps instituted several measures to increase awareness of hazardous and toxic waste issues. In the early 1990s, for example, the agency began an environmental compliance program and developed a review guide to evaluate Corps projects. The agency also established environmental compliance coordinator positions to help the Corps "get into compliance and identify the problem."¹⁰⁵

The HTRW program recognized that there was a limited amount of expertise in the field of hazardous waste. Accordingly, the Corps designated centers of expertise throughout the nation for HTRW work. In the North Pacific Division, the agency established the Seattle District as the regional center. The Portland District, therefore, often turned to Seattle District for assistance on some of its larger projects. The Corps also relied heavily on contractors to investigate a site and clean it up.¹⁰⁶

Since 1985, when the Corps began working on the EPA Superfund sites, the District's HTRW program has been involved in a variety of projects. The District, for example, helped the EPA with remediation at three Superfund sites in Oregon, including the Gould, Inc. site in northwest Portland. Covering ten acres, this area housed a secondary lead smelter and lead oxide production facility from the 1940s



through the 1980s. Workers at these facilities disposed of smelter waste and battery casings on the site, and they also discharged acid to a lake remnant adjacent to the property. To clean up the property, hazardous waste experts processed batteries that had been tossed into landfills and created stabilized blocks of hazardous material. The District's role in the project was to provide on-site technical services and monitor compliance with requirements stated in approved workplans.¹⁰⁷

The District's work on contaminated sites that were not owned by the Corps was accomplished through the Corps' Support for Others (SFO) program. Through the SFO program the Corps assisted federal agencies by providing them with engineering and related services. The SFO program was divided between environmental work and facilities/infrastructure work. The Corps' goal with the program was to "apply our capabilities to assist federal agencies in the execution of their missions and not to take away missions from those agencies." The Corps recognized that its engineering and technical knowledge could aid many agencies that lacked such expertise. The agencies that the Corps supported

still provided full funding for the effort and retained control and legal responsibility for their program. In return for offering support, the Corps was able "to maintain and enhance its capabilities."¹⁰⁸

In addition to its work with the EPA, the Corps assisted other agencies through its HTRW program. The District assisted the Farmers Home Administration, for example, in the cleanup of contaminated properties that the agency acquired through foreclosures and bankruptcies in the early 1990s. Specifically, the Corps worked on preliminary assessments and site investigations, remedial designs and remedial actions, and other environmental restoration services. In FY 1994, for example, the District completed remedial design and actions on seven properties.¹⁰⁹

The Corps also performed HTRW work through its Defense Environmental Restoration Project – Formerly Used Defense Sites (DERP-FUDS) program. This



program was designed to reduce the risks to human health, public safety, and the environment from contamination resulting from past sites that were owned, leased, or used by the Department of Defense. By 2000, the FUDS program had more than 9,800 properties in its national inventory. These properties included privately-owned farms, National Parks, residential areas, schools, airports, and industrial sites.¹¹⁰ The Portland District was responsible for site assessment



Soil samples were taken over a two-year period from Hamilton Island and tested for contaminants.

and clean up of FUDS in Oregon until the mid 1990s, when the assessments were completed. From approximately 1986 to 1994, the District evaluated many former defense sites, including Fort Stevens, Camp Adair, and Tongue Point. In the process, Corps engineers identified problems and either cleaned them up themselves or forwarded them to the Seattle District. Once the District finished all of the site investigations, it forwarded its findings to the Seattle District to complete.¹¹¹

The District's HTRW work eventually expanded to include remediation at its own sites. In particular, Hamilton Island and Bradford Island, located at Bonneville Lock and Dam, and the U.S. Government Moorings site on the Willamette River required the Corps' attention. The EPA eventually delisted Hamilton Island from the NPL in 1995, but work at Bradford Island and the U.S. Government Moorings continued into the 21st century. At all of these sites, Corps employees faced a number of technical and political challenges in their clean-up efforts.

EVALUATING CONTAMINATION AT HAMILTON ISLAND

Hamilton Island, which measures 240 acres, is located on the Columbia River, approximately 40 miles east of Portland. During the construction phase of the Bonneville second powerhouse, workers used the island, as well as a river slough separating the island and the Washington shore, to dispose of soil and rock that had been excavated for the powerhouse. Between the years of 1976 and 1981, the Corps' contractors deposited 19 million cubic yards of material on the site. In addition, they buried debris from the old town of North Bonneville and excess material from construction operations.¹¹²

Once the Corps completed the construction of the second powerhouse, the site was managed as part of an overall plan to maximize use of Corps land for wildlife. Specifically, the agency used it to fulfill a portion of the mitigation

requirements for wildlife habitat that had been destroyed as a result of the second powerhouse construction. Hamilton Island also provided access for fishing and was a popular recreation spot.¹¹³

Concern at Hamilton Island first surfaced in 1986, when Bonneville project personnel discovered oily water in small pools on the site. Of special interest was one 12-acre parcel, referred to as the "knoll," where workers placed debris from the last stages of excavation. In December 1986, District personnel took a water sample from the area and subsequent test results identified some metals and organics in runoff from the site. As a precautionary measure, the Corps erected a fence around 20 percent of the island in September 1987. The fence was intended to prevent anyone from entering the knoll area and the lands immediately surrounding it until further studies were completed.¹¹⁴



Drilling for soil samples and testing water samples

In many ways Hamilton Island “became a catalyst” for the Corps’ hazardous waste program. It was, in fact, the first civil works project in the nation to become a Superfund site. When personnel discovered the oily water, the only Corps staff experienced in dealing with hazardous waste were located in the construction branch. The situation at Hamilton Island prompted the District to develop expertise in environmental engineering and to establish a committee to deal with hazardous waste issues. Out of this effort came a compliance review guide to assist Corps personnel in this emerging area of work.¹¹⁵

As the story of Hamilton Island spread, local residents and users of the site had a variety of reactions to the news of possible contamination. One fisherman, for example, did not appear concerned. “I don’t feel threatened,” he explained. He added that if he saw “a bunch of guys around in hygienic suits and masks and gloves,” he would then “worry about it.” In contrast, many residents of the town of North Bonneville, which was adjacent to the site, were quite worried. One woman said that she had “seen tires sticking up in the landfill before they were covered and houses built on top of them, and the children play on the berms.”¹¹⁶

The potential impact on fish and wildlife was a major concern shared by both federal and state agencies and the public. In 1987 William

Renfro, an environmental engineer with the Corps, observed that while “The human impacts are pretty low ... impacts on wildlife might be quite high.”¹¹⁷ Following the installation of the fence on the island, a member of the public wrote in an opinion piece that, “Canada geese, robins and other birds are not likely to be stopped by a fence. Nor are rabbits. Yet just two or three feet from the fence, coyote scat with feathers and fur was found last week. The food chain respects no boundaries.”¹¹⁸

Others questioned how the situation could have occurred in the first place. Reporter Eric Olson observed that many had asked, “How could contractors dump toxic waste on the Columbia River, right under Uncle Sam’s nose, if that’s what happened, and get away with it?” Renfro responded by explaining that, “The Corps’ activities were focused on the actual construction of the dam, the powerhouse itself...” He added that once contractors load the material and indicate that they are going to transport it to the waste site, that is typically the extent of Corps inspectors’ involvement.¹¹⁹

The Corps conducted tests and other investigations on the site. The agency completed sampling and drilling in 1988 and 1989. A total of 54 surface and subsurface soil samples and 51 water samples were taken in this two-year period.



During these investigations, workers found miscellaneous metal objects, low concentrations of a heavy oil, low-grade concentrations of some heavy metals, and organic solvents scattered throughout the site. They also identified a small amount (3,000 cubic yards) of oil-stained soil in the knoll area. By February 1990, the Corps completed a site investigation report, sending it to the EPA.¹²⁰

Based on the guidelines for analysis of potentially hazardous sites, Corps personnel didn’t feel that Hamilton Island would be nominated for inclusion on the NPL. Using revised scoring methods, however, the EPA reviewed the site investigation report and calculated a score of 51.92 for the site. At that time, a site needed a hazard score of 28.5 to qualify for the NPL. On July 29, 1991, the EPA nominated the site for listing on the NPL. The agency’s primary concerns behind the proposed listing were environmental in nature. In particular, the EPA noted that the site was intended as mitigation for lost wildlife habitat.



III ENVIRONMENTAL WORK



Colonel Wood speaking at the ceremony to reopen Hamilton Island to the public

Bald eagles and peregrine falcons resided in the area. Runoff from Hamilton Island drained directly into the Columbia River, and, as noted, the site was a favored fishing area.¹²¹

Following a public comment period, the EPA placed Hamilton Island on the NPL in October 1992. The Washington Department of Ecology also placed the island on the state's Hazardous Sites List. As a result, on July 26, 1993, the Corps began field investigations as the first of several studies required by the Superfund process. The field testing initiated the RI/FS, which was accomplished through a contract with Woodward-Clyde Consultants of Seattle. The purpose of this study was to learn the nature and extent of contamination, find potential risks to human health and the environment, and develop cleanup alternatives.¹²²

By January 1994, the Corps completed the initial phase of soil, sediment, and water sampling. Environmental engineers took approximately 170 soil samples from soil borings, test pits, and trenches on the island. They also gathered 50 water samples from on-site monitoring wells, off-site wells, and seeps. The results of lab analyses on these samples found no contaminants exceeding screening levels in the surface water. The only contaminant found above screening levels in groundwater

was manganese. Manganese was found in wells throughout the area, however, and was probably related to local geologic conditions, not to human activities at Hamilton. Furthermore, no volatile or semi-volatile compounds, Polychlorinated Biphenyls (PCBs), or pesticides were discovered above screening levels in soils or sediments. Nor did the lab results identify any metals that exceeded natural background levels in the soils or sediments. Field crews found petroleum hydrocarbons in samples at two locations in the knoll area that were above Washington state screening levels. This was the only substance of concern, and, after further investigations, the Corps and the state decided that it was not pervasive enough to merit any remediation work.¹²³

On October 18, 1994, the Corps released the final results of a year-long study of the site, which focused on areas of contamination and routes of exposure. Woodward-Clyde's report found no threat to human health or the environment. Typically a remedial investigation was followed by a feasibility study. Because no contamination exceeded levels considered by the regulating agencies to be hazardous to people or the environment, no feasibility study was required.

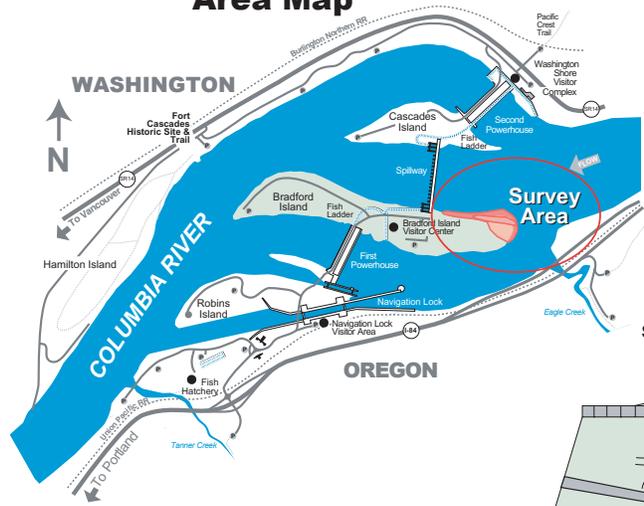
In February 1995, the Washington Department of Ecology delisted Hamilton Island from the state's Hazardous Sites List and the Corps expected delisting from the federal NPL to occur by the summer. While normally it took an average of 11 years to go through the federal Superfund process – from the date listed to the date investigations were completed – Hamilton Island was concluded in just two years. The Corps, EPA, and Ecology attributed the speedy resolution to agency cooperation. “We each made a commitment to concentrate on big picture issues to avoid jurisdictional disputes that sometimes occur,” commented Chris Cora, EPA project manager. Norm Tolonen, Corps District project manager, observed that each agency worked to simplify regulatory standards that sometimes conflicted. “It worked,” he said. “We were offered choices, rather than hard and fast rulings. That let us respond effectively and fulfill requirements with very few conflicts – it let us keep moving instead of stalling out.”¹²⁴

Two months after Ecology delisted the site, the Corps, EPA, and Ecology all concluded that no cleanup was necessary at Hamilton Island, and they developed a proposed plan for the site that recommended No Action. Public comments supported their No Action approach. Based on their own findings and public support, these three agencies drafted a final plan for Hamilton Island (also called a Record of Decision), reiterating the No Action recommendation. Following the signing of the Record of Decision, the EPA published a “Notice of Intent to Delete,” for delisting the site from the NPL. After a 30-day comment period, where no comments were received, the agency officially removed Hamilton Island from the NPL on May 25, 1995 – just three years after listing.¹²⁵

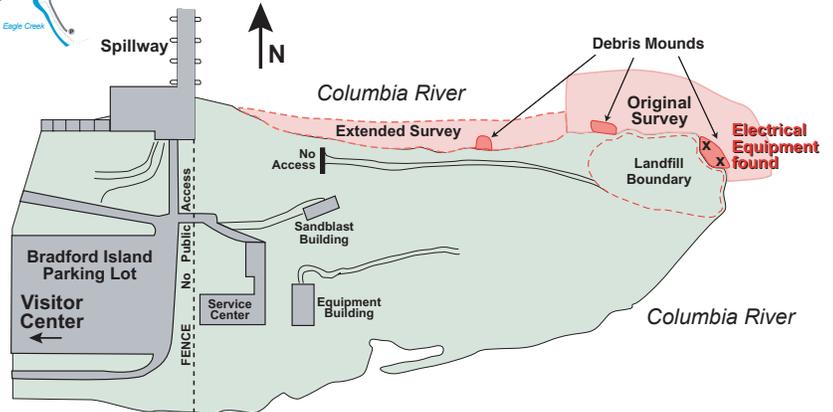
On June 15, 1995, the District reopened Hamilton Island to the public. Personnel from Ecology, EPA, and the Corps were joined by elected officials and residents of the town of North Bonneville at the ceremony. The site removal was



Bonneville Lock and Dam Project Area Map



Bradford Island Underwater Retrieval



particularly poignant for those people who lived in North Bonneville. “The stigma of a Superfund site next door to your city is gone,” Colonel Wood said at the ceremony. “Tentative plans are to use the area primarily as wildlife habitat, and it will be open for the public to use and enjoy.” In his remarks Colonel Wood also stressed his appreciation for the cooperation on the part of federal and state agencies and the townspeople. “What we’ve achieved could be used as a case study for future issues of Vice President Al Gore’s National Performance Review. It fits his goals of government efficiency, cooperation, and good practices. It is an example of what government bodies and private citizens can accomplish when they work as partners.”¹²⁶

CLEANING UP BRADFORD ISLAND

Like Hamilton Island, Bradford Island is located on the Columbia River adjacent to Bonneville Lock and Dam. In the 1930s, when the dam was being constructed, a small community of single-family homes was built on the project to house

Corps’ personnel and their families. In the 1950s, apartments were added to accommodate the growing number of people working on the project. These units were occupied until the 1970s, when they were removed. From 1942 to 1982, Corps employees used a landfill site on Bradford Island to dispose of household garbage and some project waste materials, such as oil and grease, paint, solvents, scrap metals, mercury vapor lamps, pesticide residues, sand blast grit, and electrical components, including switchgear, cables, light ballasts, and possibly insulators. The total size of the landfill was approximately one-half acre and was located on a forested section of the island, which was managed for wildlife habitat. The area was not open to the public.¹²⁷

Since the late 1980s, as hazardous waste disposal and compliance requirements were implemented on a national basis, the District became involved in a Corps-wide effort to bring all projects into compliance using a comprehensive self-evaluation program management system called ERGO (Environmental Review Guide for Operations).

ERGO required a team of Corps personnel or a contractor to assess potential hazardous problems at each district project every five years. Bonneville’s first ERGO audit was in 1992. At that time, the Bradford Island landfill was a minor finding, due to a lack of information about contaminated items at the site. Between 1992-1995, all 31 items identified for corrective action in the 1992 audit were completed. But as the years passed and new information became available, concern about the landfill grew.¹²⁸

In June 1996, the Corps notified the Oregon Department of Environmental Quality (DEQ) and the EPA about its intent to begin an investigation and potential remediation of the site. Before work could begin, the Corps needed to clarify requirements and obtain funds. In February 1997, the Corps and DEQ signed a voluntary cleanup agreement that put the site into the DEQ’s Voluntary Cleanup Program (VCP). The VCP was a program designed to forge cooperative relationships between DEQ and the responsible landowner or operator, in this case the Corps. It allowed DEQ



III ENVIRONMENTAL WORK



Landfill site and contaminated material brought up by divers



to dedicate staff to researching a particular site and recommending the most responsible and cost-effective remediation alternatives.¹²⁹

Upon signing the voluntary cleanup agreement, scientists conducted a series of studies beginning in mid-1997. These phased studies found the landfill contained hazardous materials and that some nearby areas in the Columbia River were contaminated. An initial site investigation included soil and groundwater testing. It was also supposed to include sediment testing in the Columbia River, but the rocky river bottom prevented contractors from obtaining samples. In the groundwater, analysts detected Volatile Organic Compounds (VOCs), which are substances that contain carbon and evaporate at room temperature; they also found petroleum, metals, PCBs, and pesticides in soil samples. The second phase of investigations included the following work: taking samples of surface soil and groundwater, conducting a survey to find any areas where groundwater was seeping to the surface, creating a systemic grid survey of the landfill to locate water pockets, evaluating

the stability of the slope below the landfill and its potential for erosion, and making hydrosurveys of the river floor to identify any materials below the water level in areas adjacent to the landfill.¹³⁰

One of the primary concerns during these investigations was the extent of contamination in the river. In March of 2000, two ballasts from old streetlamps were recovered from the riverbank adjacent to the landfill. Both contained PCBs up to 537 parts per million (ppm). Regulations required electrical equipment with PCBs over 50 ppm to be disposed of in an approved facility in accordance with the Toxic Substance Control Act. Accordingly, the ballasts were tested and sent to ChemWaste in Arlington, Oregon. The Corps continued to investigate the potential contamination of the river, and over the next year divers identified various power transmission system components. They were able to retrieve some of the equipment (two capacitors, lightning arresters, ballasts, relays, and miscellaneous porcelain and metal pieces), and these objects were tested for asbestos and PCBs. While scientists did not find any asbestos, two of the samples

had PCB amounts above 50 ppm. One of those, an oily material from a damaged capacitor, had a PCB level of 200,000 ppm.¹³¹ Diving continued through May 2001, and the Corps expected a report, including final analyses of sediment and tissue samples plus debris mound mapping and quantifying work, by July of 2001.¹³²

In addition to its river research, the District also continued its work on the landfill. In the summer of 2001, the Corps and its contractors identified priorities and set schedules for the landfill investigations. The work was expected to include the following:

- ❖ slope stabilization



- ❖ a seismic survey to determine the depth to bedrock and flow paths within the landfill
- ❖ investigation of a gully and potential removal of mercury vapor lamps reported at that site
- ❖ installation of new monitoring wells
- ❖ groundwater sampling at the new and old wells
- ❖ a water budget analysis to determine how much water is unaccounted for given rainfall levels, evaporation, and uptake from plants and trees
- ❖ a “hot-spot” analysis
- ❖ a final report
- ❖ a groundwater beneficial use analysis, including land and water considerations
- ❖ an update to the Environmental Risk/Human Risk Assessment.

The District expected a final evaluation report by spring 2002. When the investigation is completed, the Corps, along with the DEQ and EPA, will decide if remedial actions are needed. Possible alternatives include: total removal of materials in the river and/or the landfill, a cap on the landfill and/or some type of cap in the river, or no action.¹³³

The Corps faced several challenges in its work to address the problems at the Bradford Island landfill. While some of these were unique to the site, several applied to the HTRW program in general. First, this type of work was expensive. The federal government operated on a two-year budget cycle, resulting in a lag period with funding requests, and a problem had to be clearly identified before money could be requested. Second, many of these sites had overlapping jurisdictions and involved a number of agencies, each of which had different priorities. The Bradford Island site, for example, was located on Corps land, but included the Columbia River – a migratory pathway for endangered species. Therefore, in addition to the Corps and the DEQ, the USFWS and NMFS were consulted. According to Mark Dasso, program manager for the site, “The plan which the Corps and DEQ devised to remove the components



U.S. Government Moorings.

from the river has caused concern for NMFS and USFWS, who are worried that sediments would be flushed downriver. Right now, I’m not sure how we’re going to work that out.”¹³⁴

Another difficulty concerned the dissemination of information for the public. In the case of Bradford Island, there was a lot of inaccurate or incomplete information that circulated about the historic landfill. With this project, the District struggled to explain to the public “that the Corps is doing the right thing.” To aid communication, Dasso held monthly meetings with the District’s senior leaders, and the public affairs office sent out news releases and responded to media inquiries on a regular basis. Public Affairs also created a web site to provide information to the public.¹³⁵

The landfill at Bradford Island illustrates the nation’s changing attitudes toward the disposal of waste. In the 1930s, little thought was given to the practice of dumping materials of all kinds directly into a landfill. As awareness of the dangers of hazardous materials increased, particularly after World War II, the American public grew concerned about the impacts of dumping contaminated substances and the effects on human health and the environment. The Corps

acknowledged that, “we as a culture made a lot of mistakes in our past. The Bradford Island Landfill is one of those long-ago mistakes.”¹³⁶

DETERMINING THE FUTURE OF U.S. GOVERNMENT MOORINGS

Unlike Bradford and Hamilton islands, where hazardous waste was relatively contained, the Corps-operated U.S. Government Moorings facility was linked to a more pervasive contamination problem along the lower Willamette River – one that involved numerous potentially responsible parties. Due to hazardous sediments, the Corps had been unable to dredge at the site since 1981, and the EPA’s designation of a six-mile stretch of the Willamette as a Superfund site in 2000 halted the agency’s dredging work on that portion of the river. Accordingly, the Corps proposed to deepen and restore the river through a program of environmental dredging, which was allowed under Section 312 of the Water Resources Development Act of 1990 and was typically done for environmental restoration, not navigational purposes. The issue, however, remained unsettled in the early years of the 21st century. The struggle to determine a solution was due, in part,



III ENVIRONMENTAL WORK



The *Essayons* and *Yaquina* dredges docked at the Moorings

to the number of interested parties, each of whom held their own goals and values in regards to the future of the river.

Situated six miles northeast of downtown Portland and encompassing approximately 13 acres, U.S. Government Moorings is located on the Willamette River. The Corps began constructing the site after acquiring the first parcel of land in 1903. By 1904, the District operated the site as a facility to provide port, supply, and repairs for its dredges, hydrosurvey vessels, and other support ships. The site also housed warehousing facilities for the agency. To repair and maintain the vessels, District personnel historically engaged in a variety of activities, including sandblasting, paint removal, oil and petroleum usage, painting, overhaul of equipment, steam cleaning, welding and cutting, stockpiling, and storage of fittings, dredge equipment, and other materials. In 1986 the Corps turned over a portion of the facility to the District's Logistics Management Office, who used it primarily as a warehouse and storage space. By the 1990s, the Corps had terminated several of these activities at the site, such as fueling the dredges, sandblasting, and vehicle maintenance.¹³⁷

In 1989, the agency contracted with Battelle-Northwest from Sequim, Washington to conduct sediment analysis in preparation for lowering the berth depth of the *Essayons*, a hopper dredge moored at the site. Chemical and physical tests revealed that heavy metals, pesticides, and Polyaromatic Hydrocarbon (PAH) exceeded the District's levels of concern. Corps and EPA criteria characterized the mean lead concentrations as heavy pollution. EPA guidelines classified the levels of chromium, copper, mercury and nickel at the site as moderately polluting. Scientists also found elevated levels of the pesticides DDD, DDT, and dieldrin. In a preliminary report discussing the results of the analyses, the Corps concluded that sediment dredged from the U.S. Government Moorings should not be placed in unconfined in-water sites.¹³⁸

Following the sediment analysis, Geotechnical Resources, Inc. conducted a preliminary site assessment at U.S. Government Moorings for the Corps. The purpose of the study was to evaluate, on a preliminary basis, whether contamination due to hazardous substances was present at the project area and to determine whether additional investigations were

appropriate. The consulting firm based its assessment on a visual examination of the site and a review of available information, files, and documented past uses of the site. The company concluded that the most likely sources that contributed to contamination of the U.S. Government Moorings site came from activities in the Doane Lake area, adjacent to and upstream from the site.¹³⁹

Doane Lake is an area of roughly 360 acres that once consisted of marshes and shallow lakes. Since the early 1900s, it gradually filled in with a variety of industries, and by the 1990s only small remnants of Doane Lake existed. Past industrial activities at the site included oil gasification, wood treatment, recovery of lead from batteries, and the manufacturing of pesticides. In the late 20th century, the site housed the manufacturing of herbicides, chlor-alkali operations, production of acetylene gas, recycling of construction debris, silicon chip manufacturing, and storage and distribution of liquefied natural gas, petroleum products, and creosote. Multiple studies of the area documented extensive soil and groundwater contamination.¹⁴⁰

Geotechnical Resources, Inc. attributed the Corps' 1989 findings of metals, pesticides, and PAH to the agrochemical industry in the Doane Lake area. Specifically, they believed that the PAH compounds probably came from the old gasification work. The metals were most likely due to a combination of industrial activities in the Doane Lake area and the flaking and scaling of bottom paint on the dredges and other craft anchored at U.S. Government Moorings. Perhaps further contributing to contamination at the Corps site was the old General Construction Company yard, located west of the property.¹⁴¹

In 1992 and 1993, InterMountain West, Inc. performed another round of investigations for the District at the U.S. Government Moorings facility. The company completed soil surveys, and site characterizations, which focused on past facility waste management activities, and found three discrete areas of concern. Workers at the site had sandblasted



machinery and equipment parts at two areas within the site, resulting in piled accumulations of chrome and lead contaminated spent sand blast residue. At a third spot, District personnel stored leaking oil-filled equipment, causing limited shallow surface contamination.¹⁴²

To address those areas that had been contaminated with sand blast grit the District contracted with InterMountain West, Inc. in August of 1993 to excavate and clean up portions of the site. In the process workers removed 400 tons of soil containing low concentrations of metals, which they transported and disposed of at the Columbia Ridge Landfill near Arlington, Oregon. Most of the metal deposits resulted from the removal of paint on metal surfaces and were not classified as hazardous, according to Jeff Hepler, the District's environmental compliance coordinator. The District worried, however, that they could become a health risk to nearby workers if inhaled over an extended period. Following the cleanup, the Corps cleared these areas for normal use.¹⁴³

During the same year as the soil clean up, the EPA required the Corps to conduct a preliminary assessment report on the U.S. Government Moorings site. The EPA's authority for requesting the report came from CERCLA, as amended by SARA. The purpose of the report was to describe any potentially hazardous waste spills or releases that occurred at the site, document waste handling and disposal, provide information on current practices, and record known site conditions. The information in the report provided the EPA with data to use in the HRS, which ranked the site relative to other sites. In the preliminary assessment, the Corps evaluated the risk of exposure to contaminants at U.S. Government Moorings through four pathways – surface water, groundwater, air, and soil. The agency concluded that exposure through these four pathways was low.¹⁴⁴

Meanwhile District personnel continued to struggle with an ongoing challenge at U.S. Government Moorings. "The



A view of the contaminated Doane Lake area upstream of the Moorings

biggest problem we have with the Moorings right now is we have too many sediments," said Michael Gross in 2001. Underneath the Mooring's dock, sediment regularly accumulated, requiring dredging. Without dredging there was not enough depth for the large dredges, such as the *Yaquina* and the *Essayons*, which the Corps housed at the facility. Yet the District had not dredged the area since 1981. Despite several attempts to dredge since then, elevated contaminant levels – especially PAHs – prevented any such efforts.¹⁴⁵

The situation at the U.S. Government Moorings became more complicated when the EPA declared

an entire stretch of the Willamette River a Superfund site in 2000. As a result of this designation, U.S. Government Moorings was no longer an isolated site, but was part of a much larger area of contamination – one that involved many government agencies and potentially responsible parties. Inevitably the process was "going to be protracted because of all the responsible parties out there," explained Gross. "It's a large, complicated project." In fact, by 2001 the EPA had identified 90 responsible parties, and Gross expected them to name several hundred by the time the agency completed its research.¹⁴⁶



III ENVIRONMENTAL WORK



The navigation channel of the Port of Portland supports a thriving shipping trade for grain, minerals, and manufactured products.

The process of listing a portion of the river as a Superfund site began in 1997, when the DEQ requested that the EPA sample sediments in the Portland Harbor. The EPA found elevated levels of pesticides, PCBs, and heavy metals throughout the harbor area.¹⁴⁷ Based on the results of this investigation, this agency made an initial determination that Portland Harbor might qualify for listing on the NPL. Despite requests by the state that the site be deferred from listing and cleaned up under state authority, the EPA continued to pursue NPL listing, and by December of 2000, the agency finalized the Superfund listing. The area included in the Superfund site was a six-mile stretch of the Willamette River, between Sauvie Island and Swan Island. This area encompassed 17 active cleanup sites and 74 industrial sites, including U.S. Government Moorings.¹⁴⁸

The stretch of the lower Willamette designated as a Superfund site was environmentally and economically important to the region. The lower Willamette was a popular recreational fishing area for spring chinook, steelhead, coho, shad, and white sturgeon. All of these fish, plus the Pacific lamprey, depended on the lower Willamette for spawning grounds.¹⁴⁹ Furthermore, within the lower Willamette River basin there were several species of fish listed under the ESA, with several more

proposed for listing. Chinook, chum, steelhead, bull trout, and Oregon chub were all either threatened or endangered; the NMFS was also considering listing coastal cutthroat trout and coho salmon.¹⁵⁰

In addition to serving as crucial habitat for these fish species, the Willamette River backed a thriving shipping trade. As part of the federal navigation channel, the Willamette River supported the transport of grain, minerals, and manufactured products through Portland Harbor. In 1996, for example, Portland Harbor's marine facilities produced a total of more than 7,000 jobs and \$723 million in business revenue.¹⁵¹

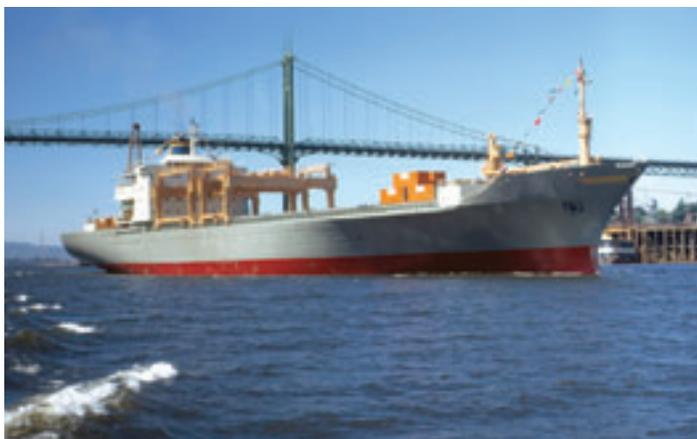
The problem was that to ensure the continued existence of the shipping business, the Corps needed to maintain the federal navigation channel through dredging. Since the late 1980s, the Corps had pushed to deepen the channel from 40 to 43 feet to accommodate modern, larger ships [See Chapter Two]. The contaminated sediments in the lower Willamette and the resulting Superfund listing, however, prevented maintenance dredging in the river. To address this dilemma, the Corps prepared a reconnaissance study of the Willamette River in December of 2000 that proposed a program of environmental dredging.

Corps policy prohibited the agency from using civil works funds in a site being remediated

under CERCLA authority. Under this policy, continued channel maintenance, potential deepening, or dredging for maintenance at the U.S. Government Moorings would not be done until cleanup of the harbor was completed. Without a policy change, exception or waiver, adjustment or hold harmless agreement with agencies and responsible parties, Corps activity would be limited to issues where the agency was a responsible party.

Because of this probable impasse, the Corps looked to a separate policy that existed for environmental dredging projects. Under Section 312 of the Water Resources Development Act of 1990, the Corps was able to perform environmental dredging in conjunction with a CERCLA cleanup under the following conditions: the polluter paid for allocable contamination, the Corps was shielded from liability for its actions, and the project was coordinated with the EPA cleanup. This policy existed for environmental dredging, but it could be extended to maintenance dredging if the agency addressed coordination and liability issues.¹⁵²

As long as the Corps met the conditions listed above, Section 312 provided a means for the District to continue its dredging work in the Willamette River. Essentially, the agency sought to combine its environmental restoration and



dredging work. Recognizing the potential of Section 312, the District drafted a proposal for environmental dredging. This proposal was the first one in the Corps to attempt attaching the civil works authority to another agency's authority – the EPA.¹⁵³ The Corps' broad goals were to coordinate the cleanup and environmental dredging work with the navigation maintenance dredging, allowing continued use of the navigation channel and restoring the lower Willamette aquatic ecosystem.¹⁵⁴

In the process of preparing the reconnaissance study, the District considered several options related to sediment remediation, including taking no action, monitoring natural attenuation, capping sediments in place, and dredging sediments. The agency also discussed alternatives for managing dredged sediments, such as confined aquatic disposal, near-shore confined disposal, and upland confined disposal. After considering these various options, the Corps selected as its preferred alternative a program where all sediments requiring remediation would be dredged and placed in a single confined aquatic disposal facility. Ideally the disposal site would be located in the Willamette River to reduce transport costs.¹⁵⁵

The Corps' plan to combine the environmental restoration and dredging program elicited a variety of responses. Some environmentalists

worried that in its quest to dredge the river, the agency might overlook other types of restoration plans, such as capping the river bottom with a fresh layer of sediments, which they believed might be less risky for endangered fish. "As an agency on a whole, they are not known for environmental protection," said Nina Bell, a lawyer for Northwest Environmental Advocates. "They are proponents of dredging ... and putting alleged economic interests over environmental concerns." Others pointed out that the Corps' presence as a potentially responsible party and cleanup partner raised conflict-of-interest questions that DEQ officials "really haven't even investigated." Opponents of the channel-deepening project specifically questioned whether the Corps would pursue polluters aggressively because the agency itself was responsible for a portion of the contaminants in the harbor.¹⁵⁶

Some also questioned the EPA's interest in handling the Portland Harbor. While the 1980 Superfund law levied taxes on oil and chemical companies to pay for cleanups where responsibility could not be assigned, taxing authority expired in 1995, resulting in a dwindling fund. Facing serious budget concerns, the EPA had to decide whether to undertake a new project that might spawn numerous lawsuits and take decades to complete. Officials at the EPA's regional office in Seattle said

they would scrupulously follow the Superfund law. Yet one employee added that the agency welcomed the chance to work with the Corps and its cleanup resources. "I look at it more from getting the right people together to work on a really difficult and complex problem," noted Sally Thomas, Portland Harbor project manager for the EPA. "The Corps has a lot of expertise to offer."¹⁵⁷

The District recognized the challenge it faced in combining environmental restoration and maintenance dredging on the lower Willamette. "For me, getting that little stretch of ... Willamette River ... resolved and maintaining it without concerns for future liability is my biggest challenge," explained Gross. While it took "a lot of coordination" and could "be a headache at times," it was also "real interesting to try to resolve everybody's interest and make a project that works."¹⁵⁸

Cleaning up hazardous waste represents a new direction for the Corps, and this work will continue into the 21st century. By 2001, more than 1,200 sites had made the EPA's National Priorities List.¹⁵⁹ Of these 1,200 sites, a number were located in Oregon and involved the Portland District. As an agency comprised largely of engineers and scientists, the Corps was ideally suited to addressing hazardous waste issues, and the HTRW program utilized the Corps' technical expertise in a variety of challenging situations.



CONCLUSION

By the late 20th century, environmental concerns touched nearly all aspects of the Corps' work. Whether issuing permits for wetland development, documenting cultural resources, or cleaning up hazardous waste, the District had to conform to a wide range of environmental laws and policies, such as NEPA, FWPCA, and ESA. Furthermore, the agency had to balance the region's diverse interests. Developers, environmentalists, Indian tribes, and local citizens – all wanted their voices to be heard. While it was not always possible to satisfy everyone's needs, the District's scientific and engineering expertise made it capable of carrying out its mission in an increasingly complex arena.



ENDNOTES

- ¹ V.L. Parrington characterized the late 19th century as the Great Barbecue for its excessive rate of resource consumption. See Stephen J. Pyne, *America's Fires: Management on Wildlands and Forests* (Durham, North Carolina: Forest History Society, 1997), p. 4. See also William G. Robbins, *Lumberjacks and Legislators: Political Economy of the U.S. Lumber Industry, 1890-1941* (College Station: Texas A&M Press, 1982), p. 16.
- ² Samuel P. Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890-1920* (Cambridge: Harvard University Press, 1959); John F. Reiger, *American Sportsmen and the Origin of Conservation*, third edition (Corvallis: Oregon State University Press, 2001).
- ³ Joseph M. Petulla, *American Environmental History: The Exploitation and Conservation of Natural Resources* (San Francisco: Boyd & Fraser Publishing Company, 1977).
- ⁴ Lieutenant General J.W. Morris, "The Corps of Engineers and the American Environment: Past, Present, and Future," Federal Records Center, Pacific Alaska Region, RG 77, Installation History Files, # 77980005, Box 45.
- ⁵ Thomas M. Clement, Jr., Glenn Lopez, and Pamela T. Mountain, "Engineering a Victory for Our Environment: A Citizens' Guide to the U.S. Army Corps of Engineers," Washington, D.C., Institute for the Study of Health and Society, 1971.
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- ¹⁵⁴ U.S. Army Corps of Engineers, Portland District, “General Investigation Reconnaissance Study Willamette River Environmental Dredging, Oregon,” December 26, 2000, pp. 14-19, from Michael Gross’ files.
- ¹⁵⁵ U.S. Army Corps of Engineers, Portland District, “General Investigation Reconnaissance Study Willamette River Environmental Dredging, Oregon,” December 26, 2000, pp. 14-19, from Michael Gross’ files.
- ¹⁵⁶ Jim Barnett and Brent Hunsberger, “Harbor cleanup may dredge taxpayers’ pockets,” March 20, 2000, *The Oregonian*, Portland District, Public Affairs Office, 870-5b, Willamette River, Hazardous & Toxic Waste.
- ¹⁵⁷ Jim Barnett and Brent Hunsberger, “Harbor cleanup may dredge taxpayers’ pockets,” March 20, 2000, *The Oregonian*, Portland District, Public Affairs Office, 870-5b, Willamette River, Hazardous & Toxic Waste.
- ¹⁵⁸ Gross Interview.
- ¹⁵⁹ Environmental Protection Agency, accessed at <http://www.epa.gov/superfund/sites/query/query.html/nplfin.htm#Oregon>, on August 1, 2001.