

Mitigation of Impacts to Fish and Wildlife Habitat: Estimating Costs and Identifying Opportunities

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Acronym List

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BPA	Bonneville Power Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESCF	Cooperative Endangered Species Conservation Fund
CWA	Clean Water Act
CWCS	Comprehensive Wildlife Conservation Strategy (also known as State Wildlife Action Plan)
DARRP	Damage Assessment, Remediation and Restoration Program
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
DOT	Department of Transportation
EA	Environmental Assessment
ECOS	Environmental Conservation Online System (FWS online database)
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EFH	Essential Fish Habitat
ELI	Environmental Law Institute
EPA	U.S. Environmental Protection Agency
ERDAR	Environmental Response, Damage Assessment, and Restoration Program
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration
FPA	Federal Power Act
FPEIS	Final Programmatic Environmental Impact Statement
FWS	U.S. Fish and Wildlife Service
GAO	Government Accountability Office (formerly General Accounting Office)
HCP	Habitat Conservation Plan
ILF	In-Lieu Fee or In-Lieu Fee Program
ITP	Incidental Take Permit
ITS	Incidental Take Statement
MB	Mitigation Bank
MOA	Memorandum of Agreement
MSA	Magnuson-Stevens Act (Magnuson-Stevens Fishery Conservation and Management Act)
NAHB	National Association of Home Builders
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NPS	National Park Service
NRD	Natural Resource Damage

NRDA	Natural Resource Damage Assessment
NWP	Nationwide Permit
NWPA	Northwest Power Act (Pacific Northwest Electric Power Planning and Conservation Act)
OPA	Oil Pollution Act
OSLTF	Oil Spill Liability Trust Fund
PAD	Pre-Application Document
PCTS	Public Consultation Tracking System (NMFS online database)
PME	Protection, Mitigation, and Enhancement
PSRPA	Park System Resources Protection Act
SHA	Safe Harbor Agreement
USDA	U.S. Department of Agriculture
WRDA	Water Resources Development Act

Executive Summary

I. BACKGROUND

Every year, human activities cause significant harm to fish and wildlife habitat and the environment. Many of the impacts to these natural resources are never addressed. In certain cases, however, federal, state, and local laws and programs can require monetary or in-kind compensation for these impacts, in an effort to at least partially offset the damage caused.

This report examines some of these compensatory mitigation programs at the federal level. For purposes of the report, “compensatory mitigation” is defined as the restoration, creation, enhancement, or preservation of natural resources to compensate for impacts pursuant to a regulatory program that: (1) prospectively issues permits or licenses for activities that affect fish and wildlife habitat or other natural resources; or (2) assesses after-the-fact damages for injury to, destruction of, or loss of habitat or natural resources.

For the most part, the funds collected to date to compensate for impacts under these federal laws are reactively allocated on a permit-by-permit or case-by-case basis, with minimal regard for how they might be used to piece back together the fabric of the biological landscape. However, a proactive tool has emerged with the potential to address this problem: each of the fifty states has developed a State Wildlife Action Plan that maps out ways to conserve fish and wildlife before they become more rare and too costly to protect. The state fish and wildlife agencies were required to develop these plans under federal legislation that established the Wildlife Conservation and Restoration Program and State Wildlife Grants Program. The plans provide scientific data and identify priorities for conserving fish and wildlife habitat – information that potentially could be used to direct the allocation of compensatory mitigation funds from other programs.

The objective of this report is two-fold. First, the report draws from available data to estimate, for the first time, an annualized dollar amount of damages to fish and wildlife habitat and the environment that are captured under the major federal compensatory mitigation programs. Second, the report highlights opportunities that may exist to use the fifty State Wildlife Action Plans to direct these compensatory mitigation funds in a manner that could support state, regional, or local conservation objectives; and, in so doing, to help conserve fish and wildlife species and biodiversity nationwide and over the long term.

II. DATA LIMITATIONS

In interpreting the dollar estimates provided in this report, it is critical to note that:

- For most federal programs, aggregate data on mitigation costs or requirements is not readily available or is incomplete. One recommendation of this report is that federal and state programs might routinely track their compensatory mitigation requirements and costs, in order to allow for a more accurate understanding of how these dollars are spent, and to ensure that adequate funds are devoted to repairing actual impacts to fish and wildlife habitat and the environment.

- Although this report represents the most comprehensive attempt to date to quantify the amount and cost of federally required compensatory mitigation in the United States, it was necessary to rely on incomplete data sets and on reasonable estimates derived through methodologies explained in this report. The data gaps and the assumptions used to compensate for them vary from program to program, and are explained at length in the program-specific chapters.

III. COST ESTIMATES

The report details ELI's estimate of the annualized dollar amount of damages to fish and wildlife habitat and the environment that is captured by key federal compensatory mitigation programs. In addition, this report briefly discusses a few other federal authorities that may relate to compensatory mitigation, although cost estimates for these are not provided. For each major federal program, this report provides an overview of the statute and how the program works in practice. It also describes data availability and limitations with respect to estimating the dollar amount of damages captured by each program.

Using the best available data and assumptions for each program, ELI estimates that the annualized cost of compensatory mitigation conducted under the key federal programs nationwide is approximately \$3.8 billion. In order to understand fully what this aggregate number represents, it is essential that readers review the individual program chapters. The following chart summarizes the program-by-program estimates:

Estimated Annual Compensatory Mitigation Costs Expended or Committed Under Major Federal Regulatory Programs	
<i>Regulatory Program or Authority</i>	<i>Cost Estimate (in millions)</i>
Clean Water Act Section 404	\$2,947.3
Endangered Species Act Section 10	\$370.3
Federal Natural Resource Damage Programs	\$87.7
Federal Power Act	\$210.3
Northwest Power Act	\$207.1
<i>Total:</i>	<i>\$3,822.7</i>

It is important to note that over \$2.9 billion of this \$3.8 billion – over 77 percent of the estimated annual amount of funds spent on compensatory mitigation – is generated through the mitigation requirements of Section 404 of the Clean Water Act. As a result, any efforts to direct mitigation monies toward protecting the critical fish and wildlife habitat identified in the State Wildlife Action Plans would most effectively focus on the Section 404 program. Section 404 is, however, driven by its own statutory requirements and programmatic goals, which are critical to take into account when considering whether and how these funds could be strategically directed for fish and wildlife conservation purposes. The statute-by-statute breakdown of these mitigation costs is summarized below:

- **Section 404 of the Clean Water Act/\$2.9 billion in FY 2003.** Clean Water Act Section 404, along with its supporting regulations and guidance, is the primary mechanism by which activities in wetlands and aquatic resources are regulated. Prior to issuing a Section 404 permit for discharges of dredged and fill material, the Corps of Engineers must determine

that potential impacts have been *avoided* “to the maximum extent practicable” and *minimized* “to the extent appropriate and practicable,”¹ and then ensure that any remaining impacts are *compensated* for “to the extent appropriate and practicable.”² ELI’s dollar estimate for Section 404 compensatory mitigation considers both wetland and stream mitigation. With respect to wetland compensation, the figures were aggregated from disparate data that reflect the inherent variability in mitigation costs due to regional location, the mitigation mechanism (permittee or third-party), and the different methods of mitigation used (such as creation, restoration, enhancement and preservation). The available data for stream compensation are less detailed, and do not account fully for these kinds of variables.

Working within these data constraints, and using FY 2003 as a baseline, ELI’s initial aggregate estimate of wetland mitigation costs across all regions of the country ranged between \$2.5 billion and \$4.4 billion, with a likely midpoint of approximately \$3.4 billion. Adjusting these estimates to account for the probable mix of different methods of wetland mitigation used then reduced the bottom-line range to approximately \$1.7 billion to \$3.1 billion, with a mid-range estimate of about \$2.4 billion. ELI further estimates that the total FY 2003 cost of stream mitigation was between \$179 million and \$955 million, with a likely mid-point of around \$573 million.

Combining the two estimates for wetland and stream mitigation suggests that the total amount spent on aquatic resource mitigation under Section 404 of the Clean Water Act in FY 2003 was between \$1.9 billion and \$4.0 billion, with a probable midpoint of around \$2.95 billion. As indicated, all of these estimates are based on specified assumptions and extrapolations from incomplete data, and should be viewed in that context. There is significant need for additional, reliable data that will enable a more full and accurate estimate of the total cost of aquatic resource mitigation.

- **Endangered Species Act/\$370.3 million committed annually between 2003 and 2006.** The Endangered Species Act (ESA) includes two sections that may require compensatory mitigation for impacts to the habitat of listed (threatened or endangered) species. Under ESA Section 7, all federal agencies are required to consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service (the Services) to ensure that any activities funded, authorized, licensed, or permitted by the agency will not jeopardize a species listed under the Act or adversely affect designated critical habitat for listed species. These consultations may result in mitigation requirements to compensate for allowed impacts.

Additionally, under ESA Section 10, non-federal entities may receive a permit from the Services for the “take” of listed species, provided that the take is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.”³ These incidental take permits

¹ See Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act, Section 404(b)(1) Guidelines, 55 Fed. Reg. 9210, 9211-12 (Mar. 12, 1990) [hereinafter Mitigation MOA], § II.C.

² *Id.*

³ ESA, 16 U.S.C. § 1539(a)(1)(B) (2000).

and their associated habitat conservation plans require that permittees minimize and mitigate their impacts to listed species and habitat “to the maximum extent practicable.”⁴

There are no specific data available for mitigation expenditures that may get undertaken as part of the vast scope of ESA Section 7 consultations. Data on mitigation costs associated with Section 10 habitat conservation plans and incidental take permits (HCP/ITPs) are available and more thorough, although they are not complete. ELI’s estimate for the annualized commitment of funds to compensatory mitigation under ESA is based on an examination of the 65 HCP/ITPs approved by FWS in the years 2003 through 2006. These HCP/ITPs required permittees to commit a total of \$1,481,345,433 in mitigation expenditures over the duration of the HCP/ITPs, for an average long-term commitment of \$370.3 million per year.

- **Natural Resource Damages/annual average of \$87.7 million.** Parties responsible for injuries to the environment, such as oil and chemical spills or leaks, may be held liable under one or more federal laws for the cost of removal and remedial actions, as well as the cost to restore the natural environment. Liability for natural resource damages (NRDs) includes the expenditures and/or services required to restore environmental functions.⁵ Depending on the source and location of the injury, NRDs may be assessed under any of five federal laws: the Comprehensive Environmental Response, Compensation, and Liability Act, the Clean Water Act, the Oil Pollution Act of 1990, the Park System Resources Protection Act, or the National Marine Sanctuaries Act. ELI’s dollar estimates for mitigation required for NRDs include both the costs of injury *assessment* and *restoration*.

The data on NRD settlements are relatively complete compared to other programs, which allowed ELI to consider a wide range of years (1997-2005) to produce an annualized average figure. These data, combined with data for a somewhat different range of years for the Oil Spill Liability Trust Fund, suggest that, on average, about \$87.7 million was expended annually for natural resource damages under federal programs.⁶

- **Federal Power Act/\$210.3 million committed annually between 2003 and 2006.** The Federal Energy Regulatory Commission (FERC) issues and renews licenses for more than 1,000 non-federal hydropower projects under the Federal Power Act. To receive an original license, renew an old license, or surrender a license, a hydropower project must comply with conditions designated by FERC, which may include environmental mitigation requirements. The mitigation actions that are mandated under a license typically include a mix of measures intended to prevent harm from occurring and to compensate for harm to fish and wildlife habitat.

The best available data on compensatory mitigation required by hydropower licenses come from Environmental Assessments (EAs) and Environmental Impact Statements (EISs) issued

⁴ 16 U.S.C. § 1539(a)(2)(B).

⁵ See VALERIE ANN LEE ET AL., THE NATURAL RESOURCE DAMAGE ASSESSMENT DESKBOOK: A LEGAL & TECHNICAL ANALYSIS [hereinafter NRD DESKBOOK] §1.2.1 (2002).

⁶ It is important to note that the annual amount recovered through NRD settlements fluctuates widely, and that large individual settlements may substantially change the total amount recovered in any specific year. For example, the *Exxon Valdez* oil spill resulted in an \$865 million settlement alone in 1991.

by FERC during the licensing process. During the years 2003 through 2006, FERC issued a total of 70 EAs and final EISs that itemized recommended mitigation measures. Aggregated, these EAs and EISs on average recommended an annual commitment of \$210.3 million to compensatory mitigation, including the cost of measures that would be spread out over the lifetime of the licenses.

- **Northwest Power Act/\$207.1 million.** Federal hydropower projects in the Columbia River Basin must comply with the Northwest Power Act (NWPA) which, in addition to encouraging the development and conservation of electric power, seeks to “protect, mitigate and enhance” fish and wildlife in the Columbia River and its tributaries. Under the NWPA, a Regional Conservation and Electric Power Plan must be developed that considers this goal. The Act also requires the development of a Fish and Wildlife Program, the purpose of which is to enhance fish and wildlife in the Columbia River Basin. The program is developed and implemented by the Pacific Northwest Electric Power and Conservation Council and the Bonneville Power Authority (BPA), and provides funding for specific projects that include protection, mitigation, and enhancement measures.

The data from BPA on the cost of hydropower project mitigation expenditures are comprehensive, and are detailed in annual reports issued by the Council. These compensatory mitigation expenditures averaged \$207.1 million per year during the years 2003 to 2005.

- **Other Federal Compensatory Mitigation Programs.** Several additional federal regulatory programs that are not covered in this study occasionally might include some type of compensatory mitigation activities. These programs were not analyzed or included in the totals because they did not consistently meet the criteria for program selection that EII developed for this study. For example, one-time, project-specific appropriations under the Water Resources and Development Act are not included, nor are the largely unenforceable mitigation requirements that sometimes emerge under process-oriented statutes and programs such as the National Environmental Policy Act and the Magnuson-Stevens Fishery Conservation and Management Act. These programs are outlined briefly in the report, but cost estimates for them are not included.

IV. STATE WILDLIFE ACTION PLANS

For each of these federal programs that require compensatory mitigation for impacts to fish and wildlife and the environment, the report identifies and discusses potential opportunities for utilizing the State Wildlife Action Plans to inform allocation of these funds. As a general matter, opportunities may exist under all of the programs to direct funds toward habitat conservation priorities identified in the Plans, while at the same time meeting the regulatory objectives laid out in the authorizing federal statutes and regulations. The specific avenues for applying the Plans vary by program, and are discussed in detail in the individual chapters.

For example, it may be possible to use State Wildlife Action Plans to integrate actions into Habitat Conservation Plans under the Endangered Species Act that address broader fish and wildlife conservation needs in addition to the explicit needs of the listed species, to achieve benefits for other at-risk species in the planning area. Similarly, in the area of Clean Water Act Section 404 mitigation, there is a growing effort to develop and use a “watershed approach” to guide compensatory mitigation

projects, a trend that may allow State Wildlife Action Plans to inform and influence the siting and design of federally permitted wetland and stream compensatory mitigation projects.

Although such opportunities exist to use the Plans to improve the effectiveness of compensatory mitigation programs, there also are inherent, program-specific limits on the extent to which the Plans can be used in this way. Notably, since compensatory mitigation *by definition* is intended to replace or restore specific resources that have been lost or damaged by a specific action, many federal programs restrict the siting and nature of mitigation projects to the affected area. For example, all federal natural resource damage statutes require that restoration be related to the specific injury, regardless of whether the restoration is conducted on-site or off-site. Similarly, under Section 404 of the Clean Water Act, the Corps of Engineers and EPA have historically had a number of policies that articulate the agencies' preference for conducting mitigation at the site of the impact, replacing lost aquatic resources with the same type of aquatic resources, utilizing restoration over other methods of compensation, and using preservation as a mitigation option only in "exceptional circumstances." Nevertheless, use of State Wildlife Action Plans to inform compensatory mitigation programs may hold significant promise for replacing impacts to fish and wildlife habitat and the environment in the United States.

Introduction

Human activities cause significant harm to fish and wildlife habitat and the environment through a variety of direct and indirect means. Habitat is often directly destroyed through activities such as agriculture, development, mining and other extractive practices, deforestation, over-harvesting, and contamination.⁷ Indirect impacts on habitat and natural resources from activities that fragment and degrade them, such as the presence of roads and power lines, can have equally detrimental (though more difficult to measure) effects on fish and wildlife.

Federal, state, and local laws regulate some, but far from all, of the direct impacts to habitat and the environment that occur each year. Some of these regulatory programs require compensation for impacts in an effort to offset the damage caused. Such provisions requiring compensatory mitigation for fish and wildlife impacts have been in effect for over 70 years. For example, the 1934 Fish and Wildlife Coordination Act required mitigation of impacts to fish habitat caused by federal agencies in constructing or permitting dams.⁸ Today, there are a wide range of programs that require compensatory mitigation for impacts to fish and wildlife habitat and the broader environment.

Mitigation of environmental impacts covers a wide array of requirements, including: (1) avoiding impacts to the maximum extent possible; (2) minimizing impacts; and (3) compensating for unavoidable impacts -- *compensatory mitigation*. For purposes of this study, “compensatory mitigation” is the restoration, creation, enhancement, or preservation of habitat to compensate for impacts pursuant to a regulatory program that: (1) prospectively issues permits or licenses for activities that will affect fish and wildlife habitat or other natural resources; or (2) assesses after-the-fact damages for injury to, destruction of, or loss of habitat or natural resources.

This definition is drawn from various other definitions, but primarily relies on compensatory mitigation definitions found in Clean Water Act Section 404 and natural resource damage laws, or similar terms under the laws and programs that are covered in this study.⁹ The definitions vary somewhat, but ELI strived to identify the common threads and choose a workable definition.

Some of the mitigation programs covered in this report, chiefly the Section 404 program, follow the avoidance-minimization-compensation structure set out in regulations developed by the federal Council on Environmental Quality to guide compliance with the National Environmental Policy Act of 1969.¹⁰ Others highlighted here, such as the natural resource damages programs, are retrospective rather than prospective: they attempt to capture and compensate for prior unauthorized impacts to the environment, rather than require mitigation for permitted impacts.

⁷ David S. Wilcove et al., *Leading Threats to Biodiversity: What's Imperiling U.S. Species*, PRECIOUS HERITAGE: THE STATUS OF BIODIVERSITY IN THE UNITED STATES (Bruce Stein et al. eds., 2000).

⁸ FWCA, 16 U.S.C. §§ 661-666c (2000); see NATIONAL RESEARCH COUNCIL, COMPENSATING FOR WETLAND IMPACTS UNDER THE CLEAN WATER ACT [hereinafter NRC (2001)] 61 (2001).

⁹ Under the Clean Water Act Section 404, wetland mitigation banking regulations, compensatory mitigation is defined as “the restoration, creation, enhancement, or in exceptional cases preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable impacts.” Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, 60 Fed. Reg. 58,605, 58,605-14 (Nov. 28, 1995). Natural resource damage laws require mitigation when natural resources are damaged or destroyed. For example, CERCLA holds parties liable for “injury to, destruction of, or loss of natural resources,” and the Oil Pollution Act holds parties liable for “damages for injury to, destruction of, loss of, or loss of use of, natural resources.”

¹⁰ Mitigation, 40 C.F.R. § 1508.20 (2007).

Using the best available data and reasonable assumptions for each selected program, EII estimates that the annualized cost of compensatory mitigation conducted under the key federal programs nationwide is approximately \$3.8 billion. For the most part, the funds collected to date to compensate for impacts under these federal laws are reactively allocated on a permit-by-permit or case-by-case basis, with minimal regard for how they might be used to piece back together the fabric of the biological landscape.

Tools may exist, however, to direct these federal funds in a more holistic manner that supports ongoing state, regional, or local conservation objectives. In particular, this report examines the opportunities presented by the recent issuance in all U.S. states and territories of comprehensive plans that articulate goals of the state fish and wildlife agencies and their conservation partners with respect to the actions needed to prevent fish and wildlife from becoming endangered. Congress created the Wildlife Conservation and Restoration Program and State Wildlife Grants Program in 2001 to support such state-level fish and wildlife conservation efforts. In order to receive funds through these new programs, each state was required to develop a State Wildlife Action Plan (technically known as a Comprehensive Wildlife Conservation Strategy), which is intended to help proactively conserve fish and wildlife before they become more rare and too costly to protect.¹¹

Although states were given significant discretion in crafting their Wildlife Action Plans, each plan is required to include eight common elements (see Box 1). As a result, there is some degree of consistency from state to state in what the plans cover, and every wildlife action plan identifies habitat conservation actions that will advance the needs of species at the greatest risk.

Box 1. State Wildlife Conservation Strategies: Eight Required Elements.
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<p>Congress identified eight required elements to be addressed in each state's wildlife conservation strategy. Congress also directed that the strategies must identify and be focused on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife-related issues. The strategies must provide and make use of:</p>
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- | |
|---|
| <ol style="list-style-type: none">(1) Information on the distribution and abundance of species of fish and wildlife, including low and declining populations as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's fish and wildlife; and,(2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1); and,(3) Descriptions of problems that may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors that may assist in restoration and improved conservation of these species and habitats; and,(4) Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions; and,(5) Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; and,(6) Descriptions of procedures to review the strategy at intervals not to exceed ten years; and, |
|---|

¹¹ Association of Fish and Wildlife Agencies, State Wildlife Action Plans, http://teaming.com/state_wildlife_strategies.htm (last visited July 16, 2007).

(7) Plans for **coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes** that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.

(8) Congress also affirmed through this legislation that **broad public participation** is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the "Species in Greatest Need of Conservation" that Congress has indicated such programs and projects are intended to emphasize.

Adapted from The International Association of Fish and Wildlife Agencies. *State Wildlife Conservation Strategies: Eight Required Elements* (Sept. 28, 2002), available at http://www.azgfd.gov/pdfs/w_c/cwcs/Guiding%20Principles.pdf.

For each of the programs included in this study, the opportunity exists to consider State Wildlife Action Plans in making decisions related to compensatory mitigation activities -- including how to direct mitigation funds to areas identified as priority fish and wildlife habitat -- while at the same time meeting the objectives laid out in their authorizing statutes and regulations. Clearly, doing so would require coordination among state fish and wildlife agencies and the federal agencies or other entities that oversee the allocation of mitigation funds. Yet despite the data constraints encountered by EII in conducting this study, the analysis suggests that existing compensatory mitigation programs in the United States generate significant sums that could hold considerable promise for supporting the coordinated protection of fish and wildlife habitat.

Chapter 1: Overview of Methodology

I. SELECTION OF PROGRAMS FOR REVIEW

A wide variety of federal requirements potentially could be considered “compensatory” mitigation, including, for example, regulatory actions, grant-making to compensate generally for impacts, congressional appropriations for mitigation projects, and court-ordered injunctive relief and other remedies. The focus of this effort is to estimate the dollar amounts captured by major federal programs each year to compensate for specific impacts to fish and wildlife habitat and the environment that are:

- In connection with a specific statutory mandate to undertake mitigation;
- Pursuant to a substantive, rather than procedural, regulatory requirement; and
- Part of a well-established regulatory program, as opposed to a one-time legislative, judicial, or regulatory action.

ELI selected these criteria in an effort to identify those ongoing regulatory programs that could benefit from and help achieve state fish and wildlife and habitat priorities over the long term. In addition, ELI included programs with well-established mechanisms for public participation and information sharing, as these mechanisms provide opportunities for introducing State Wildlife Action Plans into compensatory mitigation decision-making processes.

For these reasons, ELI excluded activities largely derived from congressional appropriations that fluctuate from year to year, because those mitigation funds and activities are not consistently mandated or funded over time. ELI similarly excluded *ad hoc* activities based on administratively or judicially ordered injunctive relief or supplemental environmental projects for violations of environmental laws such as the Clean Air Act or Clean Water Act, if those violations were not related to a specific statutory mandate for compensatory mitigation.¹² Finally, ELI did not evaluate compensatory mitigation activities that result from purely procedural requirements to assess environmental impacts, where it is difficult to assess the extent to which the proposed mitigation was actually required or carried through in the final project.

The included federal regulatory programs that issue permits with mitigation requirements are: the Clean Water Act (CWA), the Endangered Species Act (ESA), the Federal Power Act (FPA), and the Pacific Northwest Electric Power Planning and Conservation Act (NWPAA). In addition, the report includes natural resource damage (NRD) programs, which systematically impose liability for injuries to natural resources and require responsible parties to pay for or conduct mitigation activities, under the following statutes: the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Oil Pollution Act (OPA), the Clean Water Act, the National Marine Sanctuaries Act (NMSA), and the Park System Resources Protection Act (PSRPA) (see Box 2).

¹² Conversely, the report *does* cover judicial settlements and judgments under natural resource damage authorities in environmental laws, as such cases are based on specific statutory requirements to mitigate injuries to natural resources.

Box 2. Federal Statutes Reviewed In This Study.

(1) Regulatory Laws

- Clean Water Act (CWA)
- Endangered Species Act (ESA)
- Federal Power Act (FPA)
- Pacific Northwest Electric Power Planning and Conservation Act (NWPA)

(2) Natural Resource Damage Provisions

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Oil Pollution Act (OPA)
- Clean Water Act
- National Marine Sanctuaries Act (NMSA)
- Park System Resources Protection Act (PSRPA)

The following laws are not covered in this report in detail because they did not meet the selection criteria: the National Environmental Policy Act (NEPA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Natural Gas Act (NGA), and the Water Resources Development Acts (WRDAs). These laws are briefly summarized in Chapter 7, but cost estimates for them were not developed.

In addition, the report does not analyze other major federal regulatory programs that may undertake compensatory mitigation activities under the authority of laws that, for the most part, are otherwise accounted for here. For example, it does not separately evaluate compensatory mitigation conducted by the Federal Highway Administration under authority granted by NEPA, ESA, and the CWA, but either accounts for those activities under the relevant environmental statute, or excludes them under the criteria described above.

Finally, the report excludes compensatory mitigation mandates under state laws that are similar or related to the federal statutes covered in the report: for example, state natural resource damages laws, state endangered species acts, and state environmental policy acts.

Box 3. Statutes and Authorities Not Reviewed in this Study.

(1) Federal Laws and Authorities

- National Environmental Policy Act
- Magnuson-Stevens Fishery Conservation and Management Act
- Natural Gas Act
- Water Resources Development Acts
- Federal Land Policy and Management Act

(2) State Regulatory and NRD Laws

- State Natural Resource Damages Laws
- State Endangered Species Laws
- State Environmental Policy Acts ("Little NEPAs")

II. REPORT APPROACH, FORMAT, AND LIMITATIONS

For each included federal program, ELL:

- identified and summarized the statutory provisions and regulations that require compensatory mitigation;
- highlighted the available data sources for compensatory mitigation expenditures under these programs, the limitations of those data sources, and the assumptions employed to make calculations and fill gaps in the existing data;
- developed and summarized compensatory mitigation cost estimates based upon the data and information available through websites, agency reports, gray literature, and interviews with key personnel;
- for the Clean Water Act Section 404 program only, conducted primary survey research of all thirty-eight U.S. Army Corps of Engineers district offices; and
- examined each program to determine how and where State Wildlife Action Plans might be used to inform compensatory mitigation programs and possibly help target compensatory mitigation funds, and discussed programmatic limitations that may restrict the Plans' use.

The principal findings from ELL's research should be interpreted with the following considerations in mind:

- There are significant data gaps. For most programs, accurate data on mitigation costs are either not maintained or not publicly available. As a result, most of the cost estimates presented in this report rely on incomplete datasets and on estimates derived through methodologies and assumptions that are explained in detail in each chapter. Accordingly, these findings should be treated as ELL's professional estimates, based on the best data currently available. **Please refer to the appropriate report chapter for complete information on ELL's methodology and data limitations for each selected statute.**
- Although these data offer some indication of what may occur in a recent typical year, they are not necessarily an accurate predictor of mitigation trends. In some of the program chapters, additional analysis is provided that attempts to consider how typical or anomalous the datasets are relative to other years.

Chapter 2: Clean Water Act Section 404

I. PROGRAM SUMMARY

Clean Water Act Section 404, and its supporting regulations and guidance, are the primary mechanism by which the nation's wetland and aquatic resources are regulated. Authority for overseeing the program is split between the U.S. Army Corps of Engineers (the Corps) and the U.S. Environmental Protection Agency (EPA). CWA Section 404 permitting decisions are largely carried out by the Corps in one of its 38 district offices.

Two national goals guide the agencies' administration of the wetland program. The first is the Clean Water Act goal, enacted into law in 1972, of restoring and maintaining the "chemical, physical, and biological integrity" of the nation's waters.¹³ The second is the goal of "no overall net loss" of wetland acres and functions (often referred to as the "no net loss goal"), first announced in 1989.¹⁴ In the intervening years, EPA and the Corps have developed an array of rules and guidance to support the achievement of these goals.

A Memorandum of Agreement issued by EPA and the Corps in 1990¹⁵ (the "Mitigation MOA") lays out a three-part sequence that must be followed by the Corps when evaluating permits. Prior to issuing a Section 404 permit, the Corps must make a determination that potential impacts have been *avoided* "to the maximum extent practicable" and *minimized* "to the extent appropriate and practicable."¹⁶ Once potential impacts to wetlands and other aquatic resources are avoided and minimized, the remaining impacts must be *mitigated*, again, to the extent "appropriate and practicable."¹⁷ Compensatory mitigation is the third step of this three-step sequential mitigation process, which is designed to meet the goals of the Act and support the national policy of "no overall net loss" of wetland acres and functions.¹⁸

Currently, there are three primary mechanisms supported by the Corps and EPA for permittees to meet their compensatory mitigation obligations: (1) direct or "permittee-responsible" mitigation, (2) purchasing credits from a mitigation bank, or (3) making a payment to an approved "in-lieu fee" mitigation sponsor. The last two mechanisms are often referred to as third-party compensatory mitigation, since responsibility for conducting the actual compensation, and the liability for ensuring project success, generally is transferred to a party other than the permittee.

¹³ CWA, 33 U.S.C. § 1251(a) (2000).

¹⁴ See Mitigation MOA, *supra* note 1, at 9211. (Section II.B states, "The Corps . . . will strive to achieve a goal of no overall net loss of values and functions." Because no consensus currently exists on an effective and efficient method for evaluating functional replacement, the agencies most often rely on acreage as a surrogate.) See also U.S. Army Corps of Engineers, Regulatory Guidance Letter No. 02-2, at 4 (Dec. 24, 2002) [hereinafter RGL 02-2 (2002)]. ("In the absence of more definitive information on the functions of a specific wetland site, a minimum one-to-one acreage replacement may be used as a reasonable surrogate for no net loss functions.")

¹⁵ *Id.*

¹⁶ *Id.* at 9211-12. (§ II.C)

¹⁷ *Id.*

¹⁸ *Id.* at 9211. (§ II.B)

Over the past twenty years, significant attention has been paid to improving the effectiveness of compensatory wetland mitigation to ensure that the compensation being provided is ecologically effective, self-sustaining, protected in perpetuity, has “assurances of long-term sustainability and stewardship,”¹⁹ and ultimately meets the no net loss goal. The federal agencies have issued a variety of guidance documents on mitigation, including the 1990 Mitigation Memorandum of Agreement,²⁰ the 1995 Banking Guidance,²¹ the 2000 In-Lieu Fee Guidance,²² and the Corps’ Regulatory Guidance Letter No. 02-2.²³ In March 2006, EPA and the Corps issued a proposed rule on compensatory mitigation that sets out to establish “to an extent that is feasible and practical, equivalent standards for all forms of compensatory mitigation.”²⁴ The proposed rule, if finalized as it stands, would eliminate in-lieu fees as an option for providing compensatory mitigation.²⁵ The final rule may be issued by November 2007.

In sum, decisions about where aquatic resource compensation is located on the landscape, the type of wetland resources that are provided through compensatory mitigation, and the method used to replace lost aquatic resource functions, are all dictated by more than twenty-five years of federal policy.

1. The Role of Compensatory Mitigation Method

CWA Section 404 compensatory mitigation can also be accomplished through different means, or “methods”: creation, restoration, enhancement, or preservation (see Table 1 below for definitions). The agencies recognize that these various compensation methods differ in their ability to replace wetlands acres and functions and contribute to the no-net-loss goal. They have addressed these disparities through guidance that generally favors wetland restoration over the other compensatory mitigation methods.

¹⁹ See NRC (2001), *supra* note 8, at 9.

²⁰ See Mitigation MOA, *supra* note 1.

²¹ Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, 60 Fed. Reg. 58,605 (Nov. 28, 1995) [hereinafter Banking Guidance (1995)].

²² Federal Guidance on the Use of In Lieu Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, 65 Fed. Reg. 66,914 (Nov. 7, 2000) [hereinafter ILF Guidance (2000)].

²³ See generally RGL 02-2 (2002), *supra* note 14.

²⁴ Compensatory Mitigation for Losses of Aquatic Resources, 71 Fed. Reg. 15,520 (proposed Mar. 28, 2006) (to be codified at 33 C.F.R. pt. 325 and 332, and 40 C.F.R. pt. 230) [hereinafter Proposed Compensatory Mitigation Rule (2006)].

²⁵ *Id.*

Table 1. Compensatory Mitigation Methods. ²⁶	
<i>Creation (Establishment)</i>	<p>Definition: The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site where a wetland did not previously exist.</p> <p>No net loss role: Results in a gain in wetland acres.</p>
<i>Restoration</i>	<p>Definition: The manipulation of the physical, chemical, or biological characteristics of a site, with the goal of returning natural or historic functions to a former wetland.</p> <p>No net loss role: Results in a gain in wetland functions, and may or may not result in a gain in wetland acres.</p>
<i>Enhancement</i>	<p>Definition: The manipulation of the physical, chemical, or biological characteristics of a wetland (undisturbed or degraded) site to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes, such as water quality improvement, flood water retention, or fish and wildlife habitat.</p> <p>No net loss role: Does not result in a gain in wetland acres.</p>
<i>Preservation (Protection/Maintenance)</i>	<p>Definition: The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This term includes the purchase of land or easements, repairing water-control structures or fences, or structural protection such as repairing a barrier island.</p> <p>No net loss role: Does not result in a gain in wetland acres.</p>

²⁶ See RGL 02-2 (2002), *supra* note 14. (Definitions from RGL 02-2 (2002)).

For example, the 1990 MOA states that simple purchase or “preservation” of existing wetlands should not be considered adequate compensation except in “exceptional circumstances.”²⁷ The 1995 Banking Guidance reinforced this earlier position on preservation, but added that the Corps could allocate credits to preservation when it was conducted “in conjunction with restoration, creation or enhancement activities, and when it is demonstrated that the preservation will augment the functions of the restored, created or enhanced aquatic resource.”²⁸ In 2002, the Corps released guidance to the field reiterating these views.²⁹ The 2006 compensatory mitigation rule proposes to change the definition of compensatory mitigation to include the preservation of aquatic resources in “*certain* circumstances,”³⁰ which are specified in the rule. This may or may not lead to greater leeway in utilizing preservation than the current policy, which emphasizes the use of preservation only in “*exceptional*” (but unspecified) circumstances. It remains to be seen whether this definition will stand once the mitigation regulations are finalized.

Because each of the four compensatory mitigation methods contributes differently to the no-net-loss goal, the Corps takes the proposed compensation method into account when determining how much compensatory mitigation credit to assign to a project. Since restoration contributes to a net gain in wetland functions and/or acres, permittees generally are required to mitigate one acre of wetland loss with at least one acre (and frequently more) of wetland restoration. Wetland preservation, on the other hand, is not viewed as contributing to the overall goal of no net loss; as a result, permittees may be required to offset one acre of wetland loss with five, ten, or more preserved acres when relying upon preservation as the compensation method. The Corps also may require that preservation be used only in conjunction with other compensation methods that ensure that the no net loss goal is met.

The four compensatory mitigation methods also carry significant cost differentials. The primary costs related to preservation may be land acquisition, while creation may require significant earth-moving activities, planting, and the installation of water-control structures. Restoration and enhancement, on the other hand, involve manipulating conditions at existing or previously existing wetland sites, and therefore may carry fewer construction costs than creation. All methods of compensation face the same costs of long-term management, site protection and easement defense.

2. The Role of Compensatory Mitigation Location and Wetland Type

Federal wetland policy also plays a strong role in dictating where and what kind of wetland resources are put on the ground to replace lost aquatic resource functions. Because of the highly localized functions that aquatic resources and specific wetland and resource types provide to humans and the environment, federal wetland policy has established a general preference for compensatory mitigation to be conducted “on-site” – in reasonable proximity to the original acreage impacted – and “in-kind” – identical or comparable to the original resources lost.

On-site compensatory mitigation. The 1990 MOA, 1995 Banking Guidance, and 2002 Corps guidance letter have all used fairly consistent language to establish a preference that compensation be undertaken in areas “adjacent or contiguous” to the impact site.³¹ If the Corps determines that such on-site compensation is

²⁷ See Mitigation MOA (1990), *supra* note 1, at 9212. (§ II.C.3).

²⁸ See Banking Guidance (1995), *supra* note 21, at 58,607. (§ II.B.4).

²⁹ See RGL 02-2 (2002), *supra* note 14, at 4.

³⁰ See Proposed Compensatory Mitigation Rule (2006), *supra* note 24, at 15,525. (§ 332.2).

³¹ See, e.g., Mitigation MOA (1990), *supra* note 1, at 9211-12. (§ II.C.3). (“Compensatory actions . . . should be undertaken, where practicable, in areas adjacent or contiguous to the discharge site (on-site compensatory mitigation). If on-site

“impracticable,” or that off-site compensation would be “environmentally preferable,” federal guidance supports compensation at an off-site location.

This allowance for off-site compensatory mitigation was established primarily because of concerns that an undue preference for on-site compensation often led to the creation of numerous small compensation projects surrounded by development, some of which failed. There was also concern over the Corps’ ability to monitor the performance of multiple compensation sites scattered across the landscape. These concerns about on-site compensatory mitigation set the stage for the increasing prevalence of larger-scale mitigation banks and in-lieu fee arrangements. However, to ensure that local wetland functions continue to be replaced as close to the impact site as possible, the agencies have established a preference that even off-site compensation be located “in the same geographic area” as the impact site, and “to the extent practicable,” in the same watershed.³²

The 2006 compensatory mitigation rule, however, proposes to change the definition of “on-site” to compensation conducted “on the same parcel of land as the impact site, or on a parcel of land contiguous to or near the impact site.”³³ If this definition stands in the final rule, the change from “adjacent or contiguous” to “contiguous or near,” may mean that compensatory mitigation may be located further away from the impact site and still satisfy the “on-site” preference.

In-kind compensatory mitigation. Federal guidance has also established a clear preference for “in-kind” compensatory mitigation. In-kind compensation refers to compensation that replaces the lost aquatic resources with the same type of aquatic resources: for example, the replacement of forested wetlands with forested wetlands, rather than the out-of-kind replacement of forested wetlands with open-water wetlands.³⁴ The Corps’ 2002 guidance defines in-kind compensation as “compensation for a wetland loss [that] involves replacement of a wetland area by establishing, restoring, enhancing, or protecting and maintaining a wetland area of the same physical and functional type.”³⁵ The in-kind preference stems

compensatory mitigation is not practicable, off-site compensatory mitigation should be undertaken in the same geographic area if practicable (i.e., in close physical proximity and, to the extent possible, the same watershed.”). *See also* Banking Guidance (1995), *supra* note 21, at 58,611. (§ II.D.4). (“The agencies’ preference for on-site mitigation . . . should not preclude the use of a mitigation bank when there is no practicable opportunity for on-site compensation, or when use of a bank is environmentally preferable to on-site compensation.”); *and* RGL 02-2 (2002), *supra* note 14 at 4. (“Districts may require on-site, off-site, or a combination of on-site and off-site mitigation to maintain wetland functional levels within watersheds. Mitigation should be required, when practicable, in areas adjacent or contiguous to the discharge site (on-site compensatory mitigation) . . . [O]ff-site mitigation may be used when there is no practicable opportunity for on-site mitigation, or when off-site mitigation provides more watershed benefit than on-site mitigation, e.g., is of greater ecological importance to the region of impact. Off-site mitigation will be in the same geographic area, i.e., in close proximity to the authorized impacts and, to the extent practicable, in the same watershed.”).

³² *Id.*

³³ *See* Proposed Compensatory Mitigation Rule (2006), *supra* note 24, at 15,525. (§ 332.2 and § 230.92) (emphasis added).

³⁴ *See, e.g.,* Mitigation MOA (1990), *supra* note 1, at 9211. (§ II.C.3). (“Generally, in-kind compensatory mitigation is preferable to out-of-kind.”). *See also* Banking Guidance (1995), *supra* note 21, at 58,611. (II.D.5). (“In the interest of achieving functional replacement, in-kind compensation of aquatic resource impacts should generally be required. Out-of-kind compensation may be acceptable if it is determined to be practicable and environmentally preferable to in-kind compensation (e.g., of greater ecological value to a particular region.”); *and* RGL 02-2 (2002), *supra* note 14, at 4. (“Districts may require in-kind, out-of-kind, or a combination of in-kind and out-of-kind, compensatory mitigation to achieve functional replacement within surrounding watersheds . . . Out-of-kind mitigation is appropriate when it is practicable and provides more environmental or watershed benefit than in-kind compensation (e.g., of greater ecological importance to the region of impact).”).

³⁵ RGL 02-2 (2002), *supra* note 14, at 5.

largely from the desire to replace the same functions as those lost through the permitted activity; in other words, to achieve no net loss of aquatic resource functions.

The 2006 rule proposes to change the in-kind definition slightly, allowing compensation that is “structurally and/or functionally similar to the impacted resource type.”³⁶ If this revised definition stands, the slight change in terminology is unlikely to have a large impact on the in-kind preference.

3. Methodology for Estimating Expenditures on Aquatic Resource Compensation

For this study, ELI sought to estimate the total amount spent annually on aquatic resource compensatory mitigation under Section 404 of the Clean Water Act, including both wetland compensation and stream compensation, using fiscal year 2003 as a baseline. Unfortunately, the Corps does not currently have in place a national system for tracking the costs associated with compensatory mitigation. Attempts to calculate these statistics present a variety of complications.

Previous studies have demonstrated that the actual costs of individual wetland compensation projects may vary by several orders of magnitude, making it extremely difficult to compare costs across regions, wetland types, and compensatory mitigation methods employed or to draw more general conclusions.³⁷ And the sheer number of compensation projects conducted annually precludes any attempt to consider them individually; the Corps, for example, evaluated a total of 86,177 permits in fiscal year 2003 alone.³⁸ Instead, the present ELI study sought to estimate the aggregate annual amount spent on wetland and stream compensation, using data for fiscal year 2003 wherever possible.

In theory, these aggregate costs would be the product of the total acreage (for wetlands) or linear feet (for streams) of compensatory mitigation conducted nationwide in 2003, multiplied by the average cost of that compensation per acre or per linear foot. The Corps does maintain statistics on the *amount* of wetland compensation required in each Corps district and nationwide in each fiscal year. However, there are no similar data available for the number of linear feet of streams impacted or the amount of stream compensation required of permittees. Moreover, the agency does not currently track or assemble data on the *costs* associated with either the wetland or stream compensation it requires, nor are permittees required to report on the costs of satisfying their compensation obligations. These data limitations are significant.

Given these constraints, ELI’s approach strikes a middle ground between detailed project-specific data, which is largely unobtainable, and the Corps’ aggregate national data, which includes information on total acreage but does not include information on per-project or cumulative costs for compensatory mitigation. Focusing on the individual Corps districts, ELI used the Corp’s district-level data, primary data obtained from surveying the Corps district offices, and reasonable estimates for the average costs of wetland and stream compensation from other existing studies, to make an approximate calculation of the aggregate annual cost of Section 404-related compensatory mitigation nationwide.

³⁶ Proposed Compensatory Mitigation Rule (2006), *supra* note 23, at 15,525. (§ 332.2 and § 230.92).

³⁷ See D.M. KING & C.C. BOHLEN, U.S. DEPARTMENT OF ENERGY, THE COST OF WETLAND CREATION AND RESTORATION, Technical Report DOE/MT/92006-9 (DE95000174) (1995) [hereinafter KING & BOHLEN (1995)]; and BERGER AND ASSOCIATES, INC. COST FOR WETLAND CREATION AND RESTORATION PROJECTS IN THE GLACIATED NORTHEAST, EPA Contract No. 68-D5-0171 (1997) [hereinafter BERGER AND ASSOCIATES, INC. (1997)].

³⁸ U.S. Army Corps of Engineers, U.S. Army Corps of Engineers Regulatory Program: Regulatory Statistics FY03 [hereinafter Corps Regulatory Statistics FY03], <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/2003webcharts.pdf> (last visited July 16, 2007).

In compiling this estimate, ELL's analysis was affected by, and attempted to take into consideration, three factors that play particularly significant roles in determining the cost of compensatory mitigation projects: location of the compensation; the compensation method (creation, restoration, enhancement, or preservation); and the compensation mechanism (permittee-responsible, mitigation banking, or in-lieu fee compensation).

Location. Broadly defined, locational factors relate to the geographic region where a compensatory mitigation project is conducted. Locational considerations that affect compensation costs include geographic, hydrologic, and biotic factors, variable land costs, and land ownership patterns in the region where the project is carried out. Since the available data on acres of wetland compensation required annually is tracked by the Corps and reported at a district level, ELL's aggregate estimate derives from developing an estimate for the average cost per acre of wetland compensation in each of the Corps' 38 districts. Consequently, these results reflect some of the inherent regional differences in wetland compensation costs, but do not incorporate the cost effects of location-based factors that operate at the level of individual compensation sites, which may be significant.

Compensatory mitigation method. ELL also sought to account for the effects of compensatory mitigation method on average cost estimates, as well as the actual or probable mix of compensation methods used in each district. In the course of compiling the estimates, we encountered varying costs associated with compensation through the restoration of degraded wetlands, creation of new wetlands, enhancement of existing wetlands, or preservation of existing wetlands (see Table 1 for definitions). Many, if not most, aquatic resource compensation projects include a combination of these methods, but the method chosen may have a dramatic impact on average costs. For example, excluding land costs, King and Bohlen (1995) found that there was no statistically significant difference between the cost of wetland creation projects and the cost of wetland restoration projects, but that the cost of either of these compensation methods is approximately three times that of enhancement projects.³⁹

Compensatory mitigation mechanism. Finally, this study also attempted to factor into its cost estimates the compensatory mitigation mechanism employed. As discussed above, wetland compensation is generally performed either by the permittee or by a third party, usually a mitigation banker or an in-lieu fee provider. The compensation mechanism affects costs because it may affect the degree to which a compensation project can take advantage of economies of scale (mitigation banks generally encompass more acreage than do individual, permittee-responsible compensation projects), land acquisition costs associated with the project, and variable costs associated with project approval and regulatory oversight, among other factors. As a result, the cost of compensatory mitigation conducted through each mechanism may vary considerably.

Stream compensatory mitigation. Although stream compensation encompasses a significant portion of the Section 404 compensation conducted annually, it has generally received less study than wetland compensatory mitigation. Given the dearth of information on stream compensation, this study attempts to quantify the annual cost of stream compensation using the same methodology outlined above for wetland compensation. Since wetland and stream compensation are sometimes both required for a single permitted impact and may involve similar types of activities, the analysis presented in this report assumes that the costs of stream compensation are influenced by the same suite of variables that affect wetland compensation costs.

³⁹ See KING & BOHLEN (1995), *supra* note 37, at 10.

II. DATA

1. Cost Estimate Background

Previous studies evaluating the costs associated with wetland restoration and creation have found that the costs of these projects vary substantially across different parts of the country and different parcels of land. In 1995, a nationwide study commissioned by the U.S. Department of Energy found that costs for wetland restoration and creation projects varied by several orders of magnitude, ranging from \$5 per acre to \$258,800 per acre, excluding the cost of land acquisition.⁴⁰ A similar 1997 study that looked only at wetland restoration and creation projects in New England found that per-acre costs ranged from \$800 to \$1,426,000.⁴¹

A variety of factors influence the cost of wetland compensation projects. In their 1995 study, King and Bohlen concluded that the biggest determinants of project costs include overall size of the project, the amount of excavation necessary, whether off-site disposal of fill is required, and whether the site has any unique or unusual characteristics. They also found that project costs were only weakly linked to the type of wetland being constructed.⁴² The 1997 New England study found that primary factors influencing project costs included permitting, site selection, project goals and wetland types, construction costs, the cost of engineering plans, and monitoring costs.⁴³ Both studies found that wetland creation and restoration projects benefit from economies of scale. Overall, these two studies suggest that costs for any particular wetland project are determined by a suite of project-specific variables, which makes cost predictions and average costs very difficult to assess accurately.

2. Data Sources

Since there is no single source of data sufficient to allow an accurate calculation of the total annual cost of aquatic resource mitigation conducted in the United States under the Section 404 program, this study relies on a number of primary and secondary sources. By combining and reconciling the information available from these sources, ELI has attempted to formulate a comprehensive estimate of the nationwide costs associated with Section 404-related aquatic resource compensation.

PRINCIPAL DATA SOURCES:

- *ELI Survey of the Corps Districts*: In August 2005, ELI distributed a survey to all 38 U.S. Army Corps of Engineers districts. These surveys were completed by regulatory staff at each of the agency's district offices, and returned to ELI between August and October 2005. District staff were asked to provide estimates of the total costs associated with wetland and stream compensation projects in their districts and to provide supporting documentation, if available. They also were asked to estimate the percentage of required wetland and stream compensation that was satisfied through each of the four compensatory mitigation methods (restoration, creation, enhancement, and preservation), and through each of four compensatory mitigation mechanisms (permittee-responsible, mitigation banks, in-lieu fee programs, and "other" mechanisms). The district staff were requested to rely upon fiscal year 2003 (FY03) data if available. Finally, district staff were

⁴⁰ *Id.* at 9.

⁴¹ BERGER AND ASSOCIATES, INC. (1997), *supra* 37, at 54.

⁴² See KING & BOHLEN (1995), *supra* note 37, at 9.

⁴³ See BERGER AND ASSOCIATES, INC. (1997), *supra* note 37, at 54.

asked to verify and update a list of the active and pending mitigation banks, umbrella banking agreements, and in-lieu fee programs in their districts. These data were published separately in an April 2006 ELI study: *2005 Status Report on Compensatory Mitigation in the United States*.⁴⁴

All 38 Corps districts responded to ELI's survey, for a 100 percent response rate, and the districts all provided quantitative estimates of the compensatory mitigation methods and mechanisms used to satisfy compensation requirements. The districts also provided updated information on active mitigation banks, umbrella banking agreements, and in-lieu fee programs. Only 15 of the 38 Corps districts (39 percent), however, were able to provide any estimates of the costs of wetland compensation in their district, and only 8 of the 38 districts (21 percent) were able to provide stream compensation cost estimates.

Although incomplete, these cost estimates provided ELI with a baseline for calculating the costs of compensatory mitigation in the responding districts. They are, however, far from perfect. For several districts, it is unclear whether these estimates are based on empirical data or whether they represent the best professional judgment of the staff member who completed the survey. In addition, several districts noted that the costs of compensation can vary significantly even within districts, and many did not specify whether their cost estimates included land acquisition and transaction costs. Finally, many districts did not specify whether their estimate was based on a particular compensation method or mechanism, and none of the districts provided enough information to estimate the relative costs of different methods or mechanisms.

- *Data Collected by the Corps:* The Corps compiles annual statistics on the amount of wetland impacts requested and permitted in each district, and the amount of wetland compensation required in each district.⁴⁵ These statistics are subdivided between individual permits and general permits, and further differentiated between tidal and non-tidal impacts and mitigation. This ELI report relies primarily on the Corps' FY2003 statistics, the most recent year for which data are available and the year for which ELI asked the Corps districts to provide data in the corresponding ELI survey.

In 2005, the Corps conducted its own internal survey of the 38 districts to collect information about compensatory mitigation, as part of an Environmental Assessment being completed in support of the compensatory mitigation rule proposed in March 2006.⁴⁶ Included in this survey were questions about the price of wetland and stream credits from mitigation banks and in-lieu fee programs in each district. Due to varying response rates for these four questions, the Corps published their findings related to wetland credit prices as cost ranges for mitigation banks and for in-lieu fee programs at the divisional level. The Corps published their findings regarding stream credit prices as general ranges of prices at mitigation banks and in-lieu fee programs nationwide.⁴⁷

⁴⁴ JESSICA WILKINSON & JARED THOMPSON, ENVIRONMENTAL LAW INSTITUTE, 2005 STATUS REPORT ON COMPENSATORY MITIGATION IN THE UNITED STATES (2006) [hereinafter ELI, 2005 STATUS REPORT (2006)]. A sample of the survey and a searchable database of all the data collected from the Corps districts are available at <http://www2.eli.org/wmb/index.htm>.

⁴⁵ Although the Corps does track the amount of compensation required in each district, the agency has insufficient resources to evaluate how much of this required compensation is actually carried out, or whether the compensation conducted meets performance standards and is sustainable over time.

⁴⁶ See Proposed Compensatory Mitigation Rule (2006), *supra* note 24.

⁴⁷ STEVE MARTIN ET AL., COMPENSATORY MITIGATION PRACTICES IN THE U.S. ARMY CORPS OF ENGINEERS 10, (2006) [hereinafter CORPS WORKING PAPER (2006)]. See also U.S. ARMY CORPS OF ENGINEERS, DIRECTORATE OF CIVIL WORKS, DRAFT ENVIRONMENTAL ASSESSMENT AND

ADDITIONAL DATA SOURCES:

- In June 2006, ELI published a comprehensive report on in-lieu fee compensatory mitigation programs, based on research and interviews conducted from July 2005 through June 2006.⁴⁸ Eight of the 38 in-lieu fee programs were able to provide ELI with information on the actual prices charged for wetland credits. An additional 10 programs reported enough information to allow ELI to calculate the average price of wetland credits from these programs. Collectively, the data gathered from these programs provide information on the cost of in-lieu fee compensation in 17 of the 38 Corps districts.

In addition, two in-lieu fee programs provided data on the actual cost of stream compensatory mitigation credits purchased from the program, and seven programs provided information on the total amount of stream compensation conducted by the program.

- In January 2005, Montana Wetlands Legacy (MWL) released a report on the fee cost-basis for its Montana In-Lieu-Fee Aquatic Resources Mitigation Program. Although the purpose of this report was to establish the initial fee structure for MWL's in-lieu fee program, the report included and considered wetland and stream compensation cost estimates from twelve other states, which were compiled from a variety of primary and secondary sources.⁴⁹
- Siobhan Fennessy, Ph.D. of Kenyon College's Department of Biology, has conducted numerous studies on wetland restoration and compensation. One of her classes assembled an undated list of wetland credit prices charged by 26 mitigation banks in at least 10 Corps districts.⁵⁰
- The Minnesota Board of Water and Soil Resources has published a series of three reports on wetland compensation in Minnesota. The 2001-2003 Minnesota Wetlands Report includes statistics on the range of prices and average price per acre for wetland credits sold through the Minnesota Wetland Banking Program.⁵¹
- The Corps released a Final Programmatic Environmental Impact Statement (FPEIS) for its Nationwide Permits (NWPs) in 2002. The FPEIS included data on the number of acres of compensatory mitigation required by NWPs in 2000, and separated that compensation out by method (restoration, creation, enhancement and preservation).⁵²

FINDING OF NO SIGNIFICANT IMPACT, AND REGULATORY ANALYSIS FOR PROPOSED COMPENSATORY MITIGATION REGULATION, § 4.2.3 (Sept. 20, 2006), available at <http://www.epa.gov/wetlandsmitigation>.

⁴⁸ JESSICA WILKINSON ET AL., ENVIRONMENTAL LAW INSTITUTE, THE STATUS AND CHARACTER OF IN-LIEU FEE MITIGATION IN THE UNITED STATES (2006) [hereinafter ELI, IN-LIEU FEE STUDY (2006)].

⁴⁹ CURTIS KRUER, MONTANA WETLANDS LEGACY, DEVELOPMENT OF THE FEE COST-BASIS FOR IN-LIEU-FEE AQUATIC RESOURCE MITIGATION PROJECTS IN MONTANA 6-9 (2005).

⁵⁰ Siobhan Fennessy, Kenyon College, Mitigation Banks and Credit Prices in U.S., <http://biology.kenyon.edu/fennessy/envs93/banks.html> (last visited July 16, 2007).

⁵¹ DAVID WEIRENS, MINNESOTA BOARD OF SOIL AND WATER RESOURCES, 2001-2003 MINNESOTA WETLAND REPORT 100 (2005).

⁵² U.S. ARMY CORPS OF ENGINEERS, NATIONWIDE PERMITS FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT [hereinafter CORPS NATIONWIDE PERMIT FPEIS], Appendix G (2002).

- In 2001, ELI published *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States*,⁵³ which sought to catalog all the wetland mitigation banks, in-lieu fee programs, and umbrella banking agreements in the United States and to analyze trends in off-site compensatory mitigation. Although it did not specifically seek to study the costs of wetland compensation, the report did include cost ranges for the price of credits from mitigation banks and in-lieu fee programs where available. The mitigation bank credit prices reported in the study are considered in this report; however, the in-lieu fee program prices from *Banks and Fees* are not included here, because ELI's 2006 report included more recent and comprehensive data for those programs.
- In 1997, the U.S. Environmental Protection Agency, Region 1, released a report on the costs associated with specific wetland creation and restoration projects in the glaciated northeast. The report, compiled by Louis Berger and Associates, examined the costs incurred by 35 restoration projects and 40 creation projects throughout the northeastern region. Although the report did not attempt to calculate average costs of wetland restoration and creation, it did analyze the relative contributions of various factors to the overall cost of these projects, and reported the range of costs incurred for the projects considered by the study.⁵⁴
- In 1995, the Department of Energy published a study by Dennis King and Curtis Bohlen that included average per-acre costs for wetland creation, restoration, and enhancement projects.⁵⁵ Their report analyzed the influence of various factors on the costs of wetland creation and restoration projects, and reported average per-acre costs for projects involving nine different categories of wetlands.⁵⁶

3. Data Limitations

From the above sources, ELI was able to identify and analyze a broad range of data on the costs of aquatic resource compensatory mitigation. However, there remain significant shortcomings and gaps in the data, which limit the accuracy of the total annual cost estimate. As described below, we encountered further limitations in the data available for analyzing specific variables, such as the amount, location, or method of compensation, and the compensation mechanism used. Even so, ELI's efforts represent the most comprehensive attempt to date to estimate annual Section 404-related compensatory mitigation costs.

⁵³ JESSICA WILKINSON ET AL., ENVIRONMENTAL LAW INSTITUTE. *BANKS AND FEES: THE STATUS OF OFF-SITE WETLAND MITIGATION IN THE UNITED STATES* 199 (2002).

⁵⁴ See, e.g., BERGER AND ASSOCIATES, INC. (1997), *supra* note 37, at 54.

⁵⁵ See KING & BOHLEN (1995), *supra* note 37.

⁵⁶ Some statistics also are available on the costs associated with voluntary wetland restoration programs, such as the Wetlands Reserve Program administered by the U.S.D.A. Natural Resource Conservation Service and the North American Waterfowl Management Plan. Many of these projects, however, involve the conversion and restoration of marginal agricultural land. King and Bohlen found that these types of activities are significantly less expensive than all other types of wetland restoration and creation that were considered. Voluntary projects are also not subject to the same regulatory oversight as mitigation projects, which consequently may have significantly lower planning and monitoring costs. Because these voluntary projects may not accurately reflect the costs involved in regulatory wetland mitigation, this report does not utilize statistics from voluntary programs to inform wetland mitigation cost estimates.

AMOUNT OF COMPENSATORY MITIGATION

As stated earlier, though the Corps has available accurate statistics on the amount of wetland compensatory mitigation it *required* in FY2003, these data only represent the acreage required as part of permit and project approvals. The Corps does not maintain data on whether the amount of wetland compensation required was actually *carried out*, or whether, if carried out, it met performance standards and proved to be sustainable. In addition, some of the actual expenditures related to these compensation projects may have been spread out over the course of several years; and it is even possible that some of these projects were never carried out.⁵⁷ Thus, ELI's estimates are limited to the amount of compensation the Corps deemed necessary, but may not reflect what actually happened on the ground, and indeed may overstate actual expenditures.

Moreover, the Corps' own data do not include statistics on the total amount of *stream* compensation required or conducted, in FY2003 or in any other year – a significant data gap. ELI's attempts to estimate the total amount of stream compensation were complicated by differences in how stream impacts and mitigation are measured and reported. Most compensation programs and Corps districts measure stream compensation in linear feet, but a few use acreage. Other districts reported projects that involved a combination of linear feet of streams and acres of wetlands. By combining data from ELI's survey of the Corps districts and ELI's in-lieu fee study, this study provides an estimate the total amount of stream compensation in FY2003, but these numbers are neither as accurate nor as fine-grained as the data on wetland compensation.

Finally, Corps statistics on the amount of compensatory mitigation required in fiscal years 1999 through 2003 indicate that slightly less compensation was required in FY2003 than in any of the preceding four years. Over this five-year period, the amount of compensation required varied between 43,379 and 57,821 acres per year, and averaged about 47,244 acres per year.⁵⁸ As a result, the total cost estimates for FY2003 may be slightly lower than the average annual amount of required compensation. It should not be assumed that total cost estimates for aquatic resource compensation in FY2003 are representative of the amount that is spent on aquatic resource compensation in other years.

LOCATION OF COMPENSATORY MITIGATION

In this study, ELI compiled its aggregate cost estimates from district-level data for the individual Corps districts where the compensatory mitigation took place (see Methodology section above). Despite combining data from the Corps and other sources, however, this study still lacks district-specific wetland compensation cost estimates from 6 of the 38 Corps districts, and district-specific stream compensation cost estimates from 30 of the 38 Corps districts. For an additional five Corps districts, the only available wetland compensation cost estimates are sufficiently old, or divergent from cost estimates in nearby districts, that ELI considers those data suspect and has discounted them (see CWA Table 1).

To compensate for these limitations, the cost estimates for wetland compensation in districts with missing or insufficient data are informed primarily by the costs in neighboring districts. For stream compensation cost estimates, there is not enough available data to attempt district-level adjustments in stream compensation costs. The cost estimates that are available are confined to a relatively narrow range,

⁵⁷ See NRC (2001), *supra* note 8.

⁵⁸ See Corps Regulatory Statistics FY03, *supra* note 38.

however, so estimating the cost of stream compensation at the national level seems to be reasonable, and probably does not overlook large regional differences in the costs of stream compensation.

COMPENSATORY MITIGATION MECHANISM

Through surveying the Corps districts, ELI obtained estimated breakdowns of how much aquatic resource compensation in each district is conducted by the permittees, and how much through the purchase of credits from mitigation banks, through payment to in-lieu fee programs, or through other mechanisms. The districts, however, were not able to provide estimates of how the costs associated with these mechanisms differ. Combining data from alternative sources allowed ELI to estimate the relative prices of wetland credits from mitigation banks and in-lieu fee programs in the Chicago and Norfolk districts, as well as the difference in wetland credit prices between these two mechanisms nationwide based on average statistics compiled by the Corps.⁵⁹

For third-party compensatory mitigation, the nature of the compensation provider may significantly affect the price of aquatic resource credits in several ways. For example, a bank or in-lieu fee program administered by a public agency may be designed to charge permittees the actual costs of the compensation, or an approximation thereof. Other public programs may undercharge permittees and subsidize compensatory mitigation through other sources of public funds.⁶⁰ Privately run programs, however, generally include a profit margin that raises the price of credits above the actual costs related to generating those credits.

Another gap in the available data is the lack of statistics on the cost of permittee-responsible compensatory mitigation relative to other compensation mechanisms. Permittee-responsible compensation constitutes about 60 percent of all wetland compensation and about 82 percent of all stream compensation that was conducted nationwide in FY2003.⁶¹ Moreover, third-party compensation and permittee-responsible compensation are not directly comparable: the cost of permittee-responsible compensation is likely to vary considerably based on whether it requires the permittee to acquire additional land, the difficulty of engineering and constructing the compensation project, and the permittee's long-term obligations for monitoring and maintaining the project.⁶²

As a result of these factors, there is no available breakdown of the costs associated with permittee-responsible compensation and either the actual costs of providing third-party compensation or the price of credits from local third-party providers. Given the constraints of the data, ELI's aggregate estimate ultimately does not account for cost differences between the various compensation mechanisms.

COMPENSATORY MITIGATION METHOD

As with the compensatory mitigation mechanism data, the Corps districts were able to provide ELI with estimated breakdowns of the percentage of aquatic resource compensation satisfied through creation, restoration, enhancement, and preservation. They were not, however, able to provide estimates of how the

⁵⁹ Similar district-level comparative statistics are not available for stream mitigation, but statistics compiled by the Corps suggest that nationwide there is only a very small difference in the price of stream mitigation credits between mitigation banks and in-lieu fee programs.

⁶⁰ *E.g.* ELI, IN-LIEU FEE STUDY (2006), *supra* note 48, at 33-34.

⁶¹ See ELI, 2005 STATUS REPORT (2006), *supra* note 44, at 26-27.

⁶² Personal communication with U.S. Army Corps staff, U.S. Army Corps of Engineers, in Norfolk District, Va. (July 21, 2006).

costs of these compensation methods may differ relative to one another; nor do most other sources referenced in this study offer any specific data on the relative costs of these compensation methods. The varying amounts of planning and construction costs associated with the different methods of compensation suggest that creation would be the most expensive method of compensation, followed, in order, by restoration, enhancement and preservation. Other factors, such as land ownership and project size, may also significantly affect the costs of each compensation method in project-specific ways that cannot be easily predicted or modeled.

Of the sources considered by ELI, the only study to consider the relative costs of compensation methods was King and Bohlen (1995), which found that the costs of wetland creation and restoration projects did not differ significantly from one another; and that both of these compensation methods were, on average, about three times more expensive than enhancement projects.⁶³ This study did not examine stream compensation projects, and there are no data available about the relative costs of the different methods of stream compensation. Moreover, stream compensation methods are not as well defined as wetland compensation methods; compensatory mitigation programs and Corps districts may use different definitions for stream compensation methods, which makes comparisons between districts difficult.

VARIABILITY OF DATA

A final consideration in assessing the data in this report is that the cost estimates gathered may not be directly comparable, and may vary in their degree of precision. In ELI's survey of the Corps districts, many districts did not expressly specify whether their cost figures were best professional estimates or based on actual data. Likewise, many did not specify what compensation method and mechanism were used, and it is unclear whether many of the estimates include land costs. As a result, there are likely to be some inconsistencies in the data presented here. Whenever possible, ELI has attempted to use cost estimates that do include land costs, and that refer to the cost of restoration or creation credits generated by third-party compensatory mitigation providers – the most readily available data points – as the baseline form of compensation.

III. COST ESTIMATES

1. Wetland Compensatory Mitigation

As described above, ELI's estimates of the total annual cost of wetland compensation were aggregated from disparate data that reflect the inherent variability in compensation costs due to regional location, the method of compensation, and the different compensation mechanisms used. Within the constraints of the data gathered, the estimates below attempt to reflect the variability in costs due to regional location and compensation method; however, the paucity of data on the relative costs of various compensation mechanisms precluded detailed discussion of this factor.

⁶³ See KING & BOHLEN (1995), *supra* note 37, at 10.

COST ESTIMATES BY LOCATION

ELI's survey of the Corps districts and other data sources produced reasonably reliable data on the estimated cost of wetland compensatory mitigation in 27 of the 38 Corps districts.⁶⁴ These district-by-district data are presented in [CWA Table 1]. ELI formulated three estimates for the average per-acre cost of wetland compensation in each district, including a low-range estimate, a high-range estimate, and a mid-range estimate. The low- and high-range estimates are intended to define the full range within which the cost of compensation should fall in that district; while the mid-range estimate represents ELI's best assessment of what the average per-acre cost of compensation in the district is likely to be, based on ELI's best professional judgment and relying upon the limited data available (see CWA Table 2).

In the 11 districts for which cost data were not available, ELI's estimates are informed by the per-acre cost of compensation in nearby districts, especially nearby districts with similar geographic and ecological conditions (see CWA Table 1). ELI also considered the average cost of wetland compensatory mitigation reported by the Corps at the relevant *divisional* level, and combined these inputs to produce low-, mid-, and high-range per-acre cost estimates for the district.

Multiplying the low-, mid-, and high-range per-acre cost estimates for all 38 districts with the Corps' data on the total amount of wetland compensation required in each district in FY2003, ELI calculates that the total amount spent nationally on wetland compensation in FY2003 ranges between \$2.5 billion and \$4.4 billion, with a likely midpoint of approximately \$3.4 billion (see CWA Table 2).

COST ESTIMATES BY MECHANISM

Nearly 60 percent of all wetland compensatory mitigation nationwide is conducted by permittees themselves (see Figure 1).⁶⁵ However, much of the available data in CWA Tables 1 and 2 is based on cost estimates, price schedules, and actual sales of credits from third-party mitigation banks or in-lieu fee programs. ELI was unable to identify or generate separate data on the average costs of permittee-responsible compensation projects. It is reasonable to expect that, depending on the circumstances, some permittee projects will have costs quite similar to third-party compensation options, while others will have costs that are widely divergent from the costs of third-party compensation. For example, permittee-responsible compensation conducted on-site is likely to have fewer economies of scale and be more expensive than third-party compensation, whereas larger, off-site permittee compensation projects could well have costs similar to third-party compensatory mitigation. The Corps reported that in FY2003, 55 percent of permittee-responsible compensation took place on-site, 18 percent took place off-site, and 27 percent was a mix of on- and off-site.⁶⁶ Beyond this average, though, there is no reliable data on how the costs of compensatory mitigation vary when permittees conduct the mitigation, so ELI has relied on the available baseline data that primarily reflects third-party compensation costs, without further attempting to adjust cost estimates to allow for the prevalence of permittee-responsible compensation.

⁶⁴ This includes the Sacramento district, for which the survey yielded a single cost estimate from a mitigation bank in Colorado. Since a quarter of all the mitigation conducted in FY2003 took place in this district, a more comprehensive assessment of costs there might significantly change the estimate for the total cost of wetland mitigation.

⁶⁵ See ELI, 2005 STATUS REPORT (2006), *supra* note 44, at 27.

⁶⁶ See CORPS WORKING PAPER (2006), *supra* note 47, at 6.

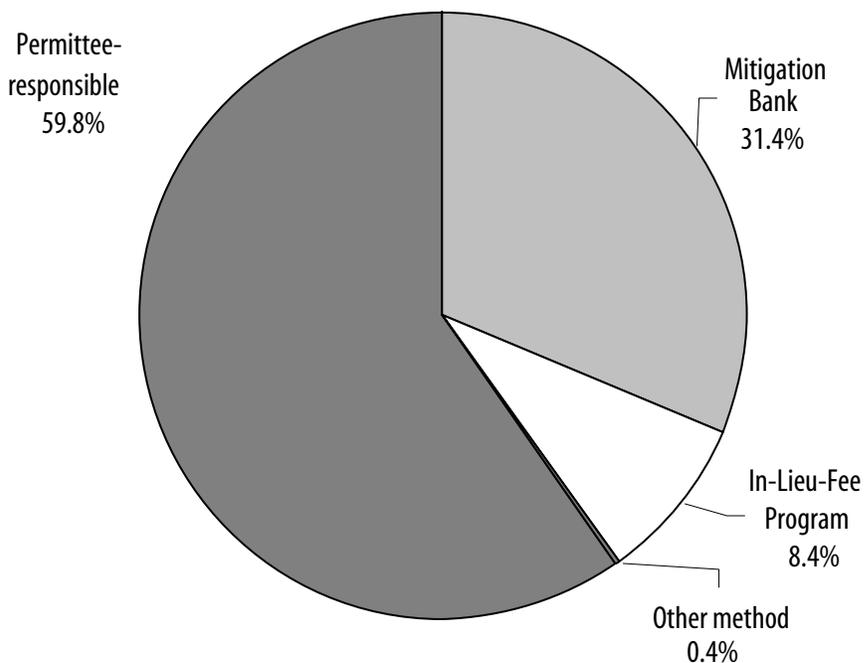


Figure 1. Wetland Compensatory Mitigation Mechanisms - Proportion of required wetland compensation nationwide (43,549 acres, FY03) satisfied by permittee-responsible compensatory mitigation, purchase of credits from a mitigation bank, payment to an in-lieu-fee program, and by other means.

COST ESTIMATES BY METHOD

Similarly, the cost data collected from the Corps districts were not sufficiently detailed to break down the actual wetland compensatory mitigation costs in each district by the method of compensation used. Instead, as noted above, the cost estimates in CWA Tables 1 and 2 assume that wetland restoration and creation are the baseline compensation methods.

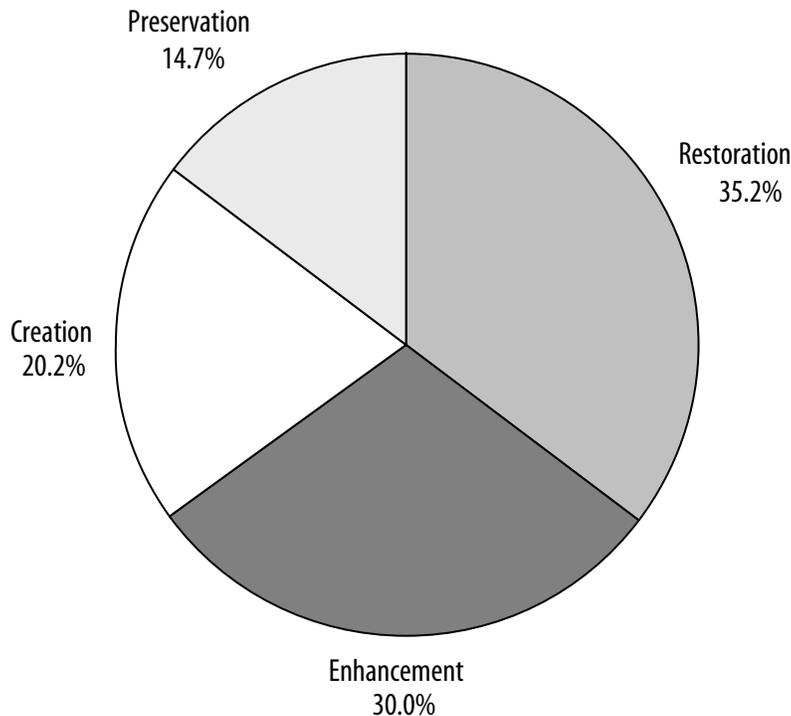


Figure 2. Wetland Compensatory Mitigation Methods - Proportion of required wetland compensatory mitigation (out of a reported 43,549 acres, FY03) accomplished nationwide through restoration, enhancement, creation and preservation, calculated as percentages of the total amount of compensatory mitigation.

The data submitted to ELI by the Corps districts indicate that preservation and enhancement account for approximately 45 percent of all compensatory mitigation conducted in FY2003 (see Figure 2). By comparison, the Corps' data on compensation conducted pursuant to nationwide permits in 2000 show that preservation and enhancement accounted for about 48 percent of that compensation,⁶⁷ which helps corroborate the 45 percent figure for FY2003.

The only study to consider relative costs of compensation methods, King and Bohlen (1995), found that restoration and creation costs were approximately the same, and that either was about three times the cost of enhancement;⁶⁸ but they did not consider the cost of preservation, which may entail a permanent conservation easement or the fee title purchase of the property. It can generally be assumed that preservation purchases should not cost any more than enhancement projects, since both include some sort of land transaction costs, and preservation generally does not require any initial physical changes to the property.

⁶⁷ See CORPS NATIONWIDE PERMIT FPEIS, *supra* note 52, at Appendix G.

⁶⁸ See KING & BOHLEN (1995), *supra* note 37, at 9-10.

Since preservation and enhancement overall are less expensive than restoration and creation, ELI's baseline cost estimate from CWA Table 2 should be reduced to account for their lower costs. Continuing to assume (based on the 1995 study) that these two compensation methods cost about two-thirds less than restoration and creation projects, the total cost estimate for FY2003 should be reduced by 30 percent (a 67 percent reduction in cost for the 45 percent of all wetland compensation that represents preservation and enhancement projects). This reduction yields a bottom-line range for the total cost of wetland compensatory mitigation in FY2003 of approximately \$1.7 billion to \$3.1 billion, with a mid-range estimate of about \$2.4 billion.

2. Stream Compensatory Mitigation

Estimating the dollar amount spent on stream compensatory mitigation is complicated by a lack of data on the total amount of stream compensation conducted in FY2003. Nearly all the Corps districts were able to provide estimates of the *percentage* of stream compensation conducted by each compensation mechanism and method (see Figures 3 and 4),⁶⁹ and 8 of the 38 districts (21 percent) provided ELI with an estimate for the *cost* of stream compensation. These district estimates ranged from \$75 to \$400 per linear foot (see CWA Table 1). Similarly, the Corps' own survey on the cost of stream compensation found that mitigation bank prices ranged from \$45 to \$400 per linear foot, and in-lieu fee prices ranged from \$15 to \$400 per linear foot.⁷⁰ Based on these data, and assuming that stream compensation projects are fairly evenly distributed along this cost continuum, ELI estimates that the average cost of stream compensatory mitigation ranges between \$75 and \$400 per linear foot, and probably averages about \$240 per linear foot.

⁶⁹ The Honolulu district reported no stream compensatory mitigation in FY2003, the New Orleans district does not track stream compensation separately from wetland compensation, and the Detroit district declined to provide estimates because little or no stream compensation was required in the district in FY2003.

⁷⁰ See CORPS WORKING PAPER (2006), *supra* note 47, at 10.

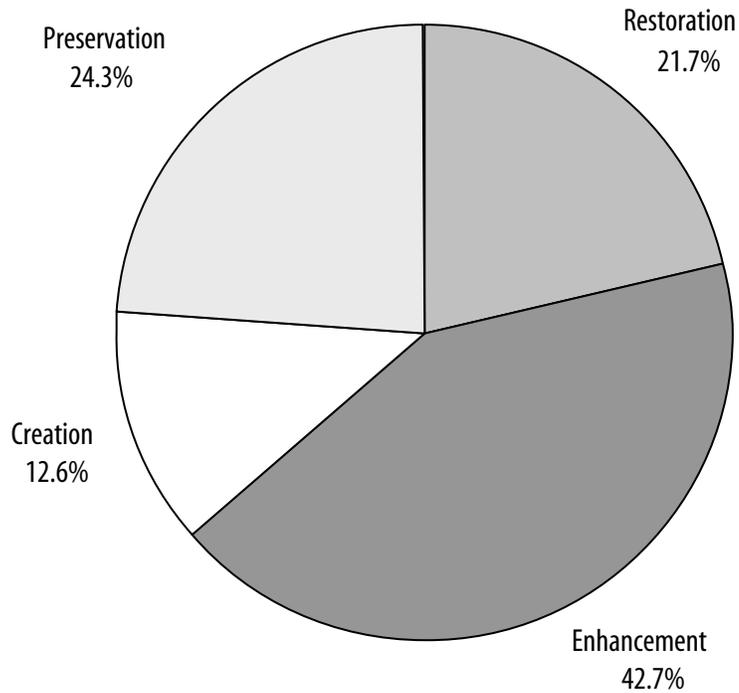


Figure 3. Stream Compensatory Mitigation Methods - Average proportion of required stream compensation accomplished through restoration, enhancement, creation and preservation in the 35 Corps districts that reported stream compensation data. (Wilkinson, Jessica and Jared Thompson. *2005 Status Report on Compensatory Mitigation in the United States*. Washington, D.C.: Environmental Law Institute, 2006.)

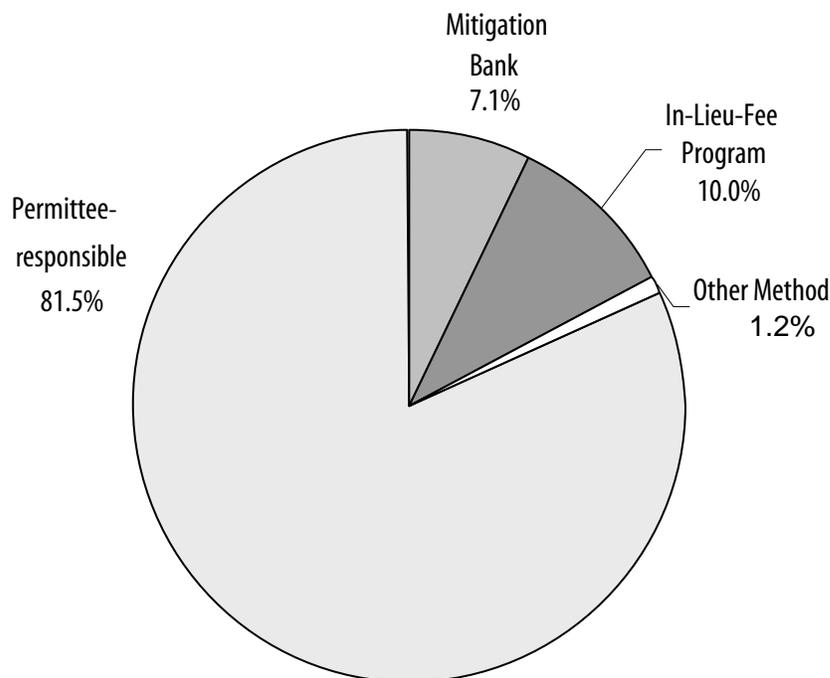


Figure 4. Stream Compensatory Mitigation Mechanisms - Average proportion of required stream compensation satisfied by permittee-responsible compensation, purchase of credits from a mitigation bank, payment to an in-lieu-fee program, and by other means as reported by 35 Corps districts that reported stream compensation data.

To estimate how much total stream compensatory mitigation is conducted annually, this report combines the data collected in ELI’s study of in-lieu fee programs with the Corps districts’ estimate that in-lieu fee programs account for about 10 percent of all stream compensation (see Figure 4, above).⁷¹ Seven of the in-lieu fee programs that ELI interviewed provided data on how much stream compensation they have conducted since their inception (see Table 2 below). Using these data and assuming that the stream compensation is evenly distributed over the entire life of each program, ELI calculates that these in-lieu fee programs collectively have performed at least 238,648 linear feet of stream compensation per year. This estimate is almost certainly low, since not all in-lieu fee programs that conduct stream compensation reported data, and at least one in-lieu fee program measures stream compensation in acres rather than linear feet.

⁷¹ See ELI, 2005 STATUS REPORT (2006), *supra* note 44, at 27.

Table 2. Stream Compensation Since Inception.⁷²

Program Name (Sponsor)	Total Amount of Stream Compensation (lf)	Time Period	Average Annual Rate of Stream Compensation (lf/year)
Georgia Wetlands Trust Fund (Georgia Land Trust Center)	32,207	1997-2005	3,579
In-Lieu-Fee Program for Stream & Wetland Mitigation (Kentucky Dept. of Fish and Wildlife Resources)	12,587	2003-2005	4,196
Stream Stewardship Trust Fund (Missouri Conservation Heritage Foundation)	5.05 acres of impacts	2003	N/A
Stream and Wetland In-Lieu Fee Program (North Carolina Ecosystem Enhancement Program)	1,552,575	1998-2005	194,072
Stream Corridor Restoration Fund (Northern Kentucky University)	17,800	1999-2005	2,543
Tennessee Stream Mitigation Program (Tennessee Wildlife Resources Foundation)	112,334	2002-2005	28,084
Virginia Aquatic Resources Trust Fund (The Nature Conservancy)	61,742	1995-2005	6,174
Total Average Annual Rate			238,648

Assuming that these in-lieu fee programs comprise about 10 percent of the total stream compensation, and that they conduct about 238,648 linear feet of stream compensation annually, ELI’s estimate of the total annual amount of stream compensation is 2,386,480 linear feet. Multiplying that figure by the per-foot cost estimates, the total amount spent annually on stream compensatory mitigation ranges from about \$179 million to \$955 million, and probably averages about \$573 million. These estimates are highly approximate, since they may overlook regional variation in stream compensation costs, they do not consider differing costs due to compensation method or mechanism, and they are based on a very rough estimate for the total amount of stream compensation conducted each year. Significant data compilation would be necessary to more accurately determine the annual amount of and costs associated with stream compensation.

3. Total Cost of Aquatic Resource Compensatory Mitigation

As detailed above, ELI’s initial aggregate total of the district-by-district data estimated that the total cost of wetland compensatory mitigation in FY2003 was somewhere between \$2.5 billion and \$4.4 billion, and probably approximately \$3.4 billion, assuming a baseline of third-party compensation through restoration or creation. Further adjusting these totals to account for the likely mix of different methods of wetland compensation used, including preservation and enhancement, reduced the range to approximately \$1.7 billion to \$3.1 billion, with a mid-range estimate of about \$2.4 billion. In addition, this report estimates that the total cost of stream compensation in FY2003 was between \$179 million and \$955 million, and

⁷² See ELI, IN-LIEU FEE STUDY (2006), *supra* note 48, at Appendix D. All data in this table are from the study.

probably somewhere around \$573 million. Combining the estimates for wetland and stream compensation suggests that the total amount spent on aquatic resource compensatory mitigation under CWA Section 404 in FY2003 was somewhere between \$1.9 and \$4.0 billion, and was probably approximately \$2.9 billion (see Table 3). Again, however, it is important to note that all of these cost estimates are based on incomplete data, and are therefore approximate. There is a great need for additional, reliable data if the total cost of aquatic resource compensation required under Section 404 is to be calculated more accurately.

	Low Range Estimate	Mid Range Estimate	High Range Estimate
Wetland compensation considering location and method	\$1,736,225,692	\$2,374,275,829	\$3,054,974,484
Stream compensation	\$179,000,000	\$573,000,000	\$955,000,000
Grand Total (wetland compensation considering location and method and stream compensation):	\$1,915,225,692	\$2,947,275,829	\$4,009,974,484

IV. STATE WILDLIFE ACTION PLANS

1. Program Opportunities

As discussed in the Program Summary above, existing mitigation rules and guidance have long been designed to support the Clean Water Act and to achieve the goal of no net loss of wetland acres and functions. Some opportunities exist for the federal mitigation program to encourage permittees to use State Wildlife Action Plans to identify compensation project sites that will both meet the Section 404 goals, and help protect or restore fish and wildlife habitat.

Perhaps the most promising opportunities related to the Section 404 program lie with compensatory mitigation rules that were proposed in March 2006 and are expected to be finalized in 2007. In 2001, the National Research Council issued an influential study on compensatory mitigation that has had a profound impact on the development of federal mitigation policy. The study, *Compensating for Wetland Losses under the Clean Water Act*, offered 26 recommendations for improving federal compensatory mitigation.⁷³ One of the report’s most influential recommendations was that the federal program move away from an automatic preference for on-site and in-kind compensation, and toward making site selection decisions that “follow from an analytically based assessment of the wetland needs in the watershed and the potential for the compensatory wetland to persist over time.”⁷⁴

This recommendation was embraced by the Corps in a 2002 Regulatory Guidance Letter.⁷⁵ The proposed compensatory mitigation rule further supports the use of the watershed approach by encouraging permittees to identify “locations of compensatory mitigation activities that would best serve the watershed,”⁷⁶ and thus may provide opportunities for State Wildlife Action Plans to help guide compensatory mitigation decision-making.

⁷³ See NRC (2001), *supra* note 8.

⁷⁴ *Id.* at 4.

⁷⁵ See RGL 02-2 (2002), *supra* note 14.

⁷⁶ See Proposed Compensatory Mitigation Rule (2006), *supra* note 24, at 15,523-24. (§ III).

The proposed rule expressly states that the district engineer must “use a watershed approach to establish compensatory mitigation requirements...to the extent appropriate and practicable.”⁷⁷ It offers two alternative circumstances under which the watershed approach can be applied:

- In the first circumstance, a watershed plan is already in existence and the watershed approach is based on the existing plan. The proposed rule defines this approach as one that is “based on a formal watershed plan, developed by Federal, state, and/or local environmental managers in consultation with affected stakeholders.”⁷⁸
- In the second circumstance, a watershed plan does not currently exist. However, the proposed rule states that in such circumstances, “the watershed approach may be based on a structured consideration of watershed needs and how wetland types in specific locations can fulfill those needs.”⁷⁹

In either case, the rule states that the watershed approach to compensatory mitigation should consider, among other things, “*habitat requirements of important species...*, as well as the requirements of other regulatory and non-regulatory programs that affect the watershed, such as...*habitat conservation programs.*”⁸⁰ This language could allow for State Wildlife Action Plans to become a basis for the habitat analysis, and the final rule could expressly encourage or require the consideration of these plans.

The proposed rule further describes the type of information on watershed conditions that should be utilized in either of the above circumstances. The proposed rule states that such information includes:

Current trends in habitat loss or conversion, cumulative impacts of past development activities, current development trends, *the presence and needs of sensitive species*, site conditions that favor or hinder the success of mitigation projects, chronic environmental problems such as flooding or poor water quality, and local watershed goals and priorities. This information may be contained in an existing watershed plan *or may be available from other sources.*⁸¹

The rule could specify that State Wildlife Action Plans must be the source for information on the presence and needs of sensitive species, or that the plans should be considered.

In the definitions section, the proposed rule states that a “watershed plan” is, among other things, a plan that is “developed by federal, tribal, state, and/or local government agencies, in consultation with relevant stakeholders.” It also states that watershed plans are those that identify priority sites for aquatic resource restoration and protection. It goes on to say: “Examples of watershed plans include special area management plans, advance identification programs, and watershed management plans.”⁸² The rule could include State Wildlife Action Plans among the examples listed.

The preamble to the proposed rule (Section III, pages 15,523-15,524) also states that:

⁷⁷ *Id.* at 15,525-26. (§ 332.3(c) or § 230.93(c)).

⁷⁸ *Id.* at 15,523. (§ III).

⁷⁹ *Id.*

⁸⁰ *Id.* at 15,525. (§ 332.3(c)(2)(i) or § 230.92(c)(2)(i)) (emphasis added).

⁸¹ *Id.* at 15,525. (§ 332.3(c)(3) or § 230.92(c)(3)) (emphasis added).

⁸² *Id.* at 15,525-26. (§ 332.3 or § 230.92).

A watershed approach to compensatory mitigation involves a regional or landscape perspective, and should involve consideration of Federal, Tribal, *state*, community, and private *interests, including the requirements of other programs and objectives, such as habitat conservation, storm water management, flood control, pollution prevention, and economic development* when determining compensatory mitigation requirements for [Department of the Army] permits.⁸³

Thus, the State Wildlife Action Plans – available in all fifty states – could provide a sound basis for many of the sensitive species and habitat considerations that are to be included in the watershed approach. In circumstances where a formal watershed plan does not exist, EPA and the Corps could require or encourage the consideration of the Wildlife Action Plans, along with information from other appropriate sources.

2. Program Limitations

As discussed above, existing mitigation rules and guidance are designed to support the Clean Water Act goals and to achieve “no net loss” of wetland acres and functions. If Corps districts do not have a functional assessment method available to ensure that aquatic resource *functions* are being replaced, the agency is required to ensure that a minimum one-to-one *acreage* replacement ratio is used.⁸⁴ Because of this need to replace lost aquatic resource functions acre for acre, preservation of wetlands has long been discouraged as a compensation method. With the appropriate real-estate instruments in place, preservation provides significant assurances that valuable wetland acreage will be protected in perpetuity. It does not, however, *replace* lost wetland acreage, and therefore contributes to a net loss of wetland acreage.⁸⁵

As discussed earlier, existing policy also has created a preference for compensatory mitigation to be conducted on-site and in-kind, followed by a preference for off-site and in-kind when it is determined to be environmentally preferable. This preference affects the agencies’ flexibility to locate compensation projects to suit the conservation priorities of different programs. Using mitigation requirements to support preservation of non-wetland acreage (i.e., uplands) or to restore riparian buffers in compensation for a different wetland type would result in net loss of wetlands. In other words, funds generated by the Section 404 mitigation program cannot simply be diverted to serve other conservation priorities, unless those priorities also support the no-net-loss goal.

Although the watershed approach articulated in the proposed rule, if formally adopted, would open the door for greater flexibility in compensation site selection, that flexibility will continue to have some constraints. The Corps has limited ability to require a watershed analysis in the site-selection process, or to direct compensation projects to specific sites. In the case of permittee-responsible compensation and mitigation banking, site selection is at best a passive exercise on the part of the Corps. Although Corps districts undoubtedly provide significant advice on selecting sites, the agency does not have the authority in the permitting and mitigation plan approval process to direct compensation providers – either permittees or bankers – to locate compensation projects in areas that are deemed ecologically desirable in a watershed plan or through watershed-based analysis.

⁸³ *Id.* at 15,523. (§ III) (emphasis added).

⁸⁴ See Mitigation MOA, *supra* note 1, at 9212-9213. (§ III.B). See also ILF Guidance (2000), *supra* note 22, at 66,916. (§ IV(A)(7)); and RGL 02-2 (2002), *supra* note 14, at 3. (§ 2(d)(4)).

⁸⁵ See Banking Guidance (1995), *supra* note 21, at 58,608-09. (§ II.B.4). See also ILF Guidance (2000), *supra* note 22, at 66,916, (§ IV(A)(6)); and RGL 02-2 (2002), *supra* note 14, at 4, (§ 2(f)).

Because the primary objective of the private mitigation banker is to provide compensation on demand to clients (preferably in a way that will maximize profits), and an objective of the permittee is to minimize expenses, neither may have an incentive to explore analytical, watershed-based site selection or to rely upon other kinds of plans. In contrast, in-lieu fee programs, depending upon the conservation objectives of the program sponsors, may have a significant incentive to do so. Many of these same constraints exist under the current regulatory program, absent any consideration of the proposed rule. Current mitigation policy strongly encourages the federal agencies to meet the no-net-loss goal. Compensatory mitigation projects and policies that do not contribute to replacing lost aquatic resource functions will not contribute to the Corps' no-net-loss goals on a project-specific or programmatic basis.

CWA APPENDIX: COST ESTIMATE DATA BY CORPS DISTRICT

CWA Table 1. Available data for formulating cost estimates.									
Corps District	Clean Water Act Section 404 Aquatic Resource Compensatory Mitigation Cost Estimates								
	Wetland Cost Estimate Sources					Stream Cost Estimate Sources			
	Wetland costs reported by the Corps districts to ELI	Corps District Data Average	ELI Regional Estimate ⁸⁶	Corps Division Average	MT Report (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	Kenyon (MB prices per acre)	Banks & Fees (MB prices per acre unless noted)	Stream costs reported by the Corps districts to ELI
Alaska	\$15,000/acre (preservation)	\$15,000	\$15,000			\$3,800-\$3,900, \$500			\$235.00/foot (restoration)
Albuquerque	not available		\$40,000	\$229,500	\$80,000 (Colorado)				not available
Baltimore	\$3,000/acre to \$37,000/acre (not including land acquisition) ⁸⁷	\$50,000 ⁸⁸		\$183,000		\$11,776 (Pennsylvania); \$11,000 to \$58,000 (Maryland)			\$250/linear foot
Buffalo	\$16,000 to \$65,000/acre (bank prices)	\$40,500		\$29,280					\$75 to \$200 per linear foot (restoration/creation)
Charleston	not available		\$35,000	\$36,288				\$1,000 ⁸⁹	not available

⁸⁶ For districts that did not report data in response to ELI's survey, ELI formulated a cost estimate based on the costs reported in nearby districts with similar geography and hydrology.
⁸⁷ Ranges from \$3,000/acre for nontidal wetland restoration up to \$37,000/acre for nontidal wetland creation (not including land acquisition).
⁸⁸ This estimate attempts to include land acquisition costs, using the \$25,000 per acre for land acquisition reported by the Philadelphia district to adjust the cost estimates reported from the Baltimore district.
⁸⁹ Cost estimates marked with an asterisk are included here to indicate that the report authors are aware of them but were not included in ELI's analysis of average costs because they are highly divergent from other cost estimates reported in the district or in similar districts.

Corps District	Clean Water Act Section 404 Aquatic Resource Compensatory Mitigation Cost Estimates										Stream Cost Estimate Sources
	Wetland Cost Estimate Sources					Wetland Cost Estimate Sources					
	Wetland costs reported by the Corps districts to ELI	Corps District Data Average	ELI Regional Estimate ⁸⁶	Corps Division Average	MT Report (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	Kenyon (MB prices per acre)	Banks & Fees (MB prices per acre unless noted)			Stream costs reported by the Corps districts to ELI
Chicago	not available		\$52,500	\$29,280	\$40,000- \$43,000 (ILFs); \$40,000-60,000 (MBs)	\$175,000 (reported price) to \$281,000 (price calculated from data) (DuPage County)	\$45,000, \$45,000, \$65,000, \$80,556, \$95,500, \$65,000 to 100,000	\$9,000, \$50,000, \$60,000, \$65,000, \$80,556, \$95,500, \$106,000			not available
Detroit	\$40,000 to \$80,000 (Michigan, northern Indiana) ⁹⁰	\$60,000		\$29,280							not available
Fort Worth	not available		\$64,000	\$13,704							not available
Galveston	not available		\$30,000	\$13,704			\$25,000/ credit (0.9 acres)				not available
Honolulu	not available										not available
Huntington	\$16,000 to \$30,000 (bank prices)	\$23,000		\$29,280		\$80,000	\$16,000	\$15,000			\$100/foot (in-lieu fee price)
Jacksonville	not available		\$88,000	\$36,288	\$88,000 (Florida)	\$85,000 (price calculated from data) to \$90,219 (reported price)	\$65,000	\$10,000,* \$5,553,* \$1,800*			not available
Kansas City	\$50,000 to \$80,000/acre	\$65,000		\$33,250		\$48,800					\$68,269.32 (in-lieu fee) ⁹¹
Little Rock	not available		\$30,000	\$13,704		\$48,800					not available
Los Angeles	\$125,000/acre for southern and central California.	\$125,000		\$229,500	\$77,889 (ILF)	\$10,000, \$11,000, \$21,000, \$124,000, \$129,000					not available

⁹⁰ Costs for fairly large wetland mitigation projects (25 acres or more)

⁹¹ Based on 5.05 acres of impacts in 2003. Most impacts are less than 1/3 acre.

Corps District	Clean Water Act Section 404 Aquatic Resource Compensatory Mitigation Cost Estimates										Stream Cost Estimate Sources
	Wetland Cost Estimate Sources					Wetland Cost Estimate Sources					
	Wetland costs reported by the Corps districts to ELI	Corps District Data Average	ELI Regional Estimate ⁸⁶	Corps Division Average	MT Report (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	Kenyon (MB prices per acre)	Banks & Fees (MB prices per acre unless noted)			
Louisville	not available		\$25,000	\$29,280						not available	
Memphis	not available		\$30,000	\$36,340		\$48,800	\$45,000	\$2,300*		\$200/foot of impact	
Mobile	not available		\$30,000	\$36,288			\$5,800*			not available	
Nashville	not available		\$30,000	\$29,280				\$12,000,* \$17,000*		not available	
New England	\$75,000/acre for restoration/creation (not including land costs)	\$100,000		\$183,000						not available	
New Orleans	not available		\$10,000	\$36,340						not available	
New York	\$100,000 - \$150,000/acre (creation)	\$125,000		\$183,000		\$117,000				not available	
Norfolk	\$16,000-\$20,000; \$55,000-\$100,000- 140,000; \$350,000/credit (or acre) ⁹²	\$97,500		\$183,000		\$114,000/acre (Virginia Aquatic Resources Trust Fund)		\$6,580*		\$144 to \$400/linear foot	
Omaha	\$60,000 to 66,000/acre	\$63,000		\$33,250		\$38,000	\$85,000			not available	

⁹² Palustrine mitigation credit prices (credits are approximately equivalent to acreage) at approved mitigation banks in Virginia range from \$16,000-\$20,000 in the Chowan Basin; \$55,000 in the James River watershed; \$100,000-140,000 in the Rappahannock and Potomac watersheds. Estuarine wetland mitigation bank prices currently average \$350,000/credit (or acre). The average cost of \$97,500/acre was calculated by averaging the cost estimates of \$55,000/acre and \$140,000/acre, which ELI assumes to define the range within which the cost of most mitigation projects would fall.

Corps District	Clean Water Act Section 404 Aquatic Resource Compensatory Mitigation Cost Estimates										Stream Cost Estimate Sources	
	Wetland Cost Estimate Sources					Banks & Fees						
	Wetland costs reported by the Corps districts to ELI	Corps District Data Average	ELI Regional Estimate ⁸⁶	Corps Division Average	MT Report (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	Kenyon (MB prices per acre)	Kenyon (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	MT Report (MB prices per acre unless noted)	Banks & Fees (MB prices per acre unless noted)	Stream costs reported by the Corps districts to ELI
Philadelphia	\$100,000/acre for creation (not including land costs) ⁸⁵	\$125,000		\$183,000	~\$15,000 (Pennsylvania ILF)	\$11,776/acre (Pennsylvania)	\$86,500, \$105,000, \$140,000, \$150,000, \$150,000, \$150,000 (New Jersey)					not available
Pittsburgh	not available		\$25,000	\$29,280	~\$15,000 (Pennsylvania ILF)	\$11,776/acre (Pennsylvania)						not available
Portland	not available		\$60,000	\$33,250			\$30,000	\$4,500 (MB); \$18,100-77,900/acre (ILF) ⁸⁴				not available
Rock Island	not available		\$40,000	\$36,340			\$35,000, \$45,000-65,000	\$20,000				not available
Sacramento ⁸⁵	not available		\$150,000	\$229,500	\$80,000 (Colorado)	\$35,000/acre (Sacramento County)		\$25,600				not available
San Francisco	\$32,000/acre	\$32,000	\$35,000	\$229,500				\$32,670				not available
Savannah	not available		\$35,000	\$36,288				\$5,000*				not available

⁸³ The Philadelphia district reported that land acquisition costs are charged at \$25,000 per acre unless more specific data are available. ELL's average cost estimate for the district adds this amount to the cost estimate reported by the district.

⁸⁴ In-lieu fee prices were reported to be \$18,100/acre salt marsh, \$48,700/acre freshwater emergent wetland, and \$77,900/acre freshwater forested wetland.

⁸⁵ Because the Sacramento district required over a quarter of all wetland mitigation nationwide in FY2003, ELL sought additional sources of cost data for this district. District regulatory staff reported that, as of April 2007, the district's in-lieu fee program charges \$110,000/acre for seasonal wetland, perennial marsh, riparian marsh and open water credits; \$134,000/acre for riverine wetland credits; \$151,000/acre for riparian wetland credits; \$171,000/acre for vernal pool credits; and \$183,000/acre for shallow water marsh credits. District staff also reported that one of the larger mitigation banking companies in the district, Wildland, Inc., charges about \$150,000/acre for most types of wetland credits and about \$300,000/acre for vernal pool credits. (Personal communication with district regulatory staff, U.S. Army Corps of Engineers, in Sacramento, Cal. (Apr. 2, 2007)).

Corps District	Clean Water Act Section 404 Aquatic Resource Compensatory Mitigation Cost Estimates										Stream Cost Estimate Sources
	Wetland Cost Estimate Sources					Wetland Cost Estimate Sources					
	Wetland costs reported by the Corps districts to ELI	Corps District Data Average	ELI Regional Estimate ⁸⁶	Corps Division Average	MT Report (MB prices per acre unless noted)	ILF Report (ILF prices per acre)	Kenyon (MB prices per acre)	Banks & Fees (MB prices per acre unless noted)			Stream costs reported by the Corps districts to ELI
Seattle	not available		\$60,000	\$33,250				\$37,129			not available
St. Louis	not available		\$30,000	\$36,340		\$48,800					not available
St. Paul	\$4,050 -35,420/acre ⁸⁶	\$19,700		\$36,340							not available
Tulsa	not available		\$64,000	\$13,704							not available
Vicksburg	not available		\$30,000	\$36,340							not available
Walla Walla	not available		\$60,000	\$33,250				\$500*			not available ⁹⁷
Wilmington ⁸⁸	\$12,276-\$122,760/acre (ILF)	\$35,000		\$36,288		\$12,276-\$122,760/acre		\$11,750, \$25,000			\$219/linear foot

⁸⁶ Minnesota's Board of Soil and Water Resources sets prices at \$35,420/acre within the 7-County Metropolitan area (around Minneapolis/St. Paul); at \$7,980/acre outside the 7-county metro area but within a major watershed that is wholly or partially in the Metro area; and at \$4,050/acre in other areas.

⁹⁷ Cost estimates for 2 projects along the Boise River in Idaho that each involved creation of 600 feet of channel and 0.1 acre wetland. Mitigation for one cost \$17,000 but consisted only of plantings and monitoring because property was donated and work was done by the state fish and game department at no cost to applicant. The same work at another site cost \$57,000, including land purchase, engineering, acquisition of water right, construction and monitoring

⁸⁸ NORTH CAROLINA ECOSYSTEM ENHANCEMENT PROGRAM, ANNUAL REPORT 2003-2004 24 (Dec. 1, 2005), available at <http://www.nceep.net/news/eeppublications.htm>. (as of July 2004, the North Carolina Ecosystem Enhancement Program had a fee structure of \$12,276/acre non-riparian wetland; \$24,552/acre riparian wetland; \$122,760/acre saltwater wetland; and \$205/linear foot of stream. The fee structure is updated annually to account for inflation. For current rates, see <http://www.nceep.net/pages/fee.htm>.)

CWA Table 2. Best Professional Estimates of District-Level and Aggregate Wetland Compensatory Mitigation Costs.

District	Acres in FY03 ¹⁰⁰	Estimated Average Costs ⁹⁹			Total Cost Estimates		
		Low	Mid	High	Low	Mid	High
Alaska	615	\$4,000	\$9,500	\$15,000	\$2,460,220	\$5,843,023	\$9,225,825
Albuquerque	103	\$72,000	\$80,000	\$88,000	\$7,411,680	\$8,235,200	\$9,058,720
Baltimore	101	\$28,000	\$45,000	\$62,000	\$2,838,640	\$4,562,100	\$6,285,560
Buffalo	726	\$16,000	\$40,500	\$65,000	\$11,618,720	\$29,409,885	\$47,201,050
Charleston	1511	\$31,500	\$35,000	\$38,500	\$47,599,020	\$52,887,800	\$58,176,580
Chicago	74	\$50,000	\$80,000	\$140,000	\$3,675,500	\$5,880,800	\$10,291,400
Detroit	77	\$40,000	\$60,000	\$80,000	\$3,092,000	\$4,638,000	\$6,184,000
Fort Worth	1487	\$30,000	\$47,000	\$64,000	\$44,595,600	\$69,866,440	\$95,137,280
Galveston	1040	\$27,000	\$30,000	\$33,000	\$28,091,610	\$31,212,900	\$34,334,190
Honolulu ¹⁰¹	0						
Huntington	169	\$16,000	\$23,000	\$30,000	\$2,703,040	\$3,885,620	\$5,068,200
Jacksonville	8543	\$65,000	\$77,000	\$90,000	\$555,306,700	\$657,824,860	\$768,886,200
Kansas City	500	\$50,000	\$65,000	\$80,000	\$24,994,500	\$32,492,850	\$39,991,200
Little Rock	303	\$43,920	\$48,800	\$53,680	\$13,296,780	\$14,774,200	\$16,251,620
Los Angeles	271	\$78,000	\$103,500	\$129,000	\$21,129,420	\$28,037,115	\$34,944,810
Louisville	152	\$25,000	\$27,750	\$30,000	\$3,804,000	\$4,222,440	\$4,564,800
Memphis	800	\$45,000	\$46,900	\$48,800	\$36,011,700	\$37,532,194	\$39,052,688
Mobile	602	\$30,000	\$33,150	\$36,300	\$18,068,700	\$19,965,914	\$21,863,127
Nashville	70	\$27,000	\$30,000	\$33,000	\$1,882,440	\$2,091,600	\$2,300,760
New England	186	\$90,000	\$100,000	\$110,000	\$16,738,020	\$18,597,800	\$20,457,580
New Orleans	4394	\$10,000	\$23,150	\$36,300	\$43,944,100	\$101,730,592	\$159,517,083
New York	170	\$100,000	\$125,000	\$150,000	\$16,970,000	\$21,212,500	\$25,455,000
Norfolk	470	\$55,000	\$97,500	\$140,000	\$25,836,800	\$45,801,600	\$65,766,400
Omaha	542	\$60,000	\$63,000	\$85,000	\$32,495,700	\$34,120,485	\$46,035,575
Philadelphia	36	\$86,500	\$125,000	\$150,000	\$3,120,920	\$4,510,000	\$5,412,000
Pittsburgh	87	\$13,400	\$21,300	\$29,300	\$1,161,780	\$1,846,710	\$2,540,310
Portland	850	\$18,000	\$48,000	\$78,000	\$15,299,100	\$40,797,600	\$66,296,100
Rock Island	453	\$20,000	\$42,500	\$65,000	\$9,065,600	\$19,264,400	\$29,463,200
Sacramento	11478	\$110,000	\$150,000	\$183,000	\$1,262,538,200	\$1,721,643,000	\$2,100,404,460
San Francisco	830	\$110,000	\$150,000	\$183,000	\$91,325,300	\$124,534,500	\$151,932,090
Savannah	663	\$31,500	\$35,000	\$38,500	\$20,874,420	\$23,193,800	\$25,513,180
Seattle	832	\$18,000	\$48,000	\$78,000	\$14,982,660	\$39,953,760	\$64,924,860
St. Louis	402	\$43,920	\$48,800	\$53,680	\$17,654,962	\$19,616,624	\$21,578,286
St. Paul	1117	\$4,000	\$19,700	\$35,400	\$4,467,680	\$22,003,324	\$39,538,968
Tulsa	93	\$57,600	\$64,000	\$70,400	\$5,377,536	\$5,975,040	\$6,572,544
Vicksburg	744	\$30,000	\$33,150	\$36,300	\$22,311,600	\$24,654,318	\$26,997,036
Walla Walla	1753	\$18,000	\$48,000	\$78,000	\$31,546,620	\$84,124,320	\$136,702,020
Wilmington	1306	\$12,275	\$19,050	\$122,760	\$16,031,150	\$24,879,300	\$160,324,560
TOTALS:	43549				\$2,480,322,418	\$3,391,822,613	\$4,364,249,262

⁹⁹ Costs are per acre. Estimated average costs are ELI's best estimates based on the district-level data available (see CWA Table 1). These estimates attempt to capture the range of cost estimates reported to ELI. For districts for which only one estimate was available, the low and high estimates were derived by decreasing and increasing the estimate by 10 percent.

¹⁰⁰ The Corps tracks the amount of mitigation *required* in each district, but does not evaluate how much of this required mitigation is carried out, or whether the mitigation conducted meets performance standards and is sustainable.

¹⁰¹ The Honolulu district reported that no aquatic resource mitigation was conducted in FY2003.

Chapter 3: Endangered Species Act

I. PROGRAM SUMMARY

In 1973, Congress enacted the Endangered Species Act (ESA) to protect and recover threatened and endangered species and the ecosystems upon which they depend.¹⁰² The U.S. Fish and Wildlife Service (FWS)¹⁰³ administers the Act, along with the National Marine Fisheries Service (NMFS).¹⁰⁴ The FWS has primary responsibility for land and freshwater species, while the NMFS covers marine species such as whales and sea turtles.

ESA Section 4 requires FWS and NMFS (“the Services”) to “list” a species as endangered or threatened by considering its current biological status, habitat, and threats to its continued survival.¹⁰⁵ An “endangered” species is any species that is in danger of extinction throughout all or a significant portion of its range.¹⁰⁶ A “threatened” species is one that is likely to become endangered within the foreseeable future.¹⁰⁷ As of June 2007, the Services have listed 1,882 plant and animal species worldwide, of which 1,314 are found in the United States.¹⁰⁸ NMFS has jurisdiction over approximately 60 of the listed species.¹⁰⁹

As part of the listing process, the Act also requires the designation of “critical habitat” – those geographic areas that the Services determine are essential to conservation of the species and that may require special management and protection.¹¹⁰ Critical habitat may include not only area occupied by a listed species, but also that deemed necessary for recovery of the species. While the decision to list a species as threatened or endangered is based solely on scientific data and analysis, and not on economic factors, economic impact may be considered when designating critical habitat.¹¹¹

Once a species is listed, the ESA provides several protections for it.¹¹² ESA Section 9(a) makes it unlawful to “take” (kill or harm) a listed species. This section includes a prohibition on significant modification or

¹⁰² ESA, 16 U.S.C. § 1531(b) (2000). A species is listed as “endangered” or “threatened” depending on its biological status and the degree of threat it faces. Endangered species are plants and animals that are in immediate danger of becoming extinct and need protection to survive. Threatened species are those that are declining in numbers and might become endangered if conservation efforts are not immediately taken. *See, e.g.*, U.S. Fish and Wildlife Service, Pacific Islands Endangered Species, <http://www.fws.gov/pacificislands/wesa/endspindex.html> (last visited July 16, 2007).

¹⁰³ The U.S. Fish and Wildlife Service is a division within the Department of the Interior. U.S. Fish and Wildlife Service, <http://www.fws.gov/endangered/> (last visited July 16, 2007).

¹⁰⁴ The National Oceanic and Atmospheric Administration’s National Marine Fisheries Service is a division within the Department of Commerce. National Marine Fisheries Service, <http://www.nmfs.noaa.gov/> (last visited July 16, 2007).

¹⁰⁵ 16 U.S.C. § 1533(a).

¹⁰⁶ 16 U.S.C. § 1532(6).

¹⁰⁷ 16 U.S.C. § 1532(20).

¹⁰⁸ U.S. FWS, Species Information, <http://www.fws.gov/endangered/wildlife.html#Species> (last visited July 16, 2007).

¹⁰⁹ U.S. National Marine Fisheries Service, *Species Protected under the ESA*, <http://www.nmfs.noaa.gov/pr/species/esa.htm> (last visited July 16, 2007).

¹¹⁰ 16 U.S.C. §§ 1532(5) and 1533(a).

¹¹¹ 16 U.S.C. § 1533(b).

¹¹² In addition to the mitigation requirements described in the body of this report, the ESA also, among other protective measures, directs all federal agencies to use their legal authorities to carry out conservation programs (§ 7(a)(1)); authorizes land acquisition (§ 5); requires recovery plans (§ 4(f)); and provides grants to states and private landowners to promote conservation and recovery (§ 6).

degradation of species habitat that would significantly impair a species' ability to breed, feed, or find shelter.¹¹³

Under ESA Section 7, every federal agency must consult with the Services to ensure that any action that the agency funds, authorizes, licenses, or permits will not (1) jeopardize the continued existence of a listed species, or (2) result in the destruction or adverse modification of designated critical habitat for that species.¹¹⁴ After this consultation, the Services will provide the federal agency with a written statement that specifies the impact of any incidental taking or harm to the species from such action, and "reasonable and prudent measures" that are "necessary or appropriate to minimize such impact."¹¹⁵ This process is known as a Section 7 consultation.

Under the original Act, the prohibition on "taking" a listed species was absolute, with exemptions allowed only for harm to a species that might occur during scientific research or conservation activities. Private landowners whose land happened to be inhabited by a listed species risked violating the ESA if they proceeded with development activities. In 1982, Congress amended the ESA to allow the Services to permit, under certain conditions, the taking of a listed species by non-federal entities if the take "is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."¹¹⁶ One of the conditions is that the applicant will, "to the maximum extent practicable, minimize and mitigate the impacts of such taking."¹¹⁷ Such permits are known as Section 10 incidental take permits.

In summary, ESA includes two separate provisions that may require some form of mitigation to compensate for allowed impacts to a listed species or its habitat: Section 7 consultations, and Section 10 incidental take permits.

1. Section 7 Consultations

Before a federal agency funds, authorizes, licenses, or permits an action, the planning agency (or the permit applicant) must ask the Services for information on species and critical habitat that may be present in the project area. If no species or habitat is present, no further action is required, and the project may proceed.

Informal consultation. If a listed species is present, the federal agency determines through "informal consultation" with the Services whether the project may affect listed species or habitat. A *biological assessment* may be prepared to evaluate whether listed species would be adversely affected, and whether a formal consultation will be required.¹¹⁸ During these informal discussions, FWS or NMFS staff may suggest modifications to the plan to avoid any likely adverse impacts. If the agency concludes and the staff agrees, in writing, that the project is not likely to adversely affect a listed species, the consultation is considered complete and the project may proceed.¹¹⁹ Although the numbers vary widely each year, FWS averages

¹¹³ See 16 U.S.C. § 1538(a). See also 15 U.S.C. § 1532(19). ("Take" is defined in the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."); and 50 C.F.R. § 17.3. (Federal regulations further define "harm" of a species as including "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering.")

¹¹⁴ ESA, 16 U.S.C. § 1536(a)(2).

¹¹⁵ 16 U.S.C. § 1536(b)(4).

¹¹⁶ 16 U.S.C. § 1539(a)(1)(B).

¹¹⁷ 16 U.S.C. § 1539(a)(2)(B).

¹¹⁸ Biological Assessments, 50 C.F.R. § 402.12. (If the proposed activity is a "major construction action" as defined in NEPA, the agency must prepare a "biological assessment" of the potential impacts.)

¹¹⁹ Informal Consultations, 50 C.F.R. § 402.13.

around 60,000 informal consultations annually.¹²⁰ NMFS has far fewer consultations; the agency conducted 1,006 informal consultations in 2005, 968 in 2004, and 1,003 in 2003.¹²¹

Formal consultation. The ESA regulations require a “formal consultation” with the Services any time it is determined that an agency action may adversely affect a listed species or designated critical habitat.¹²² FWS staff estimate that the agency conducts over 2,000 formal consultations per year.¹²³ Most of these take place in the FWS’s seven regional offices or a field office within a region. Similarly, NMFS conducted 364 formal consultations in 2005, 308 in 2004, and 512 in 2003. Year-to-year differences within NMFS are usually driven by fire risks on federal lands in the West, highway construction and maintenance projects, and changes in fishery management regimes.¹²⁴

The vast majority of formal consultations result in the Services determining that there will be no jeopardy to the species. The Services may, however, determine that the action will cause incidental harm in violation of Section 9. In these cases, the Services will issue a biological opinion and an “incidental take statement” (ITS) that identifies “reasonable and prudent measures” deemed necessary “to minimize the impact” of the harm.¹²⁵ The ITS also sets forth terms and conditions that the agency or permittee must follow in implementing these measures in order to establish protection from liability under the ESA.

In rare instances the Services determine, after extensive discussion with the agency about modifying the proposed action, that the activity would jeopardize the species or adversely modify critical habitat (a “jeopardy opinion”). In such cases the Services must identify any reasonable and prudent alternatives that would allow the project to proceed. The action agency can decide whether to: (1) adopt the alternatives; (2) not undertake the project (or deny the permit); (3) continue consultation on other options; (4) apply for an exemption from the ESA; or (5) proceed without approval or exemption at its risk.¹²⁶ FWS estimates that of the 300,000 formal and informal consultations that have occurred from 1998-2002, only 420 received a “jeopardy” opinion that set forth alternatives for reducing impacts. NMFS estimates that it averages between 20 and 50 jeopardy biological opinions each year (between the years 1998 and 2003).¹²⁷

Reasonable and prudent measures to minimize impact. Unlike ESA Section 10, which requires a permit applicant to “minimize and mitigate” impacts, ESA Section 7 only requires “minimization” of the level of take. Accordingly, the 1998 FWS *Final ESA Section 7 Consultation Handbook* advises that “it is not appropriate to require mitigation for the impacts of incidental take,” and that minimization measures should only occur within the action area, and only to minimize the impacts on specific species or habitat.¹²⁸

¹²⁰ U.S. FWS, CONSULTATIONS WITH FEDERAL AGENCIES: SECTION 7 OF THE ESA (2005), <http://www.fws.gov/endangered/consultations/consultations.pdf> (last visited July 17, 2007).

¹²¹ Email from NMFS staff, Endangered Species Division, NMFS, (June 19, 2006) (on file with author).

¹²² Formal Consultations, 50 C.F.R. § 402.14.

¹²³ Personal communication with U.S. FWS staff, Section 7 Consultations, U.S. FWS, in Arlington, Va. (May 2006).

¹²⁴ *Id.* Public Consultation Tracking System, <http://seahorse.nmfs.noaa.gov/pcts/> (last visited July 17, 2007). (NMFS maintains an online database called the Public Consultation Tracking System (PCTS), which is updated by the regions on a weekly basis and allows agencies to track the status of § 7 consultations.)

¹²⁵ ESA, 16 U.S.C. § 1536(b)(4)(C) (2000); 50 C.F.R. § 402.14.

¹²⁶ *Id.*

¹²⁷ Email from NMFS staff, Endangered Species Division, NMFS, (June 19, 2006) (on file with author).

¹²⁸ U.S. FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE, FINAL ESA SECTION 7 CONSULTATION HANDBOOK 4-50 (1998).

More recently, however, FWS has included in the Section 7 consultation process fee-based mitigation arrangements with agencies to avoid adverse impacts.¹²⁹ Moreover, FWS' 2003 guidance on the use of conservation banks acknowledges that "activities regulated under Section 7 or Section 10 of the ESA may be eligible to use a conservation bank, if the adverse impacts to the species from the particular project are offset by buying credits created and sold by the bank."¹³⁰ FWS has determined that impacts to listed species may be "minimized" by requiring conservation measures. These "conservation measures could include, if appropriate, protection of off-site listed species habitat through the purchase of conservation bank credits."¹³¹

In interviews conducted by ELL, however, FWS staff continue to state that the authority provided to the Service under Section 7 and the consultation process both emphasize the minimization or avoidance of project impacts through design and project changes rather than fee-based compensatory mitigation.¹³² Those minimization and avoidance measures include actions that do not readily have a dollar figure attached to them, such as educating employees, timing the project to avoid impacts during breeding season, or changing the number of animal management units allowed to graze per acre.¹³³

Likewise, despite the FWS guidance, Section 7 consultations conducted by NMFS rarely if ever result in compensatory mitigation as a requirement in an incidental take statement. NMFS instead relies on avoidance and minimization measures. As explained by NMFS staff, compensatory mitigation in the form of purchasing title or development rights to parcels of land does not translate well to the coastal and pelagic ecosystems over which the NMFS has jurisdiction.¹³⁴ Most of the consultations on NMFS-covered listed species, such as sturgeon, Pacific and Atlantic salmon, and seagrasses, are in areas that are already highly regulated and publicly owned.

2. Section 10 Incidental Take Permits and Habitat Conservation Plans

Under ESA Section 10(a), a private landowner, county, state, or corporation -- in short, any non-federal entity— may obtain an "incidental take permit" (ITP) from the Services to engage in an activity that may cause incidental harm to a listed species, if the permittee agrees to follow a pre-approved habitat conservation plan (HCP) that is designed to minimize or mitigate the impact.¹³⁵ The HCP must accompany an application for an ITP, and must identify the impact on the listed species, the steps the applicant will

¹²⁹ U.S. GENERAL ACCOUNTING OFFICE, ENDANGERED SPECIES ACT: FEE-BASED MITIGATION ARRANGEMENTS, GAO-01-287R (2001) [hereinafter GAO, ESA (2001)], available at <http://www.gao.gov/new.items/d01287r.pdf>.

¹³⁰ U.S. FWS, *Guidance for the Establishment, Use, and Operation of Conservation Banks 3* (2003), available at <http://www.fws.gov/endangered/policies/conservation-banking.pdf> [hereinafter U.S. FWS, GUIDANCE CONSERVATION BANKS (2003)].

¹³¹ *Id.* at 4. See Marybeth Bauer et al., *Landowners Bank on Conservation: The U.S. Fish and Wildlife Service's Guidance on Conservation Banking*, 34 ELR 10717, 10718 (2004).

¹³² Personal communication with NMFS staff, *supra* note 123. Personal communication with U.S. FWS staff, Habitat Conservation Plan Division, U.S. FWS, in Arlington, Va. (May 2006); U.S. FWS staff, Habitat Conservation Plan and § 7 Consultations, U.S. FWS, in Arlington, Va. (May 2006); U.S. FWS staff, Region 1 § 7 Consultations, in Sacramento, Cal. (June 2006).

¹³³ Personal communication with U.S. FWS headquarters staff, *supra* note 132.

¹³⁴ Email from NMFS staff, Endangered Species Division, NMFS (June 30, 2006) (on file with author). As a member of the § 7 consultation program for NMFS since 1998, the NMFS staff member was not aware of any incidental take statement issued by NMFS that has required compensatory mitigation as the term is normally used in regulatory settings. "Our incidental take statements only [require] avoidance and minimization, not compensation."

¹³⁵ ESA, 16 U.S.C. § 1539(a) (2000).

take to monitor, minimize, and mitigate those impacts, and the funding available to implement the plan.¹³⁶ Under the “No Surprises” rule, once the permittee has agreed to an HCP, the Services may not require additional compensation or mitigation should “unforeseen circumstances” arise in the future.¹³⁷

An HCP approved by FWS may cover, for example, agricultural activities, development of beachfront or mountain property, or logging projects. Projects that may require an ITP/HCP from NMFS may include state sport-fishing programs, non-listed fish stocking programs, and other instream or watershed activities that may impact listed species.

The HCP process, particularly that developed by FWS, continues to evolve. HCPs were first adopted primarily to allow individual projects to proceed without risk to landowners. More recent HCPs have attempted to address broader-based regional planning issues and, in some cases, multiple species.¹³⁸

The types of mitigation measures specified in an HCP are as varied as the HCPs themselves. According to the FWS’ *HCP/ITP Processing Handbook*, mitigation actions generally fall into one or more of the following categories. When possible, the agencies prefer to see the plans address impacts in the following order:

- *Avoid* the impact (such as changing the timing of the project, relocating the project, and restricting access);
- *Minimize* the impact (such as modifying land use practices, creating buffer areas, and reducing project size);
- *Rectify* the impact (such as enhancement, restoration, or revegetation of degraded or former habitat);
- *Reduce or eliminate* the impact over time (through proper management, monitoring, and adaptive management); or, finally,
- *Compensate* for the impact (such as habitat restoration or protection on- or off-site).¹³⁹

3. Habitat Mitigation

Activities approved pursuant to HCPs and ITPs frequently involve permanent habitat loss, for which a permittee is required to provide “habitat mitigation” by “acquiring, or otherwise protecting, replacement habitat at an onsite or offsite location.”¹⁴⁰

¹³⁶ *Id.*; Incidental Take Permits, 50 C.F.R. § 17.22.

¹³⁷ 50 C.F.R. § 17.22(b)(5). The “No Surprises” rule has been challenged on both procedural and substantive grounds in court, and the FWS briefly suspended approval of permits with these assurances after the court remanded the regulation to the Service for reconsideration. See *Spirit of the Sage Council v. Norton*, 294 F.Supp.2d 67 (D.D.C. 2003), *appeal dismissed*, 411 F.3d 225 (D.C. Cir. 2005). A challenge to the reissued rule is pending in D.C. District Court.

¹³⁸ U.S. FWS, HABITAT CONSERVATION PLANS: SECTION 10 OF THE ENDANGERED SPECIES ACT (2005), *available at* http://www.fws.gov/endangered/hcp/HCP_Incidental_Take.pdf [hereinafter U.S. FWS, HABITAT CONSERVATION PLANS].

¹³⁹ U.S. FWS AND NMFS, HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK 3-19 (1996). See also U.S. FWS, *supra* note 139; and 65 Fed. Reg. 35,242 (June 1, 2000) (an addendum to the Handbook). The addendum, known as the “five-point policy,” provides additional guidance on HCPs regarding: (1) establishment of biological goals and objectives for HCPs, (2) adaptive management, (3) monitoring, (4) determination of permit duration, and (5) the use of public participation.

¹⁴⁰ *Id.* at 3-21.

A 2001 GAO report identified eight types of fee-based arrangements that are currently approved by FWS to satisfy mitigation obligations.¹⁴¹ GAO found that these arrangements varied widely in size and complexity, and involved millions of dollars for species protection.¹⁴² The report did not indicate how frequently these types of mitigation arrangements were used, or provide a specific dollar amount. GAO found seven separate types of fee-based arrangements, which required the landowner to:

- Buy land outside the project area;
- Set aside part of his or her own land and pay a third party to manage it;
- Pay a third party to buy and/or manage land outside the project area;
- Buy credits in a conservation bank;¹⁴³
- Pay a fee into a fund that a third party will use later to buy and manage habitat;
- Pay a fee into a water depletion fund to mitigate adverse impacts caused by withdrawing water; or
- Pay a third party to improve habitat on federal land.

In an eighth type of arrangement, which involves small projects covered by a larger programmatic agreement, a federal agency sets aside funding for mitigation in lieu of landowner payments because the administrative costs of collecting each individual payment would be greater than the payment itself.¹⁴⁴

NMFS staff is not aware of any HCPs issued by the NMFS that require mitigation banking or other form of compensatory mitigation.¹⁴⁵

II. DATA

1. Available Data

SECTION 7 CONSULTATIONS

FWS is a decentralized agency, with seven regional offices and nearly 700 field offices and units. As mentioned above, the FWS regional and field offices average over 60,000 consultations per year, of which about 2,000 or more reach formal consultation status. There is no centralized database of FWS Section 7 consultations, although the Pacific Region has developed a database showing the status, lead federal agency, and species affected for informal and formal consultations in Washington, Oregon and Idaho from January 2003 to the present.¹⁴⁶ The database does not, however, include information on the incidental take mitigation measures required.

¹⁴¹ See GAO, ESA (2001), *supra* note 129, at 2.

¹⁴² *Id.*

¹⁴³ See U.S. FWS GUIDANCE OF CONSERVATION BANKS (2003), *supra* note 130, at 11. Under the FWS' 2003 banking guidance, conservation bank credits are only available to meet ESA requirements if the bank covers the same species or habitat being affected by the project. FWS also stresses that conservation banking is not a substitute for avoiding and minimizing impacts to a species: "The purpose of conservation banking is not to encourage development of listed species' habitats, but rather to provide an ecologically effective alternative to small on-site preserves, which are not defensible." U.S. FWS, Conservation Banking (Oct. 2006), available at <http://www.fws.gov/endangered/landowner/banking.7.05.pdf>.

¹⁴⁴ *Id.* at 2.

¹⁴⁵ Email from NMFS staff, *supra* note 121; and personal communication with NMFS staff, Northwest Region, Central Puget Sound Habitat Branch, NMFS, NOAA, in Lacey, Washington (June 2006).

¹⁴⁶ Pacific Region Section 7 Consultation Database, <http://r1consult.fws.gov/Consultations.nsf/Default?OpenForm> (last visited July 17, 2007).

NMFS has an online query system, the Public Consultation Tracking System (PCTS) that allows federal agencies and applicants for U.S. Army Corps of Engineer permits to track the status of Section 7 consultations. The system is password-protected and not available for public access.¹⁴⁷

ESA Section 18 requires FWS to submit to Congress an annual report on expenditures made in support of threatened and endangered species conservation under all programs (not just those expended as a result of the Section 7 and Section 10 requirements) by state and federal government agencies. The 2004 Report, which was published in January 2006, shows total expenditures of \$1.4 billion, of which \$793 million was expended for specific individual species and \$60 million for land acquisition. The total also includes \$550 million in other expenditures for activities such as law enforcement, recovery coordination, consultation and activities benefiting multiple species, staff salaries, operations, maintenance, and other support services.¹⁴⁸

These totals cover the entire gamut of federal and state expenditures for conservation of listed species under every part of the Act. As it is currently compiled, although data on the costs of mitigation under Section 7 may well be included in the Section 18 report, the data cannot be disaggregated to determine Section 7 costs separately.

SECTION 10 INCIDENTAL TAKE PERMITS/HABITAT CONSERVATION PLANS

FWS maintains a centralized database of ITPs, HCPs, and other FWS agreements with non-federal landowners, called the Environmental Conservation Online System (ECOS).¹⁴⁹ Implementing agreements and HCPs for some of the permits issued by the regions, particularly in recent years, are available for viewing through the system. FWS also maintains a central, on-line library of Federal Register notices of ITP applications and permit decisions.¹⁵⁰

From 1982 through 2006, FWS has approved 485 HCPs and 764 incidental take permits.¹⁵¹ HCPs vary greatly in size and scope and in the type of activities that they permit. Most HCPs apply to areas of less than 1,000 acres, about 10 exceed 500,000 acres, and a few are larger than 1,000,000 acres.¹⁵²

For example, according to the ECOS database, FWS issued 24 Section 10 ITP/HCPs in 2003 to non-federal landowners. Only 13 of these covered more than 5 acres. Of the 13, only five were for projects over 500 acres. Those few large projects, however, may require large amounts for compensatory mitigation in the form of mitigation fees. Just one, the Natomas Basin HCP, covered 53,342 acres in the interior of the Natomas Basin, California, which is located in the northern portion of Sacramento County and the southern portion of Sutter County. The HCP required the developers to pay annual mitigation fees to the Natomas

¹⁴⁷ See Public Consultation Tracking System, *supra* note 124.

¹⁴⁸ U.S. FWS, FEDERAL AND STATE ENDANGERED AND THREATENED SPECIES EXPENDITURES: FISCAL YEAR 2004 (2006), available at <http://www.fws.gov/endangered/pubs/expenditurereports.html>.

¹⁴⁹ U.S. FWS, Environmental Conservation Online System, http://ecos.fws.gov/conserv_plans/public.jsp (last visited July 17, 2007).

¹⁵⁰ U.S. FWS, Federal Register Documents, <http://www.fws.gov/policy/frsystem/default.cfm> (last visited July 17, 2007).

¹⁵¹ *Id.* One large HCP may accompany and cover multiple incidental take permits.

¹⁵² See U.S. FWS, HABITAT CONSERVATION PLANS, *supra* note 138, at 1.

Basin Conservancy of \$12,270 per developed acre (in 2003),¹⁵³ up to a maximum of 15,517 acres. The fees are not required to be paid in advance for the entire acreage; instead the permittees pay the Conservancy as the acreage is developed. By the end of 2005, developers had paid total fees of \$61,898,045.04 for development of 7,184 acres.¹⁵⁴

Although NMFS does not have a centralized database on its Section 10 ITPs/HCPs, information on these permits may be obtained from the agency's regional websites.¹⁵⁵ NMFS estimates that it has approved fewer than 20 ITPs/HCPs since 1996.¹⁵⁶

2. Data Limitations

SECTION 7 CONSULTATIONS

There exists no national database summarizing the "reasonable and prudent measures" required by Section 7 incidental take statements issued by the FWS, or the cost of those measures. The implementing documents for the take statements are not currently available online.

The NMFS's PTCS database comprises an index of Section 7 consultations, but does not summarize the measures required for the project to proceed or the costs of those measures.

SECTION 10 INCIDENTAL TAKE PERMITS/HABITAT CONSERVATION PLANS

FWS maintains a database listing all of the issued Incidental Take Permits, along with a list of the accompanying Habitat Conservation Plans. Some of the implementing documents and plans are accessible through this database for review, although documentation for many of the permits is not available.¹⁵⁷ Costs for mitigation required by an HCP range widely and depend on several factors, including the status of the federally-listed species, the estimated impact to the species, the type and size of the project, the project location, and the mitigation measures chosen by the applicant and approved by the agency.¹⁵⁸ Minimization and mitigation measures should be commensurate with the level and type of potential take or harm to the species.

The cost commitment may involve a one-time payment (such as an endowment, donation to a foundation, or purchase of conservation bank credits); a land acquisition and preservation requirement; or management and conservation activities (such as for fencing, etc.) over the life of the contract or over the first few years during construction. Total cost commitments may not be estimated in the final HCP

¹⁵³ NATOMAS BASIN CONSERVANCY, THE NATOMAS BASIN CONSERVANCY IMPLEMENTING ANNUAL REPORT, CALENDAR YEAR 2005 10 (2006), available at <http://www.natomasbasin.org/images/stories/pdf/nbc060523iar1of3public.pdf>. (Fee amounts have increased each year, with fees of \$16,124 per acre assessed in 2004 and \$24,897 per acre in 2005.)

¹⁵⁴ *Id.* at 5.

¹⁵⁵ See, e.g., Northwest Regional Office, <http://www.nwr.noaa.gov/Salmon-Habitat/Habitat-Conservation-Plans/Index.cfm> (last visited July 17, 2007).

¹⁵⁶ Personal communication with NMFS staff, *supra* note 145.

¹⁵⁷ For example, Region 4 does not provide online access through ECOS to any of the supporting permit documents issued by its offices.

¹⁵⁸ Email correspondence with U.S. FWS staff, Ecological Services Division, Region 4, Atlanta, Ga. (May 24, 2006) and U.S. FWS staff, Division of Information and Education, Carlsbad Fish and Wildlife Office, U.S. FWS (Mar. 20, 2007) (on file with author).

document. Additionally, costs associated with the implementation of the mitigation measures required by an HCP may vary from year to year depending on potential land acquisitions that may occur in one year but not another. FWS does not compile information on fee-based mitigation arrangements approved through these HCPs, nor does it track actual dollars *spent* by permittees.¹⁵⁹ Large HCPs often have specific reporting requirements, and some of the plans that establish funds or conservancy organizations may have their own web site and annual reports tracking the fees paid into them via HCP requirements.¹⁶⁰

III. COST ESTIMATES

1. Section 7 Consultations

As a result of the data limitations described above, ELI was unable to estimate the cost of compensatory mitigation measures performed in response to ESA Section 7 consultations between FWS and other federal agencies. FWS simply does not track these expenditures independently; ITs are issued from the many FWS field offices and are not centralized at headquarters.¹⁶¹

ELI reached this conclusion after conversations with several FWS personnel, who could offer no method to calculate this number other than making a Freedom of Information Act request to each of the 700 FWS field offices.¹⁶² Another FWS staffer suggested asking the project proponents themselves (either the federal agency or permit applicant) for these data. Although the data may theoretically be available through these means, embarking on such an effort is well beyond the scope of this report.

2. Section 10 Incidental Take Permits/Habitat Conservation Plans

ELI estimates that, under 65 ITP/HCPs issued from 2003 through 2006, FWS required near-term expenditures of at least \$802,761,275 for compensatory mitigation, or an annual average of \$200.7 million per year expended during this study's four-year sampling period. (See Table 4). Further, taking into account the mitigation requirements over the life of the same permits – some of which extend 30 years or longer – the agency actually required these same permittees to *commit* a total of \$1,481,345,433 in mitigation expenditures, for an average of \$370.3 million per year.¹⁶³

¹⁵⁹ Personal communication with U.S. FWS staff, *supra* note 132; and U.S. FWS staff, Division of Consultations, U.S. FWS, in Arlington, Va. (May 2006).

¹⁶⁰ See, e.g., Natomas Basin Conservancy, *supra* note 153.

¹⁶¹ However, ESA compensation amounts required for large projects may be reported by other agencies that must consult with FWS when issuing permits under the Clean Water Act, the Federal Power Act, or the Northwest Power Act, and some of those expenditures are captured in the respective chapters of this study.

¹⁶² ELI also spoke with FWS staff responsible for developing the ESA Section 18 report on ESA expenditures for threatened and endangered species, to see if mitigation/minimization costs could be separated from the total dollars reported by the federal agencies for 2003 expenditures. Staff explained that the agencies do not separate their reported expenditures in that way, and that it would be impossible to extrapolate those amounts from the annual report. Personal communication with U.S. FWS staff, Division of Consultations, U.S. FWS, in Arlington, Va. (May 2006).

¹⁶³ To estimate the dollar amounts required to be committed during 2003–2006 for compensatory mitigation pursuant to an approved ITP/HCP, ELI pulled from the FWS ECOS database a list of ITPs/HCPs, by region, that FWS had approved in those years. A few of the ITPs had a link to the plan itself; most did not. To obtain information on HCP requirements when documentation was unavailable through ECOS, ELI requested the information from the FWS Regions or Field Offices that issued the permits, and used the mitigation amounts provided by those FWS offices that responded. For the other permits, ELI searched the web for annual reports or copies of the HCPs to determine cost figures.

Table 4. ESA Mitigation Costs Expended and Committed, 2003-2006.

FWS Region	Total HCP Mitigation Costs Expended 2003-2006	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
1	\$778,873,949	\$15,239,340	\$745,885,586	\$17,117,820	\$631,203
2	\$21,921,984	\$535,160	\$728,796	\$6,712,142	\$13,945,886
3	\$55,750	\$52,000	\$1,250	\$1,250	\$1,250
4	\$20,700	\$20,700	Unavailable	Unavailable	Unavailable
5	\$510,500	\$500,000	\$10,500	\$0	\$0
6	\$1,378,392	\$654,250	\$485,642	\$119,250	\$119,250
Totals	\$802,761,275	\$17,001,450	\$746,962,652	\$23,950,462	\$14,697,589

FWS Region	Total HCP Mitigation Costs Committed 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
1	\$821,919,305	\$61,898,045+	\$752,776,305	\$1,838,818	\$5,406,137
2	\$656,029,036	\$26,113,160	\$206,796	\$628,090,790	\$1,618,290
3	\$69,500	\$69,500	\$0	\$0	\$0
4	\$20,700	\$20,700	Unavailable	Unavailable	Unavailable
5	\$510,500	\$500,000	\$10,500	\$0	\$0
6	\$2,796,392	\$2,410,000	\$371,392	\$15,000	\$0
Totals	\$1,481,345,433	\$91,011,405	\$753,364,993	\$629,944,608	\$7,024,427

Note: The ECOS database listed no permits from Region 7.

Table Summary:
 Total Mitigation Costs *Expended* 2003-2006: \$802,761,275, or \$200.7 million/year
 Total Mitigation Costs *Committed* 2003-2006: \$1,481,345,433, or \$370.3 million/year

Note that these figures include only the costs associated with ITP/HCPs for which ELI could obtain documentation, and thus are an understatement of actual costs expended or committed. The detailed charts in the ESA Appendix list all permits issued from 2003-2006 by region. Where possible, ELI calculated the amounts expended each year under the HCP requirements, although for many permits, those annualized costs were impossible to determine from the HCP.

Note also that the estimated total costs expended for each year of the years 2003-2006 do not include expenditures during those years from HCPs/ITPs issued prior to 2003, even though expenditures possibly are still being made pursuant to those plans. By calculating both the annual average costs expended and committed under permits issued over four years, this study attempts to estimate how much new funding is either spent or dedicated to mitigation under the ITP/HCP program in an average permitting year. Finally, where possible to distinguish, the costs include only those incurred for mitigation-related activities; they do not include costs associated with document preparation, cultural surveys, monitoring reports, and other financial obligations that are not directly negotiated or presented by the applicant.

IV. STATE WILDLIFE ACTION PLANS

1. Program Opportunities

Several opportunities exist under the federal ESA to encourage the use of State Wildlife Action Plans in identifying mitigation sites or mitigation actions that could support the protection of critical fish and wildlife habitat and the implementation of conservation priorities identified in the plans. The trend toward the development of regional HCPs itself provides an opportunity for State Wildlife Action Plan priorities to influence local planning projects. Additional opportunities may include:

- The process used by FWS and NMFS for developing Section 7 and Section 10 minimization and mitigation measures involves gathering all available data on surrounding habitat. This process would benefit from consulting State Wildlife Action Plans, which could provide strategic guidance for HCP development.
- State Wildlife Action Plans may contain information and strategies that could be particularly useful in developing HCPs that address broad-based, landscape-level planning issues. The development of these regional and multi-species HCPs, which benefit the species in a whole ecosystem while streamlining the process for small landowners, brings together local and state agencies as well as private stakeholders.
- Under the ESA, particularly in the context of Section 7 consultation, where federal agencies are required to avoid or minimize the impact or take, design alternatives and measures are usually the first option considered. If the timing of the project can be changed or activities suspended for a period to reduce impact on a species' breeding season, that is the course that will be taken. Information contained in State Wildlife Action Plans could be useful in developing such avoidance and minimization measures.
- State Wildlife Action Plan goals could be further supported through the participation of state fish and wildlife agency staff in the development of HCPs, either through discussion with project proponents or through formal comment during the public comment process.
- FWS is currently working with the National Association of Home Builders (NAHB) to develop a web-based tool to enable home developers confronted with ESA requirements to more easily develop HCPs. The computer program is similar to the "one-stop" environmental management systems tool recently developed by NAHB to help home builders comply with EPA regulations. The FWS web-based program will combine all relevant policies, fact sheets, and requirements in an effort to streamline creation of HCPs required by ESA Section 10. State Wildlife Action Plans could be incorporated into this computer program to provide landowners with additional information on the states' best practices and the plans' priorities as they develop their HCPs.¹⁶⁴
- The Cooperative Endangered Species Conservation Fund (CESCF), established through ESA Section 6, provides funding to states and territories for species and habitat conservation actions on non-federal lands. ESA Section 6 grants are specifically prohibited for *mitigation* activities, but may be used to *further support* the development of regional HCPs or *complement* (but not replace) private mitigation responsibilities under an HCP.¹⁶⁵ States may be able to use these

¹⁶⁴ Personal communication with U.S. FWS staff, Division of Partnerships and Opportunities, U.S. FWS, in Arlington, Va. (June 2006).

¹⁶⁵ Personal communication with U.S. FWS staff, State Grants, Division of Consultation, HCPs, Recovery and State Grants, U.S. FWS, in Arlington, Va. (June 2006).

Section 6 grants to further voluntary conservation projects that could be coordinated with state action plan priorities. For example, in FY 2006 the FWS awarded:

- \$9.8 million for Conservation Grants to fund state activities such as habitat restoration, species status surveys, public education and outreach, captive propagation and reintroduction, nesting surveys, genetic studies, and development of management plans;
- \$7.5 million in HCP Planning Assistance Grants to support the development of regional HCPs through funding of baseline surveys and inventories, document preparation, outreach, and similar planning activities;
- \$46.1 million in HCP Land Acquisition Grants to acquire land associated with approved HCPs. The purchases must support the mitigation of impacts through the acquisition of land adjacent to acreage covered by the HCP. This contributes to the recovery of the target species by allowing for the protection of larger, connected parcels of habitat; and
- \$13.9 million for Recovery Land Acquisition Grants for the acquisition of habitat for listed species to support recovery plans.¹⁶⁶

2. Program Limitations

Mitigation required by Section 7 and Section 10 of the federal ESA is restricted in type and geographic location by factors that are inherent to the ESA and its stated program objectives. As a result, the extent to which state wildlife action plans might inform mitigation under the statute may be limited. These factors include:

- Mitigation is targeted to offset impacts to the specific listed species from permitted activities. As a result, any compensation must contribute to supporting the preservation and recovery of the particular species at issue. This programmatic restriction might limit the range of compensatory mitigation options.
- ESA requirements are applicant-driven. The mitigation is dependent on the type and location of the project or activity being proposed, which limits the range of mitigation options. As noted, however, more recently HCPs have been developed that address broad-based, landscape-level planning issues, which broaden the scope and type of mitigation that might be required of an applicant.

Compensatory damages are not authorized under ESA for violation of incidental take permits or statements. Fines and penalties go directly into the Conservation Fund, which may not be used for compensatory mitigation.¹⁶⁷

¹⁶⁶ U.S. FWS, Cooperative Endangered Species Conservation Fund Grants (Nov. 2005), available at <http://www.fws.gov/endangered/grants/section6/FY2006/Section%206%20Grants%20-%20FY%202006%20FINAL.pdf>.

¹⁶⁷ Cooperative Agreements, 15 U.S.C. § 1540 (1992); personal communication with U.S. FWS staff, Solicitor's Office, U.S. FWS, in Washington, D.C. (May 4, 2006).

ESA APPENDIX: DATA ON HCPs/ITPs ISSUED FROM 2003 TO 2006, ORGANIZED BY FWS REGION.

Region 1—California and Nevada Operations and Pacific: Washington, Oregon, California, Nevada, Idaho, Hawaii

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Folsom Professional Center	TE072797	06/25/2003	5.59 acres (California)	3 years	Not available				
Harley John Reservoir	TE075628	09/04/2003	5 acres (California)	3 years	No cost estimate				
Natomas Basin HCP	TE73663 TE73665 TE73667	06/27/2003	53,342 acres	50 years	\$61,898,045 paid from inception through 2005, with additional per-acre fees in future years.	\$15,239,340	\$5,606,959	\$16,880,166	Not available
Newport Estates	TE079353	11/26/2003	278 acres	15 years	Not available				
Shimboff Low Effect	TE079118	11/26/2003	.05 acres (California)	1 year	Not available				
Hyundai Test Track	TE080999 TE082034	01/21/2004	4526 acres (California)	30 years	\$4,639,505		\$4,639,505		
MHCP, City of Carlsbad	TE022606	11/12/2004	24570 acres (California)	50 years	\$2,386,800 (estimated)		\$1,650,000	Not available	Not available
Storedah's Daybreak Mine	TE064055	04/16/2004	291 acres (Washington)	25 years	\$11,500,000 (total estimated value)		\$465,000		
Newhall Farm	TE018244	09/17/2004	14 acres (California)	50 years	\$1,250,000		\$25,000	\$25,000	\$25,000
Terra Springs	TE065890	03/03/2004	76 acres (California)	30 years	Not available				
Western Riverside MSHCP	TE088609	06/22/2004	130000 acres (California)	75 years	\$733,000,000 projected for required land acquisition.		\$733,000,000		
MSCP, City of Chula Vista	TE075235	01/12/2005	57849 acres (California)	50 years	\$499,122 (minimum estimate)		\$499,122		
Lamont Public Utility District	TE106826	07/06/2005	160 acres (California)	50 years	\$61,275 (\$34,200 for mitigation bank credits; \$27,075 endowment)			\$61,275	

ENDANGERED SPECIES ACT

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Potrero Valley/Laborde Canyon	TE110582	10/14/2005	11785 acres (California) (2.7 acres impacted)	5 years	Not available				
Pioneer Meadows HCP	TE109737 TE109738 TE109731 TE109739 TE109736	08/24/2005	39 acres (Nevada)	3 years, six months	\$84,421 (\$75,000 one-time fee for land acquisition plus additional yearly management and monitoring costs)			\$78,379	\$2014
SoCal Ed Etiwanda and Miraloma	TE103476	04/20/2005	126 acres (California)	5 years	Not available				
UC Santa Cruz, RanchView Terrace	TE089916	10/27/2005	38.8 acres (California)	60 years	\$1,194,000 (\$54,000 one time cost; estimated \$19,000 annual fee over life of permit)			\$73,000	\$19,000
Westlake Ranch HCP	TE096373 TE096374	05/19/2005	165 acres (Oregon)	50 years	Costs not estimated in HCP.				
Whiskey Creek HCP	TE095550 TE095548 TE095539	04/20/2005	6 acres (Oregon)	25 years	Minimal costs for landscaping.				
Valley/Pepper Intersection Realignment	TE134528	08/31/2006	1.84 acres (California)	10 years	\$100,000 endowment				\$100,000
Joshua Tree Campground	TE133476	11/08/2006	314.6 acres (California)	30 years	\$714,297 (\$93,349 first year cost plus annual \$21,412 maintenance costs)				\$93,349
Kaheawa Pastures Windfarm	TE118901	01/30/2006	345 acres (Hawaii)	20 years	\$4,200,000 maximum over life of permit				
Washington DNR Forest Practices	TE-121202	05/26/2006	930000 acres (WA)	50 years	Not available. This is a "programmatic" HCP.				
Hillcrest Travel Plaza	TE120484	03/03/2006	10 acres (California)	10 years	Not available				

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
National Equity Engineering	TE134227	09/05/2006	15.6 acres (California)	3 years	Not available				
Post-Ranch Inn	TE119210	12/20/2006	91.98 acres (California)	20 years	\$391,840 (including monitoring and maintenance costs)				\$391,840
Totals					\$821,919,305	\$15,239,340	745,885,586	\$17,117,820	\$631,203

Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/ITPs issued prior to 2003.

Region 1 Cost Commitment Totals

Total Mitigation Costs Committed, 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
\$821,919,305	\$61,898,045+	\$752,776,305	\$1,838,818	\$5,406,137

Region 2 - Southwest Region: Arizona, New Mexico, Oklahoma, Texas

Name of Permittee	Permit No.	Date Issued	No. Acres	Permit Duration	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Fleur Land Ltd	TE065323-0	05/07/2003	209 acres (Texas)	30 years	\$1,500	\$1,500			
Griffith League Ranch	TE065406-0	11/05/2003	4848 acres (Texas)	50 years	\$1,000,000 (\$20,000/yr for life of permit)	\$20,000	\$20,000	\$20,000	\$20,000
Hunting and Mercantile	TE066141-0	05/19/2003	1.1 acres (Texas)	5 years	\$4,000	\$4,000			
Ott, Elizabeth	TE074986-0	11/14/2003	4.14 acres (Texas)	5 years	\$2,000	\$2,000			
Reid, Roger and Wanek	TE066089-0	05/19/2003	2.625 acres (Texas)	5 years	\$660	\$660			
Salt River Project Roosevelt Lake	TE060125-0	02/26/2003	21,493 acres (Arizona)	50 years	Up to \$25,100,000 million over life of the permit (estimated)	\$502,000	\$502,000	\$502,000	\$502,000
Smoot, Ralph	TE068275-0	07/08/2003	2.5 acres (Texas)	5 years	\$5,000	\$5,000			
Greenshores Subdivision	TE074582-0	02/10/2004	78 acres (Texas)	30 years	\$32,000		\$32,000		

Name of Permittee	Permit No.	Date Issued	No. Acres	Permit Duration	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Horizon (GDF Realty, Riordan Properties)	838761	12/29/2004	19.3 acres (Texas)	0 years	\$130,000		\$130,000		
SkyRanch	TE063647-0	01/30/2004	512 acres (Arizona)	20 years	Costs not estimated except for \$40,000 in fencing		\$40,000		
White, John	082706-0	08/17/2004	2,398 acres (Texas)	5 years	\$4,796		\$4,796		
Bastrop Utilities	TE078366-0	08/19/2005	142526 acres (TX)	30 years	\$1,910,790 over life of permit, with addendum			\$63,693	\$63,693
Becker, Robert	TE-098535	05/16/2005	6.58 acres (Texas)	5 years	\$0			\$0	
Lower CO River MSCP	TE-086834	04/04/2005	717814 acres (AZ)	50 years	\$626,180,000			\$6,126,449*	\$13,150,911
Caster, John & Christine	TE012423-0	01/26/2006	10.13 acres (Texas)	5 years	\$1,500				\$1,500
Cibolo Canyon - Lumberman's Investment Co.	102437-0	02/27/2006	1606 acres (Texas)	30 years	\$1,611,000 (estimated over 20 yr period)				\$201,992 (estimated in HCP for 2006 expenditures)
Hunt, John & Jim	TE010556-0	04/04/2006	20.5 acres (Texas)	5 years	\$1,500				\$1,500
Sac N Pac Stores, Inc.	124123-0	09/14/2006	1.43 acres (Texas)	5 years	\$4,290				\$4,290
Totals					\$656,029,036	\$535,160	\$728,796	\$6,712,142	\$13,945,886

*Expenditures as reported in Lower Colorado River Multi-Species Conservation Program annual report, April 2007.
 Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/ITPs issued prior to 2003.

Region 2 Cost Commitment Totals

Total Mitigation Costs Committed, 2003-2006	\$656,029,036	Costs Committed 2003	\$26,113,160	Costs Committed 2004	\$206,796	Costs Committed 2005	\$628,090,790	Costs Committed 2006	\$1,618,290
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Region 3 – Great Lakes-Big Rivers: Indiana, Illinois, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin

Name of Permittee	Permit No.	Date Issued	No. Acres	Permit Duration	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2005
Long Point LLC	TE072436	06/04/2003	15 acres (Ohio)	15 years	\$69,500 (incl. landscaping, monitoring)	\$52,000	\$1,250	\$1,250	\$1,250
Cobb to Brickyard Reconducting Project	TE94217	04/08/2005	4 linear miles (Michigan)	5 years	\$0 (only conservation measures required)				
NIPSCO	TE106233 TE106231	03/06/2006	86 acres (Indiana)	20 years	Not available				
Totals					\$69,500	\$52,000	\$1,250	\$1,250	\$1,250

Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/IIPs issued prior to 2003.

Region 3 Cost Commitment Totals

Total Mitigation Costs Committed, 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
\$69,500	\$69,500	\$0	\$0	\$0

Region 4 – Southeast: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the U.S. Virgin Islands

Note: Despite repeated requests and web searches, ELI was unable to obtain any HCP documents or information on mitigation cost estimates for permits issued by Region 4 in 2004-2006. Region 4 issued over 90 incidental take permits during that time period. Most of those permits covered single residential homes; only 17 of those permits involved the development of over 5 acres, of which 4 were over 500 acres.

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Ben McCutcheon	TE063814-0	09/8/2003	5 acres (SC)	4 years	\$0 (None required of applicant; mitigation funded by third party)	\$0			
Dunes of GP, LLC	TE079861	11/25/2003	2.08 Acres (Alabama)	23 years	\$3,000 one-time endowment; \$50 collected annually from each residential unit	\$3,000			
Howland Boulevard	TE054160-0	02/21/2003	3.21 acres (Florida)	5 years	\$0 (management costs covered from county budget)	\$0			
Vestcor Fund IX	TE042708-0	08/08/2003	18.3 acres (Florida)	5 years	\$10,700 (for management activities on mitigation site)	\$10,700			
Woodlands Group, LLC	TE037661-0	07/24/2003	971 acres (Louisiana)	4 years	\$7,000 for fund management activities on mitigation site	\$7,000			

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Palmas del Mar Resort	TE033100-0	01/17/2003	13.1 acres (Puerto Rico)	10 years	Not available				
Totals					\$20,700	\$20,700	Not Available	Not Available	Not Available

Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/ITPs issued prior to 2003.

Region 4 Cost Commitment Totals

Total Mitigation Costs Committed 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
\$20,700	\$20,700	Not Available	Not Available	Not Available

Region 5 – Northeast: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Snowshoe Mountain Resort	TE065121	02/24/2003	125 acres (WV)	24 years	at least \$500,000	\$500,000			
Virginia-Carolina Properties RCW HCP	TE090858-0	11/22/2004	75 acres (Virginia)	5 years	\$10,500		\$10,500		
Recreation and Infrastructure Expansion at Snowshoe Mountain	TE115839-0	01/23/2006	162.1 acres (West Virginia)	10 years	Not available				
Totals					\$510,500	\$500,000	\$10,500	\$0	\$0

Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/ITPs issued prior to 2003.

Region 5 Cost Commitment Totals

Total Mitigation Costs Committed 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
\$510,500	\$500,000	\$10,500	\$0	\$0

Region 6 – Mountain Prairie: Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming

Name of Permittee	Permit No.	Date Issued	No. Acres	Duration of Permit	Total HCP Mitigation Costs Committed	Costs Expended 2003	Costs Expended 2004	Costs Expended 2005	Costs Expended 2006
Briergate/La Plata	TE064967-0	02/28/2003	2,180 acres (Colorado)	30 years	\$970,000	\$84,250*	\$84,250*	\$84,250*	\$84,250*
Denver Water Board	TE068418-0	05/02/2003	6,143 acres (Colorado)	30 years	\$900,000 (\$30,000/yr)	\$30,000	\$30,000	\$30,000	\$30,000
Mayhoffer Trail	TE073325-0	06/18/2003	80 acres (Colorado)	30 years	Not available				
Struther's Ranch	TE073390-0	12/23/2003	105 acres (Colorado)	30 years	\$540,000	\$540,000			
The Meadows	TE-064965	02/17/2004	480 acres (Colorado)	30 years	\$371,392		\$371,392		
Eagle's Nest Open Space	TE-083409-0	08/05/2004	264 acres (Colorado)	30 years	No cost estimate. Mitigation part of operations budget.				
Livermore Area	TE-079479 TE-115609	11/29/2005	283346 acres (Colorado)	30 years	Minimal mitigation costs, limited to preparation of deed restrictions.				
Monument Creek Interceptor Tie-In	TE-097228	06/30/2005	1.63 acres (Colorado)	20 years	\$15,000 (over first 3 years)			\$5,000	\$5,000
Douglas County	TE-125750 TE-125749 TE-036717	05/11/2006	283 linear miles (Colorado)	10 years	No mitigation costs estimated because applicant preserved needed acreage.				
Totals					\$2,796,392	\$654,250	\$485,642	\$119,250	\$119,250

* Expenditures through 2006 equaled \$337,000. Actual per year expenditures from 2003-2006 were not available so ELI averaged the expenditures over the four-year time period.
 Note: The estimated total costs expended for each year of the years 2003-2006 do not include expenditures from HCPs/ITPs issued prior to 2003.

Region 6 Cost Commitment Totals

Total Mitigation Costs Committed, 2003-2006	Costs Committed 2003	Costs Committed 2004	Costs Committed 2005	Costs Committed 2006
\$2,796,392	\$2,410,000	\$371,392	\$15,000	\$0

Chapter 4: Natural Resource Damages

I. PROGRAM SUMMARY

This Chapter describes federal natural resource damage (NRD) authorities and programs, examines the available data on NRD settlements and judgments, and discusses how State Wildlife Action Plans could be used to inform NRD assessment and restoration.

It is important to note that many states have enacted laws that provide NRD authorities in addition to, and independent of, the authority states have under federal laws. Depending on the particular case, states may bring state-law claims in the same litigation as state and federal trustee claims under federal law. Although this Chapter focuses on settlements and judgments brought by federal and state trustees under federal law, as opposed to state law, it was not always possible to separate federal and state claims. State NRD laws are discussed briefly, but cost estimates are not provided for recoveries under those laws.

1. Federal Natural Resource Damages Laws

Statutory Authority

When an injury occurs to the environment due to human activity, such as an oil or chemical spill or leak, responsible parties may be liable for the cost of removal and remedial actions and the cost to restore the natural environment. Specifically, a responsible party may be liable for NRDs under one or more of the following federal laws: the Comprehensive Environmental Response, Compensation, and Liability Act¹⁶⁸ (CERCLA), the Clean Water Act¹⁶⁹ (CWA), the Oil Pollution Act¹⁷⁰ (OPA), the Park System Resources Protection Act¹⁷¹ (PSRPA), or the National Marine Sanctuaries Act¹⁷² (NMSA), depending on the source of the injury and the location (Table 5).

CERCLA and OPA are mutually exclusive: CERCLA is available only for hazardous waste, specifically excluding oil, and OPA is available only for injuries due to oil. It is possible that an incident could occur that would involve the discharge of both oil and hazardous waste, in which case both statutes would apply. The CWA, PSRPA, and NMSA apply to any injuries, not only hazardous waste and oil discharges. For example, if a barge collides with a reef that is designated as a National Marine Sanctuary, the relevant trustees could seek damages under the NMSA. In addition to the authorizing laws, several additional executive orders and federal, state and local laws and regulations affect the NRD restoration process.¹⁷³

¹⁶⁸ Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601 et seq. (2000).

¹⁶⁹ Federal Water Pollution Control Act, 33 U.S.C. §§ 1251 et seq. (2000).

¹⁷⁰ Oil Pollution Act, 33 U.S.C. §§ 2701 et seq. (1990).

¹⁷¹ Park System Resource Protection Act, 16 U.S.C. § 19jj (2000).

¹⁷² National Marine Sanctuaries Act, 33 U.S.C. §§ 1401 et seq. (2000). The National Marine Sanctuaries Act is part of a larger act, the Marine Protection, Research, and Sanctuaries Act, which in addition to NMSA pertains to ocean dumping. The literature may refer to NMSA or interchangeably Marine Protection, Research and Sanctuaries Act of 1972, Pub. L. No. 92-532, §2, 86 Stat. 1052 (1972). Ocean dumping provisions are codified at 33 U.S.C. §§ 1401-1445.

¹⁷³ These include, for example: Anadromous Fish Conservation Act, 16 U.S.C. §§ 757a et seq. (2002); Coastal Zone Management Act, 16 U.S.C. §§ 1451, et seq. (1990); Endangered Species Act, 16 U.S.C. §§ 1531, et seq. (1988); Executive Order 11,988 (Floodplain Management), 42 Fed. Reg. 26,951 (May 24, 1977), amended by, Executive Order 12,898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), 44 Fed. Reg. 43,239 (Feb. 11, 1994); Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661, et seq. (1934); National Environmental Policy Act, 42 U.S.C.

Table 5. NRD Statutory Authority. ¹⁷⁴					
	CERCLA	OPA	CWA	PSRPA § 19jj	NMSA
Cause of Injury	Hazardous substances	Oil	Oil and hazardous substances	Any means of injury	Any means of injury
Location of Event	Any place where hazardous substances are released or have come to be located	Navigable waters (U.S. waters), adjoining shorelines, and Exclusive Economic Zone	Navigable waters of the U.S., adjoining shoreline, contiguous zones	Within a Park Unit	Within a Marine Sanctuary
Trustees	Federal agencies, states, and Indian tribes	Federal agencies, states, Indian tribes, and foreign governments	Federal agencies, states, and Indian tribes	Secretary of the Interior	Secretary of Commerce

Natural Resources Trustees

Only designated trustees have the authority to assess damages and pursue NRD cases against liable parties.¹⁷⁵ NRD trustees may act pursuant to CERCLA, OPA, CWA, PSRPA, or NMSA. Under CERCLA and CWA, federal, state, and tribal officials are authorized to act as trustees for the damaged resources.¹⁷⁶ Foreign trustees may pursue claims under OPA.¹⁷⁷ Under NMSA, the Secretary of Commerce is the designated trustee for damages to national marine sanctuaries.¹⁷⁸ PSRPA designates the Secretary of the Interior as the trustee in cases involving injury to national park natural resources.¹⁷⁹

§§ 4321-4370d (1970); Rivers and Harbors Act, 33 U.S.C. §§ 401, et seq. (1983); Archaeological Resources Protection Act, 16 U.S.C. §§ 470, et seq. (1980); Clean Air Act, 42 U.S.C. §§ 7401, et seq. (1990); Emergency Wetlands Resources Act, 16 U.S.C. §§ 3901 (1986); Estuarine Protection Act, 16 U.S.C. §§ 1221 et seq. (1968); Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661 et seq. (1958); Marine Mammal Protection Act, 16 U.S.C. §§ 1361 et seq. (1994); Migratory Bird Treaty Act, 16 U.S.C. §§ 703 et seq. (2004); National Historic Preservation Act, 16 U.S.C. §§ 470 et seq. (1980); National Park Act of August 19, 1916 (*also known as* Organic Act, 16 U.S.C. § 1, et seq. (1996)); as well as local zoning, development and nuisance ordinances. See also NOAA, Damage Assessment, Remediation and Restoration Program [hereinafter DARRP], Laws and Regulations/Legal Documents: Referenced Laws, Regulations, and Agreements, <http://www.darrp.noaa.gov/about/laws.html> (last visited July 17, 2007).

¹⁷⁴ Adapted from NRD DESKBOOK, *supra* note 5, at §3.2.

¹⁷⁵ See *e.g.*, Designation of Federal Trustees, 40 C.F.R. § 300.600(b)(3)-(4); Executive Order 12,580, 52 Fed. Reg. 2923 (Jan. 23, 1987); see also NRD DESKBOOK, *supra* note 5, at § 3.3. The Environmental Protection Agency implements trustee provisions but does not assess damages.

¹⁷⁶ Designation of Federal Trustees, 40 C.F.R. § 300.600 (stating “[f]ederal officials so designated will act pursuant to section 107(f) of CERCLA, § 311(f)(5) of the CWA, and § 1006 of the OPA.”).

¹⁷⁷ OPA, 33 U.S.C. § 1006 (1990); 40 C.F.R. § 300.612. This report does not examine cases involving foreign trustees.

¹⁷⁸ NMSA, 16 U.S.C. § 1443 (2000).

¹⁷⁹ National Park Service, Director’s Order #14: Resource Damage Assessment and Restoration [hereinafter Director’s Order #14], at 5 (effective Sept. 28, 2004 to Sept. 30, 2008), *available at* http://www.nature.nps.gov/DOrders/Directors_Order_14.pdf.

Trustees can, and often do, pursue NRD cases under more than one law. In practice, the major federal agencies involved most often in NRD actions are the U.S. Fish and Wildlife Service (FWS), the National Park Service (NPS), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Forest Service.¹⁸⁰ In addition, state trustees often act as NRD trustees under both federal authority and similar state laws in cases involving state resources.¹⁸¹ Federally-recognized Indian tribes may act as a trustee over their natural resources.

Because of jurisdictional overlap, often more than one agency, state and/or tribe acts as a trustee in a given NRD dispute.¹⁸² There are no double fines, however, and trustees in these cases must divide the recovered sums.¹⁸³

NRD Process: From Injury to Restored Environment

In response to natural resource injury, the designated trustee typically undertakes a three-phase NRD process: (1) preassessment; (2) injury assessment/restoration planning; and (3) restoration implementation (Box 4).¹⁸⁴ Parties that cause the injury (“responsible parties”) are liable for assessment and restoration costs, including costs related to loss of use during cleanup and restoration.¹⁸⁵ Responsible parties may assist with and participate in cooperative assessments and restoration activities. Cooperative assessments are more likely in cases of acute spills, where damages are more easily quantified and assessed, than for chronic sites that involve multiple parties and hazardous releases over long periods of time.¹⁸⁶

¹⁸⁰ See NRD DESKBOOK, *supra* note 5, at § 4.2.4.

¹⁸¹ 40 C.F.R. § 300.605. (State resources are defined in Environmental Protection Agency regulations as “natural resources, including their supporting ecosystems, within the boundary of a state or belonging to, managed by, controlled by, or appertaining to such state.” States may pursue NRD claims in the absence of a federal trustee partner under federal and state laws.)

¹⁸² For example, in the Hudson River PCB discharge settlement, the trustees include NOAA, U.S. Department of the Interior, and the State of New York. NOAA, Case: Hudson River, NY, *available at* <http://www.darrp.noaa.gov/northeast/hudson/index.html> (last visited July 17, 2007).

¹⁸³ OPA, 33 USC § 2706(d)(3) (1990).

¹⁸⁴ NRD DESKBOOK, *supra* note 5, at § 1.2.3.

¹⁸⁵ *Id.* at § 1.2.4.

¹⁸⁶ Personal communication with National Park Service, U.S. Department of Interior, in Atlanta, Ga. (Dec. 15, 2005).

Box 4. The National Park Service (NPS): An Example of the NRD Process.

The process used by the National Park Service, set out in its *Damage Assessment and Restoration Handbook* (2003), provides a useful example of how trustees move from injury to restored environment.

(1) Preassessment

Known by NPS as “Case Classification and Initial Case Management,” this phase includes an initial assessment to determine whether restoration measures are possible and whether to proceed with a damage assessment. At this stage, NPS considers the type of case, case management, coordination with other trustees and/or the responsible party, cooperative assessments, funding sources, and criminal procedures.

(2) Injury Assessment/Restoration Planning

Injury Assessment. The *Handbook* advises the NRD case team to consider the resource condition, resource value, and management objectives of the Park. The case team should draw upon the park management plan, as well as other relevant management plans.* NPS advises that injury quantification assessments should make use of literature reviews, field studies, lab studies, and modeling.*

Restoration Planning. NPS classifies restoration into two categories: (a) primary restoration (returning injured resources to their baseline conditions); and (b) compensatory restoration** (replacing lost human or ecosystem services for the time-period of injury). In considering restoration measures, NPS advises that the NRD team should consider effectiveness, cost, management policies, other management plans,* and existing partnerships, among other factors.

(3) Restoration Implementation

Restoration implementation involves planning, environmental compliance, coordination and cooperation with partners, determining measures for success, implementing projects, and monitoring for success. Prior to restoration implementation, the *Handbook* states that “the project team also should consider consistency with existing resource management plans.”*

* These steps could be informed by State Wildlife Action Plans, as discussed below.

** Compensatory *restoration* should not be confused with compensatory *mitigation*. Both primary and compensatory *restoration* can include compensatory *mitigation* activities.

NRD ASSESSMENTS (NRDAs). Trustees conduct NRDA in order to determine injuries to natural resources and the cost of those injuries. Valuing lost resources can be particularly challenging and expensive, and responsible parties must pay the assessment costs in addition to paying for the cost of the resource injury.

Trustees have issued regulations that attempt to standardize injury determinations and cost assessments. For example, under CERCLA, the Department of the Interior promulgated regulations for two types of NRDA: Type A assessments for injuries requiring simplified assessments, and Type B assessments for injuries requiring individualized assessment.¹⁸⁷ Type A assessments require limited data and rely on a standardized process. For Type B assessments, DOI developed a four-step assessment process: (1) injury determination, including testing and sampling methods; (2) quantification of baseline conditions, recovery time, and lost services; (3) damage determination to ascertain the appropriate compensation for the injuries; and (4) post-assessment, including a post-assessment report.¹⁸⁸

¹⁸⁷ CERCLA, 42 U.S.C. § 9651(c) (2000); Natural Resource Damage Assessments, 43 C.F.R. §§ 11.10-11.93.

¹⁸⁸ Natural Resource Damage Assessments, 43 C.F.R. § 11.13.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT

Parties may be liable under CERCLA for the clean-up of releases of hazardous substances into the environment. Hazardous substances are defined to include substances that the Environmental Protection Agency (EPA) specifically designates under CERCLA and substances it has determined to be hazardous under other statutes it administers, such as the Clean Water Act and Clean Air Act. CERCLA provides the government with two major authorities in response to hazardous substance releases: (1) removal and remediation authority, and (2) NRD authority.¹⁸⁹

Removal and remediation, or response work, is the first step in responding to a release of hazardous substances. The purpose of removal and remediation is to prevent human health and environmental risk in the future.¹⁹⁰ EPA is the lead agency for removal and remediation work. EPA can perform the response work itself, but more often it requires responsible private parties to perform the cleanups.

In addition to imposing liability for the costs of removal and remediation actions, the statute also imposes liability for damages for injury to, destruction of, or loss of natural resources that belong to, are managed by, held in trust by, appertain to, or otherwise are controlled by a state, the federal government, or Indian tribes that results from the release of a hazardous substance. The liability includes the costs of assessing the injury, destruction, and loss. The definition of natural resources is broad, and includes: land, wildlife, fish, biota, air, water, drinking water supplies, and more. The statute provides for the designation of federal, state, and tribal trustees that may assess damages and bring actions to recover funds from private parties. The funds recovered can be used to restore, replace, or acquire equivalent resources. There can be no NRD recovery for injury and hazardous substance releases that occurred *wholly* before December 11, 1980. If the injury continued to occur after the 1980 date, NRD recovery may be possible.¹⁹¹

CERCLA establishes a trust fund (known as the Superfund), that can be used under certain circumstances for response work, but is not available for NRD assessment and restoration costs.¹⁹² Remedial actions may be coordinated with NRD assessments, however, and the amount of cleanup in remedial actions may offset NRD costs.¹⁹³ For example, environmental studies conducted to inform remedial actions may be similar to those needed for NRD assessments. By coordinating actions, NRD assessment costs – and therefore the damages owed by responsible parties – can be reduced at some sites.

¹⁸⁹ 42 U.S.C. §§ 9607 & 9611.

¹⁹⁰ NRD DESKBOOK, *supra* note 5, at §§ 4.2.3 and 4.2.4

¹⁹¹ 42 U.S.C. § 9607 (f).

¹⁹² The statute allows use of the trust fund for NRDs and NRD assessments. However, the Superfund Amendments and Reauthorization Act (SARA) of 1986 amend the Internal Revenue Service Code, prohibiting use of the trust fund for NRD assessments and activities. 42 U.S.C. §§ 9611 & 9607(c)(1).

¹⁹³ NRD DESKBOOK, *supra* note 5, at § 4.2.3; 42 U.S.C. § 9613 (g)(sets out time frames for filing NRD actions).

Box 5. The Montrose Settlement: An Example of NRDs under CERCLA.

Injury

DDT and PCBs were discharged from the Montrose Chemical Plant into the ocean from the 1940s to the 1980s. This resulted in contaminated fish, closed fisheries, contaminated peregrine falcons and bald eagles (resulting in breeding failures), as well as other contaminated species.

Trustees

Federal: National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, and National Park Service

State: California (Department of Fish and Game, State Lands Commission, and Department of Parks and Recreation)

Settlement Sum: \$140.2 million

Of this, \$65 million was used to pay past assessment costs. The remainder is for restoration and program implementation.

Restoration Activities

Restoration activities include a study to determine feasibility of bald eagle restoration on the Catalina Islands, a peregrine falcon survey, and a survey to determine fish contamination and consumption. Proposed activities include off-site restoration of seabirds to Baja California islands, artificial reef development, and wetlands restoration, among others.

OIL POLLUTION ACT

The Oil Pollution Act was created in response to the 1989 *Exxon Valdez* oil spill in Prince William Sound, Alaska.¹⁹⁴ Like CERCLA, OPA creates a liability scheme for response, cleanup and NRDs. Responsible parties are liable for “a vessel or a facility from which oil is discharged, or which poses a substantial threat of a discharge of oil, into or upon the navigable waters or adjoining shorelines or the exclusive economic zone.”¹⁹⁵ Parties may be liable for damages to real and personal property, loss of profits or earning capacity, loss of subsistence uses, loss of tax and other government revenues, increased costs of public services, and NRDs.¹⁹⁶

OPA defines NRDs as “[d]amages for injury to, destruction of, loss of, or loss of use of, natural resources, including the reasonable costs of assessing the damage, which shall be recoverable by a United States trustee, a State trustee, an Indian tribe trustee, or a foreign trustee.”¹⁹⁷ The measure of NRDs is “(A) the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of, the damaged natural resource; (B) the diminution in value of those natural resources pending restoration; plus (C) the reasonable cost of assessing those damages.”¹⁹⁸ NOAA has issued regulations and several guidance documents under OPA related to assessment, compensation, restoration planning, and restoration actions.¹⁹⁹

¹⁹⁴ For a detailed discussion of the Act as it relates to NRDs, see NRD DESKBOOK, *supra* note 5, at §5.

¹⁹⁵ OPA, 33 U.S.C. § 2702(a) (1990); see also U.S. COAST GUARD, REPORT ON IMPLEMENTATION OF THE OIL POLLUTION ACT OF 1990 [hereinafter OPA REPORT] at 9 (2004), available at http://www.uscg.mil/npfc/Documents/PDFs/osltf_report.pdf.

¹⁹⁶ 33 U.S.C. § 2702(2).

¹⁹⁷ 33 U.S.C. § 2702(b)(2)(A).

¹⁹⁸ 33 U.S.C. § 2706(d)(1)(A)-(C).

¹⁹⁹ Natural Resource Damage Assessments, 15 C.F.R. § 990; ELI REINHARZ, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PREASSESSMENT PHASE: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1996), available at <http://www.darrp.noaa.gov/library/pdf/ppd.pdf>; DOUGLAS HELTON ET AL., NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, INJURY ASSESSMENT: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1996), available at <http://www.darrp.noaa.gov/library/pdf/iad.pdf>; DEBORAH P. FRENCH, NATIONAL OCEANIC AND

In addition to creating a system of liability, OPA establishes the Oil Spill Liability Trust Fund (OSLTF) to address costs not covered by a responsible party. OSLTF funding sources include monies from consolidation of previous funds, taxes, and monies paid by liable parties (Table 6). The OSLTF is administered by the U.S. Coast Guard.²⁰⁰ It has two components: an Emergency Fund (available for initiating NRD assessments and funding removal activities) and a Principal Fund.²⁰¹ The U.S. Coast Guard and EPA are the lead agencies for removal actions in the coastal zone and inland zone, respectively.²⁰²

In addition to funding administrative costs and research and development, the Principal Fund can be used for NRD assessment and restoration, rehabilitation, replacement, or acquisition of natural resources.²⁰³ The Fund is available to trustees for NRDs only after trustees seek reimbursement from liable parties.²⁰⁴ Table 6 outlines the funding sources for the OSLTF.

Table 6. OSLTF Funding Sources. ²⁰⁵	
Source	Comments
Previous funds (Deepwater Port Liability Fund, Offshore Pollution Compensation Fund, Trans-Alaska Pipeline Fund, and the CWA Fund)	All funds have been transferred, and this is no longer a source of revenue.
Petroleum per-barrel tax	This tax expired in 1994, and is no longer a source of revenue. It was the largest revenue source and helped bring the Fund to over \$1 billion.
Interest on the principal	This is the largest existing funding source.
Cost recovery from liable parties	Actual NRD costs typically exceed the amounts recovered from liable parties.
Penalties paid pursuant to Section 311 of CWA and Section 207 of the Trans-Alaska Pipeline Authorization Act	Penalties are approximately \$4 million to \$7 million per year. Two large sums were paid in the years 2000 (> \$30 million) and 2003 (> \$40 million).

ATMOSPHERIC ADMINISTRATION, SPECIFICATIONS FOR USE OF NRDAM/CME VERSION 2.4 TO GENERATE COMPENSATION FORMULAS: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1996), available at <http://www.darrp.noaa.gov/library/pdf/cfd.pdf>; DEBORAH P. FRENCH ET AL., NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, PRIMARY RESTORATION: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1996), available at <http://www.darrp.noaa.gov/library/pdf/prd.pdf>; ELI REINHARZ, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, RESTORATION PLANNING: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1996), available at <http://www.darrp.noaa.gov/library/pdf/rpd.pdf>; and NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, SCALING COMPENSATORY RESTORATION ACTIONS: GUIDANCE DOCUMENT FOR NATURAL RESOURCE DAMAGE ASSESSMENT UNDER THE OIL POLLUTION ACT OF 1990 (1997), available at <http://www.darrp.noaa.gov/library/pdf/scaling.pdf>.

²⁰⁰ NRD DESKBOOK, *supra* note 5, at § 5.5.1.

²⁰¹ *Id.* at § 5.5.3.

²⁰² OPA REPORT, *supra* note 195, at 9.

²⁰³ See OPA, 33 U.S.C. § 2712 (1990).

²⁰⁴ See 33 U.S.C. § 2713.

²⁰⁵ Adapted from OPA REPORT, *supra* note 195, at 5-8.

CLEAN WATER ACT

Under the Clean Water Act, responsible parties are liable for discharges of oil or hazardous substances into the navigable waters of the United States.²⁰⁶ Liability includes “any costs or expenses incurred by the Federal Government or any State government in the restoration or replacement of natural resources damaged or destroyed as a result of a discharge of oil or a hazardous substance.”²⁰⁷ While still available as an authority for pursuing NRD claims, trustees have decreased their use of the CWA for NRD claims since the enactment of OPA in 1990, and also have increased their use of CERCLA’s NRD provisions.²⁰⁸

PARK SYSTEM RESOURCES PROTECTION ACT

Under PSRPA, a party that “destroys, causes the loss of, or injures any park system resource” is liable for both response costs and damages.²⁰⁹ PSRPA creates liability for injury to *any* park system resource, including any “living or non-living resource that is located within the boundaries of a unit of the National Park System, except for resources owned by a non-Federal entity.”²¹⁰ This includes, for example, injuries to buildings or stop signs, as well as natural resources. The statute is not limited to addressing oil or chemical releases, as are OPA and CERCLA. NPS, through delegation by the Secretary for the Department of Interior, acts as the federal trustee.²¹¹

Response actions include actions taken to minimize or prevent destruction, loss, or injury to the NPS resource, in addition to actions taken to minimize *imminent risk* of destruction, loss or injury. For example, if a tanker runs aground on an NPS reef, but does not cause an oil spill, the responsible party would be liable for response costs associated with actions to prevent the imminent risk of a spill, or to minimize or prevent structural damage to the reef. Damages include the cost of replacing, restoring or acquiring the equivalent resource and the value related to loss of use or the value of the resource, if the resource cannot be replaced or restored.

NATIONAL MARINE SANCTUARIES ACT

NMSA designates the Secretary of Commerce as the trustee for natural resource injuries to marine sanctuaries.²¹² Under NMSA, “[a]ny person who destroys, causes the loss of, or injures *any* sanctuary resource is liable” for response cost, damages, and any accumulated interest on that amount.²¹³ Similar to other NRD statutes, NMSA response costs are the costs related to initial actions to minimize loss or destruction of the resource. NMSA NRDs include “the cost of replacing, restoring, or acquiring the equivalent;” lost use value; resource value if it cannot be replaced, restored or an equivalent acquired; damage assessments; monitoring costs; “cost of curation and conservation of archeological, historical, and cultural sanctuary resources;” and enforcement actions taken in response to the injury.²¹⁴

²⁰⁶ CWA, 33 U.S.C. §1321(f) (2000).

²⁰⁷ 33 U.S.C. § 1321(f)(4).

²⁰⁸ NRD DESKBOOK, *supra* note 5, at §6.

²⁰⁹ PSRPA, 16 U.S.C. §19jj-1 (2000).

²¹⁰ See National Park Service, Director’s Order #14, *supra* note 179.

²¹¹ *Id.* at 5.

²¹² NMSA, 16 U.S.C. § 1443 (2000).

²¹³ *Id.* (emphasis added).

²¹⁴ 16 U.S.C. § 1432(6).

Similar to the PSRPA, liability is not limited to certain types of injuries (e.g. chemical or oil discharges). A responsible party is liable for *any* injury to a national marine sanctuary resource. Damage to reefs from vessel groundings, anchors and propellers constitute injuries under the NMSA provisions. For example, in 1989 a vessel, the *M/V Elpis*, ran aground on a coral reef in the Florida National Marine Sanctuary, injuring over six acres of reef. NOAA, as the resource trustee, pursued the claims under NMSA, and the responsible parties settled the NRD claim for \$2.075 million.²¹⁵ The ensuing restoration project included creation of a stable reef foundation using rubble and limestone boulders, followed by transplantation of corals and sea fans.²¹⁶

2. Federal Implementing Agencies and Programs

NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION

The Secretary of Commerce designates NOAA as the trustee for cases involving coastal and marine resources. NOAA conducts its trustee obligations under CERCLA, OPA, CWA and NMSA through its Damage Assessment, Remediation and Restoration Program (DARRP). DARRP is a cross-cutting program that includes the Damage Assessment Center (Office of Response and Restoration), the Restoration Center (National Marine Fisheries Service), and the Legal Counsel for DARRP (Office of General Counsel).

DEPARTMENT OF INTERIOR

DOI's Restoration Program is currently engaged in damage assessment cases throughout the country. In determining damages, DOI policy states that "[d]amage claims should document and include recoveries for response and assessment costs, interim losses and accumulated interest, and the cost of restoration implementation and direct and indirect costs for restoration activities, including, but not limited to, planning, implementation, operation, maintenance, oversight, legal protection, and environmental monitoring."²¹⁷

DOI has several sub-agencies that act as trustees in NRD cases. These include the U.S. Fish and Wildlife Service (FWS), NPS, the Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM) and the Bureau of Reclamation. FWS acts as a trustee in cases involving National Wildlife Refuges, endangered and threatened species, and migratory birds, among others. BIA may pursue NRD claims on behalf of Indian tribes, but Indian tribes also may pursue claims as trustees. The Bureau of Reclamation is tasked with protecting U.S. waters and related resources, and is a trustee in cases related to this mission. BLM is a trustee for claims related to injury to public lands and their natural resources.

As discussed, the NPS pursues NRD claims under CERCLA, OPA, CWA, and the PSRPA, as a federal trustee delegated by the Secretary of the Department of Interior for injuries that occur within national park boundaries.²¹⁸ NPS created the Environmental Response, Damage Assessment, and Restoration Program

²¹⁵ *United States v M/V Elpis*, 90-10011-CIV-JLK (S.D. Fla. 1991).

²¹⁶ National Oceanic Atmospheric Administration, DARRP, Case: Elpis Reef Restoration, <http://www.darrp.noaa.gov/southeast/elpis/index.html> (last visited July 17, 2007).

²¹⁷ Letter from Frank DeLuise, Program Manager, Policies and Operating Principles for Natural Resource Restoration Activities (May 7, 2004), *available at* <http://restoration.doi.gov/pdf/policiesandprinciples.pdf>.

²¹⁸ See National Park Service, Director's Order #14, *supra* note 179.

(ERDAR) in 1993 to address natural resource injuries.²¹⁹ NPS follows seven guiding principles,²²⁰ and developed a *Damage Assessment and Restoration Handbook* based on these principles to standardize its assessment and restoration procedures (see Box 4, above).²²¹

DEPARTMENT OF AGRICULTURE (USDA)

The U.S. Forest Service is the main agency within USDA that pursues NRD claims. Of the 273 cases with federal agency trustees that ELI identified, only nine cases included the U.S. Forest Service as one of the trustees.

DEPARTMENT OF ENERGY (DOE) AND DEPARTMENT OF DEFENSE (DOD)

The Department of Energy and the Department of Defense are the NRD trustees for the lands they hold in trust.²²² Tribes, states and other federal agencies also may be trustees at these federal sites.²²³ It is important to recognize, however, that the natural resource damage provisions of CERCLA apply to federally-owned facilities,²²⁴ and that the Departments of Energy and Defense already are engaged in costly and complex cleanup activities.²²⁵ In addition, federal facilities also are liable for damages for injury to, destruction of, or loss of natural resources, including the cost of assessing such damage.²²⁶

For example, DOE is liable for monetary damages to compensate for injuries to natural resources that resulted from its nuclear weapons production. As of June 1996 there were 160 federal facilities proposed or

²¹⁹ NATIONAL PARK SERVICE, HONORING THE TRUST: RESTORING DAMAGED PARK RESOURCES, THE NATIONAL PARK SERVICE ENVIRONMENTAL RESPONSE, DAMAGE ASSESSMENT, AND RESTORATION PROGRAM PROGRESS REPORT [hereinafter HONORING THE TRUST] (2005), available at http://www.nature.nps.gov/protectingrestoring/damageassessmentandrestoration/pdf/report_Recover.pdf.

²²⁰ See Director's Order #14, *supra* note 179, at 6. The principles are: 1) apply the law consistently; 2) establish successful precedents; 3) establish solid technical basis for claims; 4) develop a separate process for small claims; 5) develop a process to track and monitor cases; 6) establish a single revenue stream for accountability of damages collected and spent; and 7) provide for accountability in all aspects of the program.

²²¹ NATIONAL PARK SERVICE, U.S. DEPARTMENT OF THE INTERIOR, DAMAGE ASSESSMENT AND RESTORATION HANDBOOK (2003), available at <http://www.nps.gov/policy/DOrders/DO-14Handbook.pdf>.

²²² Designation of Federal Trustees, 40 C.F.R. 300.600(b)(3)-(4); Executive Order 12580 (Oct. 19, 1991).

²²³ See Memorandum from Richard B. Stewart, John Edward Sexton Professor of Law at New York University School of Law, on Legal and Related Policy Issues for Integrating Remediation and NRD Strategies at DOE Sites to Charles W. Powers (CRESP) (June 21, 2005), available at http://www.cresp.org/2005_reports/NRD/stewart_RBS_NRD_Memo_6_21_05.pdf; U.S. Army Environmental Command, Natural Resource Trustee and Natural Resource Injury Support, <http://aec.army.mil/usaec/cleanup/assistance06.html> (last visited July 17, 2007).

²²⁴ CERCLA, 42 U.S.C. § 9620 (2000).

²²⁵ For example, the Department of Energy is engaged in a cleanup of the nuclear weapons complex that is scheduled to last well into the next century at an estimated cost of \$200 billion to \$350 billion. U.S. GENERAL ACCOUNTING OFFICE, SUPERFUND: OUTLOOK FOR & EXPERIENCE WITH NATURAL RESOURCE DAMAGE SETTLEMENTS, GAO/RCED-96-71 (1996) [hereinafter GAO REPORT (1996)]. According to the Defense Environmental Programs FY 2006 Annual Report to Congress, approximately \$1.4 billion was obligated in FY 2006 for environmental restoration activities at active installations and formerly used defense site properties. An additional \$568.2 million was obligated for environmental activities at Base Realignment and Closure installations. Of the nearly \$2.0 billion obligated for restoration activities, \$1.6 billion funded cleanup of hazardous substances, pollutants, and contaminants from past DOD activities through the Installation Restoration Program, and \$201.9 million funded cleanup of munitions contamination through the Military Munitions Response Program. DEPARTMENT OF DEFENSE, DEFENSE ENVIRONMENTAL PROGRAMS, ANNUAL REPORT TO CONGRESS FY 2006, available at https://www.denix.osd.mil/denix/Public/News/OSD/DEP2006/Upfront_osd-draft.pdf.

²²⁶ 42 U.S.C. §§ 9607(a) & 9620(a).

listed on the National Priorities List (NPL). Although the sites represent less than 10% of the total sites on the NPL, some of these sites are among the most expensive and complicated cleanup projects in the country. The Department of Defense owns approximately 82% of the 160 sites, and DOE owns approximately 11%.²²⁷

Although for a variety of reasons very few NRD claims have been filed to date against federal facilities,²²⁸ the General Accounting Office estimates that DOE's potential liability for natural resource damages alone could range from \$2.3 billion to \$20.5 billion, and that a more likely range could be from \$2.8 billion to \$13 billion.²²⁹ In 1997, DOE did its own study and estimated its potential liability to be in the range of \$1.4-2.5 billion.²³⁰ ELI was unable to identify a similar type of estimate for Department of Defense facilities. In any event, the potential NRD liability of federal facilities, particularly DOD and DOE, is notable and could result in significant NRD expenditures at a later time.

II. DATA

1. Federal NRD Settlements and Judgments

Only a few estimates of the value of NRD settlements and judgments under federal law exist, including a 1996 General Accounting Office (GAO) report and a 2001 Congressional Research Service report.²³¹ NRD statutes and regulations typically do not create requirements for reporting the value of settlements or judgments. While some programs, such as NOAA's DARRP, provide substantial online information about cases, settlement and judgment values, and restoration activities, there is no national database of NRD settlements, judgments, or claims.

Accordingly, ELI attempted to identify settlements and judgments through review of trustee websites²³² and gray literature, unpublished data from NOAA's DARRP program,²³³ Department of Justice (DOJ) records²³⁴ and discussions with federal and state agency NRD program officers and agents. Records from

²²⁷ CHRISTINE DANIS & HENRY MAYER, CENTER FOR SOCIAL AND ECONOMIC ISSUES, NATURAL RESOURCE DAMAGE ASSESSMENTS AS RELATED TO DEPARTMENT OF ENERGY SITE CLEAN-UP CONCERNS: A PRELIMINARY REVIEW (2004).

²²⁸ *Id.* at 6; see also Stewart, *supra* note 223.

²²⁹ See GAO REPORT (1996), *supra* note 225.

²³⁰ See Stewart, *supra* note 223.

²³¹ Mark Reisch, *Superfund and Natural Resource Damages*, CRS REPORT FOR CONGRESS, Order Code RS20772, January 8, 2001, at <http://www.cnie.org/nle/crsreports/waste/waste-35.pdf>. See GAO REPORT (1996), *supra* note 225; see also ENVIRONMENTAL LAW INSTITUTE, AN ANALYSIS OF STATE SUPERFUND PROGRAMS: 50-STATE STUDY, 1998 UPDATE (1998) (discussing state law NRD settlements).

²³² NPS recently published a summary of its NRD program, which provides the total value of NRD settlements and judgments but does not provide data on individual cases. See HONORING THE TRUST, *supra* note 219.

²³³ Through personal communication with the DARRP program, ELI obtained a summary of all NRD settlements and judgments in which NOAA was a trustee. Summary on file with authors.

²³⁴ DOJ litigates NRD claims on behalf of trustees. Through a Freedom of Information Act (FOIA) request, ELI obtained a complete list of NRD settlements and judgments for DOJ cases from fiscal years 1997 to March 2006. The records provided by DOJ included the case name, responsible parties, the parties owed, the NRD settlement/judgment value, and the value of injunctive relief (including restoration actions undertaken by the responsible parties). In most instances, although a cost estimate is provided, the summaries do not indicate the nature or type of restoration activities. The records also identify the Fund receiving the settlement or judgment sums. For example, many sums were to be deposited in the "CERCLA 107" Fund which, in the absence of additional information, ELI interpreted to indicate that the cases involved hazardous substances claims under CERCLA. See Department of Justice, Environment and Natural Resources Division, Natural Resource Damages Cases with Settlements/Judgments

NOAA and DOJ serve as the primary basis for the cost estimates provided in this report. Although, due to limitations on available data, this study does not include every settlement and judgment reached in NRD cases, most large-scale settlement and judgment sums are included. For many settlements and judgments, ELI obtained information from multiple sources (e.g., from DOJ, NOAA and other trustees' online NRD websites). In these instances, the data were combined to create a comprehensive summary of each NRD case.²³⁵ In all, ELI identified 273 cases with one or more federal trustee, including cases that had not settled as of July 2006. Table 7 provides a sample of the cases to illustrate the nature of the data collected.

and \$ Amounts for Natural Resource Damages and Injunctive Relief, FY1997-FY2006 (Mar. 2006) (on file with authors).

²³⁵ In some instances the settlement and judgment values varied among information sources. Because of the comprehensive nature of the DOJ settlements and for consistency, ELI relied upon DOJ's estimates when available, unless substantial information from another source refuted DOJ's numbers. For example, with respect to the Bennington, Vermont landfill settlement, the estimated cost of injunctive relief was much higher than the actual expenses paid. In this instance, the numbers reported in news articles and other online sources regarding the known cost of restoration were used instead of DOJ's estimates of restoration costs.

Table 7. Sample of NRD Cases.

Year(s) of Injury	Year Settled	Site Name	Problem	Legal Authority ²³⁶	Federal Trustee(s)	State Trustee(s)	Tribal Trustee(s)	Responsible Parties	Money Spent / Settlement	INRE (if calculated separately)
1990	1991	Exxon Bayway, NJ and NY	oil spill	OPA	DOI, NOAA	NJ, NY	none	Exxon Corp	\$11,500,000	
1990	1994	Apex Galveston	700,000 gallons of catalytic feed oil	CWA, TX law (including Ch 26, Texas Water Code)	DOI - FWS, NOAA	TX	none	Shinoussa Shipping Co., M/T Shinoussa, Goiney Barge Co., Apex R.E. & T. Inc, Barges Apex 3417, 3503, 3510, Tug Chandy N., Fidelis Shipping Co., M/V Hellespont Faith	\$1,312,962	
1996	1998	Cape Mohican, CA	96,000 gallons of Intermediate Fuel Oil	OPA, NPSRPA, CA Law (Lempert-Keene-Seastrand Oil Spill Prevention and Response Act)	DOI-FWS, NOAA	CA	none	San Francisco Drydock, OMI Ship Mgmt Inc, and US DOT (ship owner)	\$4,213,832	

²³⁶ ELI attempted to identify the federal authority in each case, but did not seek to identify whether state authority was used in all cases involving state trustees.

Year(s) of Injury	Year Settled	Site Name	Problem	Legal Authority ²⁶	Federal Trustee(s)	State Trustee(s)	Tribal Trustee(s)	Responsible Parties	Money Spent / Settlement	INRE (if calculated separately)
N/A	1999	Saginaw River and Bay, Michigan	PCB contamination	MI Environmental Response Act; CERCLA	DOI-FWS	MI	Saginaw-Chippewa Indian Tribe	GM et al.	\$14,504,975	\$10,700,000
1954-1971	as of 2005	Fox River/Green Bay, Wisconsin	Hazardous materials	CERCLA	DOI, NOAA	MI, and in collaboration with WI	Menominee Indian Tribe of Wisconsin, the Oneida Tribe of Indians of Wisconsin, Little Traverse Bay Bands of Odawa Indians	Appleton Papers Inc., PH Gratteller Co, Fort James Operating Co.	\$30,450,000	\$11,260,000
N/A	2006	MacGillis and Gibbs/Bell Lumber and Pole	Hazardous materials	CERCLA 107	DOI-FWS	N/A	N/A	Qwest Corp.	1,500	

2. Oil Spill Liability Trust Fund Expenditures

The Coast Guard Maritime Transportation Act of 2004 requires the Coast Guard to report on the implementation of OPA, including expenditures from the OSLTF and the costs of response and damages for oil discharges in relation to the liability limits of the Act.²³⁷ This report relies on the Coast Guard's 2004 report on implementation of the OPA as the primary source of information about NRD-related expenditures from the OSLTF.

III. COST ESTIMATES

The total cost estimate for all identified federal NRD settlements, judgments, and OSLTF expenditures from 1989 through July 2006 is \$1,848,890,204.²³⁸ ELI estimates that the average annual total of NRD expenditures during the time periods examined was approximately \$87.65 million. Prior to discussing these estimates in more detail, it is necessary to explain the ways in which the *total* cost estimate may be over-inclusive or under-inclusive.

First, NRD *assessment* costs can constitute a considerable portion of settlement and judgment sums. NRD programs may rely on additional appropriations in order to undertake NRD assessments, as well as obtained from recovery from private parties. For example, DOI's funding for NRD assessments comes from annual appropriations and from funds recovered from responsible parties in earlier settled cases.²³⁹ When available, sums reported in this study include NRD assessment costs, including appropriations when possible, as part of the total NRD settlement and judgment estimate. ELI did not, however, conduct a comprehensive search to identify all appropriated funds used to augment funds received from settlements and the OSLTF.

Second, as discussed above, the cost estimates included in this part are for recoveries under *federal* law by both state and federal trustees. The information available on judgments and settlements, however, did not necessarily allow for the recoveries to be separated out by state-law and by federal claims, which often are brought in the same proceeding. Therefore, in some instances the cost estimates included in this study include recoveries under both state and federal laws.

Third, as discussed, states may act as trustees of natural resources and seek NRD awards under CERCLA, OPA, and CWA independently of federal agency trustee action; many states also have separate NRD laws. ELI's federal NRD cost estimate is conservative because it does not include settlements and judgments brought independently by state trustees under federal law. ELI did examine a sample of the settlements and judgments in which a state trustee pursued claims in the absence of a federal trustee. Only a few states maintain websites that include summaries or records of such state NRD settlements and judgments. Of

²³⁷ See OPA REPORT, *supra* note 195, at 2 (citing Coast Guard & Maritime Transportation Act, Pub. L. No. 108-293, § 707, 118 Stat. 1076 (2004)).

²³⁸ ELI did not attempt to account for inflation over this period. In addition, the estimate may not include all cases that were concluded by July 2006, as it was not possible to determine how frequently the government updates the online databases relied upon in developing the cost estimate provided in this report. The databases were last checked at the end of July 2006, and the cases listed at that time were included in ELI's estimate.

²³⁹ U.S. Department of Interior, Natural Resource Damages Assessment and Restoration Program, Damage Assessment, <http://restoration.doi.gov/damageassessment.html> (last visited July 17, 2007). For example, in fiscal year 2000, of the \$6 million allocated to damage assessment cases, \$4.5 million was from appropriated funds and \$1.5 million was from recovered funds.

those that do, most states provide information about a subset of cases, not a comprehensive list.²⁴⁰ The amount and range of independent state actions is considerable and it is not possible to separate recoveries based on federal as opposed to state claims.²⁴¹

Fourth, it is also important to note that some settlements and judgments require injunctive relief in addition to monetary damages, whereby responsible parties undertake restoration actions instead of paying monetary damages for injuries. Estimates of the value of the injunctive relief performed are occasionally reported; however, federal law and regulations generally do not require private parties to estimate these values or report actual expenses for in-kind services.²⁴² Because there is restoration undertaken that is not reported, the cost estimates provided in this report are likely to be conservative or under-inclusive. Further, this Report does not attempt to determine whether monetary damages actually were paid or injunctive relief actually performed by responsible parties. For example, in some cases, the responsible parties instead filed bankruptcy.

1. NRD Settlement and Judgments Brought by Federal Trustees

ELI identified sums from 241 cases with federal trustee(s) that were resolved between 1989 and July 2006. The cases involve a wide variety of injuries, including chronic hazardous material leaks, oil pipeline spills, offshore oil accidents involving vessels and platforms, damage to coral reefs and seagrass beds, acid mine drainage, and chemical discharges. NRD sums range from a low of \$995, for seagrass damage by a vessel in a marine sanctuary, to over \$800 million for the *Exxon Valdez* Oil Spill in Prince William Sound, Alaska. Of the 241 settlements and judgments, six are valued at more than \$50 million; 12 are valued at \$10 million to \$49,999,999; 73 are valued at \$1 million to \$9,999,999; 65 are valued at \$100,000 to \$999,999; 65 are valued at \$10,000 to \$99,999; and 20 are valued at less than \$10,000. Table 8 summarizes the settlement and judgment values by year. NRD *assessment* costs, as opposed to *restoration* costs, make up a large portion of settlement and judgment sums.

²⁴⁰ For example, states such as California may have several administrative agencies and local authorities pursuing NRD claims, which may make it difficult to collect and make public NRD information for all cases. California pursues claims through localities, counties, and state agencies, and cases range from small-craft spills to large-scale injuries. California does not have a central tracking system or repository of information about NRD settlements and judgments.

²⁴¹ For example, the states of California and New Jersey settled cases between 1990 and 2006 that totaled \$15.95 million and \$27.35 million respectively; whereas Massachusetts during the same time period settled cases that totaled only \$231,000.

²⁴² For example, in an NRD settlement with Chevron for injury to resources in Port Arthur, Texas, the company will undertake restoration activities that will enhance over 1,600 acres of marsh and wet prairie. However, when asked about the amount of money that will be invested in this project, the Chevron spokesperson and ecologist stated that it would be "several million dollars," but would not disclose the precise amount. See Associated Press, *Chevron Settles on Damages to Port Arthur Land*, HOUSTON CHRONICLE, Jan. 14, 2005.

Table 8. NRD Settlement Sums for Cases with a Federal Trustee, 1989-July 2006.						
TOTAL NRD SETTLEMENT/JUDGMENT SUMS:		\$1.83 billion				
	1991	1992	1993	1994	1995	1996
Annual Sums	\$882.16M*	\$30.44M	\$14.25M	\$15.58M	\$59.25	\$7.77M
Number of Settlements	6	5	3	6	3	6
Range of Sums	\$622K - \$865M	\$160K - \$19.67M	\$1.91M - \$10.20M	\$193K - \$5.42M	\$34K - \$59.06M	\$22K - \$2.50M
	1997	1998	1999	2000	2001	2002
Annual Sums	\$26.15M	\$205.59M	\$101.92M	\$46.98M	\$58.07M	\$45.64M
Number of Settlements	23	14	25	20	12	23
Range of Sums	\$10K - \$7.41M	\$26K - \$200K	\$21K - \$25.20M	\$25K - \$19.74M	\$2.5K - \$20.00M	\$995 - \$30.34M
	2003	2004	2005	mid-2006	Multiple Year Settlements/ Settlements With Unknown Dates	
Annual Sums	\$70.67M	\$18.42M	\$82.42M	\$13.46M	\$142.73M	
Number of Settlements	15	28	30	6	16	
Range of Sums	\$15K - \$57M	\$2K - \$4M	\$1K - \$56.35K	\$1.5K - \$7.60M	\$47K - \$63.98M	

Table 9 summarizes settlement and judgment values by federal legal authority for the years 1989 through July 2006. With the exception of two cases, all cases were pursued under only one federal statute. In many cases, trustees also sought damages under state laws that were resolved in the same cases. To the extent that occurred, the numbers below are over-inclusive, in that they may reflect judgments and settlements of some state claims as well as federal claims. As discussed earlier, however, the cost estimate also is under-inclusive, to the extent that it excludes the value of injunctive relief that is granted in some cases. Finally, in a limited number of cases, ELI could not determine under which legal authority the trustees pursued damages.

Table 9. Settlement and Judgment Values by Legal Authority, 1989-July 2006.		
Authority	Number of Cases	Value
CERCLA	132	\$722,433,600
CWA	5	\$876,013,959 ^{*†}
NMSA	55	\$23,850,131 [†]
OPA	48	\$126,290,530 [‡]
PSRPA	5	\$6,318,832 [‡]
Unknown Authority	28	\$87,013,414
[*] Trustees sought damages for the <i>Exxon Valdez</i> Oil Spill under CWA. [†] Trustees sought damages for the <i>Apex Houston</i> Oil Spill under both CWA and NMSA (\$5,416,430; on this Table only, the recovery is counted under both statutes. [‡] Trustees sought damages for the Cape Mohican, California Oil Spill under OPA and PSRPA (\$4,213,832); on this Table only, the recovery is counted under both statutes.		

Table 10 summarizes settlement and judgment values by trustee. Because many cases involve multiple trustees, the NRD settlement and judgment values assigned to trustees cannot be added together.

Table 10. Summary of Settlement and Judgment Values by Trustee, 1989-July 2006.		
Authority	Number of Cases	Value
DOD	3	\$35,390,500
DOI (Subagency unknown)	56	\$423,942,898
DOI-BIA	8	\$44,075,747
DOI-BLM	5	\$13,795,000
DOI-BOR	2	\$4,000,000
DOI-FWS	133	\$411,803,191
DOI-NPS	13	\$102,376,060
NOAA	143	\$1,313,614,299
USDA – Forest Service	8	\$877,296,061
Unknown or other	7	\$64,302,128

2. Oil Spill Liability Trust Fund

The Coast Guard categorizes oil pollution incidents as vessel discharges, facility discharges, and “mystery spills,” and, of these, facility discharges are the largest cost to the OPA Fund.²⁴³ Expenses paid by the Fund are categorized as follows: oil spill responses and removals, claims, and agency appropriations.

Box 6. NRD OSLTF (1992 – 2004).	
NRD Assessment Expenditures:	\$3.6 million
NRD Claims Expenditures:	\$13 million
TOTAL NRD-RELATED EXPENDITURES:	\$16.6 million

The majority of the overall OSLTF is appropriated to several federal agencies, as authorized by OPA and delegated by Executive Order 12777, to cover agency costs related to administration, operations, enforcement, and research and development.²⁴⁴ The second greatest expenditure is for oil response and removal.²⁴⁵ Claims paid by the Trust for NRDs from FY 1992 through FY 2004 were approximately \$13 million.²⁴⁶ The OSLTF also paid initial NRD assessment costs of \$3.6 million from 1992-2004.²⁴⁷ The total OSLTF NRD expenditure of \$16.6 million (Box 6) is included in ELI’s overall cost estimate.

3. Average Annual NRD Expenditures

To calculate an annual average for the cost of NRD settlements, ELI drew on both the available data on NRD settlements and data on expenditures from the OSLTF. The annual NRD settlement totals from the nine most recent years, 1997 through 2005 (see Table 8) were averaged, yielding a mean annual total of \$72.87 million. Multiple-year settlements that spanned that period and settlements of unknown date (see Table 8) were pro-rated over the same nine years yielding an additional annual average of \$13.5 million per year. Finally, ELI divided the total amount of NRD-related expenditures from the OSLTF over the somewhat different time period for which data were available (1992-2004, see Box 6), yielding an annual average OSLTF expenditure of \$1.28 million per year. Adding these three annual averages together, ELI estimates that the average annual total of NRD expenditures during the time periods examined was approximately \$87.65 million.

²⁴³ OPA REPORT, *supra* note 195, at 10.

²⁴⁴ *Id.* at 13 and 76 (“Several Federal agencies receive annual appropriations from the OSLTF to cover certain administrative, operational, personnel, enforcement, and research and development costs as authorized in OPA and as delegated by Executive Order 12777.”). Agencies include the U.S. Coast Guard (largest budget), EPA, DOI’s Minerals Management Service, Department of Commerce, Department of Transportation’s Research and Special Programs Administration, Treasury, Prince William Sound Oil Spill Recovery Institute, and the Denali Commission. From FY 2000 to FY 2004, this amount ranged from \$79.6 million to \$94.5 million per year.

²⁴⁵ *Id.* at 11-12 (approximately \$40-60 million per year total). Other expenditures by OSLTF include reimbursement of money paid in excess of legal liability. Six responsible parties, from FY 1992 to FY 2004, have sought reimbursement from the Fund for monies paid in excess of their legal liability, costing the Fund approximately \$30 million.

²⁴⁶ Because the data are presented in bar graph form, the exact amount is unknown.

²⁴⁷ *Id.* at 11-12.

IV. STATE WILDLIFE ACTION PLANS

1. Program Opportunities

The State Wildlife Action Plans could be used to inform the implementation of NRD programs in certain circumstances. NRD laws may allow for different types of actions, including restoration, replacement, and acquiring equivalent resources. This provides trustees with a range of potential options for mitigating injuries to natural resources.²⁴⁸ Under NMSA and the NPS statute, which address unique, site-specific resources, the statutes also allow for off-site, out-of-kind restoration.²⁴⁹ The agencies that implement these laws may have the discretion in some cases to consider State Wildlife Action Plans in administering their programs. For example, NRD assessments are conducted in a variety of ways, depending on the trustee, and NRD pre-assessment and assessment reports describe several alternative actions. One study recently stated that “there is no particular ‘cook book’ approach dictated by regulation or precedent except, in theory, Type A assessments under DOI’s regulations. Creativity is still rewarded in the NRD realm.”²⁵⁰

In some instances, implementing guidance documents specifically call upon NRD trustees to consider the injuries in the context of other plans and programs. For example, NPS is guided by the following policy when determining restoration activities:

When determining injury and considering restoration actions, the park superintendent should *evaluate restoration needs in the context of* resource management and park management objectives already identified in planning documents such as *general management plans, or implementation plans such as land protection plans, and resource management plans*. In all cases, the NPS will consider primary restoration on-site and in-kind, whenever, and wherever feasible to do so. The NPS will also implement, where appropriate, restoration of all lost services associated with injured park system resources, with an emphasis on restoring comparable resource services . . . [emphasis added]²⁵¹

NPS’s policy of evaluating needs in the context of resource management objectives identified in planning documents suggests that State Wildlife Action Plans that cover NPS resources could serve as valuable tools for restoration planning. NPS’s NRDA process described in its *Damage Assessment and Restoration Handbook* (Box 4, above) demonstrates several possible opportunities for case managers and assessment teams to make use of the State Wildlife Action Plans.

²⁴⁸ OPA, 33 U.S.C. § 1006(c) (1990); NMSA, 33 U.S.C. § 1432(6) (2000); CERCLA, 42 U.S.C. § 9607(f) (2000); PSRPA, 16 U.S.C. § 191j (2000).

²⁴⁹ The statute defines damages to include “the value of a sanctuary resource if the sanctuary resource cannot be restored or replaced or if the equivalent of such resource cannot be acquired.” It also allows funds to be used to restore degraded resources at other sanctuaries. NMSA, 33 U.S.C. §§ 1432(6), 1443(d). In addition, the NPS DAMAGE ASSESSMENT AND RESTORATION HANDBOOK (2003) describes potential restoration activities, including off-site, out-of-kind restoration.

²⁵⁰ Charles M. Denton & R. Craig Hupp, *Natural Resources Damages Assessments & Claims in the Great Lakes Basin: Part II Analysis of NRD Settlements*, 20 MICH. ENVTL. L.J. 3 (2002), available at http://www.varnumlaw.com/resources/1056544115_env_grtlks_damage_claims_p2.pdf. As discussed, CERCLA allows for two types of NRD assessments: Type A, a standardized process for simple injuries, and Type B for complex cases that require case-by-case assessments.

²⁵¹ Director’s Order #14, *supra* note 179, at 7.

Further, State Wildlife Action Plans may be useful for determining baseline conditions (i.e. conditions prior to injury). The DOI regulations provide a list of potential sources of historical data that may be used to determine baselines, including EAs and EISs, scientific/management literature, electronic databases, public/private landholders in the assessment area or neighboring areas, studies conducted or sponsored by NRD trustees, federally sponsored research identified by the National Technical Information Service, studies carried out by educational institutions, and other similar sources of data.

As a general matter, another point of entry for use of the State Wildlife Action Plans during NRD program assessment and restoration planning phases is during public comment periods. For example, DOI's NRD assessment regulations under CERCLA state that NRD restoration plans must be available for review by responsible parties, trustees, other interested agencies and tribes, and "any other interested member of the public for a period of at least 30 calendar days." Comments and any responses are to be included as part of the "Report of Assessment."²⁵² If State Wildlife Action Plans previously have not been considered, the notice-and-comment period would allow outside parties to introduce State Wildlife Action Plan-related materials.

2. Program Limitations

Although opportunities may exist for State Wildlife Action Plans to inform NRD injury assessments and restoration decisions, NRD spending decisions also may be constrained by laws, policies, and regulations. To understand more fully whether and how State Wildlife Action Plans can inform compensatory mitigation programs, the following discussion highlights some of these programmatic constraints.

Under all federal NRD statutes the restoration, and therefore NRD settlements and judgments, must relate to the injury. This includes on-site restoration and off-site in-kind restoration. Accordingly, the way in which NRD funds can be used is limited in many cases, and may not allow for consideration of habitat priorities contained in State Wildlife Action Plans.

For example, CERCLA states that recovered funds obtained by federal or state trustees are "for use only to restore, replace, or acquire the equivalent of such natural resources." Similarly to CERCLA, OPA states that federal, state, Indian tribal and foreign trustees may only use the settlements and judgments for assessment, and for development and implementation of plans for "restoration, rehabilitation, replacement, or acquisition of the equivalent, of the natural resources."²⁵³ Excess sums are to be deposited into the OPA Trust Fund.²⁵⁴

Second, it should be noted that the OSLTF is a decreasing source of compensatory mitigation funds. Liability under OPA is limited,²⁵⁵ and the cost of removal and NRDs far exceeds the amount recovered. For example, for FY 1995 – FY 2004, the amount spent on recovery (\$492.3 million) exceeded the amount received from

²⁵² Public Involvement in Assessment Plans, 43 C.F.R. §§ 11.32(c) and 11.81(d)(2).

²⁵³ OPA, 33 U.S.C. § 1006(f) (1990) (allowing sums for activities referred to in § 1006(c)).

²⁵⁴ 33 U.S.C. § 2706 (f). It is worth noting that Indian tribes may act as trustees, and the statute does not explicitly impose such requirements on how Indian tribes are to use the recovered NRD sums. This is based on the text of § 107(f), which provides the federal government, states, and tribes with trustee authority and explicitly states that: "Sums recovered by the United States Government" and "Sums recovered by a State . . . shall be available for use only to restore, replace, or acquire the equivalent of such natural resources." There is no such phrase or sentence limiting tribes' use of recovered sums. 42 U.S.C. § 9607(f).

²⁵⁵ 33 U.S.C. § 2704(a).

liable parties (\$130.6 million) by \$361.7 million.²⁵⁶ In part because the statutory liability limits were not increased until 2006, removal costs and damages have exceeded liability limits in nineteen oil spill incidents since 1992, making it necessary to use the OSLTF.²⁵⁷ As of 2004, the OSLTF contained \$842 million, but the Coast Guard has concluded that the Fund will be depleted by FY 2009.²⁵⁸ Further, according to the Coast Guard: “[a] single major or catastrophic oil spill could have a significant impact on the OSLTF balance and these projections.”²⁵⁹

In addition, PSRPA states that funds only may be used for response, assessment and to “restore, replace, or acquire the equivalent of resources.”²⁶⁰ Unlike other NRD laws, the PSRPA places restrictions on acquiring equivalent resources, stating that funds to acquire “any lands or waters or interests therein” outside the national park must first be approved in appropriations acts.²⁶¹ All acquisitions of equivalent lands and waters are subject to the same limitations contained in the organic legislation.²⁶² Further, while this provision allows acquisition of equivalent lands and waters, in practice this apparently does not occur.²⁶³

Finally, under the NMSA, NRD funds only may be used to restore, replace or acquire marine sanctuary resources. Specifically, the law states that recovered NRD sums may be used, in order of priority, as follows:

- (A) to restore, replace, or acquire the equivalent of the sanctuary resources that were the subject of the action, including for costs of monitoring and the costs of curation and conservation of archeological, historical, and cultural sanctuary resources;
- (B) to restore degraded sanctuary resources of the national marine sanctuary that was the subject of the action, giving priority to sanctuary resources and habitats that are comparable to the sanctuary resources that were the subject of the action; and
- (C) to restore degraded sanctuary resources of other national marine sanctuaries.²⁶⁴

Accordingly, NMSA allows the Secretary of Commerce to use recovered sums to restore degraded resources of another marine sanctuary only if the first two priorities cannot be met.

In summary, while State Wildlife Action Plans may identify important habitats and species across the state and/or designate priority areas of action, it may not be possible in all circumstances to use NRD funds to accomplish conservation of these habitats and species.

²⁵⁶ See OPA REPORT, *supra* note 195, at 7. Difficulties in obtaining compensation from responsible parties, particularly those associated with onshore facilities, is due to lack of evidence and inability to collect because the responsible party is bankrupt, deceased, or unable to pay.

²⁵⁷ OPA REPORT, *supra* note 195, at 2.

²⁵⁸ *Id.*

²⁵⁹ *Id.*

²⁶⁰ PSRPA, 16 U.S.C. § 19jj-3 (2000).

²⁶¹ 16 U.S.C. § 19jj-3.

²⁶² 16 U.S.C. § 19jj-3.

²⁶³ Personal communication with National Park Service staff, U.S. Department of Interior, in Atlanta, Ga. (Dec. 15, 2005).

²⁶⁴ NMSA, 33 U.S.C. § 1443(d) (2000).

Chapter 5: Federal Power Act

I. PROGRAM SUMMARY

This section examines the role that compensatory mitigation plays in hydropower facility licensing, estimates hydropower mitigation expenditures, and discusses how State Wildlife Action Plans could be used to inform the hydropower licensing process and related mitigation activities, as well as potential limitations on such use of the Plans.

Compensatory mitigation for hydropower projects may be mandated under one or more federal laws, including the Federal Power Act (FPA), the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act or NWPA), the Clean Water Act (CWA), and the Endangered Species Act (ESA); and it is informed by the National Environmental Policy Act (NEPA), among other federal laws, regulations and policies. The following section focuses on mitigation requirements and expenditures that are assessed directly under the FPA.²⁶⁵

1. Law and Regulations

The Federal Energy Regulatory Commission (FERC) issues and renews licenses for non-federal hydropower projects under the Federal Power Act. In all, there are more than 1,000 licensed non-federal hydropower projects in the U.S., and FERC has issued approximately 350 licenses from 1993 through 2005.²⁶⁶ The majority of issuances are for relicenses (called “new” or “subsequent” licenses) to renew previously issued licenses, rather than “original” licenses for new projects. Hydropower licenses typically are granted for 30 to 50 years, meaning that many of the hydropower projects up for relicensing today were granted prior to the passage of modern environmental laws, and had few environmental requirements.²⁶⁷ Likewise, the conditions set forth in licenses issued today may not be reviewed again or revised for an additional 30 to 50 years.²⁶⁸

Multiple provisions of the Federal Power Act relate to mitigation, including Section 4(e), Section 10(j), and Section 18. Under Section 4(e), FERC considers competing objectives when issuing licenses:

in addition to the power and development purposes for which licenses are issued, [FERC] shall give *equal consideration* to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including

²⁶⁵ FPA, 16 U.S.C. §§ 791a et seq. (2000). Other sections in this report describe mitigation under other federal and state laws. However, mitigation costs under the Federal Power Act, where available, are not tracked based upon individual statutory mandates (e.g., FPA § 10(j), Endangered Species Act, Clean Water Act). Typically, they are described together as “protection, mitigation, and enhancement” measures [hereinafter PME measures].

²⁶⁶ HYDROPOWER REFORM COALITION (HRC), CITIZEN TOOLKIT FOR EFFECTIVE PARTICIPATION IN HYDROPOWER LICENSING [hereinafter HRC, CITIZEN TOOLKIT] 1 (2005).

²⁶⁷ FEDERAL ENERGY REGULATORY COMMISSION, REPORT ON HYDROELECTRIC LICENSING POLICIES PROCEDURES, AND REGULATIONS: COMPREHENSIVE REVIEW AND RECOMMENDATIONS PURSUANT TO SECTION 603 OF THE ENERGY ACT OF 2000 [hereinafter REPORT ON HYDROELECTRIC LICENSING] 7-8 (2001).

²⁶⁸ In some instances, license conditions reserve the right for federal agencies to prescribe mitigation at a later date. For example, fishways created to mitigate for damage to migrating fish may be prescribed after the license has been issued if FERC reserves the right in the issued license. FERC also typically includes a “Standard Article” in licenses that reserves FERC’s authority to alter the license to require additional environmental conditions; however, this authority is rarely used. HRC, CITIZEN TOOLKIT, *supra* note 266, at 17-18.

related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.²⁶⁹

As a 2001 FERC report points out, courts have held that “*equal consideration*” does not necessarily mean *equal treatment* of developmental (e.g., power generation and irrigation) and non-developmental (e.g., fish and wildlife protection) values.²⁷⁰

To receive an original license, re-license an existing project, or surrender the license for an existing project, a hydropower operator must comply with conditions designated by FERC in the license, including development, safety, and in some cases environmental mitigation requirements. Section 10(j) states: “in order to adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife (including related spawning grounds and habitat) affected by the development, operation, and management of the project, each license issued . . . shall include conditions for such protection, mitigation, and enhancement.”²⁷¹ In addition, the law requires that hydropower projects must be:

best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, *for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat)*, and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in [Section 4(e)].²⁷²

FERC specifies environmental conditions in the hydropower licenses it issues based on recommendations from appropriate agencies, including the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (FWS), and other state fish and wildlife agencies.²⁷³ Based on surveys and investigations, fish and wildlife agencies are to provide recommendations and reports that determine the damage to fish and wildlife resources and the means and measures to be adopted to mitigate the damages.²⁷⁴

In some circumstances, in addition to providing recommendations, resource agencies essentially can impose mandatory licensing conditions, which can include compensatory mitigation requirements. These include mandatory conditions for projects that are: (1) within a “reservation,” imposed by the overseeing agency under Section 4(e) of the Federal Power Act,²⁷⁵ or (2) fishways prescribed by FWS or NMFS under Section 18 of the Federal Power Act.

²⁶⁹ 16 U.S.C. § 797(e) (emphasis added).

²⁷⁰ REPORT ON HYDROELECTRIC LICENSING *supra* note 267, at 10; *State of California v. FERC*, 966 F.2d 1541, 1550 (9th Cir. 1992).

²⁷¹ 16 U.S.C. § 803(j)(1).

²⁷² 16 U.S.C. § 803(a)(1) (emphasis added).

²⁷³ *Id.* The FPA states that the “conditions shall be based on recommendations received pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. §§ 661 et seq. (2000)) from the National Marine Fisheries Service, the United States Fish and Wildlife Service, and State fish and wildlife agencies.” Under the Fish and Wildlife Coordination Act, when granting federal permits or licenses for projects such as dredging, impounding, or modifying water bodies, the granting agency first must consult with the agency administering the resource (e.g. U.S. FWS or NMFS). Fish and Wildlife Coordination Act [hereinafter FWCA], 16 U.S.C. §§ 661-666(c), § 662(a) (2000).

²⁷⁴ 16 U.S.C. § 662(b).

²⁷⁵ FPA, 16 U.S.C. § 797(e) (stating “licenses shall be issued within any reservation only after a finding by the Commission that the license will not interfere or be inconsistent with the purpose for which such reservation was created or acquired, and shall be subject to and contain such conditions as the Secretary of the department under whose supervision such reservation falls shall deem necessary for the adequate protection and utilization of such reservations.”).

First, for the Department of Interior, reservations “include lands and certain facilities under the jurisdiction of the U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Bureau of Reclamation, or Bureau of Indian Affairs.”²⁷⁶ The U.S. Forest Service also may impose conditions for projects that may affect National Forests.²⁷⁷

Second, one of the greatest environmental impacts of hydropower projects is the impact on fish species. Hydropower projects fragment rivers and prevent up- and downstream movement of fish. For some species this not only restricts their range, but also can threaten the viability of species and populations. FPA recognizes this impact separately from other habitat and fish and wildlife impacts. In addition to the Section 10(j) conditions, Section 18 authorizes the Department of Interior and Department of Commerce to prescribe “fishways.” Fishways, as outlined in the *Interagency Guidance for the Prescription of Fishways*, are:

for the safe and timely upstream and downstream passage of fish [and] shall be limited to physical structures, facilities, and devices necessary to maintain all life stages of such fish, and project operations and measures related to such structures, facilities, or devices which are necessary to ensure the effectiveness of such structures, facilities, or devices for such fish.²⁷⁸

Recent amendments to the FPA provided in the Energy Policy Act of 2005 allow license applicants and other parties to a proceeding to challenge mandatory conditions and fishway prescriptions in trial-type hearings regarding any disputed issue of material fact.²⁷⁹

2. Licensing Process

FPA licensing is a multi-year, multi-step process. Because several different steps in this process may offer opportunities to use State Wildlife Action Plans to inform conservation and mitigation decisions, the process is reviewed in detail here.

Applicants may undertake an “integrated” license process, a “traditional” license process, or an “alternative” licensing process. FERC’s preferred process is the integrated licensing process, and prior approval is required to use the traditional or alternative process.²⁸⁰ This report summarizes the integrated license process—a complex, multi-step process that seeks to integrate and coordinate agency input and merge pre-filing and NEPA processes.²⁸¹ The integrated license process can be distilled into six major steps (Box 7, and discussed below).

²⁷⁶ Procedures for Review of Mandatory Conditions and Prescriptions in FERC Hydropower Licenses, Notice of Proposed Rulemaking, 69 Fed. Reg. 54,602 (Sept. 9, 2004).

²⁷⁷ See HRC, CITIZEN TOOLKIT, *supra* note 266, at 9.

²⁷⁸ FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE, INTERAGENCY GUIDANCE FOR THE PRESCRIPTION OF FISHWAYS PURSUANT TO SECTION 18 OF THE FEDERAL POWER ACT [hereinafter INTERAGENCY FISHWAY GUIDANCE] (May 2002).

²⁷⁹ Energy Policy Act of 2005, Pub. L. No. 109-58, § 241, 19 Stat. 594 (2005) (amending FPA, §§ 10(e), 18).

²⁸⁰ Hydroelectric Licensing under the Federal Power Act [hereinafter FERC Hydroelectric Regulations], 18 C.F.R. §§ 2, 4, 5, 9, 16, 375 and 385. See also Hydroelectric Licensing, 104 FERC No. 2002, Docket No. RM02-16-000, ¶ 61,109 (July 23, 2003), available at <http://www.ferc.gov/legal/maj-ord-reg/land-ord.asp>; and FEDERAL ENERGY REGULATORY COMMISSION, HANDBOOK FOR HYDROELECTRIC PROJECT LICENSING AND 5 MW EXEMPTIONS FROM LICENSING [hereinafter FERC, HYDROELECTRIC HANDBOOK] 2-3 (2004).

²⁸¹ *Id.* at 1-2.

Box 7. Integrated License Process. ²⁸²	
Steps	Description
Step 1. Decision to File and Initial Actions	<ul style="list-style-type: none"> • Applicant files notice of intent. • Applicant files pre-application document.
Step 2. Consultation, Scoping and Study Plan Development	<ul style="list-style-type: none"> • Applicant conducts pre-filing consultation concurrently with the NEPA scoping process. • Relevant parties attend a scoping meeting to review and discuss existing conditions and management objectives; identify information and study needs; finalize the process plan and schedule; and discuss role of potential cooperating agencies for NEPA document preparation. • Applicant consults with potentially affected tribes. • Public notice-and-comment period for NEPA scoping is held. • Applicant develops study plan. • Public notice-and-comment period for study plan is held.
Step 3. Studies and Preliminary Licensing Proposal	<ul style="list-style-type: none"> • Applicant commences studies based on finalized study plan. • Applicant files a preliminary licensing proposal that describes the project facilities, operation and maintenance plan, measures for protection, mitigation and enhancement, and a draft environmental analysis.
Step 4. Application Filing	<ul style="list-style-type: none"> • Applicant files application, including Exhibit E, the Environmental Report
Step 5. Application Processing and NEPA Compliance	<ul style="list-style-type: none"> • FERC issues public notice of acceptance and notice that application is ready for environmental analysis, allowing comments, protests, and interventions; conditions; and fishway prescriptions. • FERC issues an environmental assessment (EA) pursuant to NEPA and FPA Section 10(j). • Public notice-and-comment period for EA is held.
Step 6. Completion of the Section 10(j) Process	<ul style="list-style-type: none"> • NMFS, FWS, and state fish and wildlife agencies submit protection, mitigation and enhancement measures. • FERC will include measures in the license conditions unless they are inconsistent with the FPA.

First, applicants must file a pre-application document concurrently with a notice of intent.²⁸³ This document must include a description of existing environment and resource impacts, with general descriptions of: geology and soil; water resources; fish and aquatic resources; wildlife and botanical resources; wetlands, riparian and littoral habitat; rare, threatened and endangered species; recreation and land use; and the river basin.²⁸⁴ The descriptions are to be commensurate with the scope and level of resource impacts caused or that could be caused by the proposed project.²⁸⁵

Consulting, scoping and developing the study plan comprise the second step. Prior to filing an application, the applicant must consult with relevant federal, state, and tribal agencies regarding impacts.²⁸⁶ FERC

²⁸² Integrated License Application Process, 18 C.F.R. § 5; FERC, HYDROELECTRIC HANDBOOK, *supra* note 280, at §3.

²⁸³ See FERC, HYDROELECTRIC HANDBOOK, *supra* note 280, at 2-3 to 2-4.

²⁸⁴ *Id.* at 2-5; Preapplication Document, 18 C.F.R. § 5.6.

²⁸⁵ *Id.*

²⁸⁶ *Id.* at 2-6.

encourages applicants to consult with the relevant agencies regarding other environmental laws.²⁸⁷ Studies may be required based on environmental, economic, and engineering needs.²⁸⁸ The environmental studies should provide: a “description of the environment affected by the proposed project and its reasonable alternatives; project effects, both beneficial and adverse; and protection, mitigation, and enhancement measures.”²⁸⁹

Next, the applicant files the license application that must include an Exhibit E, the Environmental Report, which addresses the resources described in the pre-application document.²⁹⁰ The environmental report has the form and content of a NEPA environmental assessment, and includes information about the existing environment, known and potential impacts, and environmental measures that may be taken.²⁹¹ The application’s Exhibit E must include:

- (1) General description of the river basin;
- (2) Cumulative effects on resources;
- (3) Discussions of the following laws, if applicable: Clean Water Act (Section 401), ESA, Magnuson-Stevens Fish Conservation and Management Act, Coastal Zone Management Act, National Historic Preservation Act, Northwest Power Act, Wild and Scenic Rivers Act, and Wilderness Act;
- (4) Project facilities and operation; and
- (5) Proposed action and action alternatives, including an economic analysis that contains estimates of “the cost of each proposed resource protection, mitigation, or enhancement measure and any specific measure filed with the Commission by agencies, Indian tribes, or members of the public when the application is filed.” The regulations also state that “[i]f a protection, mitigation, or enhancement measure reduces the amount or value of the project’s developmental resources, the applicant must estimate the reduction.”²⁹²

FERC performs the NEPA analysis after the license application is filed and determined to be complete.²⁹³ This stage includes: (1) conducting a comment period associated with the notice that the application is ready for environmental analysis; (2) submitting conditions; (3) submitting fishway prescriptions; and (4) preparing an environmental assessment or environmental impact statement (EIS). If an EIS is required, it must include mitigation measures proposed by the applicant, as well as additional mitigation measures that may be more effective.²⁹⁴

In step six, FERC completes the requirements set out under Section 10(j) of the FPA, which provide for inclusion in the license of “protection, mitigation and enhancement” (PME) measures that are based upon agency recommendations and “equal consideration” of the other FPA goals. Section 10(j) of the Federal Power Act creates its own two-step process (Box 8). First, relevant federal and state fish and wildlife agencies make recommendations regarding protection, mitigation, and enhancement measures for fish

²⁸⁷ *Id.* at 3-1.

²⁸⁸ *Id.* at 2-7.

²⁸⁹ *Id.* at 2-10.

²⁹⁰ Application Content, 18 C.F.R. § 5.18(b).

²⁹¹ See FERC, HYDROELECTRIC HANDBOOK, *supra* note 280, at 2-12 to 2-13, Table 2: 3-12.

²⁹² 18 C.F.R. § 5.18(b)(5)(ii)(E). The regulations define developmental resources to “include power generation, water supply, irrigation, navigation, and flood control.” *Id.*

²⁹³ In addition to FERC’s NEPA analysis, agencies with authority under FPA § 4(e) may perform their own NEPA assessments. FERC, HYDROELECTRIC HANDBOOK, *supra* note 280, at 13.

²⁹⁴ Public Availability of NEPA Documents, 18 C.F.R. § 380.9 (2004).

and wildlife that may be affected by the project.²⁹⁵ The agencies providing recommendations are to “specifically identify and explain the recommendations and the relevant resource goals and objectives and their evidentiary or legal basis.”²⁹⁶

Second, if the Commission determines that there are inconsistencies among the recommendations and the purposes and requirements of the FPA or other applicable law, the Commission attempts to resolve these inconsistencies, or may make a preliminary determination of inconsistency.²⁹⁷ Any party or affected agency or tribe can comment upon this determination, and the Commission is required to attempt to reach a mutually agreed-upon resolution.²⁹⁸ If there is no resolution, the Commission either states that: (1) the recommendations do not comply with the FPA or other laws; or (2) the conditions selected comply with the recommendations.²⁹⁹ If the Commission does not adopt the recommendations for the final license, it publishes its findings.³⁰⁰

Finally, the Commission issues its decision. A license order typically includes “a description of the project works licensed; a description of the project operation; a discussion and findings of the issues raised in the proceeding; term of license environmental conditions; engineering conditions; and administrative compliance conditions.”³⁰¹

Another way to determine license conditions, which feeds into the licensing process, is through settlements. Since 1990, the FERC licensing process has involved 200 settlements.³⁰² The settlement process can be a mechanism to achieve collaborative results, and it reduces the transaction costs incurred by applicants.³⁰³ FERC makes the final decision about whether to approve, disapprove or modify the settlement.³⁰⁴

²⁹⁵ FPA, 16 U.S.C. § 803(j)(1) (2000).

²⁹⁶ 18 C.F.R. § 5.26(b).

²⁹⁷ 16 U.S.C. § 803(j)(1).

²⁹⁸ 18 C.F.R. § 5.26(c)-(d).

²⁹⁹ 16 U.S.C. § 803(j)(1).

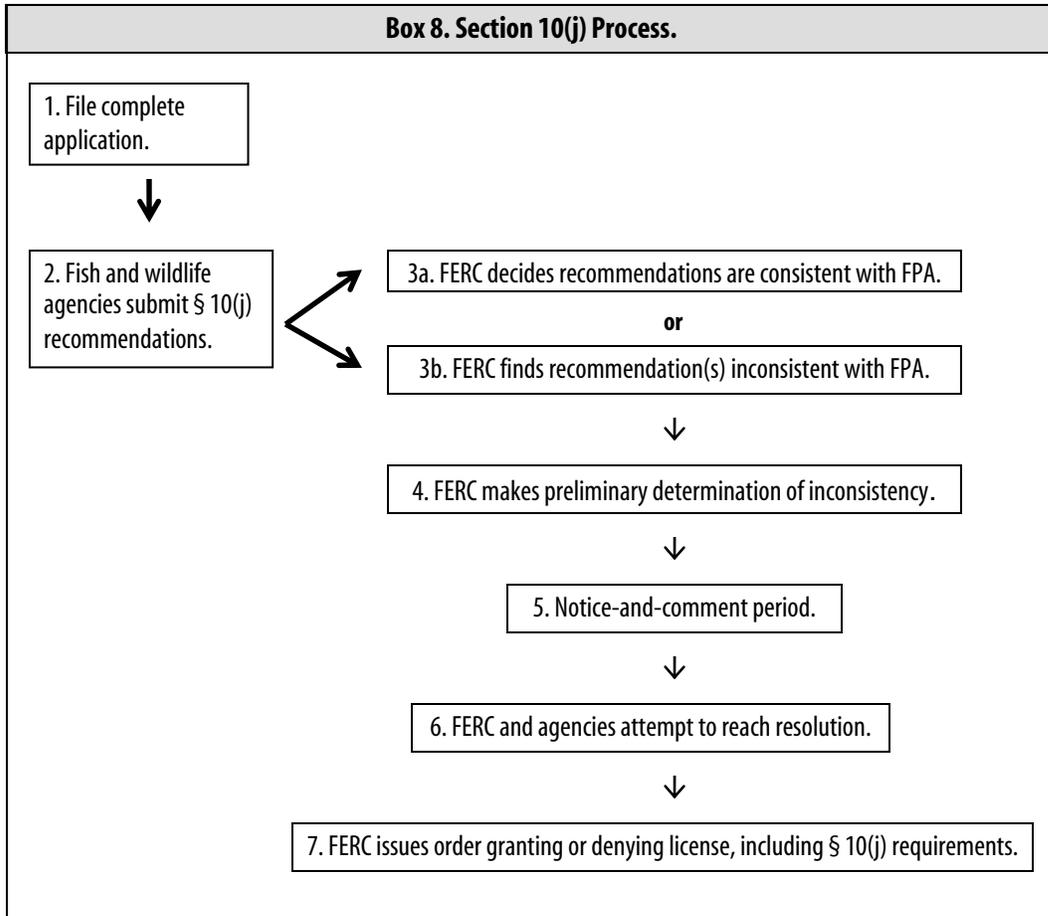
³⁰⁰ 18 C.F.R. § 5.26 (e). Where state and other federal laws such as the Endangered Species Act mandate mitigation, FERC does not have the authority to override these authorities. *Report on Hydroelectric Licensing*, *supra* note 267, at 6 (stating that protection, mitigation and enhancement “expenditures are frequently mandated in state water quality certification or mandatory federal agency conditions required pursuant to FPA Sections 4(e) and 18, and override the Commission’s balancing of all relevant factors affecting the public interest.”).

³⁰¹ See FERC, *HYDROELECTRIC HANDBOOK*, *supra* note 280, at 2-22.

³⁰² See HRC, *CITIZEN TOOLKIT*, *supra* note 266, at 113.

³⁰³ *Id.* at 108.

³⁰⁴ *Id.* at 109.



II. DATA

There is no national database that tracks the amount of money spent on FPA mitigation, nor a comprehensive report describing mitigation expenditures under the Act. ELI reviewed literature and FERC documentation, conducted interviews, and communicated with personnel from FERC, the Energy Information Administration (EIA), the National Hydropower Association, and the private bar in an attempt to identify and estimate mitigation expenditures. This section briefly describes the available data and any limitations with respect to identifying comprehensive cost estimates for compensatory mitigation under the FPA.

Neither FERC nor the EIA track mitigation expenditures on a regular basis,³⁰⁵ and the National Hydropower Association does not have public information regarding mitigation expenditures.³⁰⁶ However, FERC's website does include a publicly available electronic library that contains a broad range of documents associated with the licensing process, including environmental reports, a license application, and licensing orders describing mitigation activities that may be associated with a project.³⁰⁷

The Environmental Assessments (EAs) and Environmental Impact Statements (EISs) stored in this library give relatively detailed breakdowns of the costs of environmental measures required for original licenses, new licenses, subsequent licenses, license amendments, and the surrender of existing licenses. Because EAs and EISs are issued prior to final approval and implementation of a project, it is uncertain whether all of these environmental measures were in fact implemented, or when; but the data they contain provide the best information available for assessing the approximate annual mitigation requirements from FERC licensing actions.

For this study, ELI examined all of the EAs and final EISs that FERC issued in the years 2003 through 2006.³⁰⁸ In these documents, the cost figures for "environmental measures" generally include some combination of capital or one-time costs, annual operations and maintenance costs, and an annualized value of the costs over the period of analysis, which is usually 30 years. The lists of environmental measures include some that support the protection or restoration of fish and wildlife habitat, and many that support research or monitoring studies, or recreational and other human uses of the site.

In ELI's analysis, "environmental measures" were subdivided into four categories: 1) those that support compensatory mitigation for fish and wildlife, 2) those that avoid causing harm to fish and wildlife, 3) those that support research, planning, monitoring or reporting efforts that may benefit fish and wildlife, and 4) those that are unrelated to fish and wildlife. For the purposes of this report, only the compensatory mitigation measures were considered, including measures such as habitat enhancement or restoration funds, native fish hatchery programs, bird nesting boxes or towers, and measures to eliminate non-native invasive species. Specifically excluded from the compensatory mitigation classification are measures, such as mandatory minimum seasonal flows or fishway installation (both classified here as avoidance) and the development of management plans (classified as planning), that may also provide benefits to fish and wildlife, but that do not fit ELI's definition of *compensatory* mitigation.

³⁰⁵ Personal communications with FERC and EIA staff, in Washington, D.C. (on file with authors).

³⁰⁶ Personal communications with National Hydropower Association staff, in Washington, D.C. (on file with authors).

³⁰⁷ FERC, eLibrary, <http://www.ferc.gov/docs-filing/elibrary.asp> (last visited July 18, 2007).

³⁰⁸ Draft EISs were excluded, as were draft EAs that were subsequently replaced with final EAs.

For the environmental measures identified in its EAs and EISs, FERC generally provides annualized costs over the period of its analysis, which is typically 30 years. For this study, ELI both totaled these annualized cost figures and converted them to total costs recommended over the life of each license. By considering total costs, ELI sought to calculate, over the four-year period reviewed, the average *total* value of fish and wildlife habitat mitigation that gets recommended in a typical licensing year, in addition to the annual value of compensatory mitigation recommended in a typical year. Since licenses run for 30 to 50 years, and ELI's four-year sample covers only a fraction of active hydropower projects, the total average new *commitment* each year to compensatory mitigation provides a better proxy for the total value of compensatory mitigation performed pursuant to FPA, assuming that hydropower licensing actions are relatively evenly distributed throughout the current licensing cycle.

One type of regulatory action not included was license "surrenders" that occur with dam decommissioning. Although the removal of dams generally provides a net benefit for fish and wildlife, in the years 2003 to 2006 these actions were infrequent and the available documentation generally did not provide separate cost estimates for compensatory mitigation measures.

Finally, the data gathered from the EAs and EISs do not fully capture the *actual* costs of environmental measures performed by hydropower licensees. These data were drawn from the developmental analysis sections of hydropower license EAs and EISs, sections that are intended to assess how proposed environmental measures change the projected economic viability of the project. Since FERC's analysis is concerned with *changes* to the project's economics, the EAs and EISs do not itemize or assess the costs of environmental measures that are designed into a project proponent's proposal for an original license, nor do they consider the costs of continuing environmental measures that are already being performed by applicants for new or subsequent licenses.

III. COST ESTIMATES

In the years 2003 to 2006, FERC issued EAs and final EISs that included an analysis of compensatory mitigation costs for a total of 70 hydropower projects across the U.S. The annual costs of recommended compensatory mitigation measures varied dramatically from year to year, and comprised anywhere from two to 29 percent of the total cost of recommended PME measures. Over the four-year sampling period, FERC's average annual recommendations were for compensatory mitigation measures with a cost of about \$7 million per year, or a total recommended expenditure over the life of the licenses of about \$210 million (see Table 11).

Table 11. Annualized and total costs of compensatory mitigation measures recommended by FERC for hydropower licensing actions, 2003-2006.

Annualized Costs				
Year	# of Licenses Included	License Types Included	Fish and Wildlife Mitigation as a % of Total PME Measures	Cost of Fish and Wildlife Mitigation
2003	14	New, Original	29	\$6,654,123
2004	16	New, Subsequent, Original	5	\$1,159,873
2005	18	New, Subsequent, Original	2	\$332,536
2006	22	New, Subsequent, Original, Amendments to License	16	\$19,885,126
<i>All</i>	<i>70</i>	<i>Four-Year Annual Average:</i>	<i>15</i>	<i>\$7,007,915</i>
Total Costs (expenditures recommended over the period of analysis, usually 30 years)				
Year	# of Licenses Included	License Types Included	Fish and Wildlife Mitigation as a % of Total PME Measures	Cost of Fish and Wildlife Mitigation
2003	14	New, Original	29	\$199,679,690
2004	16	New, Subsequent, Original	5	\$34,796,200
2005	18	New, Subsequent, Original	2	\$9,976,080
2006	22	New, Subsequent, Original, Amendments to License	16	\$596,553,780
<i>All</i>	<i>70</i>	<i>Four-Year Annual Average:</i>	<i>15</i>	<i>\$210,251,438</i>

IV. STATE WILDLIFE ACTION PLANS

1. Program Opportunities

State Wildlife Action Plans may be useful during several steps in the licensing process, and for implementing mitigation requirements imposed by the license. This section identifies how the Plans might be used to inform the hydropower licensing process described in Box 7 and in subsequent mitigation actions.³⁰⁹

USE OF STATE WILDLIFE ACTION PLANS BY APPLICANTS

State Wildlife Action Plans could provide applicants with information about important natural resources, habitats, and species that may be affected by proposed projects. Applicants could refer to State Wildlife Action Plans as they: create pre-application documents; conduct the scoping process; and develop study plans, preliminary license proposals, draft environmental analyses and license applications. For example, the preliminary licensing proposal must describe measures for protection, mitigation and enhancement.

³⁰⁹ One comprehensive and easy-to-read source of information regarding when and how the public can participate in the hydropower licensing process is the HRC, CITIZEN TOOLKIT, *supra* note 280.

State Wildlife Action Plans could help in identifying the best PME measures based on, for example, priority species and habitat listed in the Plans.³¹⁰

USE OF PLANS BY REGULATORY AGENCIES

Several federal, state, and tribal agencies may be involved in a hydropower licensing process. One approach for encouraging the use of State Wildlife Action Plans in the hydropower licensing process would be to actively disseminate the Plans to federal and state natural resource agencies and to FERC, and encourage use of the plans in the licensing process.

As discussed, FERC is the lead federal agency that oversees the licensing process; it is responsible for issuing an environmental assessment or EIS and making the final determination about license conditions, including mandatory conditions, fishway prescriptions, and PME measures. State Wildlife Action Plans could provide FERC with a general reference for understanding state fish and wildlife and habitat diversity, threats, and priorities as it conducts these tasks. For example, FERC could use this information when it undertakes its assessment of PME measures in relation to other goals (e.g., energy development and recreational opportunities) of the FPA under Section 4(e).

In addition, federal and state natural resource agencies and tribes consult with applicants about potential impacts. Federal natural resource agencies recommend PME measures, including mandatory conditions and fishway prescriptions. State Wildlife Action Plans could inform such agencies and tribes about state habitat and fish and wildlife priorities, and help agencies target their recommendations to meet fish and wildlife and habitat needs.

For example, the agencies that develop preliminary fishway prescriptions must use relevant information that includes “information and study results compiled throughout the process; *fish management, restoration or natural resource plans*; historical records; scientific and technical literature; scientific expertise; and any other related information available to the Services.”³¹¹

FWS and NMFS also seek to work with applicants, other federal agencies, states, tribes and stakeholders when developing preliminary fishway prescriptions. State agencies or others could provide FWS and NMFS with information from State Wildlife Action Plans to inform fishway prescription decisions, either by providing background material or in collaborating with FWS and NMFS.

USE OF PLANS DURING PUBLIC COMMENT PERIODS

FERC holds public notice-and-comment periods at several stages during the licensing process. Notice and comment occurs during the NEPA scoping process, study plan development, and the environmental assessment or EIS preparation. In addition, resource agencies such as FWS and NOAA may have separate notice-and-comment periods when developing mandatory conditions, fishway prescriptions, and other PME recommendations. Relevant information from State Wildlife Action Plans could be introduced during these public notice-and-comment periods, if not already considered by FERC, resource agencies, and the applicant.

³¹⁰ License participants and FERC staff can comment at this time, including on whether or not the applicant should prepare an environmental assessment or environmental impact statement. If the applicants do not wish to make use of the Action Plans, state or federal agencies that are part of the process could do so at this stage.

³¹¹ See INTERAGENCY FISHWAY GUIDANCE, *supra* note 278, at 10 (emphasis added).

For example, the Action Plans may be used to inform agencies responsible for creating mandatory conditions and prescribing fishways. The Department of Interior and NOAA have established an interagency policy, *Mandatory Conditions and Review Process*, which provides a mechanism for license applicants and interested parties to review and comment on the preliminary conditions.³¹² The Departments file preliminary conditions and prescriptions in response to the notice that the application is ready for environmental analysis, and accept comments following these submissions.³¹³ In addition, applicants and interested parties can file comments during the draft NEPA process.³¹⁴

2. Program Limitations

Mitigation under FERC is an applicant-driven process, as described in previous sections. And FERC makes the final decision, with input from relevant agencies and stakeholders, about whether or not to include mitigation measures as conditions in the license.

FERC is inherently limited by its mandate under FPA Section 4(e) to, “in addition to the power and development purposes for which licenses are issued, give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.”³¹⁵ This means that it must consider recommended mitigation actions within the broader context of energy development and conservation.

In addition, FERC must assess agencies’ recommendations for mandatory conditions and fish prescriptions to ensure that the recommendations are within the scope of the FPA provisions. While FERC does not balance mandatory conditions and fishway prescriptions, it can and does find some conditions and prescriptions to be beyond the mandates of the FPA. In these instances, FERC will reject the agency conditions and prescriptions.³¹⁶ Finally, once FERC issues a license, there is little to no opportunity to revise it until it comes up for renewal in 30 to 50 years. This means that steps to ensure that proper mitigation activities are undertaken need to be considered within the timeframe of the licensing process. After a license has issued, it may be difficult, if not impossible, to require additional mitigation measures.

³¹² DEPARTMENT OF THE INTERIOR & DEPARTMENT OF COMMERCE [hereinafter DOI and DOC], POLICY FOR REVIEW OF MANDATORY CONDITIONS DEVELOPED BY THE DEPARTMENTS OF THE INTERIOR AND COMMERCE IN THE CONTEXT OF HYDROPOWER LICENSING [hereinafter MANDATORY CONDITIONS POLICY], Docket No. 001 206 343-1018-02 (2000). The DOI has sought to create regulations based on the interagency policy. See Department of the Interior, Notice of Proposed Rulemaking, Procedures for Review of Mandatory Conditions and Prescriptions in FERC Hydropower Licenses, 69 Fed. Reg. 54,602, 54,603 (Sept. 9, 2004).

³¹³ See MANDATORY CONDITIONS POLICY, *supra* note 312 at 31.

³¹⁴ *Id.*

³¹⁵ FPA, 16 U.S.C. § 797(e) (2000).

³¹⁶ See, e.g., *American Rivers v FERC*, 187 F.3d 1007 (9th Cir. 1999) (stating that in a final EIS, FERC staff rejected some of the conditions filed under Section 18, because they did not constitute fishway prescriptions in the eyes of FERC).

Chapter 6: Northwest Power Act

COMPENSATORY MITIGATION FOR HYDROPOWER PROJECTS

I. PROGRAM SUMMARY

Compensatory mitigation for hydropower projects may be mandated under one or more federal laws, including the Federal Power Act (FPA), the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act or NWPAct), the Clean Water Act (CWA), and the Endangered Species Act (ESA); and it also is informed by the National Environmental Policy Act (NEPA), among other federal laws, regulations and policies.

This chapter focuses on the NWPAct, which addresses hydropower projects in the Columbia River Basin.³¹⁷ It provides an estimate of hydropower mitigation expenditures under that Act, and discusses opportunities and limitations with respect to using State Wildlife Action Plans to inform compensatory mitigation decisions and activities under the law's implementing programs.

1. Law and Regulations

Federal hydropower projects in the Columbia River Basin must comply with the NWPAct.³¹⁸ Congress enacted the NWPAct to, *inter alia*, encourage energy development and conservation of electric power.³¹⁹ The NWPAct, however, also seeks “to protect, mitigate and enhance the fish and wildlife, including related spawning grounds and habitat, of the Columbia River and its tributaries, particularly anadromous fish which are of significant importance to the social and economic well-being of the Pacific Northwest and the Nation . . .”³²⁰ Another stated purpose of the law is to provide for participation by state and local government and stakeholders in the regional planning process for energy and conservation planning, and in “protection, mitigation, and enhancement” (PME) planning.

Two governmental bodies are instrumental in implementing the NWPAct – the Pacific Northwest Electric Power and Conservation Council (Council) and the Bonneville Power Administration (BPA). The following discussion describes the role of both bodies as they relate to PME under the NWPAct.

The Council. The NWPAct establishes the Council as a policy-making and planning body.³²¹ The Council has two main functions: (1) it creates a regional conservation³²² and electric power plan, and (2) it develops the Fish and Wildlife Program.³²³ Both functions include mitigation requirements. The regional conservation and electric power plan must give “due consideration” to protection, mitigation, and enhancement of fish

³¹⁷ Other chapters in this report describe mitigation under other related federal laws. For a discussion of the many laws affecting fish and wildlife activities in the Columbia River Basin, see GAO, *Columbia River Basin: A Multilayered Collection of Directives and Plans Guides Federal Fish and Wildlife Activities*, GAO-04-602 (June 2004).

³¹⁸ Pacific Northwest Electric Power Planning and Conservation Act [hereinafter Northwest Power Act or NWPAct], 16 U.S.C. § 839(6) (1980).

³¹⁹ 16 U.S.C. § 839 (1).

³²⁰ 16 U.S.C. § 839.

³²¹ 16 U.S.C. § 839b(a). The Council includes members from Idaho, Oregon, Montana, and Washington.

³²² “Conservation” in this context refers to energy conservation.

³²³ NWPAct, 16 U.S.C. § 839b(a)(1).

and wildlife.³²⁴ And the very purpose of the Fish and Wildlife Program is to protect, mitigate, and enhance fish and wildlife in the Columbia River Basin.

The Council develops the Fish and Wildlife Program based on recommendations, supporting documents, and information obtained from the public through public comment, participation, and consultations.³²⁵ The Council revises the Fish and Wildlife Program as needed through a process that involves federal and state fish and wildlife agencies, Indian tribes, and other interested parties.

The Council must balance competing objectives: energy development, and fish and wildlife protection. The NWPA states that the Fish and Wildlife Program must contain PME measures for fish and wildlife, “while assuring the Pacific Northwest an adequate, efficient, economical, and reliable power supply.”³²⁶ The Council must give “due weight to the recommendations, expertise, and legal rights and responsibilities of the Federal and the region’s State fish and wildlife agencies and appropriate Indian tribes.”³²⁷ If the Council, after weighing recommendations, does not adopt the recommendations, it must explain in writing why the recommendations are inconsistent with the Act or are less effective in PME than the measures adopted.³²⁸

BPA. The BPA was created by the Bonneville Project Act of 1937 to market power from the dams developed in the Columbia River Basin and to construct and maintain power transmission lines.³²⁹ In addition to its obligations under the Bonneville Project Act, the BPA has several responsibilities under the NWPA. First, BPA’s actions must be consistent with the conservation and electric power plan developed by the Council.³³⁰ Second, BPA has two major PME obligations under the NWPA: (1) it must act in a way that is consistent with the Fish and Wildlife Program, and (2) it must treat fish and wildlife measures equitably with its energy conservation and production measures.³³¹

In meeting its PME obligations, it is not enough for BPA simply to act in a way that is consistent with the Fish and Wildlife Program. BPA’s actions also must “adequately protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, affected by such projects or facilities in a manner that provides equitable treatment for such fish and wildlife with the other purposes for which such system and facilities are managed and operated,” and “[take] account at each relevant stage of decision-making processes to the fullest extent practicable, the [fish and wildlife] program adopted by the Council.”³³² In fulfilling these responsibilities, BPA coordinates with federal agencies, state fish and wildlife agencies, Indian tribes, and affected project operators.³³³

³²⁴ 16 U.S.C. § 839b(e)(2).

³²⁵ 16 U.S.C. § 839b(h)(5).

³²⁶ 16 U.S.C. § 839b(h)(5).

³²⁷ 16 U.S.C. § 839b(h)(7).

³²⁸ 16 U.S.C. § 839b(h)(7).

³²⁹ Bonneville Project Act, 16 U.S.C. §§ 832-832I (1937).

³³⁰ NWPA, 16 U.S.C. § 839b(d)(2).

³³¹ *Northwest Env'tl. Defense Ctr. v. Bonneville Power Admin.*, 117 F.3d 1520, 1532 (9th Cir. 1997) (describing the dual obligations that the Bonneville Power Administration has to energy production and fish and wildlife protection under the NWPA).

³³² 16 U.S.C. § 839b(h)(11)(A).

³³³ 16 U.S.C. § 839b(h)(11)(B).

In addition to its energy and PME obligations under the NWPA, BPA also has financial responsibility. The funds used to pay for the Fish and Wildlife Program implementation derive from BPA revenues.³³⁴ The NWPA states that BPA must use its funding and authority to

protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries in a manner consistent with the plan, if in existence, the program adopted by the Council under this subsection, and the purposes of this chapter.³³⁵

BPA's PME responsibilities under the NWPA also are in addition to environmental responsibilities that may exist under other laws such as the Endangered Species Act, and "[e]xpenditures . . . shall be in addition to, not in lieu of, other expenditures authorized or required from other entities under other agreements or provisions of law."³³⁶

2. Implementation

The Fish and Wildlife Program is the primary mechanism through which PME measures are undertaken. The development and implementation of this Program is outlined below.

Box 9. Steps from Fish and Wildlife Program to Implementation.

1. The Council creates a basin-wide Fish and Wildlife Program and sub-basin plans based upon overall program objectives. These plans form the basis for specific project selection.
2. The Council recommends projects to BPA.
3. BPA implements the Fish and Wildlife Program, and chooses projects that support the plans with assistance from the Columbia Basin Fish and Wildlife Authority and the Independent Scientific Review Panel.
4. The Council reports on Fish and Wildlife Program expenditures and status of fish and wildlife.

The Council Develops the Fish and Wildlife Program. The Council developed and adopted the first Fish and Wildlife Program in 1982. Since then, it has revised the Program four times. The most recent revision, the 2000 Fish and Wildlife Program, builds a program framework based upon an overall vision for the Columbia River Basin,³³⁷ scientific principles, biological objectives and implementation strategies.³³⁸ It describes a basin-wide plan and more detailed sub-basin plans.

The Fish and Wildlife Program has four overarching biological objectives to protect, mitigate, and enhance fish and wildlife:

³³⁴ 16 U.S.C. § 839b(h)(8)(D).

³³⁵ 16 U.S.C. § 839b(h)(10)(A).

³³⁶ 16 U.S.C. § 839b(h)(10)(A).

³³⁷ Northwest Power Planning Council, Columbia River Basin Fish and Wildlife Program, Council Doc. No. 2000-19, at 18 (Oct. 2002) [hereinafter Council, Columbia River Basin Fish and Wildlife Program]. (The vision for the current Fish and Wildlife Program is, in part: "a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing benefits from fish and wildlife valued by the people of the region.")

³³⁸ Id. at 13-34.

[1] A Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife.

[2] Mitigation across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydropower system.

[3] Sufficient populations of fish and wildlife for abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest.

[4] Recovery of the fish and wildlife affected by the development and operation of the hydrosystem that are listed under the Endangered Species Act.³³⁹

Under the Fish and Wildlife Program, the Council develops implementation strategies based on existing opportunities, taking into account what is achievable within existing constraints.³⁴⁰ Mitigation measures may be on-site or off-site, depending on needs. For example, in some instances habitats are intact, so implementation strategies would involve their preservation. If habitats are damaged but recoverable, restoration may be the appropriate strategy. In other instances, habitat may be fundamentally altered without possibility of recovery, and a substitute habitat is required.

In its Fish and Wildlife Program document, the Council prioritizes mitigation activities by region, habitat type, and species.³⁴¹ For example, in the Lower Columbia Sub-basin, the great blue heron is a high mitigation priority in riparian and riverine environment, and the ruffed grouse, elk, and American black bear are medium mitigation priority in coniferous forests.³⁴² This information helps decision-makers prioritize PME projects.

The Council Recommends Projects to BPA. The Council and BPA solicit project proposals through a public process.³⁴³ For example, the Council and BPA sent out a letter in January 2006 soliciting proposals for funding for the years 2007–2009.³⁴⁴ An Independent Scientific Review Panel and Scientific Peer Review Groups review the proposed projects and make recommendations to the Council based on project quality and priorities.³⁴⁵ Fish and wildlife managers also have input by developing an implementation work plan based on the projects proposed for funding, reviewing projects, and providing advice to the Council.³⁴⁶ The Council makes the final project recommendations to the BPA for funding.³⁴⁷

The Council also provides recommendations regarding BPA's funding of "reimbursable programs," which are federal agency programs reimbursable by the BPA, including the Columbia River Fisheries Mitigation Program, the Fish and Wildlife Operations and Maintenance Budget administered by the Corps of Engineers, the Lower Snake River Compensation Plan administered by the U.S. Fish and Wildlife Service, and the Leavenworth Hatchery administered by the Bureau of Reclamation.³⁴⁸

³³⁹ *Id.* at 16.

³⁴⁰ *Id.* at 19-20.

³⁴¹ *Id.* at C-1.

³⁴² *Id.* at C-1, Table 11-1.

³⁴³ Bonneville Power Administration (BPA), Integrated Fish and Wildlife Program [hereinafter BPA Integrated Fish and Wildlife Program], <http://www.efw.bpa.gov/IntegratedFWP/> (last visited July 18, 2007).

³⁴⁴ Northwest Power Planning Council and BPA, Letter to Interested Parties (Oct. 21, 2005), *available at* <http://www.nwccouncil.org/fw/budget/2007/intro.pdf>.

³⁴⁵ See Council, Columbia River Basin Fish and Wildlife Program, *supra* note 337, at 46.

³⁴⁶ *Id.*

³⁴⁷ *Id.* at 45-46.

³⁴⁸ *Id.*

BPA Implements the Fish and Wildlife Program. BPA makes the final decisions on which projects it will fund based upon recommendations from the Council. BPA funds hundreds of projects and spends millions of dollars on PME measures each year.³⁴⁹ BPA funds tribes, states, other federal agencies, universities, and private parties through contracts to implement the selected projects.³⁵⁰ Contractors are required to provide either monthly or quarterly reports on the status of projects.³⁵¹ In addition, projects often have biological reporting requirements based upon standardized metrics.³⁵²

The Council Reports on Expenditures. The Council creates an annual report describing BPA expenditures for the Fish and Wildlife Program and providing implementation information.³⁵³ The most recent report released in July 2006 includes information on a number of parameters that indicate fish and wildlife and habitat health, including habitat lost due to each dam construction.³⁵⁴ Table 12 provides an example of the type of information the Council collects, and shows habitat lost due to dam construction and habitat acquired for specific species.

Wildlife Species	HUs³⁵⁵ Lost	HUs Acquired	HUs Remaining	Percent Completed
Black-capped Chickadee	0	2	-2	--
Blue Grouse	0	954	-954	--
Bobcat	0	8	-8	--
Canada Goose (nesting)	74	0	74	0.00%
Downy Woodpecker	0	1,495	-1,495	--
Great Blue Heron	0	4,500	-4,500	--
Mallard	0	2	-2	--
Mink	0	24	-24	--
Mourning Dove	9,316	1,001	8,315	10.74%
Mule Deer	27,133	17,172	9,961	63.29%
Pigmy Rabbit	0	1,246	-1,246	--
Riparian Forest	1,632	200	1,432	12.25%
Riparian Shrub	27	0	27	0.00%
Ruffed Grouse	16,502	2,908	13,594	17.62%
Sage Grouse	2,746	7,432	-4,686	270.65%
Sharp-tailed Grouse	32,723	14,789	17,934	45.19%
Western Meadowlark	0	286	-286	--
White-tailed Deer	21,632	9,064	12,568	41.90%
Yellow Warbler	0	129	-129	--

Source: Fifth Annual Report on Expenditures of the Bonneville Power Administration (Table 12A)

³⁴⁹ *Id.* at 45.

³⁵⁰ BPA, Integrated Fish and Wildlife Program, *supra* note 343.

³⁵¹ BPA, Reporting Requirements, <http://www.efw.bpa.gov/contractors/reporting.aspx> (last visited July 18, 2007).

³⁵² *Id.*

³⁵³ See e.g., NORTHWEST POWER AND CONSERVATION COUNCIL, FIFTH ANNUAL REPORT TO THE NORTHWEST GOVERNORS ON EXPENDITURES OF THE BONNEVILLE POWER ADMINISTRATION TO IMPLEMENT THE COLUMBIA RIVER BASIN FISH AND WILDLIFE PROGRAM OF THE NORTHWEST POWER AND CONSERVATION COUNCIL, 1978–2005, Council Doc. No. 2006-11 (July 2006).

³⁵⁴ *Id.*

³⁵⁵ HUs are habitat units. The habitat units lost are attributable to dam construction; loss due to dam operation is not accounted for in these figures. *Id.*

II. DATA

Publicly available information on federal hydropower mitigation expenditures is comprehensive and detailed. The Council issues an annual report to the Northwest governors that provides BPA's expenditures to implement the Fish and Wildlife Program.³⁵⁶ The Council began generating the annual reports in response to a July 1999 request by Northwest governors to report on annual BPA expenditures.³⁵⁷ The 2006 report contains expenditure data from 1978 through 2005. It includes a breakdown of expenditures based on activities (e.g., data management, habitat, fish production, and research). It also supplies the names of contractors implementing the Fish and Wildlife Program and the amount of money BPA has provided to these contractors. In addition to expenditures, it provides information about species and habitat including, for example, commercial landings of salmon and steelhead, habitat lost due to dam construction and habitat replaced, properties purchased, and habitat acquired by fish and wildlife agencies (see, e.g., Table 12).

The direct program cost figures for fish and wildlife provided by BPA (Tables 13 and 14) are planned spending amounts or amounts BPA is obligated to pay. The numbers do not represent actual expenditures. Numbers used are those reported by BPA to the Council, and are not independently verified by the Council.

III. COST ESTIMATES

The Council reports BPA's mitigation expenditures based on the following categories:

- (1) fish and wildlife costs (including money spent to pay for projects that address anadromous fish, resident fish, and wildlife; data management and coordination; and internal program support);
- (2) Action Plan and high priority projects (one-time expenditures to fund projects that would immediately benefit ESA species from 2001-2004);
- (3) reimbursements to the U.S. Treasury for mitigation by other agencies (including operation and maintenance of fish passage facilities or hatcheries);
- (4) bond payments (to pay for capital investments to improve fish passage);
- (5) power purchases to replace lost power (to make up for lost power generation when mitigation actions alter dam operations); and
- (6) foregone revenue (net value of hydropower revenue lost as a result of fish operations).

Of these, items (1) – (3) directly relate to compensatory mitigation expenditures. To obtain a total PME cost estimate, ELI added these items together and averaged the annual totals over the period of 2003 through 2005, resulting in annual average compensatory mitigation expenditures of about \$207.1 million (Table 13).

³⁵⁶ See NORTHWEST POWER AND CONSERVATION COUNCIL, *supra* note 353.

³⁵⁷ *Id.* at 3.

Table 13. PME Cost Estimate for FY 2003 – 2005 (in millions).				
Activity	2003	2004	2005	Annual Average
Fish and wildlife costs	\$152.3	\$146.4	\$148.0	\$148.9
Action Plan and high priority projects (ESA-related)	\$6.5	\$0.4	\$0.0	\$2.3
Reimbursements to U.S. Treasury for agency mitigation ³⁵⁸	\$52.6	\$57.2	\$57.9	\$55.9
TOTAL	\$211.4	\$204.0	\$205.9	\$207.1
Additional (Non-Compensatory) Costs to BPA				
Bond payments to improve fish passage	\$56.7	\$85.4	\$89.7	\$77.3
Purchases to replace lost power	\$171.1	\$191.0	\$110.8	\$157.6
Foregone revenue	\$79.2	\$21.7	\$182.1	\$94.3

Source: Fifth Annual Report on Expenditures of the Bonneville Power Administration

The Council provides a more detailed report on item (1) above, the fish and wildlife mitigation costs, based on the purpose of the expenditures (Table 14). Table 14 excludes Action Plan and high priority expenditures.

Table 14. Fish and Wildlife Expenditures (in millions).				
General Purpose	2003	2004	2005	Annual Average
Coordination	\$6.4	\$5.8	\$6.6	\$6.3
Data Management	\$0.2	\$0.6	\$0.9	\$0.6
Habitat	\$39.5	\$40.3	\$44.9	\$41.6
Harvest	\$2.0	\$2.7	\$1.6	\$2.1
Mainstem Survival	\$3.6	\$3.2	\$4.1	\$3.6
Monitoring	\$20.9	\$17.2	\$18.0	\$18.7
Production	\$34.9	\$32.2	\$33.0	\$33.4
Research and Evaluation	\$32.7	\$33.9	\$27.7	\$31.4
BPA Program Support	\$12.0	\$10.6	\$11.0	\$11.2
Other	--	--	\$.2	\$0.2
Total Fish and Wildlife Costs	\$152.3	\$146.4	\$148.0	\$148.9

Source: Fifth Annual Report on Expenditures of the Bonneville Power Administration

IV. STATE WILDLIFE ACTION PLANS

1. Program Opportunities

First, State Wildlife Action Plans may be able to inform the Fish and Wildlife Program during revisions to the basin-wide program and the sub-basin plans (described above). State Wildlife Action Plans also may be helpful at the project development stage.

³⁵⁸ Primarily U.S. Army Corp of Engineers, Bureau of Reclamation, and Fish and Wildlife Service.

INFORMING FISH AND WILDLIFE PROGRAM REVISIONS

State Wildlife Action Plans could be used to inform future Fish and Wildlife Program revisions to (a) the basin-wide plan (the Fish and Wildlife Program document); and (b) the sub-basin plans (developed to implement the basin-wide Fish and Wildlife Program). This would allow the Council and BPA to make mitigation project decisions in part based on State Wildlife Action Plan information that has been incorporated into the Fish and Wildlife Program at the revision stage.

Basin-wide Plan. The Council provides two opportunities for agency, tribal, and public comment during basin-wide Fish and Wildlife Program development.³⁵⁹ First, the Council solicits recommendations from fish and wildlife agencies, tribes, and other parties before developing a Fish and Wildlife Program draft. As discussed, the NWPA *requires* the Council to develop the Fish and Wildlife Program based upon such recommendations.³⁶⁰ It cannot simply disregard recommendations, and if it rejects recommendations, it must provide its reasons.³⁶¹ State fish and wildlife agencies could submit recommendations to the Council during development of the Program that are based on information in State Wildlife Action Plans.

Second, once the draft is developed, a public comment period is provided that includes public hearings and consultations before the Program is finalized.³⁶² If not adequately considered during the recommendation period, comments based on strategies and information in State Wildlife Action Plans could also be submitted during the public comment period.

Sub-basin Plans. Sub-basin plan development may provide another opportunity to introduce State Wildlife Action Plan information and strategies. The Council initiated sub-basin plan development in 2000 with the goal of finalizing draft sub-basin plans by 2001.³⁶³ The Council intends to revise and update the sub-basin plans approximately every three years.³⁶⁴

Similarly to the basin-wide Fish and Wildlife Program planning process, the Council calls for two public input periods on sub-basin plans: (1) federal, state, tribal, and local parties are included in the planning process; and (2) a public comment period is conducted after a draft is completed.³⁶⁵ State Wildlife Action Plan information could be submitted for consideration during both stages of sub-basin plan development and revision. Also, the Council directs sub-basin planners to consider and coordinate with existing programs that address fish, wildlife, and habitat. State Wildlife Action Plans could be used by sub-basin planners in coordinating existing programs.

INFORMING PROJECT DEVELOPMENT DECISIONS

As discussed, BPA funds mitigation projects that are consistent with the Fish and Wildlife Program. The existing Fish and Wildlife Program states that the Council “will pursue opportunities to integrate [Fish and Wildlife] program strategies with other federal, state, tribal, Canadian, and volunteer fish and wildlife

³⁵⁹ Council, Columbia River Basin Fish and Wildlife Program, *supra* note 337.

³⁶⁰ NWPA, 16 U.S.C. § 839b(h) (1980).

³⁶¹ *Northwest Envtl. Defense Ctr. v. Bonneville Power Admin.*, 117 F.3d at 1531.

³⁶² Council, Columbia River Basin Fish and Wildlife Program, *supra* note 337, at 8, 9.

³⁶³ *Id.* at 41.

³⁶⁴ *Id.* at 41-42.

³⁶⁵ *Id.* at 2.

restoration programs” when developing PME projects.³⁶⁶ Accordingly, state fish and wildlife agencies and other parties could use this opportunity to make recommendations for projects that are informed by State Wildlife Action Plans, but that also meet the goals and objectives of the Fish and Wildlife Program.

2. Program Limitations

All actions under the NWPA must relate to “Columbia River and its tributaries” and “the program, to the greatest extent possible, shall be designed to deal with [the Columbia River] and its tributaries as a system.”³⁶⁷ Thus, compensatory mitigation is solely limited to actions that address fish and wildlife challenges in the Columbia River and its tributaries. Additional research would be needed to determine whether compensatory mitigation that is consistent with State Wildlife Action Plan strategies and information could be undertaken if it occurs beyond the Columbia River and its tributaries, but still supports the River’s fish and wildlife. For example, salmon protection on the high seas arguably could protect stocks within the Columbia River and its tributaries.

In addition to spatial limitations, the program is limited by the NWPA’s balancing mandate. The Act is not primarily a conservation statute, and the Council is tasked with balancing PME actions against energy production and development.³⁶⁸ This requirement could limit the extent of PME measures undertaken in specific cases.

³⁶⁶ *Id.* at 48.

³⁶⁷ NWPA, 16 U.S.C. §839b(h)(1)(A).

³⁶⁸ NWPA, 16 U.S.C. § 839 (1) (1980).

Chapter 7: Other Programs – Brief Summaries

I. NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) is a procedural statute that directs federal agencies to evaluate environmental impacts for all “proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.”³⁶⁹ In any reports or recommendations on such proposed federal actions, an agency must include a detailed statement of the environmental impact, any unavoidable adverse environmental effects, and proposed action alternatives.³⁷⁰

The purpose of NEPA is to help decision-makers make informed decisions based on an understanding of the environmental consequences of proposed actions, and to take steps to “protect, restore, and enhance the environment.”³⁷¹ To avoid or minimize environmental harm, agencies are to assess reasonable alternatives to the proposed action.³⁷² While NEPA does not mandate that agencies adopt these alternatives, NEPA policy calls upon agencies to “[u]se all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment.”³⁷³

NEPA mandates a multi-step process that usually includes an initial environmental assessment (EA), which can lead to either a “finding of no significant impact” or result in the creation of a full environmental impact statement (EIS). The EIS must include a section on alternatives to the proposed actions. In this section, the agency should provide a review of the proposed action and alternatives, and include a discussion of the environmental impacts of each potential choice.³⁷⁴ Mitigation measures may be recommended and included in the proposed action, the alternative actions, or as separate measures.³⁷⁵ Mitigation measures may also be described in the section that discusses environmental consequences of the proposed action or alternatives, if not covered in the previous section.³⁷⁶

The NEPA regulations define “mitigation” broadly to include:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing the impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.³⁷⁷

³⁶⁹ National Environmental Policy Act [hereinafter NEPA], § 102(2)(C), 42 U.S.C. § 4332(2)(C)(2000).

³⁷⁰ *Id.*

³⁷¹ National Environmental Policy Act Implementing Procedures, 40 C.F.R. § 1500.1.

³⁷² 40 C.F.R. § 1500.2(e).

³⁷³ 40 C.F.R. § 1500.2(f).

³⁷⁴ 40 C.F.R. § 1502.14.

³⁷⁵ *Id.*

³⁷⁶ 40 C.F.R. § 1502.16.

³⁷⁷ 40 C.F.R. § 1508.20.

This process is generally considered in order, and makes avoidance and minimization the preferred forms of mitigation. *Compensatory* mitigation, as defined by this report, could include actions taken under parts (c) – (e), especially (e).

NEPA does not require agencies to provide cost estimates for proposed or alternative mitigation actions. However, the regulations do allow a cost-benefit analysis to be used as an aid to evaluate environmental consequences of proposed actions and alternatives.³⁷⁸ This could include an assessment of potential mitigation expenditures.

NEPA review is likely to result in a number of *recommended* mitigation actions – compensatory and otherwise. Many of the programs and accompanying federal actions reviewed in this report include NEPA analyses, and some of the mitigation expenditures thus are captured in the relevant chapters—for example, NEPA assessment is part of the hydropower licensing process. However, because NEPA is a procedural law, mandating only compliance with the EIA process rather than specific substantive outcomes and compensatory mitigation actions, the authors did not seek to identify, quantify, or analyze any independent mitigation expenditures associated with NEPA. Nor does this report examine the potential use of State Wildlife Action Plans to inform the NEPA process, even though it is possible that the process could benefit from the use of the Plans.

II. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Congress signed the Sustainable Fisheries Act on October 11, 1996, which amended the Magnuson Fishery Conservation and Management Act (and renamed it the Magnuson-Stevens Fishery Conservation and Management Act (MSA)).³⁷⁹ Under the authority of the MSA, as delegated by the Secretary of Commerce, eight Regional Fisheries Management Councils (the Councils) and the National Marine Fishery Service (NMFS) regulate fishing in federal waters.³⁸⁰

The Regional Councils manage fish stocks by creating fishery management plans. Under Section 303(a)(1)(A) of the Act, these plans are to contain conservation and management measures “necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery.”³⁸¹ As part of the fishery management plans, the Councils are required to designate essential fish habitat (EFH).³⁸² The EFH provision directs NMFS and the Councils to:

³⁷⁸ 40 C.F.R. § 1502.23. In circumstances where there are “important qualitative considerations,” a monetary cost-benefit analysis should not be included in weighing alternatives. *Id.*

³⁷⁹ MSA, 16 U.S.C. §§ 1801 et seq., available at <http://www.nmfs.noaa.gov/sfa/activity/index2.htm>.

³⁸⁰ 16 U.S.C. § 1801(b).

³⁸¹ 16 U.S.C. § 1853(a)(1)(A).

³⁸² 16 U.S.C. § 1853 (a)(7) (“describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat”).

- Describe EFH and identify EFH in each fishery management plan;
- Minimize to the extent practicable the adverse effects of fishing on EFH; and
- Identify other actions to encourage the conservation and enhancement of EFH.³⁸³

These EFH mitigation provisions could, for example, restrict access to certain types of permitted fishing in EFH areas—i.e., mitigation through avoidance.³⁸⁴ The authors were unable to identify examples of any *compensatory* mitigation actions attached to fishing permits.

MSA Section 305(b)(2)-(4) require other federal agencies to consult with NMFS if their actions will authorize, fund, or undertake to adversely impact EFH.³⁸⁵ Upon review, if NMFS finds that the habitat would be adversely affected, it is to make recommendations that would allow conservation of such habitat.³⁸⁶ The other federal agency has 30 days to respond to these recommendations, and “[t]he response shall include a description of measures proposed by the agency for avoiding, *mitigating*, or offsetting the impact of the activity on such habitat.”³⁸⁷ If the federal agency chooses actions that are inconsistent with the recommendations, the agency must provide its rationale for doing so.³⁸⁸

This consulting requirement potentially could lead to mitigation measures being taken by the federal agency proposing to undertake an action that would cause an adverse impact. Like NEPA, however, the EFH provisions do not specifically require mitigation, but rather require a process of agency consultation that could include mitigation considerations or recommendations.

³⁸³ *Id.* See also NOAA Fisheries, Essential Fish Habitat, <http://www.nmfs.noaa.gov/habitat/habitatprotection/efh/index.htm> (last visited July 17, 2007).

³⁸⁴ See, e.g., Pacific Fishery Management Council, Backgrounder: Essential Fish Habitat (July 24, 2006), available at <http://www.pcouncil.org/facts/habitat.pdf>.

³⁸⁵ 16 U.S.C. § 1855(b)(2), “Each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act.” For more information, see NOAA’s “Essential Fish Habitat Consultation Guidance” (April 2004).

³⁸⁶ 16 U.S.C. § 1855(b)(4)(A).

³⁸⁷ 16 U.S.C. § 1855(b)(4)(B) (emphasis added).

³⁸⁸ *Id.*

III. NATURAL GAS ACT

Under the Natural Gas Act (NGA), the Federal Energy Regulatory Commission has the authority to attach to its permits “such reasonable terms and conditions as the public convenience and necessity may require.”³⁸⁹ These may include mitigation requirements derived from other environmental laws. Federal regulations describe environmental compliance conditions for activities that will disturb the ground or alter air or noise emissions.³⁹⁰ Under these regulations, all activities must be consistent with applicable law, including the Clean Water Act, Clean Air Act, National Historic Preservation Act of 1966, Archeological and Historic Preservation Act of 1974, Coastal Zone Management Act of 1972, Endangered Species Act of 1973, Executive Order 11988 (related to floodplain impacts), Executive Order 11990 (related to wetland impacts), Wild and Scenic Rivers Act, National Wilderness Act, National Parks and Recreation Act of 1978, and Magnuson-Stevens Fishery Conservation and Management Act.³⁹¹

The regulations further state that:

The certificate holder shall be deemed in compliance with:

- (i) [Endangered Species Act] . . . only if it adheres to the procedures in appendix I of this subpart in which case the Commission finds that endangered species and their critical habitat are protected in accordance with 16 U.S.C. 1536;
- (ii) [Natural Historic Preservation Act] . . . only if it adheres to the procedures in appendix II of this subpart in which case the Commission finds that there is no effect on any property protected by 16 U.S.C. 470f;
- (iii) [Coastal Zone Management Act] . . . if the appropriate state agency designated to administer the state's coastal zone management plan, prior to construction of the project, waives its right of review or determines that the project complies with the state's coastal zone management plan.
- (iv) [Clean Water Act] . . . and . . . [Executive Order 11990 related to wetlands] . . . only if it adheres to Commission staff's current “Upland Erosion Control, Revegetation and Maintenance Plan” and “Wetland and Waterbody Construction and Mitigation Procedures” . . . or gets written approval from the staff or the appropriate Federal or state agency for the use of project-specific alternatives to clearly identified portions of those documents.³⁹²

Mitigation requirements for permitted activities under the Natural Gas Act are implemented with reference to substantive mitigation provisions of environmental laws, including for example the Clean Water Act and Endangered Species Act. Thus, the costs associated with NGA mitigation will largely be documented through evaluation of other environmental laws. However, permitting under the NGA may offer additional opportunities to use State Wildlife Action Plans to inform the environmental assessment and permitting process under the Act.

³⁸⁹ Natural Gas Act, 15 U.S.C. § 717f (e).

³⁹⁰ 18 C.F.R. § 157.206(b).

³⁹¹ 18 C.F.R. § 157.206(b)(2).

³⁹² 18 C.F.R. § 157.206(b)(3). The “Wetland and Waterbody Construction and Mitigation Procedures” describe the mitigation requirements for projects that impact wetlands and waterbodies. The “Upland Erosion Control, Revegetation and Maintenance Plan” (2003) was created to “assist applicants [for natural gas project permits] by identifying baseline mitigation measures for minimizing erosion and enhancing revegetation.”

IV. WATER RESOURCES DEVELOPMENT ACTS

The U.S. Army Corp of Engineers is tasked with developing water projects, maintaining navigation, restoring the environment, protecting fish and wildlife, and providing support for disaster relief and recovery. A long series of federal Water Resource Development Acts (WRDAs) provide the Corps with appropriations and authority to undertake designated projects. Some of these projects call upon the Corps to undertake restoration and mitigation activities. For example, the WRDA of 1986 authorized over \$500 million in fish and wildlife mitigation and enhancement measures. Table 15 provides a list of typical projects with the estimated project costs, as provided in various bills. This report does not examine or analyze WRDA mitigation in detail, because WRDA's dependence on Congressional appropriations does not fall within the working definition of compensatory mitigation.

Project and Description ³⁹³	Authorized Amount ³⁹⁴
Western Tennessee Tributaries. WRDA 1974 Section 3(a) authorizes USACE to acquire 32,000 acres of land to mitigate damages to fish and wildlife, recreation, and other environmental purposes related to the project.	\$6,600,000
Wynoochee Dam and Lake. WRDA 1974 Section 47 authorizes funding of fish hatchery facilities to mitigate for lost spawning areas due to project.	\$660,000
Libby Dam. WRDA 1974 Section 49 authorizes USACE to acquire up to 12,000 acres to mitigate for lost wildlife grazing areas due to project.	\$2,000,000
Coyote Dam. WRDA 1974 Section 95 authorizes USACE to take actions to compensate for loss of fish due to dam operations, including expanding existing fish hatcheries.	N/A
Cache River Basin. WRDA 1974 Section 99 authorizes USACE to acquire up to 70,000 acres of land for fish and wildlife management, recreation and environmental purposes to mitigate for damages caused by project.	\$7,000,000
Chariton River Flood Protection. WRDA 1974 Section 102 authorizes USACE to transfer monies to the Iowa Conservation Commission for fish hatchery construction to mitigate loss to fish due to construction.	\$700,000
Beaver Dam Flood Control. WRDA 1976 Section 105 authorizes USACE to undertake trout production measures to compensate for loss due to the dam project.	\$6,000,000
Norfolk Harbor and Channels. WRDA 1986 Section 201(a) authorizes USACE to mitigate damages to fish and wildlife as necessary	N/A
San Juan Harbor, Puerto Rico. WRDA 1986 Section 202(a) authorizes the acquisition of 22 acres of land for lost algal beds due to the project	N/A
Lock and Dam 7 Replacement, Monongahela River, Pennsylvania. WRDA 1986 Section 301(a) authorizes mitigation as necessary to compensate for loss due to project.	N/A
Winfield Locks and Dam, Kanawha River, West Virginia. WRDA 1986 Section 301(a) authorizes fish and wildlife mitigation	N/A
Little Wood River Idaho. WRDA 1986 Section 401 authorizes fish mitigation in response to fish loss during project.	N/A
Halstead, Kansas. WRDA 1986 Section 401 authorizes mitigation for fish and wildlife loss.	N/A
St. Johns Bayou and New Madrid Floodway, Missouri. WRDA 1986 Section 401 authorizes land acquisition to mitigate fish and wildlife loss.	N/A
Middle Rio Grande, New Mexico Flood Control. WRDA 1986 Section 401 authorizes acquisition	N/A

³⁹³ Mitigation authorizations presented here were identified through a review of WRDAs from 1974 – 2000. Additional WRDA projects may include mitigation measures that are not explicitly authorized in the Acts.

³⁹⁴ The authorized amount is based on the amount authorized to be appropriated by the Act. It does not indicate the actual amount appropriated or spent on the project.

Table 15. Water Resources Development Act Mitigation Authorizations, 1974-2000.	
Project and Description ³⁹³	Authorized Amount ³⁹⁴
of 75 acres of wetlands for fish and wildlife protection and 200 acres of land for fish and wildlife mitigation.	
Miami River, Fairfield, Ohio. WRDA 1986 Section 401 authorizes fish and wildlife mitigation “including seeding and planting in disturbed areas, limiting removal of riparian vegetation to the minimum amount necessary for project objectives, performing work along the north streambank where construction is planned on only one side of the channel, limiting construction activities to the right stream bank in the reach of Pleasant Run extending from mile 2.75 to mile 3.10, the use of gabions and riprap for Bank protection in lieu of concrete, and the inclusion of pool-riffle complexes at bridges.”	N/A
Fry Creeks, Oklahoma. WRDA 1986 Section 401 authorizes acquisition of 20 acres to mitigate for fish and wildlife losses	N/A
Harrisburg, Pennsylvania. Authorizes action to reduce habitat loss	N/A
Tennessee-Tombigbee Waterway Mitigation. WRDA 1986 Section 601 authorizes USACE to acquire 88,000 acres for fish and wildlife mitigation in addition to other mitigation lands already held by the U.S.	Modified, see below
Helena Harbor, Phillips County, Arkansas. WRDA 1986 Section 601 authorizes USACE to mitigate adverse effects to fish and wildlife.	N/A
White River Navigation to Batesville, Arkansas. WRDA 1986 Section 601 authorizes USACE to acquire 1,865 acres of land to mitigate impacts to fish and wildlife and mitigate impacts to the Fat Pocketbook Pearly Mussel	N/A
Sacramento River Bank Protection, California. WRDA 1986 Section 601 authorizes USACE to mitigate impacts to fish and wildlife.	\$1,410,000
Port Canaveral Harbor, Florida. WRDA 1986 Section 601 authorizes USACE to mitigate impacts to fish and wildlife.	\$276,000
Richard B. Russell Dam and Lake, Georgia and South Carolina. WRDA 1986 Section 601 authorizes USACE to mitigate impacts to fish and wildlife.	\$20,000,000
Davenport, Iowa (Nahant Marsh). WRDA 1986 Section 601 authorizes mitigation activities.	\$517,000
Obion Creek, Kentucky. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss.	\$4,900,000
Red River Waterway, Louisiana. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss.	See below
Yazoo Backwater Area, Mississippi. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss, including acquisition of 40,000 acres of property.	\$17,700,000
Harry S Truman Dam and Reservoir, Missouri. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss.	N/A
Missouri River Mitigation. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss. <i>See below also.</i>	\$51,000,000
Big River Reservoir, Rhode Island. WRDA 1986 Section 601 authorizes acquisition of lands to mitigate project impacts.	N/A
Memphis Harbor, Memphis, Tennessee. WRDA 1986 Section 601 authorizes USACE to mitigate for loss to bottomland hardwood habitat.	N/A
Cooper Lake and Channels, Texas. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss.	\$14,800,000
Trinity River, Texas. WRDA 1986 Section 601 authorizes mitigation activities for fish and wildlife loss.	\$10,400,000
Lake Programs. WRDA 1986 Section 602 authorizes mitigation at Gorton's Pond, Warwick, Rhode Island.	N/A
Streambank Erosion Control. WRDA 1986 Section 602 authorizes mitigation of fish and wildlife due to Sacramento River flood control project.	N/A

Table 15. Water Resources Development Act Mitigation Authorizations, 1974-2000.	
Project and Description ³⁹³	Authorized Amount ³⁹⁴
Mitigation Fund. WRDA 1986 Section 908 authorizes the establishment of an Environmental Mitigation and Protection Fund of \$35,000,000 annually to be spent on mitigation activities associated with authorized projects.	\$35,000,000
Passaic River Main Stem. WRDA 1988 Section 101 mandates the establishment of a wetlands mitigation bank associated with the Passaic River Central Basin	N/A
Red River Waterway, Louisiana. WRDA 1988 Section 102 authorizes the acquisition of an additional 12,000 acres near the Bayou Bodcau Wildlife Management Area.	See below
Cooper Lake and Channels, Texas. WRDA 1988 Section 102 authorizes changes in the mitigation project.	\$22,500,000
Aberdeen, Washington. WRDA 1988 Section 203 authorizes the City of Aberdeen to undertake mitigation responsibilities, among others.	N/A
Red River Waterway, Louisiana. WRDA 1996 Section 301(b) authorizes increased mitigation expenditures and makes alterations to mitigation lands.	\$10,500,000
White River Basin, Arkansas and Missouri. WRDA 1996 Section 304 requires that mitigation activities be included as purposes of the project.	N/A
Jacksonville Harbor (Mill Cove), Florida. WRDA 1996 Section 317 authorizes mitigation activities for flow and circulation improvement.	\$2,000,000
Mississippi River-Gulf Outlet, Louisiana. WRDA 1996 Section 326 calls for implementation of a community impact mitigation plan.	N/A
Jones Inlet, New York. WRDA 1996 Section 335 directs USACE to place dredged materials downstream as necessary to mitigation impacts of keeping channel open.	N/A
Broken Bow Lake, Red River Basin, Oklahoma. WRDA 1996 Section 338 directs USACE to release waters to mitigate fish and wildlife impacts.	N/A
Wyoming Valley, Pennsylvania. WRDA 1996 Section 346 authorizes mitigation measures.	N/A
Assateague Island, Maryland. WRDA 1996 Section 534 calls upon USACE to expedite restoration measures.	N/A
Savannah Harbor expansion. WRDA 1999 Section 101 authorizes mitigation for Savannah Harbor expansion.	N/A
Flood Mitigation And Riverine Restoration Program. WRDA 1999 Section 212 authorizes flood mitigation and restoration for 23 projects, with a maximum of \$30 million of federal funds to be spent on any one project. \$80 million is authorized to be appropriated from 2001 – 2005	\$80,000,000
Tennessee-Tombigbee Waterway Wildlife Mitigation Project, Alabama and Mississippi. WRDA 1999 Section 301 modifies the previous provision and raises the mitigation amount authorized.	\$93,530,000
Brevard County, Florida. WRDA 1999 Section 310 authorizes shoreline mitigation measures in response to navigation actions.	N/A
Fort Pierce, Florida. WRDA 1999 Section 312 authorizes shoreline and harbor mitigation including beach nourishment.	\$9,128,000
Miami Harbor Channel, Florida. WRDA 1999 Section 315 authorizes mitigation and artificial reef building.	N/A
St. Augustine, St. Johns County, Florida. WRDA 1999 Section 316 authorizes navigation mitigation for shore protection and storm damage reduction.	\$17,208,000
Ogden Dunes, Indiana. WRDA 1999 Section 320 authorizes mitigation if a study finds that beach erosion is due to federal project.	N/A
Missouri River Bank Stabilization and Navigation Project. WRDA 1999 Section 334 authorizes mitigation for fish and wildlife losses and modifies previous provisions “to increase by 118,650 acres the amount of land and interests in land to be acquired for the project.”	N/A
Black Warrior and Tombigbee Rivers. WRDA 1999 Section 369 authorizes acquisition of land for mitigation of habitat loss.	N/A

Table 15. Water Resources Development Act Mitigation Authorizations, 1974-2000.	
Project and Description ³⁹³	Authorized Amount ³⁹⁴
Woodlawn Beach. WRDA1999 Section 542 authorizes mitigation of contamination	N/A
Point Marion Lock and Dam. WRDA1999 Section 550 authorizes mitigation of damages to shoreline from navigation project.	\$2,000,000
Aguadilla Harbor, Puerto Rico. WRDA1999 Section 554 authorizes storm damage and erosion mitigation due to project.	N/A
Richard B. Russell Dam and Lake. WRDA1999 Section 563 authorizes the conveyance of land to South Carolina Department of Natural Resources to mitigate for fish and wildlife impacts from project and pay the state to manage mitigation activities	\$4,850,000
Eel River. WRDA1999 Section 575 authorizes mitigation of flood damage due to project.	N/A
Cumberland, Maryland. WRDA1999 Section 580 authorizes mitigation to restore historic area.	\$15,000,000
Cheyenne River Sioux Tribe, Lower Brule Sioux Tribe, and State of South Dakota Terrestrial Wildlife Habitat Restoration. WRDA 1999 Title VI authorizes restoration planning and transfer of funds to implement the plan to mitigate for damages due to the Big Bend and Oahe projects. It establishes a \$108,000,000 South Dakota Terrestrial Wildlife Habitat Restoration Trust Fund, a \$57,000,000 Cheyenne River Sioux Tribe Terrestrial Wildlife Restoration Trust Fund, and land transfers.	\$165,000,000
Puget Island, Columbia River, Washington. WRDA 2000 Section 109 authorizes shoreline mitigation if studies find injury due to project.	N/A
Tennessee-Tombigbee Waterway Wildlife Mitigation Project, Alabama and Mississippi. WRDA 2000 Section 301 modifies the authorized mitigation activities, including removing mitigation provisions for 3,000 acres of land, from previous versions of the WRDA.	N/A
Red River Waterway, Louisiana. WRDA 2000 Section 316 modifies previous provisions “to authorize the purchase of mitigation land from willing sellers in any of the parishes that comprise the Red River Waterway District, consisting of Avoyelles, Bossier, Caddo, Grant, Natchitoches, Rapides, and Red River Parishes.”	N/A
Richard B. Russell Dam and Lake, South Carolina. WRDA 2000 Section 348 calls for transfer of land as identified in the 1999 WRDA.	N/A

V. DEPARTMENTS OF TRANSPORTATION

Most mitigation activities undertaken by state transportation departments and the Federal Highway Administration (FHWA) have several purposes, including Clean Water Act Section 404-related wetlands mitigation, other wetlands mitigation, and endangered species mitigation. Because of concerns regarding overlapping programs and duplication of cost figures, ELI did not undertake a comprehensive analysis of state and federal transportation programs. This section provides a brief summary of the various kinds of compensatory mitigation related to transportation projects, and the requirements specific to them.

The FHWA policy on mitigation states that “[m]easures to mitigate adverse impacts [will] be incorporated into the action” (where the action is a federally aided highway project). Mitigation includes avoiding impacts, minimizing impacts and, where impacts are unavoidable, compensating for impacts. The two key regulatory hooks for transportation-related mitigation are Section 404 of the Clean Water Act (CWA) for wetlands mitigation, and the Endangered Species Act (ESA) for fish and wildlife and habitat impacts. FHWA analyzes transportation-related wetlands mitigation (taking state reports and compiling them as an indicator of overall transportation-related wetlands mitigation), but there is no record as to what type of mitigation occurs. State reports, which may have some of the needed information, are not readily accessible online.

1. Wetlands

Enacted June 9, 1998 as Public Law 105-178, TEA-21 established a preference for mitigation banking to compensate for unavoidable losses to wetlands or other natural habitat caused by transportation projects receiving federal assistance under Title 23 of the U.S. Code. Under 33 C.F.R. Section 323, the Corps determines appropriate conditions for issuance of Section 404 permits for discharge of fill into waters of the United States, including requirements for compensatory mitigation. In the case of highway projects, these conditions and requirements are to be sufficiently specific to ensure that losses or degradation of waters of the United States are adequately compensated, and will be appropriate to the extent and nature of the impacts of the highway proposal being permitted. The Corps further has the authority to determine if mitigation proposed by the permittee (in the case of federal-aid highway projects, typically a state transportation agency) adequately compensates for those losses. However, within those constraints, the conditions will allow sufficient flexibility for the Corps to consider the availability of suitable locations, constructability, overall costs, technical requirements, and logistics.³⁹⁵

Most of the transportation-related mitigation that occurs is done and measured on a “project” basis. Projects, as defined by the FHWA, are measured either by location or length (i.e. in a given state, a project may be “Mile x to Mile y”).³⁹⁶ The Corps of Engineers prefers project-by-project mitigation, so if the mitigation can be done on-site, it does so, but if that is not workable, then its next-best choice is mitigation banks.³⁹⁷

The FHWA measures transportation-related wetlands mitigation done across the country. The natural and human environment goal of the FHWA is “to protect and enhance the natural environment and communities affected by highway transportation.”³⁹⁸ In support of this goal, FHWA provides, on a program-wide basis, an average of 1.5 acres of wetland for every acre unavoidably impacted. The FHWA field offices annually collect the information pertinent to the documentation of this wetland mitigation “indicator” from state DOTs and Federal Lands Highway Divisions.³⁹⁹ This indicator does not distinguish between on-site mitigation and mitigation banks. Progress during Fiscal Years 1996-2004 has been measured for federal-aid projects nationwide by comparing the total acres of wetland impacted by projects in the reporting state programs to the acres of wetland provided as compensatory mitigation.

2. Endangered Species

Conservation measures for endangered species generally are not labeled “mitigation” in the transportation world.⁴⁰⁰ Instead, these measures are rolled into project costs, not necessarily as line items, but the transportation agencies that have acquired property for endangered species value, and have participated in

³⁹⁵ See U.S. Department of Transportation, Federal Highway Administration, Federal Guidance on the Use of the TEA-21 Preference for Mitigation Banking to Fulfill Mitigation Requirements Under Section 404 of the CWA (July 11, 2003), available at <http://www.fhwa.dot.gov/environment/wetland/tea21bnk.htm>.

³⁹⁶ Personal communication with Defenders of Wildlife staff, Washington, D.C.

³⁹⁷ Personal communication with U.S. Department of Transportation staff, Federal Highway Administration, U.S. Department of Transportation, in Washington, D.C.

³⁹⁸ See FEDERAL HIGHWAY ADMINISTRATION, ENVIRONMENTAL PERFORMANCE MEASURES REPORT, <http://www.fhwa.dot.gov/environment/perform/index.htm> (last visited July 18, 2007).

³⁹⁹ Personal communication with Paul Garrett, *supra* note 397

⁴⁰⁰ *Id.*

conservation banks, have estimated their ESA costs in their FWS report.⁴⁰¹ Overall, the FHWA has worked to mitigate for transportation effects on fish and wildlife, specifically in the area of building wildlife corridors.

The ESA requires federal agencies to establish programs and procedures to conserve listed species. On September 28, 1994, the FHWA signed an interagency Memorandum of Agreement (MOA) on implementation of the ESA. The MOA emphasizes interagency coordination and advance planning to reduce conflicts between programs of different government agencies and better manage impacts to endangered species and their habitats. Mitigation of "damage to wildlife, habitat, and ecosystems caused by a transportation project funded under" the Surface Transportation Program is specifically identified as eligible for federal-aid participation.⁴⁰²

Costs related to mitigating impacts to unique, rare, threatened, or otherwise valuable upland, habitat resources and ecosystems are eligible for federal-aid participation under the authority established in 23 U.S.C. Section 133 (b)(1). Costs eligible for federal-aid funding include land acquisition; measures necessary to establish mitigation, such as revegetation, site preparation, fencing, irrigation or water control structures, pest management, litter removal, access control, fire control; and mitigation performance monitoring. Site establishment is considered complete when construction activities are completed and approved, or when cooperating agencies agree that the project mitigation goals have been met. Mitigation establishment periods may be as short as one to three years on some sites, or up to twenty years on slow-maturing sites. For federal-aid projects where the mitigation is not successfully established at the end of a previously agreed-upon period, the establishment period may be extended for a predetermined time if the FHWA finds that such an extension would result in successful completion of the mitigation goals.

Preference is to be given to mitigation activities, such as banks, that provide multi-species or ecosystem function benefits. Often ecological communities that are rare or limited provide habitat for species which, although not listed as endangered or threatened, are potential candidates for listing. By participating in cooperative, proactive measures, the need for listing might be avoided. For that reason, FHWA policy encourages participation in development of long-range, biotic community or ecosystem-oriented plans for mitigation of anticipated endangered species impacts.

⁴⁰¹ U.S. FISH AND WILDLIFE SERVICES, FEDERAL AND STATE ENDANGERED AND THREATENED SPECIES EXPENDITURES: FISCAL YEAR 2003, at 146, available at http://www.fws.gov/endangered/expenditures/reports/2003Expenditure%20Report_Jan05.pdf (FHWA expenditures for ESA).

⁴⁰² Surface Transportation Program, 23 U.S.C. § 133(b)(1) (2005).

Conclusions/Recommendations

- *Most of the federal programs examined would benefit from better tracking and reporting of compensatory mitigation expenditures.* One key finding of this report is that, with the exception of the Northwest Power Act, the programs covered lack comprehensive summary data on the dollar value of compensatory mitigation they require. These programs should more routinely track and report compensatory mitigation requirements and costs, to allow for a more accurate understanding of how these dollars are spent, and to ensure that adequate funds are being devoted to repairing actual impacts to fish and wildlife habitat and the environment.
- *The vast majority of compensatory mitigation required under federal programs is wetland and stream mitigation under Section 404 of the Clean Water Act.* Over \$2.9 billion of ELL's estimated \$3.8 billion annual total – over 77 percent of the funds spent on compensatory mitigation – is generated through the mitigation requirements of Section 404 of the Clean Water Act. As a result, any efforts to direct compensation monies toward protecting the critical fish and wildlife habitat identified in the State Wildlife Action Plans would most effectively focus on the Section 404 program.
- *Efforts to integrate the State Wildlife Action Plans into federally-required mitigation expenditures will necessarily be constrained by existing requirements and policies under each specific statute.* Since compensatory mitigation by definition is intended to replace or restore specific resources that have been lost or damaged by a specific action, many federal programs restrict the siting and nature of mitigation projects to the affected area. Section 404, for example, is driven by its own statutory requirements and program goals, which are often place-based, reactive, and driven by permit applications rather than prospective planning. It will be critical to take such limitations into account when considering whether and how funds could be strategically directed for fish and wildlife conservation purposes; each program's limitations are discussed in detail in their respective chapters.
- *Nonetheless, opportunities exist to more directly apply State Wildlife Action Plans and the information they contain to federal compensatory mitigation programs (also discussed in detail in their respective chapters):*
 - In the area of Clean Water Act Section 404 mitigation, there is a growing effort to develop and use a "watershed approach" to guide compensatory mitigation projects, a trend that might allow the Plans to inform and influence siting and design of federally permitted wetland and stream compensation projects. Proposed changes in the compensatory mitigation rules could, if adopted, support increased use of this approach;
 - Under the Endangered Species Act, it may be possible to encourage the use of State Wildlife Action Plans in identifying mitigation sites or actions that could support the protection of fish and wildlife habitat and implementation of conservation priorities identified in habitat conservation plans. The trend toward development of regional HCPs itself provides an opportunity for State Wildlife Action Plan priorities to influence local planning projects;

- The Plans could be used to inform the implementation of natural resource damages programs in certain circumstances. NRD laws provide trustees with a range of options for mitigating injuries to natural resources. The agencies that implement these laws may have the discretion in some cases to consider the Plans in administering their programs;
- State Wildlife Action Plans could provide Federal Power Act applicants with information about important natural resources, habitats, and species that may be affected by proposed hydropower projects. The Plans also could be disseminated to federal and state natural resource agencies and to FERC, and the agencies encouraged to use them in the licensing process;
- Under the Northwest Power Act, State Wildlife Action Plans may help inform the Fish and Wildlife Program during revisions to the basin-wide program and the sub-basin plans. The Plans also may be helpful at the project development stage.

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