Chapter 1. Purpose of and Need for Action

1.1 Introduction

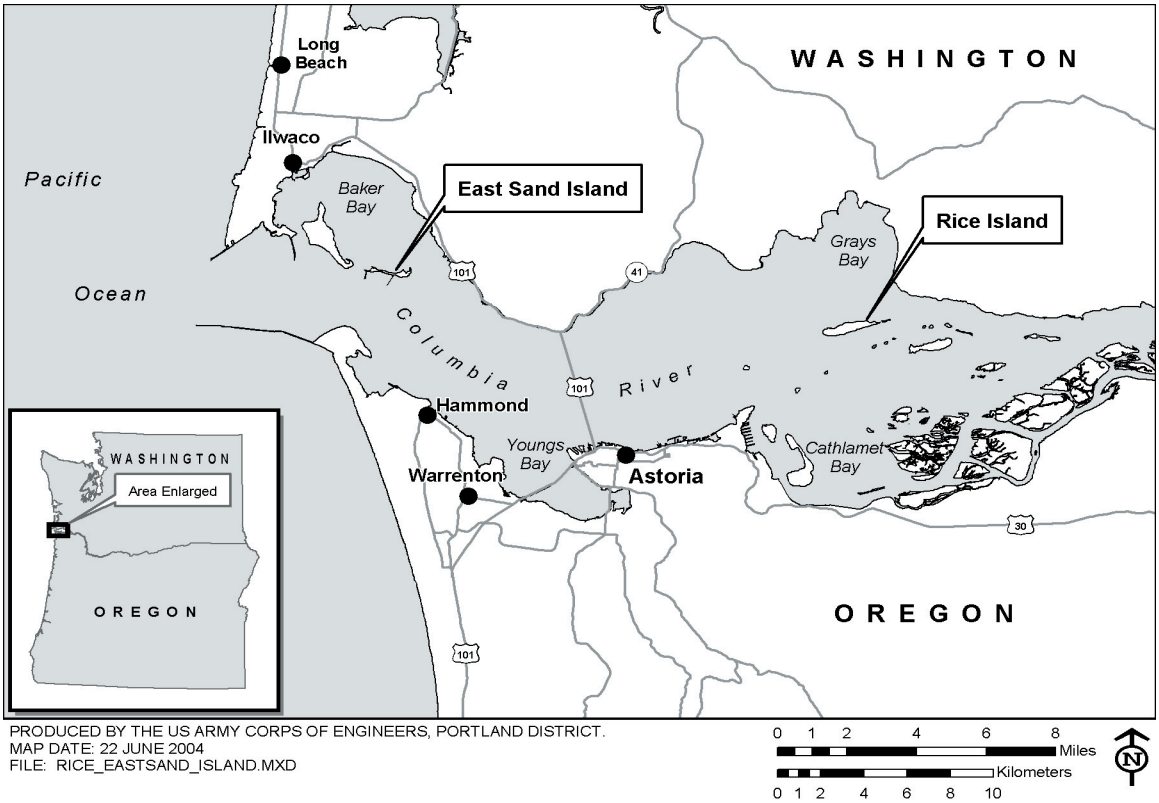
This section of the Final Environmental Impact Statement (FEIS) discusses the purpose of and need for the Federal action, the legal and policy context of the action, and stakeholder involvement in developing the FEIS.

Recent increases in the number of Caspian terns (*Sterna caspia*, hereafter, "tern" refers to Caspian tern) nesting in the Columbia River estuary has led to concerns over their potential impact on the recovery of threatened and endangered Columbia River salmonids (salmon and steelhead).

In 1999, NOAA's National Marine Fisheries Service (NOAA Fisheries) called for the U.S. Army Corps of Engineers (Corps) to eliminate tern nesting from Rice Island (located in the upper estuary) in an attempt to decrease the number of juvenile salmonids eaten by terns (NOAA Fisheries 1999). In 1999, the Corps initiated a pilot project to relocate the Rice Island tern colony to East Sand Island, near the mouth of the estuary (see Figure 1.1 for location of islands), where marine fish (i.e., non-salmon) were abundantly available to foraging terns (U.S. Army Corps of Engineers 1999). In 2000, the Corps proposed to complete the relocation effort to prevent all tern nesting on Rice Island while attracting terns to nest on East Sand Island (U.S. Army Corps of Engineers 2000).

As a result of the proposed actions in 2000, Seattle Audubon, National Audubon, American Bird Conservancy, and Defenders of Wildlife filed a lawsuit against the Corps and U.S. Fish and Wildlife Service (Service). The four groups alleged in the suit that compliance with the National Environmental Policy Act (NEPA) was not sufficient for the proposed action of relocating terns from Rice Island to East Sand Island.

FIGURE 1.1 Columbia River Estuary



Furthermore, the groups objected to the Service's issuance of a Migratory Bird Treaty Act (MBTA) permit authorizing the potential take of tern eggs as a means to prevent tern nesting on Rice Island.

In 2002, all parties reached a Settlement Agreement. Terms of the agreement required the Service (lead agency), Corps, and NOAA Fisheries to prepare an Environmental Impact Statement (this FEIS) to address long-term management of terns in the Columbia River estuary. The 2002 Settlement Agreement also required the Service and NOAA Fisheries to develop and publish three technical reports: (1) *Status Assessment and Conservation Recommendations for the Caspian Tern in North America* (Shuford and Craig 2002), (2) *Caspian Tern Predation on Salmon and Steelhead Smolts in the Columbia River Estuary* (NOAA Fisheries 2002), and (3) *A Review of Caspian Tern Nesting Habitat: A Feasibility Assessment of Management Opportunities in the U.S. Fish and Wildlife Service Pacific Region* (Seto et al. 2003).

Although the relocation of terns from Rice Island to East Sand Island resulted in a decreased percentage of salmonids in the tern diet, NOAA Fisheries remains concerned about tern predation on juvenile salmonids because the number of salmonids lost to tern predation annually is still substantial (e.g., 5.5 million, see discussion below) and there is potential for continued increases in tern predation.

Caspian tern with salmon smolt. Photo credit: OSU-RTR

1.2 Purpose of and Need for Action

The purpose of the proposed action is to comply with the 2002 Settlement Agreement by identifying a management plan for terns in the Columbia River estuary that reduces resource management conflicts with ESA-listed salmonids while ensuring the conservation of terns in the Pacific Coast/Western region (hereafter Pacific Coast region, see Chapter

Tern colony on East Sand Island, Columbia River estuary. Photo credit: Nanette Seto

3 for description). ESA-listed salmonids (Table 3.2) are those listed as threatened or endangered under the Federal Endangered Species Act (ESA) of 1973. The ESA provides for the conservation of species which are in danger of extinction throughout all or a significant portion of their range and the conservation of the ecosystems on which they depend. Managing terns to address salmonid predation would add to and complement other recovery efforts (described below), thereby, contributing to the overall recovery of ESA-listed salmonids in the Columbia River Basin.

The need for action has been driven by the recent increase of terns nesting in the Columbia River estuary and their associated predation on ESA-listed salmonids. Terns were first documented to nest in the Columbia River estuary in 1984. Since then, their numbers have increased from approximately 1,000 breeding pairs to a peak of nearly 10,000 pairs in 2002, the largest recorded tern colony in the world (Shuford and Craig 2002, Collis et al. 2002a). This increase strongly influenced the exponential growth of the regional tern population since the 1960s. From 2000 to 2004, terns on East Sand Island ate an average 5.5 million juvenile salmonids a year (the annual average ranged from 4.2 to 7.3 million), including ESA-listed salmonids (Collis et al. 2002a, 2002b, 2003a, and 2003b, K. Collis pers. comm.). NOAA Fisheries assessed the impact of tern predation on the population growth rate of four Columbia River Basin steelhead ESUs using a life cycle model and estimated predation rates from available research and monitoring data (NOAA Fisheries 2004a, Appendix C). Steelhead were the focus of this analysis because they are most affected by tern predation in the Columbia River estuary. Thus, potential benefits from reducing tern predation would be the greatest for steelhead but benefits to other salmonids outmigrating through the estuary are also expected.

The NOAA Fisheries model estimated the potential increase in population growth rates of the four steelhead ESUs based on various tern colony sizes. For example, if the number of breeding terns in the estuary was reduced by 50 percent (i.e, 5,000 pairs), steelhead population growth rates are projected to potentially increase by a maximum of 0.79 to 2.5 percent over a period of about 4 to 5 years (equal to one generation of steelhead). However, realized improvements in steelhead population growth rates

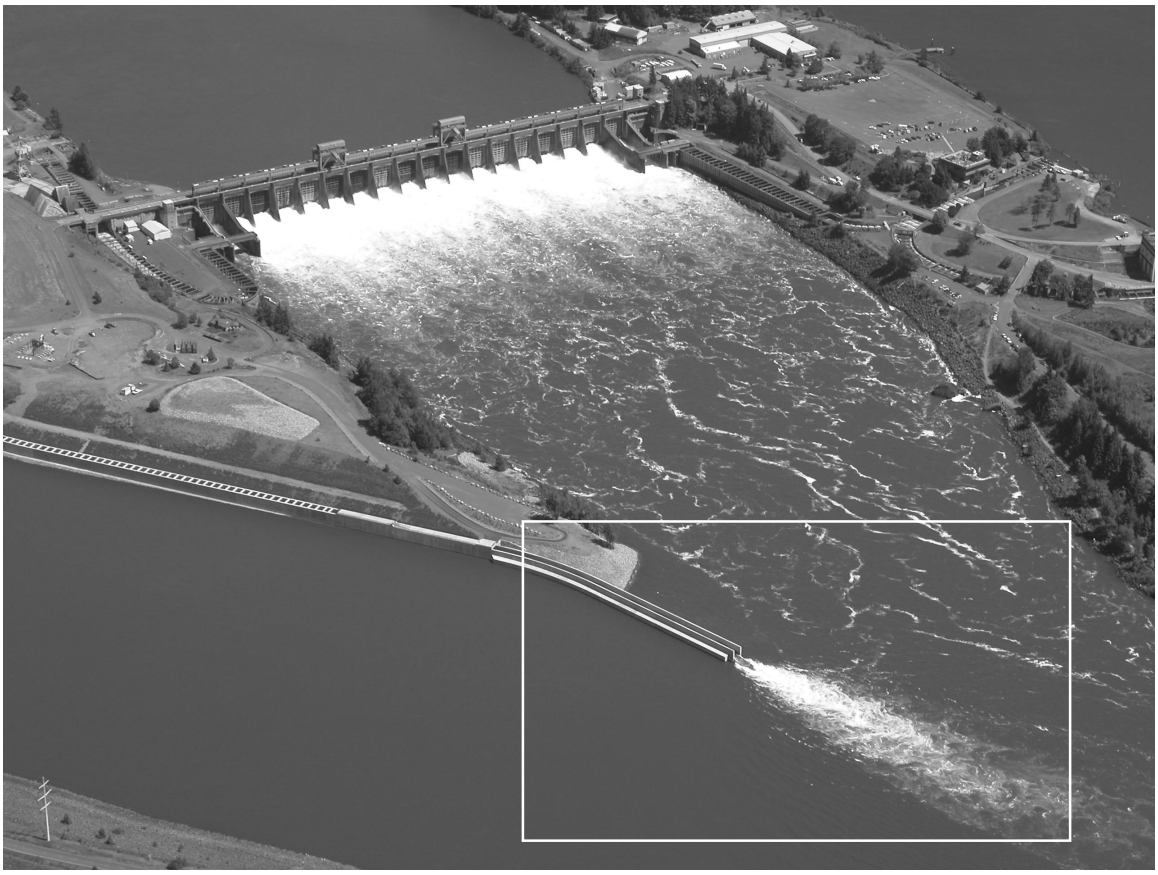
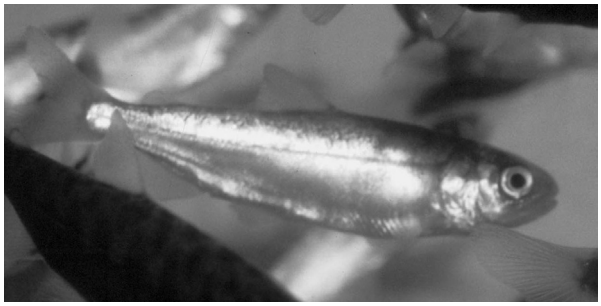


Photo inset: Second Powerhouse Corner Collector at Bonneville Dam which diverts juvenile salmonids away from dam turbines and safely back into the Columbia River. Photo credit: U.S. Army Corps of Engineers



Salmon smolt. Photo credit: Bonneville Power Administration

would likely be lower because the model assumes that there is no compensatory mortality (see glossary for definition). If all else were equal, this projected improvement in steelhead population growth rates is equivalent to projected changes in growth rates that would result from improvements in the hydropower system (e.g., increased spill, improved passage facilities, increased fish transportation, see photo inset on previous page) required by NOAA Fisheries (NOAA Fisheries 2000), but is well below improvements that have been largely realized through harvest reductions (e.g., timing, placement of nets, catch limits, McClure et al. 2003, NOAA Fisheries 2004a, Appendix C). The cumulative benefits from a reduction in tern predation, hydropower improvements, and other Columbia River Basin regional and local salmon recovery efforts are expected to result in improvement in the status of ESA-listed stocks.

An additional need for action stems from the concentration of terns on East Sand Island in the Columbia River estuary. Approximately 70 percent of the Pacific Coast regional population of terns nest in the Columbia River estuary in a single colony (Shuford and Craig 2002). This breeding concentration leaves terns more vulnerable to stochastic events, (e.g., storms, human disturbance, predation, and disease) as compared to a similar population that is dispersed among many smaller colonies (Roby et al. 2002, Shuford and Craig 2002). Management of this concentrated tern colony would help ensure the long-term conservation of the Pacific Coast regional tern population.

1.2.1 Guiding Principles

In 1998, an interagency Tern Working Group (CTWG) was formed and was comprised of representatives from Federal and State agencies, Tribes, and researchers. Their purpose was to address the role of tern predation in the estuary in the recovery of ESA-listed Columbia River salmonids. Agencies participating in the CTWG agreed to the following set of Guiding Principles in developing options for managing salmon recovery and tern resource conflicts:

1. Terns and salmonids are native species of the Pacific Northwest and the Columbia River estuary (defined as the Columbia River from its terminus to River Mile 46).

2. Terns and ESA-listed salmonids are protected under International Treaties and Federal and State laws.

3. Management actions will be implemented to ensure terns remain a viable and integral part of the estuarine, coastal, and interior ecosystems of the Pacific Coast region, including the Columbia River estuary, in a manner consistent with salmon recovery.

4. Tools are available to manage terns as one component of a comprehensive program to recover salmonids.

5. Management actions will be implemented to ensure the recovery of ESA-listed salmonids is not impeded by tern predation.

Guiding Principles 1 through 3 were included in the stipulations of the 2002 Settlement Agreement and, in combination with Principles 4 and 5, served to guide the development of management alternatives presented in this FEIS.

1.2.2 Context of Purpose and Need

Nearly every population of naturally producing anadromous salmonids in the Columbia River Basin is now listed (or is a candidate for listing) under the ESA (NOAA Fisheries 2004a). Overall salmon recovery efforts are primarily focused on in-stream improvements in both juvenile and adult survival (e.g., predator control, hydropower improvements, and habitat restoration) since management opportunities for enhancing survival in the ocean are limited. NOAA Fisheries recommends strategies to improve juvenile salmonid survival [e.g., predator control (birds and fish), increased spill, etc.] with the expectation that this will contribute to an improvement in adult returns and thereby overall recovery of ESA-listed salmonids. Reducing tern predation in the estuary would be one of several additional mechanisms that can be used to improve juvenile salmonid survival.

The tern colony in the Columbia River estuary, recently relocated to East Sand Island, continues to annually consume large numbers of juvenile

salmonids (average annual consumption for terns during 2000 to 2004 was 5.5 million juvenile salmonids, Collis et al. 2002a, 2002b, 2003a, 2003b, K. Collis pers. comm.). This high consumption level can be attributed to the large tern colony size in the estuary made possible due to modifications that have occurred in the Columbia River system.

For example, the creation of dredged material islands provide stable tern nesting habitat every year, circumstances that are atypical of naturally occurring tern nesting habitat. In addition, barging and release of hatchery-reared and wild salmonids into the estuary has altered the characteristics of the salmon outmigration (e.g. timing and concentrations) compared to what occurred under natural conditions. With the tern colony in the estuary anticipated to increase in size due to the high production of fledglings in 2001, 2002, and 2003 (Collis et al. 2002a, 2003a, 2003b), predation of juvenile salmonids by terns may also increase in the future.

Tern predation should also be considered in context with upstream investments that are implemented to improve juvenile salmonid survival. Many of the measures taken to restore salmonids in the Columbia River Basin have focused on improving survival of juvenile salmonids through the mainstem dams. These measures are associated with the operation and management of the Federal Columbia River Power System (FCRPS) and include research, development, and construction of measures under the Columbia River Fish Mitigation (CRFM) program of the Corps.

Costs associated with the implementation of the 2000 FCRPS Biological Opinion (BO) (e.g., aggressive hydropower measures, increased spill, improved passage facilities, increased fish transportation, NOAA Fisheries 2000), CRFM, and other salmon recovery efforts are substantial and are reported in the Endangered Species Act 2003 Check-In Report (U.S. Bureau of Reclamation et al. 2003). Tern predation on juvenile salmonids should be reduced to complement and protect benefits resulting from these upstream efforts (as described above) to increase the number of juvenile salmonids reaching the ocean.

Reducing tern predation in the estuary in combination with other mechanisms that aim to improve juvenile salmonid survival is anticipated to increase population growth rates of ESA-listed steelhead in the Columbia River Basin (NOAA Fisheries 2004a, Appendix C). Long-term success of efforts intended to increase population growth rates of ESA-listed salmonids must be placed in context with other sources of mortality subject to human intervention. Hydropower operations, harvest impacts, habitat conditions, hatchery operations, and introduced species all have the potential to affect population growth rates of ESA-listed salmonids, and are subject in various degrees to management efforts that are designed to alleviate detrimental effects. Actions to address these impacts have been implemented or proposed, and others may be developed in the future.

1.3 Authority and Responsibility

1.3.1 U.S. Fish and Wildlife Service

The primary responsibility of the Service is the conservation and enhancement of the nation's fish and wildlife populations and their habitats. The Service's mission is: "working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people." While the Service's responsibilities are shared with other Federal, State, Tribal, local, and private entities, the Service has specific trust responsibilities for migratory birds; threatened and endangered species; certain anadromous fish and marine mammals; and enforcing Federal wildlife laws. The Service's responsibilities for management of terns are authorized under the Migratory Bird Treaty Act. Consistent with the Settlement Agreement, the Service is the lead agency for preparation of this FEIS.

The Service also has responsibilities for the lands and waters it administers in the National Wildlife Refuge System to support the conservation and enhancement of fish and wildlife.

1.3.2 U.S. Army Corps of Engineers

The Corps, in its mission to serve the nation, is responsible for the implementation of terms and conditions of the biological opinions that pertain to the operation and/or maintenance of the Corps' civil works projects. The Corps (referred to as COE in excerpt below) responsibility regarding management of terns in the Columbia River estuary arises from implementation of mandatory terms and conditions of the September 15, 1999 NOAA Fisheries BO on the Corps' Columbia River Channel Operation and Maintenance Program (NOAA Fisheries 1999) and 2000 and 2004 FCRPS BOs (NOAA Fisheries 2000 and 2004b).

The 1999 BO addressed both tern and cormorant concerns, and included in sub-section C, the following Terms and Conditions (T&C):

Tern colony on Rice Island, before relocation to East Sand Island. Photo credit: Columbia Bird Research (OSU/RTR)

"1a. The COE shall modify the habitat on Rice Island by April 1, 2000, so that it is no longer suitable as a nesting site for Caspian terns or provide for the hazing of terns off the island in a manner that will preclude their nesting. The COE shall ensure that any terns hazed off the island do not nest on any dredge spoil islands in the action area (other than East Sand Island). The COE shall continue to prevent nesting of Caspian terns on disposal islands within the action area for the life of the project."

In accordance with the stipulations of this T&C, the Corps relocated the tern colony from Rice Island to East Sand Island in 1999 and 2000 and has annually maintained approximately 6 acres of habitat on East Sand Island for nesting terns. Hazing operations (see Chapter 2, section 2.2 for description) at Rice Island, Miller Sands Spit and/or Pillar Rock Island in the upper estuary (Columbia River mile 21 to 28) have been implemented annually as necessary to discourage terns from attempting to nest at these locations.

The Corps is also responsible for implementation of many of the reasonable and prudent alternatives identified in the 2000 FCRPS BO (NOAA Fisheries 2000) for protection and improvement of juvenile salmonid survival at their four mainstem Columbia River and four Snake River dams. The 2004 FCRPS BO (NOAA Fisheries 2004b) assessed predator control actions, including tern management. The Action Agencies (the Corps is one of the Action Agencies) intend to carry out tern management actions as proposed in this FEIS, aimed to redistribute a portion of the terns in the Columbia River estuary in order to reduce tern predation of juvenile salmonids.

Corps responsibilities for tern management are also identified under Public Law 106-53, Section 582c "(1) NESTING AVIAN PREDATORS - In conjunction with the Secretary of Commerce and the Secretary of the Interior, and consistent with a management plan to be developed by the United States Fish and Wildlife Service, the Secretary (Army) shall carry out methods to reduce nesting populations of avian predators on dredge spoil islands in the Columbia River under the jurisdiction of the Secretary."

1.3.3 NOAA's National Marine Fisheries Service

NOAA Fisheries is dedicated to the stewardship of living marine resources (i.e., Pacific salmonids, groundfish, halibut, marine mammals and their habitats) through science-based conservation and management and the promotion of healthy ecosystems. NOAA Fisheries conserves, protects, and manages living marine resources in a manner to ensure their continuation as functioning components of marine ecosystems, to afford economic opportunities, and to enhance the quality of life for the American public.

NOAA Fisheries is responsible for overseeing ESA implementation for salmonids. Under Section 7 of the ESA, Federal agencies must consult with NOAA Fisheries on any action they permit, fund, or manage that is likely to adversely affect a threatened or endangered species subject to NOAA Fisheries' jurisdiction. NOAA Fisheries must issue a "biological opinion" that explains how the Federal action affects the species and lays out what actions the agency should take to protect the species.

NOAA Fisheries also implements the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as amended by the Sustainable Fisheries Act of 1996. The MSA establishes a national program to manage and conserve the coastal fisheries of the United States through the development of Federal Fishery Management Plans (FMP) and Federal regulation of domestic fisheries under those FMPs within a 200-mile Exclusive Economic Zone.

Under the MSA, Congress also mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. NOAA Fisheries, in coordination with Fishery Management Councils and Federal agencies, is required to protect, conserve, and enhance designated essential fish habitat (EFH). Congress defined essential fish habitat for federally managed species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

1.4 Policy, Legal Compliance, Consultation, and Coordination with Others

1.4.1 Policy and Legal Compliance

In undertaking the proposed action, the cooperating action agencies must comply with a number of Federal laws, Executive Orders, regulations, and other guidance pertinent to a Federal action. These are listed and summarized in Appendix D.

The Service and Corps have initiated ESA-consultation for the preferred alternative. At this time, ESA-consultation has not been completed. A Record of Decision (ROD) on this EIS will not be signed and issued until ESA-consultation has been completed.

1.4.2 Consultation and Coordination with Others

This section describes consultation and coordination efforts with the public, interested groups, other agencies, and Tribes.

Public Outreach. On April 7, 2003, the Service, in cooperation with NOAA Fisheries and Corps, published a Notice of Intent (68 FR 16826) in the Federal Register to prepare an EIS for tern management in the Columbia River estuary. The notice also solicited public participation in the scoping process (see Section 1.5 below).

The Service mailed "Dear Interested Party" letters to 668 organizations and individuals as additional notification of the public meetings. These names were drawn from the three participating agencies' interested-party databases and additional names were provided by the States of California, Oregon, and Washington. Public scoping meetings were held in these three States (see Table 1.1 for a list of locations).

The public meeting format was in the style of an open house with information on table-top board displays. Representatives from the three agencies were available to answer questions.

Additionally, the Service created a website to provide the public with a continuous source of information about the project, access to the technical reports mentioned in Section 1.1, and various background documents. This website is located at: http://migratorybirds.pacific.fws.gov/CATE.htm. It was maintained throughout the EIS development process to keep the public updated on the project. In addition to the above public outreach, a planning update was distributed in September 2003. This was sent to people or groups who attended public meetings or sent in comments, to anyone who requested to be on our mailing list, and to other interested parties (see Appendix E for our project distribution list).

On July 23, 2004, the Service, in cooperation with the Corps and NOAA Fisheries, published a Notice of Availability (69 FR 44053) of the Draft EIS (DEIS) and 60-day public comment period in the Federal Register. Notices were also sent to more than 450 people that were either on our project mailing list or recommended for notification. The notice announced the availability of the DEIS, listed the opening and closing dates for the comment period, gave locations of three Federal websites and public libraries where copies of the document could be viewed, and provided an option for obtaining hard copies or CDs of the DEIS. Follow-up phone calls were also made by Service staff notifying key partners regarding the availability of the DEIS.

In addition, local media, and local congressional offices in Washington, Oregon, and California were sent a News Release and Q&As (questions and answers) via email or fax. One request was received from the public (Olympic Peninsula Audubon Society in Sequim, Washington) for a meeting to discuss the DEIS.

TABLE 1.1 Locations of Public Scoping Meetings

Date	Time	Location
April 14, 2003	5:30 – 8:30 pm	Marriott, Oakland, California
April 15, 2003	5:30 – 8:30 pm	Redwood Park Lodge, Arcata, California
April 28, 2003	5:30 – 8:30 pm	Grays Harbor College, Aberdeen, Washington
April 29, 2003	5:30 – 8:30 pm	Washington State Capital Museum, Olympia, Washington
May 5, 2003	5:30 – 8:30 pm	Duncan Law Seafood Center, Astoria, Oregon
May 6, 2003	5:30 – 8:30 pm	Doubletree Hotel, Portland, Oregon

Coordination with Other Agencies. Staff from the three cooperating agencies met with representatives from the wildlife agencies of the States of Washington and Oregon on May 30, 2003. The objectives of the meeting were to provide a summary report of Columbia River estuary management and research projects, an update on the status of this EIS, and discuss future plans, expectations, roles, and interagency coordination regarding tern management in the estuary and the Pacific Coast region. Meeting attendees also visited the tern colony on East Sand Island.

State agencies from Washington, Oregon, California, Idaho, and Nevada and the Bonneville Power Administration were given the opportunity to comment on an Administrative Review Draft of the DEIS prior to the public review period. Additionally, staff from the Service met with the California Department of Fish and Game (CDFG) on November 19, 2004 to clarify their concerns on the DEIS.

Coordination with Tribal Governments. Tribal governments that fell within the scope of the EIS were contacted during our scoping period and were invited to submit comments or attend our public scoping meetings. Tribes were also given the opportunity to comment on an Administrative Review Draft of the DEIS prior to the public review period. Additionally, a meeting was requested by the Quinault Indian Nation to clarify their concerns associated with the Grays Harbor area, and a member of the Jamestown S'Klallam Tribe attended the meeting requested by the Olympic Peninsula Audubon Society in Sequim.

1.5 Scoping

Scoping is the initial stage of the EIS process used to identify issues, alternatives, and impacts to be addressed in the NEPA analysis. Public comments were accepted from the date of publication of the Notice of Intent on April 7, 2003 until May 22, 2003.

Public meetings (Table 1.1) were held in California, Oregon, and Washington (see section 1.4.2.1 above). Sixty people attended the public scoping meetings. Attendees were asked to submit written comments at the meeting or through the mail. Thirty-seven comment letters were submitted from public meeting attendees and 79 comment letters were submitted outside of public meetings, either electronically (to cateeis@fws.gov) or by mail. Internal scoping meetings were also conducted during the scoping period. A full description of the scoping period can be found in the EIS Scoping Report prepared by the Service. Key issues identified during public and internal scoping are summarized below.

1.5.1 Issues of Concern Identified During Scoping

The majority of comments we received from the public and the coordinating agencies varied from concerns for local salmonid populations to potential

Federal and State agency representatives and Caspian tern researchers visit East Sand Island as part of an EIS coordination meeting, May 2003.

impacts of future management to the tern colony. Some comment letters expressed the need for justification to manage the tern population and the use of sound science in development of the EIS and management plan. Others expressed strong concern for declining salmon runs in the northwest.

Issue 1: Tern Predation Analysis. Many of the comments received expressed concern that the existing analysis of tern predation (NOAA Fisheries 2002) did not demonstrate "that Caspian terns are limiting the recovery of ESA-listed wild salmon in the Columbia River." Comments also expressed a concern that no evidence exists to suggest that there is a direct relationship between smolt and adult numbers, suggesting that "smolts saved from tern predation" will not result in a direct increase in adult salmonid numbers.

Comments called for a "rigorous" analysis of the impact of tern predation using peer-reviewed science. Additionally, some comments stressed that the EIS must discuss all factors limiting salmon recovery and put tern predation in that context. Some comments specifically stated, "Until the cost-effectiveness of hazing, relocating, and otherwise controlling terns has been firmly established in relationship to the four H's (hydropower, habitat loss, hatcheries, and harvest), the terns and other fish-eating birds should not be disturbed." Some also commented that the analyses should distinguish between tern consumption of hatchery salmonids and those that are listed under the ESA.

Issue 2: Impacts to Salmonids. Many comment letters expressed the concern for declining salmonids in the Columbia River. Some comment letters supported "relocation efforts to further disperse the massive tern colony on East Sand Island to areas where predation mortality is sustainable." However, comments received from the State agencies and the public expressed concern for salmon in various local communities. For example, comments received from the Grays Harbor, Washington area expressed concern for impacts to local salmon fisheries if terns were relocated to Grays Harbor. Comments specifically expressed a concern that relocating terns to sites outside the Columbia River estuary "would shift the impact to other regions." Some stated that communities surrounding Grays Harbor and Willapa Bay "are making significant investments in salmon recovery, in both volunteer time and Federal, State, and local funds." Therefore, relocating terns to those areas "would be counterproductive." The States of California and Oregon expressed concerns of introducing terns into non-historic nesting areas and subjecting salmon or other fish populations to tern predation.

Issue 3: Concentration of Terns at One Site (East Sand Island). There was substantial support for reducing the size of the tern colony on East Sand Island to decrease losses from catastrophic events as well as protecting endangered salmon. However, many of the public comments expressed that no efforts be undertaken to move terns from East Sand Island until suitable alternative sites are located and established. Comments specifically stated that the current management practice of providing 6 acres of habitat should be continued until alternative sites are fully developed.

1.5.2 Issues Raised, but Eliminated from Detailed Study

Four issues were raised during scoping that were outside the scope of this project. These issues, although significant, are not addressed in this FEIS.

Issue 4: Effects of Hydropower, Habitat loss, Hatcheries, and Harvest (Four H's) on Salmon. Many comment letters requested that the EIS include a detailed analysis of the four H's and their effects on salmon recovery. Commenters expressed their concern that the four H's "are the major causes of salmon declines, not avian predation." This FEIS is not addressing the issue of overall salmon recovery, and thus, will not thoroughly analyze the effects of the four H's and associated management actions to aid salmon recovery. Instead, the FEIS and proposed action is focused specifically on the management of terns in the estuary to reduce predation on juvenile salmonids as one measure to aid salmon recovery. A discussion placing tern predation in context with hydropower and harvest is presented in the NOAA Fisheries 2004 report, *Caspian Tern Predation on Juvenile Salmonid Outmigrants in the Columbia River Estuary* (NOAA Fisheries 2004a, Appendix C), Fresh et al. 2004, McClure et al. 2003, and in Chapter 4 of this FEIS. Additionally, a detailed analysis of the operation of the hydropower system is addressed in the 2004 FCRPS BO (NOAA Fisheries 2004b). Findings from these reports have been used and is frequently referenced in this FEIS for comparitive purposes to put tern predation in context with the four Hs.

Issue 5: Ownership and Management of East Sand Island. Many comment letters expressed the desire for East Sand Island to be managed as part of the

National Wildlife Refuge System for the protection of "significant wildlife resources" and habitat by the Service. On February 28, 2003, the Service and Corps issued a joint statement in compliance with the Settlement Agreement regarding the ownership and management of East Sand Island. The statement reiterates that the Corps "will retain ownership and management responsibilities for East Sand Island through the completion of the Environmental Impact Statement (EIS) and Management Plan for Caspian terns in the Columbia River estuary." During this time, the Corps will continue to provide 6 acres of habitat for terns. Since ownership status of East Sand Island would not affect implementation of the proposed action, the impact analysis of this factor is not necessary in this FEIS. The future owner and manager of East Sand Island, whether it is a Federal, State, or private entity, would need to adhere to the same regulations with respect to the Endangered Species and Migratory Bird Treaty Act regulations. The final recommendation regarding ownership and management of East Sand Island will be made when the EIS is completed and a proposed action, including management actions on East Sand Island, is identified.

Issue 6: Economic Value of Smolts Consumed by Terns. The State of Idaho's Office of Species Conservation comment letter stated "the economic value of smolts consumed by the Caspian tern colony…be a focus of this EIS." They requested that "all costs relative to smolt rearing, marking, and migration facilitation, along with costs associated with forgone power generation, flow augmentation, habitat improvement, and all other efforts undertaken to deliver smolts to the estuary be assimilated to produce a per smolt cost." Their justification for this analysis is to demonstrate the cost of "maintaining the status quo avian predation by this [East Sand Island] tern colony."

An economic analysis of this sort would not assist in the development of management alternatives aimed at reducing tern predation on salmonids in the Columbia River estuary to assist in salmonid recovery. The economic analysis proposed by the State of Idaho would not demonstrate the cost of maintaining avian predation by the East Sand Island tern colony. Rather, this analysis would demonstrate the costs of mitigating measures for a variety of activities that impact threatened and endangered salmonids in the Columbia River Basin. For example, devices are required at hydropower dams to provide fish passage; hatcheries are producing smolts to mitigate the effects of hydropower dams; and habitat restoration projects are being conducted throughout the region to restore and enhance salmonid habitat and watershed functions that have been lost or altered.

Numerous documents have already summarized costs of salmonid recovery efforts in the Columbia River Basin. These include a NOAA Fisheries Report to Congress on the Pacific Coastal Salmon Recovery Fund (NOAA Fisheries 2003a), a partial review of cost-effectiveness of artificial production programs published in 2002 by the Independent Economic Analysis Board, (Independent Economic Analysis Board 2002), a Report to the National Marine Fisheries Service on the Economics of Snake River Salmon Recovery (Huppert et al. 1996), and a General Accounting Office report on Federal agencies' recovery responsibilities, expenditures and actions (U.S. General Accounting Office 2002).

Issue 7: Tern Colony on Crescent Island
During internal scoping meetings, NOAA Fisheries expressed concern regarding predation of juvenile salmonids by terns nesting on Crescent Island, Washington. Crescent Island, in the mid-Columbia River, was created with dredge material originating from the Boise Cascade Mill channel, Port of Walla Walla. Crescent Island is managed by the Service as part of the Mid-Columbia River National Wildlife Refuge Complex through a cooperative management agreement with the Corps. In 2000, NOAA Fisheries issued a BO to the Corps, requiring the "Action Agencies… continue to conduct studies (including migrational behavior) to evaluate avian predation of juvenile salmon in the FCRPS reservoirs above Bonneville Dam." Researchers have been studying this colony since 1998, gathering the diet composition of nesting terns, colony size, and nesting success. These data are currently being analyzed and, as stated in the BO, "If warranted and after consultation with NMFS [NOAA Fisheries] and USFWS, the Action Agencies shall develop and implement methods of control that may include reducing the populations of these predators." If management actions are required for the Crescent Island tern colony, a separate management plan and associated NEPA document, if needed, will be prepared outside of this EIS. The scope of this EIS is focused on management of terns in the Columbia River estuary and extends beyond the estuary only in Alternatives C and D which discuss the potential to manage alternate sites for terns outside of the Columbia River.