
Fish and Aquatic Resources Strategic Vision & Needs Assessment

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Executive Summary

Strategic Vision

The stated vision for the FWS fish and aquatic resources programs is to achieve sustainable fish and aquatic resources populations and aquatic habitats that contribute to the nation's quality of life, economy and cultural identity by acting in partnership for the continuing benefit and enjoyment of the American people. This vision is tempered by acknowledging certain challenges: diminished aquatic habitats, expanding human population, changing social demographics, competition for human and financial resources, climate change, invasive species, increasing demands for limited water resources, declining federal budgets, and other uncertainties.

Working in partnership is a recurring theme throughout the Strategic Vision and Needs Assessment. The document highlights the strengths of the FWS fish and aquatic resource programs, but stresses that value of these core capacities and abilities is not fully realized except in shared success with the agency's many partners. Partnership is further underscored in the theme of public service and FWS's efforts to improve the nation's quality of life. Functional ecosystems and biological diversity; jobs and revenue generation; recreational, commercial and subsistence fisheries; fulfillment of treaty and trust responsibilities to tribes; and other sustainable uses and enjoyment of fish and aquatic resources are examples of the many benefits the FWS and its partners provide the American public.

A central theme throughout the document is the direct impact that FWS's actions have on the nation's quality of life. Ecosystem services and biological diversity; jobs and revenue generation; recreational, commercial and subsistence fisheries; fulfillment of treaty and trust responsibilities to tribes; and other sustainable uses and enjoyment of fish and aquatic resources are examples of these benefits. Just as importantly, the agency's cooperative actions create opportunities for the future through improved management techniques, economic value, outdoor experiences and other activities.

Operating Principles

Six operating principles imbue the FWS mission for fish and wildlife conservation. They permeate each and every aspect of the agency's fish and aquatic resource conservation efforts, and are central to translating the strategic vision into action: 1) work cooperatively with stakeholders and partners; 2) use strategic planning (targeted, effective, complementary, not duplicative); 3) undertake activities that are ecologically scaled and biologically feasible; 4) focus on outcomes providing public benefit; 5) anticipate and adapt to change; and 6) incorporate science-based and measurable evaluation.

Strategic Framework

Utilizing the operating principles outlined above, the FWS's fish and aquatic resource conservation efforts will be focused to achieve five strategic goals:

1. Conserve fish and other aquatic species at self-sustaining levels.
2. Protect, restore, and maintain aquatic habitats.
3. Meet tribal and other trust responsibilities.

4. Promote recreational fishing and other public uses and enjoyment of aquatic resources.
5. Maintain mission-critical capacities, expertise and assets.

For each of these goals, a needs assessment is presented, followed by series of objectives, strategies, actions, and outcomes which place the importance of FWS actions in the context of overall aquatic resource management and outline the means by which the FWS will help to achieve to the identified ends. The central elements of the strategic framework are presented below.

Fish and Aquatic Species

The FWS directs a wide range of activities on an equally broad array of aquatic species. Habitat improvements, conservation propagation, increasing connectivity in aquatic systems, providing for recreationally and culturally important fishing opportunities, and field monitoring to gauge success as part of adaptive management are examples of routine accomplishments.

Given the hundreds of species requiring attention and resource limitations, the FWS needs to cooperatively develop and hone its list of “priority” species with stakeholders and partners to target limited resources and achieve conservation success. It is unlikely that the challenges of aquatic conservation will diminish or that greater resources will be allocated to address mounting strain on aquatic systems and a growing list of imperiled species. Stakeholders and partners will grow increasingly disaffected unless the FWS uses a strong set of priority species and actions to face the significant challenges to aquatic resources conservation now and in the future. Two themes are resonant in the FWS’s conservation successes to date: 1) shared responsibility with states, tribes and other stakeholders, and 2) the need to work in partnership.

Building on the shared responsibility and partnership themes, the bulk of the FWS’s aquatic species conservation work should be viewed as “interjurisdictional.” The agency must work cooperatively with states, tribes and land managers who own the habitat or manage the resources (even in the case of species listed under ESA), as demonstrated conservation success is directly tied to cooperation. Conservation success is achieved, not as the result of unilateral decision-making and command and control regulation, but through a collaborative and coordinated approach between the government entities that share management responsibilities.

Aquatic Invasive Species (AIS) are a growing issue that is much larger than the limited capacity of the FWS. While AIS are recognized as a leading cause of declining biodiversity, commensurate budgetary and programmatic commitments have not kept pace with the magnitude of this threat. It appears essential that through an act of strategic triage, the FWS needs to focus limited funding on such discrete activities as injurious wildlife designations, preventing new introductions, and continuing to support stakeholders and partners to implement the on-the-ground actions outlined in AIS management plans.

Aquatic Habitat

Water quality and quantity is an essential element of aquatic habitats. Demand for limited water resources will be a growing concern, both in the arid West and increasingly throughout the country. Balancing human demands with fish and aquatic species needs will be an ever-present challenge for the FWS and its stakeholders and partners.

The FWS houses the competence to assess aquatic habitats, prioritize needs, apply sound science, and utilize innovative applications. While the FWS is not directly responsible for managing aquatic habitats (except on its own lands), the agency works cooperatively with a range of federal, state, tribal, and private land owners. This requires the FWS to work in a non-regulatory manner that respects the applicable culture, rights and authorities of its different partners.

The National Fish Passage Program (NFPP) and the National Fish Habitat Partnership (NFHP) are two strong examples of the FWS's commitment to aquatic habitats. NFHP and NFPP are model programs guided by science-based tools that help prioritize projects and direct resources where they have the most impact. The 18 Fish Habitat Partnerships (FHPs) have made enormous progress in assessing the condition of fish habitats on a landscape level. These assessments underpin the strategic conservation priorities of the FHPs, which in turn focus the use of available funding. As restoring fish passage is one of the tools actively used by the FHPs, which now are organized across the country, FWS should consider whether the NFPP should be subsumed under the NFHP, thereby increasing the efficiency and impact of the combined programs in a time of constrained resources.

The number of FHPs has grown, such that all 50 states are engaged with one or more of the partnerships. Given its national coverage, NFHPs are poised to help coordinate and prioritize the full range of FWS aquatic habitat projects.

As the "storefront" for aquatic habitat programs, the Fish and Wildlife Conservation Offices (FWCOs) are one of the most important delivery mechanisms for the FWS conservation mission. FWCOs provide primary on-the-ground staffing for FHPs, NFPP, aquatic monitoring, and work to bridge gaps between NFHP, Partners for Fish and Wildlife (PFW) and other FWS technical assistance programs, as well as with states, tribes and other partners.

Tribal Trust

The federal government has a special relationship with, and responsibility to, Native American governments. The FWS has an inherent responsibility to fulfill treaty promises, to protect tribal treaty and trust assets, and to interact directly with tribes as governments, not merely as "partners". While it is tempting to view the more than 200 tribes that the agency works with as a single homogeneous entity, they represent individual sovereign entities and, as such, represent the FWS's largest set of stakeholders.

Historically, FWS has played a vital role in working to advance and protect tribal rights and interests in relationships and interactions with non-tribal stakeholders. That role needs to continue. Going forward, FWS should implement a more proactive consensus-based process with tribes to identify treaty and trust obligations, develop programs, and take actions to meet those obligations. At the national level, FWS should consider implementing a tribal advisory body that supports government-to-government consultation and assists FWS in developing policies, programs and activities designed to meet tribal treaty and trust obligations. Tribal input is an often missing element in cooperative conservation programs, ranging from FHPs to LLCs. Such an advisory body could facilitate tribal participation in inter-governmental partnerships and

arrangements in areas of jurisdictional overlap or other shared interests among multiple stakeholders.

At the regional level, FWS will be expected to continue to deliver agreed-upon tribal trust services through FWCO's, NFHs and other agency programs. This includes providing fish as part of recovery plans for listed species, in support of sustainable fisheries management, and for trust species and ongoing programs to enhance fishing on tribal lands and in treaty ceded areas. In addition, FWS needs to continue to share expertise, technology, personnel and other assets with tribes to help carry out activities to meet tribal needs and priorities. This includes continuing to fund quality proposals under the FWS Tribal Wildlife Grants Program.

Lastly, FWS needs to continue its ongoing efforts to ensure FWS staff are trained in tribal history and culture, and versed in tribal treaty obligations and trust responsibilities. This interest extends to requiring relevant experience and training as a qualification for any position within the FWS that has responsibility toward tribes.

Recreational Fishing and Other Public Use

The FWS has a continuing role in meeting the public's expectation for use and enjoyment of fish and aquatic resources. The FWS supports and promotes public use in many ways -- by its actions on behalf of aquatic species and habitats, the aquatic resource products produced by the National Fish Hatchery System (NFHS), the recreational opportunities on its National Wildlife Refuges (NWRs), and by its efforts to get children outdoors.

The FWS and its partners need to more proactively translate the social and economic impact of recreational fishing to the broader public. Through excise taxes, license fees, and other economic activity, the recreational angler pays for a large share of fish and aquatic resources management. Anglers and the general public too often fail to recognize the return on investment associated with the Sport Fish Restoration Program. The FWS needs to assume direct responsibility to better communicate the economic and conservation benefits of fish and aquatic resources.

The FWS has unequalled expertise in the culture of aquatic species, nested within the NFHS, FWCOs and science facilities. The NFHS is a vital contributor to endangered species recovery, a place of research and innovation for aquaculture, a source of unduplicated expertise and capacities relevant to hatchery operation and all aspects of aquatic resource conservation, an efficient supplier of sport fish for systems otherwise unable to sustain recreational fisheries, and a system primed to contribute substantially to aquatic education and outreach. NWRs and NFHs are tremendous assets that citizens can visit to see tangible activities directed at conservation, recreation, and environmental services. The FWS and its partners need to feature refuges and hatcheries as part of branding for fish and aquatic conservation within the FWS.

The FWS has increased its efforts to obtain reimbursement for the mitigation services it performs on behalf of other responsible parties. The FWS's efforts to negotiate payment of these reimbursable obligations have helped narrow the gap, but without constant prodding and/or direct authorizations, other responsible parties will likely grow content to have the FWS bear their monetary obligation in full or in part. The agency recognizes the significant ecological, sociological, and economic benefits of stock enhancement activities and the need to assist federal

water development agencies in meeting their mitigation responsibilities. However, in this time of ever-tightening budgets, the FWS must strive for 100% reimbursement to ensure that essential NFHS functions are achieved, but at limited cost to the agency and other fisheries program priorities. The agency has undertaken a comprehensive hatchery workforce analysis in 2013 focusing on its 70 propagation hatcheries that was prompted primarily by increasing annual deficits (shortfalls in funding for hatchery operations and maintenance). Regarding mitigation work related to federal water projects, the FWS has stated that it will continue its mitigation fish production programs when fully reimbursed by the responsible agency.

Public use leads to public involvement. Public involvement and support is crucial in the face of declining federal appropriations that support fisheries and aquatic resource programs. It is more necessary than ever to educate and inform/communicate to all segments of the public that recreational fishing and other aquatic resource public uses are not only fun, but are important components of resource conservation and provide direct economic benefits. It is central to the issue of healthy lifestyles, and it is central to addressing change, including global climate change and diminishing water resources. The FWS needs updated communication tools capable of shaping and delivering materials and messaging that is interesting and compelling to today's public, especially youth.

Thousands of volunteers provide invaluable service to the FWS. Staffing visitor centers, acting as guides, and assisting with monitoring, research and ongoing aquatic resource management activities, these volunteers are increasingly vital to operations. Effective volunteer programs and Friends groups need support from FWS staff, including training, mentoring, recognition, and awards. Regressively, positions with primary responsibility for conducting or facilitating volunteer and Friends programs are those most likely to be affected by budget reductions.

The challenges of increasing the effect and impact of outreach and education programs on today's youth should not be underestimated. The FWS and its partners have the opportunity to develop best practices for outreach and education that builds on lessons learned to forge more impactful and sustained programs in the future. The FWS is encouraged to work with state fish and wildlife agencies and many other organizations to increase the breadth and impact of fish and aquatic resource education programs directed at youth.

Mission-Critical Assets

The FWS is a central player in the conservation of the nation's fish and aquatic resources. Stakeholders and partners readily acknowledge the critical role the agency plays. Despite the challenges of an uncertain fiscal climate, the FWS must maintain capacities, expertise and assets that are mission-critical. In defining "mission-critical," the FWS must recognize that the needs of its partners must be taken into consideration, as the mission and success of the FWS is linked to the mission and success of its partners. To maintain and expand that role, however, the FWS must commit to energized leadership, adequate staffing, maintenance of mission-critical facilities, enhanced science capacity, and defense of core budget operations.

Leadership is an abstract asset. While difficult to define, the FWS's stakeholders and partners know it when they see it. At present only two of the 22 members of the FWS Directorate are "fish" people. Notwithstanding the competencies of other members of the Directorate, it would

seem obvious that the agency needs to ensure representation of senior leaders trained and knowledgeable about fish and aquatic resources.

The lack of a comprehensive and useful workforce management analysis severely limits FWS's capability to manage and right-size its workforce in the face of continuing budget shortfalls, and to provide adequate training and work facilities to ensure employees can conduct their jobs safely and effectively. To date, workforce analysis has been conducted in reaction to anticipated budget decreases rather than as part of strategic visioning and planning. Any useful analysis should address such areas as 1) loss of efficiency of conservation output through Headquarters/Regional Directorate management silos, 2) how organizational charts might be right-sized, 3) future conservation needs and challenges, and 4) sustainability of budgeting based on core funding rather than reimbursables.

The combination of: 1) physical assets in less than operational condition, 2) aging field stations in need of updating and refurbishing to allow the efficient and effective rearing of both current and future species, 3) high energy costs, 4) reduced staffing, and 5) flat-lined budgets all conspire to place a considerable strain on the FWS's capability to consistently meet its aquatic conservation goals. The NFHS currently has identified **\$152 million** in deferred maintenance needs related to the repair, rehabilitation or replacement of constructed assets. Given that continued deferment results in the deterioration of assets and greater long-term costs, this approach, while effective in addressing short-term budgetary issues, may ultimately rob assets otherwise available for native species restoration, endangered species recovery, tribal assistance and public recreation over the long-term. Moreover, climate change and extreme weather events (e.g., Hurricane Sandy), rising operational costs, and growing conflict over water rights will conspire to increase the strain on existing facilities, equipment, and capacities. The FWS has the capability to track, prioritize and account for the physical and personal assets under its care, but must do more than monitor their decline. The agency must be proactive in minimizing the loss of asset functionality in light of current and future budgetary constraints.

The FWS continues to work on strengthening the agency's tradition of scientific excellence in the conservation of fish, wildlife, plants, and their habitat. The agency prides itself on using best science, but meeting that goal will increasingly present a challenge. Going forward, the FWS needs to work with the U.S. Geological Survey to establish a clear set of priorities and processes for funding essential fish and aquatic science, not just at the current level, but at a level that provides the necessary support to the FWCs, NFHPs and other field-based efforts requiring these scientific tools. Increased attention from the agency to landscape-level conservation including Strategic Habitat Conservation and Landscape Conservation Cooperatives (LCCs) and climate change is critical to meeting long-term management goals for aquatic systems. These initiatives must complement and support the FWS's long-term core fish and aquatic outputs, such as aquatic animal propagation, Aquatic Animal Drug Approval Partnership Program, fish health surveys, AIS, and FWCs working with tribes.

The FWS recognizes the need to fully understand and provide leadership on the effects of climate change on our nation's fish and aquatic resources, including the facilities and fisheries resources of direct responsibility to the FWS. As the challenges go beyond the resources of the FWS to address alone, the FWS will need to increasingly engage with stakeholders, FHPs, LCCs

and other partners to collaborate effectively, address priority science needs, and leverage existing resources. The fish and aquatic resources activities of the FWS must continually seek innovative ways of addressing resource concerns and constantly evaluate their current activities to ensure that they are the most appropriate use of our resources.

Budgets for fish and aquatic resources management may have increased in absolute dollars over the last 10-15 years, but they have remained stagnant or are in actual decline when adjusted for inflation and other factors that impact how these funds reach the ground. The overall loss of purchasing power for field stations is profound as a result of increased salary-to-operations ratios. In addition, it is clear that the erosion of base funding is preventing FWCOs and other programs from accomplishing core functions while the pressure to fund field station operations with “soft-money” and reimbursables increasingly dictates priorities. While this erosion of base funding hampers the FWS in accomplishing traditional core functions, it is equally clear that the FWS must meet future conservation challenges and stakeholder/partner expectations within the current budget climate.

To Invigorate and Enhance—the Purpose of the Strategic Vision and Needs Assessment

In presenting this Strategic Vision and Needs Assessment, the Sport Fish and Boating Partnership Council (SFBPC) has focused on providing an inclusive assessment of the U.S. Fish and Wildlife Service (FWS) fish and aquatic resource activities, as seen from the perspective of the agency’s stakeholders and partners. The report is the product of the hard work of a Steering Committee consisting of members from the SFBPC Fisheries Issues Committee, FWS, and representatives from the larger fisheries community. As this vision is intended to shape the future directions of the FWS, it has been framed with the active participation of FWS staff, across a range of the agency’s programs.

The document is designed to provide general guidance, identify overall priorities for the next 10 years, and highlight areas of excellence within the FWS’s fish and aquatic resource programs. While the document is not intended to be prescriptive or reduce the agency’s management flexibility, it does outline objectives and expected outcomes that are considered important for the future conservation of fish and aquatic resources by the agency’s principal stakeholders and partners. The scope of the document was broadened mid-project to encompass all fish and aquatic activities of the FWS, though its focus centers primarily on the activities and scope of the newly reorganized Fish and Aquatic Conservation program.

This Strategic Vision and Needs Assessment is also written with the recognition of the current fiscal climate and the knowledge that the agency’s leadership is charged with identifying the agency’s most critical roles for fish and aquatic resource conservation. This task is too big to accomplish alone and states, tribes and other federal land management agencies commonly have management primacy over both the species and the land. The FWS must reach decisions and take actions in a collaborative fashion with its stakeholders and partners.

During discussions of priorities, staffing and budgeting, FWS staff and others often stated the overriding need for the agency ‘to stanch the bleeding’ in the decline of staff and budget. They stressed the need to maintain core functions the agency provides to its state, tribal and other conservation partners, and they recognized the inherent challenge in addressing how to maintain

aquatic habitat integrity and resilience in the face of numerous challenges, including a changing population demographic and climate change. Frederick II, King of Prussia, observed “He who defends everything, defends nothing.” This military reference from the 1700s underscores an important principle for the FWS. The agency needs to prioritize its actions throughout the agency on behalf of fish and wildlife, work cooperatively with stakeholders and partners, act strategically, and increase (not decrease) its outputs on behalf of fish and aquatic resources by narrowing its focus and identifying core functions and activities. This strategic vision is one step in providing that focus.

This Strategic Vision outlines an historic, present and future set of responsibilities and actions on behalf of the nation’s fish and aquatic resources that are larger and more pressing than the FWS current priorities. Rather than declare that the agency cannot continue to do everything it has been doing given the current fiscal climate and workforce reduction (an oft heard refrain), this Strategic Vision notes the hugely undervalued importance of fish and aquatic resources to the American people, in terms of economic impact, environmental services, and recreational enjoyment; and it demonstrates the invaluable role played by the FWS.

Ultimately, the primary concerns for the FWS’s efforts in fish and aquatic conservation now and into the future are leadership and adequate funding. The FWS can write all the plans they want but if the funding and capacity are not present to do the work, then it is for naught. Fish and aquatic resource staff can be pressed to do more with less, to redirect existing funding from one area to other efforts, but if FWS leadership is not pressing for fish and aquatic priorities and the funding remains inadequate, the capacity to initiate, innovate, and enhance will fade along with the fish and aquatic resources themselves.

After more than a decade of FWS Fisheries program reviews and evaluations, the Steering Committee is left with a lasting concern that the FWS Fisheries Program, now Fish and Aquatic Conservation Program, has long been undervalued and under-funded. Now in this present period of budget cutting, these programs are being cut further as part of agency- and department-wide austerity measures. Yet the social and economic value of aquatic resources in the United States demands more of the FWS. The issue of increasing water scarcity and its impacts in an era of climate change is a single example of what is at risk.

The time and commitment of the Steering Committee and dozens of other stakeholders and partners in framing this Strategic Vision is but one indicator of the fish and aquatic community’s overarching concern for aquatic resource conservation, and their interest and willingness to work with the FWS to implement a robust Fish and Aquatic Conservation program for the future.

I. Preamble/Setting the Stage

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A. Case for Action

America's fish and aquatic resources are among the richest and most diverse in the world. These resources, and the recreational, commercial, and subsistence opportunities they provide, have helped support the nation's growth by providing enormous ecological, social and economic benefits. As one example, the 2011 National Survey of Fishing, Hunting and Wildlife Associated Recreation found 33.1 million individuals participating in recreational fishing. The economic impact from recreational fishing alone supports more than 587,000 jobs and provides a total economic contribution exceeding \$61 billion.¹ The estimated economic impact of the Fisheries Program of the U.S. Fish and Wildlife Service (FWS) also provides a strong indication of the value of the United States' aquatic resource assets.² In 2010 the program's activities yielded an estimated \$3.56 billion in economic output, supporting more than 68,000 jobs and \$301 million in substitution value for subsistence activity (Table 1).³

Table 1. Economic Contribution from Fisheries & Aquatic Resources Conservation		
Activity	Estimated Value	# of Jobs
Aquatic Habitat	\$1.98 billion	45,000
Aquatic Species	\$677 million	15,000
Public Use	\$903 million	8,000
Total	\$3.56 billion	68,000

Despite efforts by the FWS and others to conserve fish and aquatic resources, challenges remain. Hundreds of aquatic species require special protection in some part of their range. The number of species listed as threatened or endangered under the Endangered Species Act (ESA) continues to increase, including valuable recreational, subsistence, and commercially important species such as salmon, sturgeon and trout. Of the 297 species of freshwater mussels in the United States, 72 percent are threatened, endangered, or of special concern.⁴ Not a single listed aquatic species has been removed from the ESA list due to recovery.⁵ From 1900-2010, freshwater fish species in North America went extinct at a rate 877 times faster than the rate found in the fossil record and it is estimated that this rate may double between 2012 and 2050.⁶

¹ Southwick Associates, 2011, The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States. Report prepared for the National Fish and Wildlife Foundation, page 8.

² In 2012, FWS reorganized the Fisheries Program and created the Fish and Aquatic Resource Program (FAC).

³ Joseph J. Charbonneau and James Caudill, 2010, An Assessment of Economic Contributions from Fisheries and Aquatic Resource Conservation, U.S. Fish and Wildlife Service.

⁴ Williams, J.D., M.L. Warren, K.S. Cummings, J.L. Harris, and R.J. Neves, "Conservation status of freshwater mussels of the United States and Canada, *Fisheries*, vol. 18, number 9 (1993):6-22.

⁵ No fish have been delisted due to recovery but fish species have been delisted due to extinction (e.g., blue pike, longjaw cisco, Amistad gambusia). Both Apache and Gila trout have been downlisted. Species dependent on aquatic habitats have been delisted, including the bald eagle, brown pelican, Aleutian Canada goose, concho water snake, Lake Erie water snake, and American alligator.

⁶ Noel Burkhead, "Extinction Rates in North American Freshwater Fishes, 1900-2010," *BioScience*, September 2012: 798-808.

The two principal factors implicated in these declines are habitat loss or alteration (including in-stream flow changes, water quality and/or quantity, and sedimentation) and the impacts of harmful non-native invasive species. Healthy stream and riparian habitats are critical to the sustainability of all aquatic resources. In the past 300 years, one-half of the original wetlands in the United States have been drained or filled.⁷ More than 75,000 high dams and thousands of low dams block 600,000 miles of rivers (17% of all river miles) in the United States.⁸ Dams alter water flow and temperature regimes, stop the migration of fish, and isolate populations of mussels, crayfish, snails and other aquatic animals. Water quality, including temperature, dissolved oxygen, nutrients and organic constituents, is an equally critical component of habitat that establishes which aquatic organisms can inhabit which waters and to what extent.

Invasive species in the United States cause major environmental damage and losses adding up to almost \$120 billion per year. There are approximately 50,000 foreign species currently present and the number is increasing. About 42 percent of the species on the threatened or endangered species lists are at risk primarily because of alien-invasive species. While some of these species create significant economic benefits (e.g., European honeybee, *Apis sp.*), others, such as zebra mussels, Asian carp and Eurasian water milfoil, cause irreversible harm to aquatic resources.⁹ Native fish and other aquatic resources are especially threatened by these invaders because of their rapid spread through connected waterways. Clearly, the nation is at risk of losing more of its diverse aquatic resources and the critically important benefits they provide.

B. Situational Analysis

The FWS works cooperatively with its primary stakeholders--the states and tribes--with whom it has statutory, treaty and other legal obligations to manage or co-manage fish and aquatic resources. Just as importantly, the FWS works in partnership with the states, tribes, other federal agencies, conservation organizations, industry, private landowners, other countries, and many others to achieve mutually shared goals. This Strategic Vision is built on a foundation forged with the FWS's stakeholders and partners.

Biological and social scientists, government agencies, conservation groups, and other citizens are concerned about the decline of fish and other aquatic resources and the ecological, cultural, and economic impact of those declines. Management and conservation actions for virtually all aquatic resources are a shared responsibility. Success in reversing the downward trend will rely on continuing partnerships and forging new partnerships that cut across jurisdictions and link stakeholders and partners.

Although built on decades of experience, the FWS's execution of this Strategic Vision and Needs Assessment must recognize the current and future contexts within which fish and aquatic

⁷ EPA, America's Wetlands, Our Vital Link between Land and Water, www.epa.gov/owow/wetlands/vital/wetlands.pdf

⁸ Louis Helfrich *et al*, "Why is Aquatic Biodiversity Declining," Department of Fisheries & Wildlife Sciences, Virginia Tech, 2009.

⁹ David Pimentel, Rodolfo Zuniga and Doug Morrison, "Update on the environmental and economic costs associated with alien-invasive species in the United States," *Ecological Economics*, vol. 52, number 3 (2005): 273-288.

resource conservation will function during the life of the plan (2015-2020). Though not inclusive, the following seven factors are pivotal:¹⁰

1. Subject to approval by the Administration and Congress, the FWS Directorate sets priorities and budgets annually for all program activities within the agency. New administrations, social and economic factors and geopolitical debates strongly influence these allocations. Fish and aquatic resources activities must compete for attention against other important activities in an era of tight resources.
2. Globalization of trade and transportation will require greater understanding of the opportunities, threats and cultural perspectives affecting both domestic and international stock management, invasive species, and disease introductions.
3. Fish and aquatic organisms depend on water. Water quality and quantity will be pivotal factors in the coming years, especially in the western United States, where water needs are already surpassing available supplies in dry years. Climate change will have a significant influence on aquatic habitat protection, resilience, and rehabilitation, due to climate effects on in-stream flows, species persistence, thermal tolerances of aquatic organisms, spawning times, and a host of interacting factors.
4. Economic pressure, volatile markets, a transient and reduced workforce due to declining public sector budgets and changing demographics, and demands from rising economies will require organizations to be more strategic with limited resources, modify training and hiring practices, and dramatically restructure some commercial and recreational fisheries as well as use of and access to fish and other aquatic resources.
5. Landscape-scale ecosystem-based management coupled with social and economic concerns will continue to drive research and management agendas that will, by necessity, be shared among state and federal agencies, tribes, and other land and water management interests operating collaboratively.
6. Increasing urbanization and shifting demographics will present challenges to traditional resource use and management models, requiring land and water management agencies to adapt as nimbly to these changes as to those presented by climate change.
7. Electronic communication and social networking will be the predominant means of interacting, particularly among young professionals, international colleagues, and dispersed organizations.

II. Mandate for Fish and Aquatic Resource Conservation

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The FWS's fish and aquatic resource conservation activities are accountable to a wide range of legislative authorities, treaties, compacts, court orders, mitigation agreements, and cooperative

¹⁰ Statements #2-7 are adapted from the American Fisheries Society Strategic Plan: 2020 Vision (2010-2014), <http://fisheries.org/strategic-plan>.

agreements. These authorities and mandates range from the broad nationwide tenets of the Fish and Wildlife Coordination Act to the “Voigt Decision” (Lac Courte Oreilles v. Wisconsin) which confirmed the hunting, fishing, and gathering rights of tribes in Wisconsin (Tables 2 and 3).

This mixture of aquatic resource-related authorities has assigned the FWS an expanding set of program responsibilities, often with little to no evaluation as to how the new activities will be staffed and budgeted, or how the agency should deal with conflicting mandates or authorities. For example, the FWS has a responsibility to stock fish, traditionally non-native species, into some waters as mitigation for federal water projects, while concurrently working to conserve native fish and aquatic species.¹¹ Over time the agency has become adept at addressing these challenges.

In addition to complying with a large and cumbersome set of authorities, the fish and aquatic conservation priorities and activities of the FWS from year to year are heavily influenced by the annual appropriations process and the resulting directives provided by the Administration and Congress. The budget, along with accompanying language, can have as profound an effect on Program “mandates” as the authorities listed in Tables 2 and 3.

How the FWS appropriately sets aquatic resources priorities in light of its authorities is as much art as science. The FWS works to meet its overlapping, complementary, and sometimes competing responsibilities while working within the shifting priorities of the Administration, Congress, stakeholders, partners, and the American public. However, the impact of the FWS’s conservation efforts lies in the condition of the natural resources under its care.

Table 2. Legislation and Other Authorities	
Airborne Hunting Act	Lacey Act
Anadromous Fish Conservation Act	Magnuson/Stevens Fishery Conservation and Management Act of 1976
Compensation and Liability Act	Marine Mammal Protection Act
Comprehensive Environmental Response	National Aquaculture Act of 1980
Department of Transportation Act	National Environmental Policy Act of 1969
Endangered Species Act of 1973	National Fish Hatchery System Volunteer Act of 2006
Estuarine Protection Act	National Invasive Species Act of 1996
Exclusive Economic Zone of the USA	National Wildlife Refuge System Administration Act of 1966
Federal Aid in Sport Fish Restoration Act	National Wildlife Refuge System Improvement Act of 1997
Federal Food, Drug, and Cosmetic Act	Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
Federal Power Act	Pacific Salmon Treaty Act of 1985
Federal Water Pollution Control Act	Recreation Use of Conservation Areas Act
Federal Water Project Recreation Act	Recreational Fishing (Executive Order 12962)
Fish and Wildlife Act of 1956	Reorganization Plan No.4 of 1970
Fish and Wildlife Conservation Act of 1980	Rivers and Harbors Act of 1899
Fish and Wildlife Coordination Act	
Fish and Wildlife Improvement Act of 1978	
Fisheries Joint Resolution, 1871	
Fisheries Restoration & Irrigation Mitigation Act of 2000	

¹¹Non-native fish (mostly salmonids) are often stocked for mitigation in habitats (e.g., tailraces) that can no longer sustain native species. So a recreational fishery is created in areas that would have depauperate or extirpated native fish.

Indian Self-Determination & Education Assistance Act of 1976	Sikes Act
Invasive Species (Executive Order 13112)	Sport Fishing and Boating Safety Act Watershed Protection and Flood Prevention Act

Table 3. Regionally Specific Authorities	
Alaska National Interest Lands Conservation Act	Mitchell Act
Atlantic Coastal Fisheries Cooperative Management Act	New England Fishery Resource Restoration Act of 1990
Atlantic Salmon Convention Act of 1982	Pacific Northwest Electric Power Planning and Conservation Act
Atlantic Striped Bass Conservation Act	Pere Marquette River Amendment
Central Valley Project Improvement Act	Salmon & Steelhead Conservation & Enhancement Act
Chehalis River Fishery Resources Study	State of Alaska v. Babbitt (Katie John I)
Colorado River Storage Project Act	Treaties with Indian Tribes as affirmed by Lac Courte Oreilles v. Wisconsin (Voigt Decision)
Connecticut River Basin Atlantic Salmon Compact Act	Treaties with Indian Tribes as affirmed by US v. Oregon (Belloni Decision)
Elwha River Ecosystem and Fisheries Restoration Act	Treaties with Indian Tribes as affirmed by US v. Washington (Boldt Decision)
Emergency Striped Bass Study Act	Trinity River Basin and Wildlife Restoration Water Resources Development Act of 1976
Fish-Rice Rotation Farming Program of 1958	Yakima Fishery Enhancement Project
Fox Decision & US v. Michigan Consent Decree	Yukon River Salmon Act of 1995
Great Lakes Fish and Wildlife Restoration Act	
Great Lakes Fishery Act of 1956	
Joint Secretarial Order #3206, 1997	
Klamath River Basin Fishery Resources Restoration Act	
Mississippi Interstate Cooperative Resource Agreement	

III. Introduction to Strategic Vision & Needs Assessment

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Initiation

In October 2011, the Director of the FWS requested the assistance of the Sport Fishing and Boating Partnership Council (SFBPC) to renew the Fisheries Program vision as the foundation for an updated strategic plan (Exhibit A). Recognizing that SFBPC’s ability to engage partners, stakeholders and experts was integral to the FWS’s ability to successfully address the nation’s aquatic resource challenges, the FWS director asked the SFBPC to convene a diverse group of stakeholders to assist in this strategic planning effort.

In undertaking this project, the SFBPC contracted with DJ Case & Associates (DJ Case) to assist the SFBPC and FWS in coordinating and conducting the project. To accomplish this task, the SFBPC and DJ Case worked closely with the SFBPC Fisheries Issues Committee, FWS staff, and a wide range of stakeholders and partners.

Basis of Review

The SFBPC has a history of commitment to the fish and aquatic resources programs of the FWS. In 2000, the SFBPC undertook a stakeholder engagement process resulting in *Saving a System in Peril: A Special Report on the National Fish Hatchery System*, undertaken at the behest of members of Congress and the FWS to help establish a clear mission for the National Fish Hatchery System. In 2002, *A Partnership Agenda for Fisheries Conservation* was released with

recommendations addressing accountability, stakeholder involvement, habitat, native species conservation, and mitigation. In 2005 and 2010, the SFBPC completed independent evaluations of the FWS Fisheries Program. These SFBPC efforts provide a solid foundation on which this Strategic Vision and Needs Assessment is constructed. In addition, the FWS's *National Fisheries Program Strategic Plan, FY 2004-2008* and a collection of other reports provide additional framework for this effort.

Intent

This Strategic Vision and Needs Assessment is intended to provide general guidance, identify overall priorities for the next 10 years, and highlight areas of excellence within the FWS's fish and aquatic resource programs. While the document is not intended to be prescriptive or reduce the agency's management flexibility, it does outline objectives and expected outcomes that are considered important to the conservation of fish and aquatic resources by the agency's principal stakeholders and partners for the future (given the changing contexts in which fish and aquatic conservation will function).

The SFBPC anticipates that the FWS will utilize this strategic vision document to develop a detailed strategic plan for the Fish and Aquatic Resource Program which will build on the goals, objectives, strategies, and outcomes presented here, to include specific outputs, timelines, budgets and performance measures.

Methodology

As a first step, scoping meetings were held in April 2012 with the SFBPC Fisheries Issues Committee, FWS staff, and members of the fisheries community. Based on those discussions, the project work plan was developed and a SFBPC Strategic Vision Steering Committee assembled. The Steering Committee's membership was drawn from the SFBPC Fisheries Issues Committee, the FWS, and representatives from the larger fisheries community. Care was taken to select individuals with expertise in a range of aquatic resource topics and to be inclusive of the stakeholder and partner interests. The resulting committee had representatives from states, tribes, other federal agencies, science and universities, industry, and conservation organizations (Table 4).

As part of the first phase, project consultants assembled vision elements, drawing from previous visions/strategic plans, programmatic evaluations, and other published reports. Concurrently, the SFBPC Steering Committee began discussions and development of iterative drafts of the strategic vision and elements of a strategic framework outlining how the vision's broad constructs will be accomplished. Face-to-face meetings of the steering committee were held in June and November, 2012, and discussions were routinely conducted via email and webinars.

As the project progressed through the summer of 2012, the initial project scope was broadened to encompass both the FWS Fisheries Program and the broader fish and aquatic resource management activities of the FWS. In close consultation with the FWS, SFBPC, and the Steering Committee, DJ Case redrafted the "Revised Vision and Strategic Plan Framework" into a "Strategic Vision and Needs Assessment for the Fish and Aquatic Resource Conservation Activities of the U.S. Fish and Wildlife Service," and updated the associated process and presentation materials.

Table 4. Strategic Vision Steering Committee	
Stakeholder & Partner Representatives	
Mike Armstrong Arkansas Game and Fish Commission	Tom Champeau Florida Fish & Wildlife Conservation Commission
Noreen Clough B.A.S.S., LLC	Nathaniel Gillespie USDA-Forest Service
Michael Grayum Northwest Indian Fisheries Commission	Fred Harris American Fisheries Society
Elise Irwin Auburn University	Gary Kania Congressional Sportsmen's Foundation
Scott Kovarovics Izaak Walton League of America	Joe Larscheid Iowa Department of Natural Resources
Joseph McGurrin Trout Unlimited	Christine Moffitt University of Idaho, USGS Idaho Cooperative Research Unit
Mike Nussman American Sportfishing Association	Steve Perry Eastern Brook Trout Joint Venture
Larry Riley Arizona Game & Fish Department	Tom Sadler Middle River Group
Mark Smith The Nature Conservancy	Rick Swanson USDA-Forest Service
Jesse Trushenski Southern Illinois University	Chris Williams American Rivers
Krystyna Wolniakowski National Fish and Wildlife Foundation	Jim Zorn Great Lakes Indian Fish and Wildlife Commission
FWS Team	
Jared Brandwein National Wildlife Refuge System, FWS	Michael Carrier Fish and Aquatic Resources, FWS
Robert Clarke Fish and Aquatic Resources, FWS	Kate Freund Office of the Science Advisor, FWS
Doug Frugé Fish and Aquatic Resources, FWS	Jaime Geiger Fish and Aquatic Resources, FWS
Linda Kelsey Fish and Aquatic Resources, FWS	Steve Klosiewski Fish and Aquatic Resources, FWS
Mike Oetker Fish and Aquatic Resources, FWS	Rick Sayers Ecological Services, FWS
Todd Turner Fish and Aquatic Resources, FWS	Jeff Underwood Fish and Aquatic Resources, FWS
Mike Weimer Fish and Aquatic Resources, FWS	
Project Coordination	
Doug Hobbs FWS Coordinator for SFBPC	Whitney Tilt (Leader-Project Consultant) Conservation Benchmarks
Dave Case (Leader-Project Consultant) D.J. Case & Associates	

In December 2012, the FWS proposed and in early 2013, conducted a realignment of the Fisheries and Habitat Conservation Program, creating a new Fisheries and Aquatic Conservation (FAC) Program along with an Ecological Services Program. The realignment largely affects how various programs are overseen by the FWS Headquarters Office (HQ), creating a HQ structure which closely mirrors the programs managed at the Regional Office level. For purposes of this

Strategic Vision, all fish and aquatic resource activities for the entire agency are considered and examined, not just those housed within the FAC.

In December 2012, FWS proposed a reorganization of the Fisheries and Habitat Conservation Program, creating a new Fisheries and Aquatic Conservation (FAC) Program. The proposed changes, approved by the House and Senate Appropriation Committees, largely affect how various programs are overseen by FWS Headquarters, and more closely mirrors how the programs are managed at the regional level. For purposes of this Strategic Vision, the individual fish and aquatic resource activities of the overall agency are examined with an emphasis on the core programs traditionally included under the old Fisheries Program and the new FAC Program.

The SFBPC and the FWS both recognized the importance of ensuring buy-in and ownership of the strategic vision and needs assessment by stakeholders and partners. To this end, the project solicited input from the broader fish and aquatic resource community through presentations at professional meetings (Table 5), face-to-face meetings of Steering Committee members with fellow stakeholders and partners, outbound email alerts, and online at <http://fishplan.org>. The strategic vision and needs assessment were revised on an iterative basis to reflect partner and stakeholder input. As documents were revised, newer versions were made available for further stakeholder and partner review.

From the outset, the Steering Committee worked to proactively solicit input from the larger fisheries and aquatic resource community. More than 475 individuals and organizations received ongoing email communications. A website, <http://fishplan.org>, was developed to assist with communications and offer a repository for documents and input. A series of 11 public input sessions and briefings were organized as part of other association and professional meetings (Table 5). Exhibit B provides letters received from the Association of Fish and Wildlife Agencies (AFWA), National Fish Habitat Partnership (NFHP), and “Fish Net,” a coalition of organizations interested in fisheries conservation. The input of state fish chiefs concerning the functions of the FWS Fisheries Program important to their state agencies is presented as Exhibit C. Throughout the process, the draft document was continually revised on an iterative basis to reflect the input received and ensure the resulting Strategic Vision and Needs Assessment reflected the involvement of the broader fish and aquatic conservation community.

In February 2013, a day-long meeting was held with FWS staff at its Arlington headquarters to review the existing strategic vision elements, discuss additional edits, and request outstanding data needs.

Based on extensive input and review of draft documents on an iterative basis, a final Strategic Vision and Needs Assessment was developed by the Steering Committee and submitted to the SFBPC for its consideration and action on May 20-21, 2013. **[Update to reflect final steps after SFBPC action]**

Nomenclature, Acronyms and Abbreviations

Some of the terms used in this report have multiple interpretations that could lead to confusion. Accordingly, a set of definitions/nomenclature is provided as Table 11 (page 65) and a listing of acronyms and abbreviation used in this report is provided as Table 12 (page 68).

July 2012	National Fish Habitat Board, Portland, ME
August 2012	American Fisheries Society, St. Paul, MN
September 2012	Association of Fish and Wildlife Agencies, Hilton Head, SC
October 2012	Southeastern Association of Fish and Wildlife Agencies, Hot Springs, AR
October 2012	American Sportfishing Association Sportfishing Summit, Hilton Head, SC
October 2012	National Fish Habitat Board, Big Cedar, MO
November 2012	Sport Fish and Boating Partnership Council, Corpus Christi, TX
December 2012	Midwest Association of Fish & Wildlife Agencies, Wichita, KS
January 2012	Western Association of Fish and Wildlife Agencies, Tucson, AZ
March 2013	North American Wildlife & Natural Resources, Arlington, VA
May 2013??	Sport Fish and Boating Partnership Council, Washington, DC

IV. Strategic Vision

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Mission: To work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people.

Vision: To achieve sustainable fish and aquatic resources populations and aquatic habitats that contribute to the nation's quality of life, economy, and cultural identity by acting in partnership for the continuing benefit and enjoyment of the American people.

Challenge: To conserve the nation's fish and aquatic resources in the face of declining and diminished aquatic habitats, expanding human population, changing social demographics, competition for human and financial resources, climate change, invasive species, increasing demand for limited water resources, and other uncertainties. The FWS recognizes the need to respond decisively and effectively to emerging issues. Economic limitations and the demand for a more effective government require strong leadership in the FWS and federal administration to ensure financial and staff resources are optimized through responsive prioritization of programs and activities.

Values

The values of the fish and aquatic resources program activities of the FWS are embedded in the agency's mission: The U.S. Fish and Wildlife Service works with others to conserve, protect, and enhance fish and aquatic resources and their habitats for the continuing benefit of the American people.

U.S. Fish and Wildlife Service – The FWS serves the American people as an agency of public servants. They work with federal, state and international natural resource managers, tribes, industry, private landowners and others, as stewards of the nation's fish and aquatic resources. The FWS respects the jurisdiction, authority, beliefs and opinions of its state, tribal and international stakeholders and partners. The agency brings a wide variety of science-based conservation tools to the partnership, and strives to deploy the tools as an integrated system to

confront current challenges. The FWS recognizes that a diverse, well trained and equipped workforce is its most valuable resource.

Works with Others – The task of aquatic resource conservation is too large to accomplish alone. In addition, states and tribes typically have management primacy for fish and wildlife species and land use. In addition, other federal agencies (e.g., Bureau of Land Management and U.S. Forest Service) manage extensive lands, especially in the western United States and Alaska. Therefore, the FWS collaborates with, and supports the aquatic conservation actions of, state, tribal, private and international stakeholders and partners, as well as other federal agencies. The FWS acknowledges the need to engage its stakeholders and partners openly and often. At the national and international level, the agency provides critical support for interjurisdictional coordination, cooperation, and innovation.

To Conserve, Protect, and Enhance Fish and Aquatic Resources and their Habitats – Using the best science and knowledge available, the FWS works to conserve aquatic resources, and their associated habitats, in cooperation with federal, state, tribal and other natural resource managers. The FWS strives to maintain or restore resilience in aquatic systems, and provides leadership in areas such as technical assistance, science and technology, fish culture, genetics, fishing and other recreational opportunities, refugia for threatened and endangered species, prevention and control of aquatic invasive species, aquatic animal drug testing and approval, and fish health. The FWS supports conservation at the landscape scale through initiatives such as the National Fish Habitat Partnership and other cooperative efforts, and provides vital funding to assist the cooperative work of many stakeholders and partners. Agency policy directs staff to adaptive management principles to continually improve and refine the conservation of the public's fish and aquatic resources.

For the Continuing Benefit of the American People – The mission of the FWS has a direct impact on the nation's quality of life. Benefits arising from FWS efforts include ecosystem services and biological diversity, jobs and revenue generation, commercial and subsistence fisheries, cultural and historical resources, as well as fulfillment of treaty and trust responsibilities to tribes. The FWS provides access to, and support for, recreational fishing and other sustainable use and enjoyment of fish and aquatic resources. FWS activities help connect people to nature and the outdoors, as well as with the importance of a healthy and productive natural environment. Just as importantly, the agency's cooperative actions create opportunities for the future through improved management techniques, economic value, outdoor experiences and other activities.

V. Operating Principles

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Translating the strategic vision into action, a set of six operating principles permeates each and every aspect of the FWS's fish and aquatic resource conservation efforts:

1. Partnership – The FWS delivers fish and aquatic resources conservation through effective partnerships, marked by mutual accountability, recognition of authorities and competencies, and the routine engagement of stakeholders and partners with openness and transparency.

2. Strategic – Given the amount of mission-critical work to be accomplished, staffing constraints and tight budgets, the FWS must be strategic, working with stakeholders and partners to ensure efforts are targeted, effective, and complementary--not duplicative. The FWS recognizes that ecosystems, history and culture, partners' resources, and conservation needs vary substantially throughout the nation. The agency must be regionally astute in its approach, deploying its diverse conservation tools – from fish propagation to genetics to habitat restoration and beyond – to address those regional differences.
3. Ecologically scaled and biologically feasible – The FWS will work to achieve results at the watershed/landscape level, often across state, tribal, and international boundaries, to maintain, restore, and rehabilitate habitats and their ecological resilience, while recognizing that many systems have been fundamentally changed and returning them to unaltered conditions may not be feasible.
4. Public benefit – The FWS recognizes the obligation to ensure its actions are appropriate, sustainable and valuable to the American public, and to effectively communicate these benefits to the public.
5. Anticipate change – The FWS recognizes the import, impact, and uncertainty added by external drivers, such as climate change, invasive species, and changing population demographics through the application of adaptive management techniques.
6. Science-based and measurable – The FWS will use the appropriate tools to design, monitor, and evaluate the outcomes of its management actions. Actions will be scientifically justifiable, time bound, and measured by biological, economic, and social metrics.

VI. Goals, Objectives, Strategies, Activities, and Outcomes

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Utilizing the operating principles outlined above, the FWS's fish and aquatic resource conservation efforts will be focused to achieve five strategic goals:

1. Conserve fish and other aquatic species at self-sustaining levels.
2. Protect, restore, and maintain aquatic habitats.
3. Meet tribal and other trust responsibilities.
4. Promote recreational fishing and other public uses and enjoyment of aquatic resources.
5. Maintain mission-critical capacities, expertise and assets.

These five goals are presented as a holistic set--one goal cannot be pursued without full engagement with remaining four. For each of these goals, a needs assessment is presented placing the importance of FWS actions in context of overall aquatic resource management. In addition, each goal expressly incorporates the six operating principles.

Goal 1: Conserve fish & other aquatic species at self-sustaining levels.

Needs Assessment

Fish and other aquatic species, including mussels, crayfish, insects, and plants, define the functional aquatic systems on which American society relies, from streams and lakes to estuaries and marine waters. Conserving fish and aquatic species that are commercially, recreationally, ecologically, and culturally important is central to the FWS mission. Like the roles these species play in their environments, the role of the FWS in aquatic species conservation is complex: states, tribes, and federal land management agencies retain principal authority in the management of most lands, waters, and resources, while the FWS has co-management responsibilities for interjurisdictional species, lead responsibility for endangered and threatened species restoration (for freshwater systems), tribal and other trust obligations, and specific mitigation responsibilities for federal water projects. However, the agency's role extends beyond that of mandates and jurisdictional authorities in that the FWS is obliged to support the efforts of its partners in conserving aquatic resources for the benefit of the American people. As a partner, the FWS contributes sound science, technical expertise, and other resources to shared conservation initiatives.

The FWS's 540+ National Wildlife Refuges (NWRs), 72 National Fish Hatcheries (NFHs), 9 Fish Health Centers (FHCs), 6 Fish Technology Centers (FTCs), 65 Fish and Wildlife Conservation Offices (FWCOs) and 80 Ecological Services Field Offices (ESFOs) work with states, tribes, federal land management agencies, and the public in collective efforts to: sustain healthy native aquatic species and populations; restore depleted stocks of fish and other aquatic resources; recover threatened and endangered aquatic species; and manage invasive species (see page 32 for fuller discussion of FWCOs and other FWS field offices).

The National Fish Hatchery System (NFHS) is composed of 72 hatcheries that propagate and/or offer refugia to more than 139 species (96 fish species, 26 mollusks, and 12 other aquatic organisms) as of FY 2012. Of the 96 fish species, 54 were released across 46 states in FY 2012, and 37 of these had recreational fishing value. These fish species include important recreational and commercial species like rainbow trout, Pacific salmon, striped bass, and American shad. NFHs help ensure recovery of threatened or endangered species, restore native fish stocks to self-sustaining levels, mitigate recreational fisheries lost as a result of federal water projects, and supply fish to certain state, tribal, and federal waters as established in agreements and treaties. FTCs are another important asset, providing leadership in science-based management of aquatic resources through the development of new concepts, strategies, and techniques to solve problems in hatchery operations and aquatic resource conservation. Their expertise in fish culture technology, genetics, population dynamics, modeling, and ecophysiology are part of the larger science focus of Landscape Conservation Cooperatives (LCCs), Climate Science Centers (CSCs), National Fish Habitat Partnerships, other federal agencies, universities, and the private sector. The FWS's FHCs are leaders in the detection and diagnosis of wildlife diseases and in the science of aquatic animal health, and work closely with federal, state, tribal, academics, and conservation partners in efforts to further the management and science of fisheries and aquaculture.

More recently, the FWS has worked in cooperation with other federal agencies, states, tribes, and conservation partners to form and support LCCs to undertake conservation science partnerships, otherwise beyond the reach or resources of individual partners. The LCCs have two primary functions: 1) to promote collaboration in defining and implementing shared conservation goals, and 2) to provide the science and technical expertise needed to support conservation planning at landscape scales. Presently there are 22 LCCs working to promote conservation across geographic and political boundaries across the United States and reaching into Canada, Mexico, the Caribbean, and the Pacific Islands.

The potential range of activities concerning fish and aquatic species is extremely wide and varied requiring the FWS to focus and prioritize its activities in concert with states, tribes, and other stakeholders and partners. Three specific areas are examined here: 1) Native Species, 2) Interjurisdictional Fisheries, and 3) Aquatic Invasive Species.

Native Species

Native fish and other aquatic species not formally listed under the Endangered Species Act (ESA) are managed by the states and tribes. For the majority of aquatic species, FWS acts in a supporting role to state and tribal management agencies. Generally, FWS responsibilities with non-listed species are outlined in a fishery management plan (FMP) cooperatively prepared by the responsible management agencies and partners. The overall effectiveness of FMPs varies greatly, dependent on the species and the management agencies tasked to implement the plans. The FWS's work on native species is principally focused on: 1) maintaining diverse, self-sustaining fish and other aquatic resource populations; 2) restoring declining fish and other aquatic resource populations before they require listing under the ESA; and 3) recovering fish and other aquatic resource populations listed under the ESA. Habitat improvements, removal of fish passage barriers, reintroduction of extirpated species, development of innovative rearing techniques and the identification of hosts for imperiled mollusks are examples of tasks routinely accomplished by FWCOs and other field stations in concert with stakeholders and partners.

The scope and breadth of the FWS's challenge in conserving and recovering native species is captured in the sheer number of "species of management concern" or "trust species" for which the FWS has some form of responsibility. Such species are: 1) listed under the ESA, 2) tribal trust species, 3) reared/held in the NFHS, 4) interjurisdictional, and/or 5) present on FWS lands. In 2012, the FWS created a "priority" species list for each FWS region (see Priority Species section below).

For species listed under the ESA, the FWS, principally under direction of the Endangered Species Program, works to recover and conserve imperiled species by developing a workforce of dedicated conservation professionals, fostering partnerships, implementing innovative and effective conservation programs, and demonstrating scientific excellence. The Endangered Species Program's guiding principles are to focus on recovery, provide conservation incentives, increase public participation, ensure clear and consistent policies and implementation, make decisions based on sound science, and resolve conflicts.¹²

¹² Adapted from U.S. Fish and Wildlife Service, "Endangered & Threatened Species, Preventing Extinction... Achieving Recovery" brochure (March 2011), 4 pages.

The NFHS plays an integral role in conserving imperiled species by providing refugia for select species as one strategy to re-establish wild populations. Hatcheries within the NFHS actively manage these captive populations as part of ongoing recovery or restoration efforts as called for in a recovery plan or FMP. Similarly, FWS policy states that stocking may only be conducted as part of a recovery plan, FMP, or other formal agreement.

Priority Species. As part of the FWS's efforts to enhance strategic planning, the concept of "priority species" was introduced in 2011 based, in part, on criteria developed by the Fisheries Management Team (composed of senior FAC headquarters leadership and assistant regional directors) in 2010. Priority Species were developed by each region and were incorporated into the Fisheries Information System (FIS) in 2012. Work related to these species is tracked via performance measures. The list is provided as Exhibit D. The priority species concept provides an important tool for formulating budgets, measuring success, and communicating priorities.

"Priority species" comprise threatened and endangered species (including distinct population segments and evolutionarily significant units), species of management concern (native, non-listed), and recreational species. Designating priority species also provides for improved performance reporting and accountability for fish and aquatic resource activities. As a key component to this process, current assessment, biological status, and trend information are captured for priority species at the population level, commonly by FWCOs, ESOs, and/or refuge personnel, in order to gauge progress toward restoration and recovery. Regional priority species lists are expected to remain stable within strategic planning cycles.

The Fisheries Management Team also recommended that a list of focal species (defined as a subset of Priority Species on which to focus resources, based on ecological significance, management significance, legal mandates, and feasibility of implementing long-term, landscape-based adaptive management) be developed as part of regional strategic planning. However, subsequent to this recommendation, the FWS introduced the concept of "surrogate" species (see below).

Working with LCCs. The FWS's fish and aquatic resources conservation activities are intended to be integral to Strategic Habitat Conservation (SHC) within the LCC framework and the National Fish Habitat Partnership (see page 31). LCCs provide a forum for states, tribes, federal agencies, non-governmental organizations, universities, and other groups to work together under shared conservation goals. These applied conservation science partnerships are intended to bring together the science and technical expertise needed to support conservation planning at landscape scales.

Surrogate Species. As part of the overall effort to implement SHC at landscape scales, the FWS is currently in the process of designating "surrogate species" in order to establish biological outcomes at defined landscape scales. This concept is closely tied with the SHC approach, which entails setting measurable population objectives for selected species of fish, wildlife, or plants that will help conserve the functional landscapes that support sustainable populations. Selecting a subset of species to serve as surrogates for a broader array of biological outcomes is a practical approach that helps fulfill an important step in the biological planning component of

SHC. Selected surrogate species and targets will be used as the basis for regional conservation planning efforts within a landscape or geographic area.

The process of choosing aquatic surrogates will consider existing priority species as designated by participating agencies and programs (such as the Fisheries Program Priority Species). The resulting surrogates will represent the habitat and/or management needs of larger groups of species.

The identification of surrogate species is not intended to replace or supersede FWS trust species responsibilities. The conservation and management needs of trust species will remain unchanged and must be addressed either through the surrogate species approach or individually. If it is determined that listed or other trust species' limiting factors are not addressed with this approach, resources and effort to address them in another manner will be necessary.

Table 6. Criteria for Designating Non-listed Species as Priority Species¹³

- Statutory
 - Does the FWS have a statutory, legal, regulatory, etc. mandate, directive, etc. to work with the species? Yes or No
- State Wildlife Action Plans (SWAP)
 - Is the species identified as a 1st Tier or highest priority species in SWAPs? Yes or No
- Tribal Trust
 - Does the FWS have treaty or other obligations to work on the species? Yes or No
- Treaty (International)
 - Is Department of the Interior and/or the FWS identified as responsible party in a treaty and/or international agreement? Yes or No
- Interjurisdictional/Diadromous (where agreements exist)
 - Is the species managed by two or more entities? Yes or No
 - Does the FWS have a role identified in the management of the species? Yes or No

Interjurisdictional Fisheries

Interjurisdictional (IJ) fisheries are fish stocks whose effective management extends beyond a single agency, and across international, state, and/or tribal boundaries. For example, Pacific salmon species in the Columbia River extend across numerous states, tribes, and Canada before entering international marine waters; pallid sturgeon cross state and tribal boundaries along the Missouri River during their lifecycles; and striped bass migrate across jurisdictional boundaries on a daily basis as they traverse large rivers and estuaries. The "IJ" designation indicates the need for species management across administrative boundaries. Imposing jurisdictional boundaries upon living resources that move freely across these boundaries is a challenge. The sheer volume of legislation, court orders, and other mandates imposes overlapping authorities and complicates the definition of federal, state, and tribal roles. Conservation success requires a focused, prioritized, and coordinated effort on the part of those entities with shared fisheries management responsibilities.

¹³ Priority species include both "species of management concern" and T&E species. Criteria developed specifically for non-ESA listed "species of management concern". Meeting any one of these criteria would constitute the rationale for a priority species designation.

Given that management authority for aquatic species rests primarily with the states and tribes, the FWS has an important role in managing inland and coastal IJ species, such as striped bass, lake trout, pallid sturgeon, and Pacific salmon. The FWS provides technical expertise, assists in documenting findings, and formulates conservation strategies. As stated for native fish, FWS policy dictates the agency becoming involved in IJ fish issues only where a cooperative Fishery Management Plan (FMP) outlines a distinct set of responsibilities. Unfortunately, there are a number of inherent challenges, starting with the very definition of “interjurisdictional species.” A species can be considered an IJ species in one FWS region while the same species might be not considered an IJ species in an adjoining region. Coastal Atlantic fish species are more clearly defined and species designated as IJ are managed under the auspices of the Atlantic States Marine Fisheries Commission and various laws including the Atlantic Striped Bass Conservation Act and Anadromous Fish Conservation Act, among others.

FWS staff acknowledges the continuing challenges to building interjurisdictional management capabilities, meeting expectations by stakeholders and partners and addressing the full range of IJ species under the FWS’s responsibility. The challenge of effectively managing an IJ fish, such as the paddlefish in the Missouri River, is difficult. IJ management of the Atlantic and Pacific oceans, Great Lakes, and other offshore regions is even more complex and challenging. The United States has jurisdiction over 3.4 million square nautical miles of ocean territory in its exclusive economic zone—larger than the combined land area of all fifty states. The National Oceanic and Atmospheric Administration (NOAA) Fisheries agency plays the lead role in coordinating the United States’ activities in managing marine fisheries, though the FWS has shared and/or supporting roles in many areas. More than 55 congressional committees and subcommittees oversee some 20 federal agencies and permanent commissions in implementing at least 140 federal ocean-related statutes.¹⁴

Aquatic Invasive Species (AIS)

An increasing number of invasive plants and animals threaten native aquatic species, the ecological stability of infested waters, and the commercial, agricultural, and recreational activities dependent on those waters. Aquatic habitats are especially susceptible to aquatic invasive species (AIS) due to their interconnected nature, the high commercial and recreational traffic, and the stressed condition of many aquatic species and habitats. The ecological impact from these non-native introductions is considered second only to habitat alteration as a factor in the decline of native aquatic species in North America.¹⁵ Introductions of additional invasive species and the continued spread of established invasive species are likely to continue to compound these declines and hinder efforts to restore native species. Managing AIS is further complicated by factors associated with climate change, such as storms and floods that can lead to range shifts and new introductions.

Under the provisions of the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 and the National Invasive Species Act of 1996 (NISA), the FWS is charged with coordinating and integrating activities to prevent and control AIS. The FWS provides a national and regional coordination role of leadership and support to the Aquatic Nuisance Species Task

¹⁴ U.S. Commission on Ocean Policy, “An Ocean Blueprint for the 21st Century,” Final Report (2004).

¹⁵ Yvonne Baskin, *A Plague of Rats and Rubber Vines, the Growing Threat of Species Invasions*, Island Press (2002), page 3-4.

Force (ANSTF), and its regional panels, committees, and working groups. ANSTF's mission is to develop and implement a program to prevent introduction and dispersal of aquatic nuisance species; to monitor, control, and study such species; and to educate and inform stakeholders, partners, and the general public about the prevention and control of these species. ANSTF is co-chaired by the FWS Director and the Under Secretary of Commerce for Oceans and Atmosphere.

Historically, a wide range of actions have been used to prevent, control, and manage AIS. The FWS is drawing on this experience to develop its emerging AIS strategic plan which looks to focus on the following:¹⁶

1. Prevention –The most cost-effective and ecologically protective strategy for dealing with invasive species is to prevent them from being introduced, established, and spread within U.S. borders. The AIS program's highest priority is to proactively prevent invasive species from entering and becoming established in the U.S. The FWS plays a vital role because of its ability to prohibit the importation of species found to be injurious under 18 USC 42 of the Lacey Act. However, this process is laborious and slow and must be accelerated. Since the states and tribes have primary fish and wildlife authority within their borders, AIS program efforts must support state- and tribal-led efforts.
2. Early Detection/Rapid Response – The next highest priority is early detection of an invasive species that evades international and domestic prevention efforts, and to respond rapidly to eradicate an infestation before it becomes established within U.S. ecosystems. The tools, permits, and planning for early detection and response are key assets that need to be developed at regional and local levels.
3. Containment – If invasive species become established in an area, they may be contained within that area by controlling their outward pathways.
4. Control and mitigation – Where priority conservation goals and other societal benefits can be achieved, the FWS should provide information and tools to manage established populations of invasive species for state-led control and mitigation programs.

The FWS's AIS program, working with its stakeholders and partners, will prioritize its activities based on: 1) the strength of Federal authorities and responsibilities; 2) whether the strategies complement partners' actions and the degree and extent of support for actions; 3) whether the actions will produce measureable resource, social, and economic results; and 4) collective effectiveness to manage the risk of invasive species introduction and spread.

Direction and Priorities

The FWS directs a wide range of activities on an equally broad array of aquatic species. Habitat improvements, removal of fish passage barriers, identification of hosts for imperiled mollusks, and field monitoring to gauge success as part of adaptive management are examples of routine accomplishments. Given staff and resources limitations, however, the FWS needs to cooperatively develop and hone its list of "priority" species with stakeholders and partners to

¹⁶ U.S. Fish and Wildlife Service, "Strategic Plan for the U.S. Fish and Wildlife Service Aquatic Invasive Species Program, FY 2013 to FY 2023" (August 2012).

target limited resources and achieve conservation success. Absent a strong set of priority species and actions, the FWS will be forced to allocate a smaller and smaller share to a growing list of imperiled species. In turn, stakeholders and partners will grow increasingly disaffected. Two themes are resonant in the FWS's conservation successes to date: 1) shared responsibility with states, tribes, and other stakeholders, and 2) the need to work in partnership.

Building on the shared responsibility and partnership themes, the bulk of the FWS's aquatic species conservation work should be viewed as "interjurisdictional," as the agency must work cooperatively with states, tribes, and land managers who own the habitat or manage the resource (even in the case of species listed under ESA), as demonstrated conservation success is directly tied to cooperation. Conservation success is a collaborative and coordinated approach between the government entities that share management responsibilities. It remains clear, as it did to the 2004 and 2009 evaluation teams, that the FWS needs to focus its efforts on conserving a set of priority species as the agency lacks the resources to effectively undertake its current management operations directed at inland and anadromous fisheries, let alone broader aquatic resource issues. When marine species and fisheries are considered, the need for tightly defined roles and responsibilities is even more evident. NOAA Fisheries and the regional fisheries management councils and marine fisheries commissions all play a role in marine waters. Absent a major overhaul of legislative authority over marine and coastal waters, FWS engagement must be targeted to prevent duplicative and ineffective actions that will spread the limited resources of the agency even more thinly.

AIS is a growing issue that is much larger than the limited capacity of the FWS. While AIS is recognized as a leading cause of declining biodiversity, commensurate budgetary and programmatic commitments have not kept pace with the magnitude of this threat. The agency's efforts are targeted and thoughtful given resource realities, but its overall impact may prove to be inconsequential given the enormity of the challenge. It appears essential that through an act of strategic triage, the FWS needs to focus limited funding on such discrete activities as injurious wildlife designations, preventing new introductions, and continuing to support stakeholders and partners to implement the on-the-ground actions outlined in state, regional, and species AIS management plans.

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Goal 1: Conserve fish & other aquatic species at self-sustaining levels.

Objectives, Strategies, Activities, and Outcomes

Objective 1.1: Work with states, tribes and other stakeholders and partners to effectively co-manage interjurisdictional fish and other aquatic trust species.

- Strategy 1.1.1. With stakeholders and partners, develop list of priority species, and engage as appropriate in associated activities directed at conservation and management of those species.
 - Activity 1.1.1: Drawing principally on stakeholder/partner feedback and FWS mandates, rank existing Regional Fisheries Program Priority Species lists and coordinate key

management objectives for top-ranked species via association with relevant management plans.

- Outcome 1.1.1.1: List of priority species developed and ranked with stakeholders and partners.
 - Activity 1.1.2: Develop annual work plans in concert with stakeholders and partners for each priority species/activity on list with action items and budgets to be allocated.
 - Outcome 1.1.1.2: Annual work plans for priority species with conservation goals identified.
 - Activity 1.1.3: Align activities of FWCOs and other FWS field stations to support priority species. Non-priority activities, if present, to be re-tasked.
 - Outcome 1.1.1.3: Activities 1.1.1 and 1.1.2 incorporated into work plans of FWCOs and other field stations, as appropriate.
 - Outcome: 1.1.1.4: Performance measures for FWCOs and other field stations demonstrate contribution to management and conservation of priority species.
- Strategy 1.1.2.: Facilitate interagency coordination for implementing agreed-upon management actions for priority species identified in Objective 1.1.
 - Activity 1.2.1: Work with stakeholders and partners to task management actions.
 - Outcome 1.2.1.1: Demonstrated leadership in advancing conservation goals of priority species among stakeholders and partners.

Objective 1.2: Incorporate best science and adaptive management actions into species conservation actions.

- Strategy 1.2.1: Collaborate with partners in the development of innovative methods and technique to conserve, restore and rehabilitate aquatic species.
 - Activity 1.2.1: The FWS works with LCCs, FTCs, National Fish Habitat Partnerships (NFHPs), USGS, and other partners to develop regional priorities for cooperative management of fish and other aquatic species that address environmental stressors and other key factors.
 - Outcome 1.2.1.1: High risk aquatic systems identified that are likely to undergo substantial changes resulting from environmental stressors (e.g., water loss, climate change, invasive species).
 - Outcome: 1.2.1.2: FMPs, recovery plans and other management plans for priority species incorporate likely environmental changes resulting from climate change.

- Activity 1.2.2: The FWS works with LCCs, FTCs, FHPs, USGS, and other partners to identify unmet science and research needs.
 - Outcome: 1.2.2.1: Ranked list of priority science needs, developed with stakeholders and partners. Available funding is directed toward this ranked list.

Objective 1.3: Prevent or reduce ecological and economic impacts from aquatic invasive species (AIS).

- Strategy 1.3.1: Provide federal leadership in developing and implementing an effective nationally-coordinated AIS program, including program functions of prevention, eradication, containment, and control; and assist in planning and implementation of nationally coordinated AIS prevention, management, control and mitigation.
 - Activity 1.3.1: Provide overall coordination and assistance to federal/state/tribal AIS efforts through appropriate national and regional forums.
 - Outcome 1.3.1.1: State, tribal, and federal partnerships are fully supported through State/Interstate AIS Management Plans and Regional Panels.
 - Outcome 1.3.1.2: Information and outreach products deliver coordinated and consistent education and outreach messages that are communicated and stepped down by federal, state, and tribal agencies, and partners.
 - Outcome 1.3.1.3: An annual assessment of progress on AIS outcomes is prepared and shared with stakeholders and partners.
- Strategy 1.3.2: Utilize federal authorities to prevent AIS from entering the United States and establishing new populations, and to control impacts.
 - Activity 1.3.2: Lead efforts under Title 18 of the Lacey Act to prevent injurious wildlife and other species introductions.
 - Outcome 1.3.2.1: The introduction of new invasive, nonnative species into the United States through the organisms in trade pathway is eliminated, reflecting a “zero tolerance policy” toward invasive species.
 - Activity 1.3.3: Assist conservation partners with assessing and managing the risk of AIS spread within active pathways.
 - Outcome 1.3.3.1: The spread of invasive species, by means of recreational activities, connecting waterways, and other vectors, beyond their current range is prevented or contained.
 - Activity 1.3.4: Deploy a nationally coordinated early detection and rapid response program that is effective in meeting on-the-ground management objectives for new AIS infestations.

- Outcome 1.3.4.2: New infestations of invasive species or populations are found early in the invasion process and effectively managed.
- Activity 1.3.5: Using integrated pest management principles, develop and implement an effective, efficient and environmentally sound AIS suppression and mitigation programs.
 - Outcome 1.3.4.1: Achieve management objectives for reducing AIS population abundance as identified within approved national AIS management plans.

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Goal 2: Protect, restore, and maintain aquatic habitats.

Needs Assessment

Aquatic habitats are critical to the survival of aquatic species, while also providing significant benefits to human society. Such benefits range from clean drinking water and commercial fish landings to groundwater replenishment and flood crest moderation. Loss of aquatic habitat is consistently cited by experts as the primary cause for the reduction in biological diversity and lost environmental services. This loss is exacerbated by ecological changes associated with climate change and other global stressors, such as increasing water temperatures, severe weather events, wildfires, and chronic drought. Habitats important for aquatic species conservation and delivery of environmental services include both intact pristine systems as well as altered systems such as reservoirs, canals, and ponds that continue to provide a range of public benefits.

The FWS is involved in aquatic habitat management across the United States and, therefore, is in a strong position to facilitate habitat projects and programs. It is a principal landowner and manager of more than 150 million acres of the NWRS and 15,000 acres associated with the NFHS which collectively contain significant aquatic resources. However, the FWS must work cooperatively with the states on the majority of aquatic habitats in the United States, since the states are the primary owners and managers of the fish and wildlife that depend on aquatic habitats. Other federal agencies (e.g., BLM, USDA-Forest Service), tribal nations and private landowners also own and manage aquatic habitats critical to overall watershed and landscape health. The FWS also works with federal agencies such as Army Corps of Engineers (COE) and Bureau of Reclamation (BR) that manage water flows, and local water municipalities.

The FWS delivers funding and expertise for aquatic habitat conservation through such programs as the National Fish Habitat Partnership, Partners for Fish and Wildlife, National Fish Passage Program, and LCCs. Examples of habitat-related efforts include providing technical assistance and funding for fish passage, designating critical habitat for listed aquatic species, developing prescriptions to regulate in-stream flows as part of hydropower relicensing, and drafting aquatic components for NWRS comprehensive conservation plans. Three programs illustrate the FWS's principal roles and responsibilities in aquatic habitat conservation and management: 1) National Fish Habitat Partnership, 2) National Fish Passage Program and 3) Fish and Wildlife Conservation Offices.



Water Quality and Quantity

Water is at the very core of fish and aquatic resources. Water, quality and quantity, is central to defining aquatic habitat and in turn dictates which species can occupy which habitats. The FWS acknowledges this in their emblem, which depicts a springing mallard, jumping fish and meandering river, all within a single shield.

The challenge for the FWS in light of growing competition for water is to ensure that sufficient quantities of good quality water are available for fish, wildlife, and plants. Examples of the agency's involvement in water quality and quantity include:

- Review of federal water resource projects to address adverse impacts and help recover listed species.
- Ongoing advisory role in Clean Water Act, Section 404/ Rivers and Harbors Act, Section 10 regulating discharge of dredged and fill material in navigable watercourses and wetlands.
- Assisting U.S. Environmental Protection Agency (EPA), states, and tribes in the development and approval of water quality standards and permits under sections 303 and 402 of the Clean Water Act.
- Environmental review of Federal and non-Federal hydropower licenses, to incorporate appropriate environmental protection and enhancement measures.
- Securing, perfecting, and protecting FWS water rights for refuges, hatcheries, and research stations.
- Water resources inventory and assessment (WRIA) of water quantity and quality on FWS lands to identify needs and threats, prioritize work, and take prescriptive actions.
- Natural Resources Damage Assessment and Restoration (NRDAR) Program works with the U.S. Department of Justice and other state, tribal, and federal trustees to quantify the harm from releases of hazardous substances (e.g., oil, chemicals) to species managed for the public.
- Restoration of in-stream flows through restoration projects with private landowners and conservation groups under the Partners for Fish and Wildlife and the Fish Passage Programs.

FWS FWCOs and other field stations collect data used to define minimum environmental flows. Other federal agencies look to the FWS to help them manage water in a manner that protects the public interest, allows for economic development, and helps sustain fish and aquatic resource populations. Water resources are of paramount importance in the western United States and other regions where predictions related to climate change indicate increasing prevalence of drought conditions. River systems, such as the Colorado River face future shortages given projected demands against existing supplies. At the heart of these issues are domestic, agricultural and industrial demands, water flows and habitat requirements for listed fish and other aquatic species, recreational uses, and many other factors.

While the FWS clearly has both a keen interest and an important role in water management issues, the primary responsibility for managing water resources is widely spread among federal (e.g., Bureau of Reclamation, COE, EPA), states, tribes and private interests.

National Fish Habitat Partnership

The National Fish Habitat Partnership (NFHP) is guiding an ambitious effort to address the loss and degradation of aquatic habitats through development and support for “fish habitat partnerships” that mobilize and focus national, regional, and local support for on-the-ground conservation. More than \$35.7 million has been invested in implementing the National Fish Habitat Action Plan (NFHAP) since 2006, supporting the formation of national and regional partnerships, development of habitat condition reports, and on-the-ground projects. These projects restore in-stream and riparian habitat, remediate acidic drainage from abandoned mines, remove barriers such as culverts and old dams, and identify pristine waters for protection. Federal funds totaling \$18.9 million were directed to these on-the-ground projects that were matched in turn by \$49 million from partners. As of 2012, 18 Fish Habitat Partnerships (FHPs) have been formally recognized by the National Fish Habitat Board.

Primary leadership for guiding implementation of the NFHP is provided by states, the Association of Fish and Wildlife Agencies (AFWA), and conservation organizations. The FWS plays a vital role by supporting the National Fish Habitat Board and its operations, providing coordinators for a number of FHPs, helping to fund development and operation of FHPs, conducting habitat assessments, and providing strategic planning and project coordination.

The NFHP is founded on the principle of applying the best-available science to develop strategies and prioritize actions. All 18 recognized FHPs have developed strategic plans that link scientific assessments of habitat condition to conservation strategies and actions. The *Framework for Assessing the Nation’s Fish Habitats*, completed in October 2008, represented the first comprehensive, process-based methodology for describing the condition of all categories of fish habitats, from mountain streams to nearshore marine waters. The National Fish Habitat Assessment, completed in 2010, provides the first nationwide assessment of factors that affect all categories of fish habitat, scalable from small local watersheds to the national scale.¹⁷

With initial success and the growth in number and scope of FHPs, the challenge is to continue to build support for the NFHAP and acquire funding for its implementation. As Table 7 below illustrates, overall funding for the NFHAP has increased, but failed to keep pace with the addition of new FHPs.

Metric	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Number of FHPs	5	5	5	6	15	17	18
Total NFHP Funding	\$985,000	\$2,985,000	\$5,153,000	\$5,153,000	\$7,153,000	\$7,153,000	\$7,142,000
Total Project Funding	\$812,625	\$1,760,000	\$3,246,000	\$2,746,000	\$3,556,000	\$3,638,000	\$3,317,000
NFHAP funding / FHP	\$197,000	\$597,000	\$1,030,600	\$858,833	\$476,867	\$420,765	\$420,118
Project Funding / FHP	\$162,525	\$352,000	\$649,200	\$457,667	\$237,067	\$214,000	\$195,118

¹⁷ National Fish Habitat Board, “Through a Fish’s Eye: The Status of Fish Habitats in the United States 2010”, National Fish Habitat Action Plan, www.fishhabitat.org (2010), 68 pages.

National Fish Passage Program

An estimated 2.5 million dams, culverts, and other barriers impede passage of fish and other aquatic species. These barriers represent a leading cause for population extermination and declines, including valuable fisheries such as salmon and shad. The National Fish Passage Program (NFPP) is a voluntary, non-regulatory effort that provides financial and technical assistance to remove or bypass artificial barriers that impede the movement of fish and contribute to their decline. Since 1999, the NFPP has worked with over 700 partners on a cost-share basis to remove or bypass 950 barriers across the United States. Working with local communities and partners, the NFPP has re-opened 15,500 stream miles and 82,100 acres of wetlands for fish. Completed projects range from the removal of Edwards Dam on Maine's Kennebec River to the repair of culverts and irrigation diversions. In FY 2012, \$11 million was appropriated for the NFPP which, in turn, leveraged an average match of \$3 in partner funding for each federal dollar. The program requires a one-time match in aggregate across all FWS regions, which provides a good deal of flexibility to undertake the most important projects. In the coming years fish passage projects will be critical to help address the effects of global climate change by maintaining and restoring connectivity.

The NFPP also demonstrates the economic benefit that fish and aquatic resources and their habitats provide to communities. While enhancing aquatic resources, NFPP project funding benefits the economy. In 11 years NFPP has created an economic value of more than \$9 billion to local economies. Studies indicate the total economic impact of barrier removal to be approximately \$8,947/acre and \$535,955/mile, of river restored to natural flows.¹⁸

The FWS co-chairs a federal Fish Passage Steering Committee where federal agencies share resources and ideas to address the issues of fish passage and connectivity across the United States. To support the barrier removal process, the FWS and partners developed the Fish Passage Decision Support System (FPDSS), an on-line national inventory of barriers, with geo-spatial and quantitative tools that assists resource managers with identifying critical areas, prioritizing fish passage projects, and modeling the removal of barriers to make better decisions on the management of aquatic resources. While FPDSS and other tools have improved the ability to prioritize projects on a landscape basis, the ability of partners to pull together projects with a ready source of matching funds remains a primary attribute of NFPP projects.

Fish and Wildlife Conservation Offices and other Field Offices

Much of the FWS's on-the-ground competence is found in the network of FWCOs, ESFOs, NWRs and NFHs located across all 50 states, Puerto Rico, U.S. Virgin Islands, Samoa and other Pacific islands. The 65 FWCOs play multiple roles and serve as the local "storefront" for conservation delivery for the nation's aquatic resources. These offices serve on multi-agency species or ecosystem recovery teams, conduct annual monitoring of fishes and other aquatic organisms, as well as perform and publish original research; all requisite components to enact scientifically-based adaptive management. FWCO staff initiate, implement, and oversee projects for NFHAP, NFPP, or collaborate with the Partners for Wildlife Program with multiple federal, state, tribal, and local partners including private landowners. Many FWCOs provide assistance managing fish and wildlife to tribal nations and to the U.S. Department of Defense on military

¹⁸ U.S. Fish and Wildlife Service, "Net Worth, the Economic Value of Fisheries Conservation" (Fall 2011), 8 pages. The National Fish Passage Program at <http://www.fws.gov/fisheries/facilities/nfpp.html>.

installations. Given these varied roles, no two FWCOs are the same and emphasis for any particular role can change over time.

Collaborative prelisting efforts are a focal point for the FWCOs and other FWS field offices. Generally, FWCO's conduct research and management activities to assist in the recovery of threatened and endangered species and develop management strategies for biologically controlling aquatic nuisance species. Aquatic habitat restorations, removal of fish passage barriers, managing fisheries and their habitats, and evaluating stocking programs to develop management recommendations that maximize survival of hatchery-reared fish, habitat improvements, reintroduction of extirpated species, development of innovative rearing techniques and the identification of hosts for imperiled mollusks are routinely accomplished by FWCOs and other FWS field stations in concert with stakeholders and partners.

Unlike NOAA Fisheries Service, National Park Service or BLM, the FWS has a strong mandate to work across habitat types and land ownerships. Positive results stemming from these collaborative efforts include the recovery of the Gila trout and Atlantic coast striped bass stocks. FWS field offices assist in managing aquatic resources within the Great Lakes Basin helping to restore lake trout and lake sturgeon populations, while also working to control aquatic invasive species such as Asian carp and sea lamprey.

The diffuse nature of FWS field offices, multiple names (i.e., Fish and Wildlife Coordination Office, Fisheries Resources Office, Ecological Services, Partners for Fish and Wildlife, etc.), different program origins, and varying mandates hamper the ability to quantify the collective conservation impact of these "partnership" offices. It is clear, however, that these field offices are where the bulk of "cooperative conservation" is conducted. But this work can no longer be taken for granted.

The challenges facing FWCOs are illustrative. At the precise time that NFHP, NFPP and other aquatic habitat responsibilities are increasing, the number of FWCO FTEs (full-time equivalents) is decreasing--from 352 in FY 2004 to 302 FTEs in FY 2012. The erosion of base funding and subsequent loss of FTEs hinders the FWCO's ability to accomplish core functions (see Staffing Trends, page 54, for further discussion).

Direction and Priorities

Water quality and quantity is an essential element of aquatic habitats. Demand for limited water resources will be a growing concern, both in the arid West and increasingly throughout the country. Balancing human demands with fish and aquatic species needs will be an ever-present challenge for the FWS and its stakeholders and partners.

The FWS houses the competence to assess aquatic habitats, prioritize needs, apply sound science, and utilize innovative applications. While the FWS is not directly responsible for managing aquatic habitats (except on its own lands, e.g., NWRs and NFHs), the agency works cooperatively with a range of federal, state, tribal, and private land owners. This requires the FWS to work in a non-regulatory manner that respects the applicable culture, rights, and authorities of its different partners.

The establishment of the NFPP and NFHP are two strong examples of the FWS's commitment to aquatic habitat work. NFHP and NFPP are model programs guided by science-based tools that help prioritize projects and direct resources where they will have the most impact. The 18 FHPs have made enormous progress in assessing the condition of fish habitats on a landscape level. These assessments underpin the strategic conservation priorities of the FHPs, which in turn focus the use of available funding. Tracking the outcomes of habitat projects, especially on a cumulative basis, remains a work in progress. Continuing improvements to the Fisheries Information System (FIS), including a geo-spatial interface and a new project tracking module, promise to improve the ability to measure and communicate conservation outcomes within two-three years.

As restoring fish passage is one of the tools actively used by the FHPs, which now are organized across the country, FWS should consider whether the NFPP should be subsumed under the NFHP, thereby increasing the efficiency and impact of the combined programs in a time of constrained resources.

The number of Fish Habitat Partnerships has grown, such that all 50 states are engaged with one or more of the partnerships.¹⁹ Given its national coverage, NFHP can help to coordinate and prioritize the full range of FWS aquatic habitat projects.

The FWS field offices provide leadership in fish habitat improvement through their work with the NFHP, NFPP, and other programs. They are a leading source of technical outreach and liaison efforts in concert with states, tribes and private landowners. A strong strategic focus on cooperative programs that involve cost-share and partnerships is unlikely to succeed without the FWS maintaining its "boots on the ground" through its FWCs and other field offices. Going forward, the FWS has the opportunity to highlight the cooperative conservation value of these programs collectively, and build a greater visibility and constituency for the FWS.

As the "storefront" for aquatic habitat programs, FWCs are one of the most important delivery mechanisms for the FWS conservation mission, providing the primary staffing on the ground for NFPP, NFHP, and aquatic monitoring, and helping to bridge gaps between FHPs, Partners for Fish and Wildlife (PFW) and other FWS technical assistance programs, as well as with states, tribes and other partners. Evidence from the 2009 Fisheries Program evaluation suggests that tribes, states, and private landowners do not identify with the agency or even the program--they identify with the FWS staff they come to know, depend on, and trust.

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Goal 2: Protect, restore, and maintain aquatic habitats.

Objectives, Strategies, Activities, and Outcomes

Objective 2.1: Engage in coordinated, partnership-driven, landscape-scale efforts to leverage FWS capabilities and achieve measurable aquatic habitat conservation results.

¹⁹ Island territories are not yet engaged with NFHP.

- Strategy 2.1.1: Ensure mission and goals of the National Fish Habitat Action Plan (NFHAP) form the foundation for FWS fish and aquatic resource conservation actions.
 - Activity 2.1.1: Issue policy guidance encouraging all FWS aquatic habitat programs to consider the priorities of Fish Habitat Partnerships when funding and implementing projects.
 - Outcome 2.1.1.1: Improved implementation of NFHAP through decreased redundancy and increased delivery effectiveness.
 - Outcome 2.1.1.2: FWCs and other FWS field offices conduct projects that address priorities of Fish Habitat Partnerships.
 - Outcome 2.1.1.3: Stronger and more diverse community of support for FWS and NFHP aquatic habitat programs.
- Strategy 2.1.2: Provide national and regional coordination and joint leadership of fish habitat conservation efforts.
 - Activity 2.1.2: Support Fish Habitat Partnerships as an effective approach to implement a regional framework for strategic aquatic habitat conservation.
 - Outcome 2.1.2.1: Important aquatic habitats receive coordinated planning and evaluation that engages all potential partners in a professionally facilitated process.
 - Outcome 2.1.2.2: Significant progress made toward achieving goals and objectives of the National Fish Habitat Action Plan (as updated).
 - Activity 2.1.3: Advance the science needed to empower strategic aquatic habitat conservation action, and on-the ground fish habitat conservation projects by leveraging assets of LCCs, Joint Ventures and FHPs.
 - Outcome 2.1.3.1: Science-based tools in place that allow strategic priorities to be better targeted, including linkage of aquatic and terrestrial landscape processes and conservation priorities.
 - Outcome 2.1.3.2: Habitat restoration and protection plans and actions incorporate climate change assessment information.
 - Activity 2.1.4: Improve coordination among FWS resource programs (e.g. Endangered Species, Migratory Birds) to identify shared aquatic resource needs and opportunities.
 - Outcome 2.1.4.1: Reduced compartmentalization among FWS habitat programs and increased NWRS participation in the NFHP at the national and regional levels.
 - Outcome 2.1.4.2: Demonstrated collaboration between regional Fish Habitat Partnerships and the NFPP, PFW, Coastal Program, relevant LCCs, and other

FWS habitat programs at the national and regional level to identify priorities and resources for projects of mutual interest.

- Strategy 2.1.3: Assess and communicate the natural resource, economic, and cultural benefits of aquatic resource conservation.
 - Activity 2.1.5: Develop and use tools to better assess the social and economic benefits of aquatic habitat conservation and restoration.
 - Outcome 2.1.5.1: Effective and consistent communication of aquatic habitat conservation and restoration needs, projects, and outcomes to decision and policy-makers and the public.

Objective 2.2: Protect intact aquatic habitats and restore degraded aquatic habitats in partnership with state, tribal, private and other federal landowners.

- Strategy 2.2.1: Utilize FWCOs and other FWS field offices to cooperatively engage landowners in protecting intact aquatic habitats.
 - Activity 2.2.1: Provide “one-stop” shopping for landowners to utilize the full range of available technical assistance and grant programs directed at protection and restoration of aquatic habitats (e.g., Partners for Fish and Wildlife, USDA-Farm Bill, etc.).
 - Outcome 2.2.1.1: FWCOs, NWRs, other FWS field offices, and programs provide technical assistance and other support for identified priority habitat projects in concert with stakeholders, partners, and private landowners.
 - Outcome: FWS Field offices recognized as essential resources for aquatic habitat protection and restoration.
 - Activity 2.2.2: Provide technical and funding assistance to stakeholders and partners resulting in the elimination of existing barriers that inhibit movement of fish and aquatic species.
 - Outcome 2.2.2.1: Priority fish passage barriers removed and access to blocked habitats restored.

Objective 2.3. Use best available science and continually work to improve its application and efficiency for protection and restoration of aquatic habitats.

- Strategy: 2.3.1: Continue to develop, refine, and maintain expertise in fish ecology and aquatic habitat assessment, protection, and restoration (e.g., hydrology, geomorphology, engineering, project management, GIS, etc.).
 - Activity 2.3.1: Work with LCCs, FHPs, USGS, and other partners to develop shared priorities and share information for habitat restoration or other management activities.

- Outcome 2.3.1.1: Increased use of adaptive management and continuous improvement in the delivery of fish and aquatic resource conservation programs.
 - Outcome 2.3.1.2: Scientific and technical capability to identify, assess, and prioritize fish passage projects in place, and available throughout U.S.
 - Outcome 2.3.1.3: Habitat restoration and protection plans and actions are informed by climate change assessment information.
- Activity 2.3.2: Collaborate with LCCs, USGS, and other partners to refine assessment tools that determine effectiveness of conservation actions and better understand, track and predict climate change impacts on aquatic resources.
 - Outcome 2.3.2.1: Project proponents able to assess effectiveness and economic benefits of their conservation actions.
 - Outcome 2.3.2.2: Increased understanding of physical process changes (hydrology, sediment transport, etc.) and the resulting impact on aquatic species and their habitats.
 - Outcome 2.3.2.3: Increased capacity to manage landscapes, species, and their habits in response to short- and long-term environmental change.

Objective 2.4. Effectively communicate the natural resource, economic, and cultural benefits of aquatic resource conservation.

- Strategy 2.4.1: Implement a national strategy for communicating the natural resource, economic, and cultural benefits of aquatic resource conservation.
 - Activity 2.4.1: Develop tools to better frame and communicate the social and economic benefits of aquatic habitat conservation and restoration.
 - Outcome 2.4.1.1: Environmental, social and economic benefits routinely communicated to stakeholders and partners, elected officials, and the general public.
 - Outcome 2.4.1.2: Increased public support for securing the fiscal resources necessary for aquatic resource conservation.

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Goal 3: Meet tribal and other trust responsibilities.

Needs Assessment

Tribal Nations manage aquatic resources and habitats on 56 million acres of tribal trust lands and 44 million acres of Alaska Native lands. In addition, in the Great Lakes and Pacific Northwest regions, tribes are guaranteed hunting, fishing, and gathering rights to large areas outside of their reservations. Collectively, these lands encompass valuable fish and aquatic habitats that support

flora and fauna that are integral to the overall sustainability and well-being of tribal communities and therefore, the United States.

Tribes set management goals and priorities that recognize an interdependence with, and reliance upon, natural resources to meet the underlying values and life ways that are at the heart of their societies. Depending on particular needs and circumstances, tribal natural resource management programs are designed to help meet spiritual, cultural, medicinal, subsistence, and economic needs of the communities they serve. Despite continuing challenges and unmet needs, tribal natural resource management programs are based upon a foundation of culturally-appropriate principles, as well as upon sound biology and science that integrate traditional ecological knowledge. The benefits of tribal natural resource management programs extend beyond tribal boundaries, providing significant recreational, economic, and other opportunities.

The United States and tribes enjoy a government-to-government relationship grounded in the Constitution and in various other laws and court decisions. All three branches of the federal government recognize that this unique relationship involves specific treaty and statutory obligations and an overall fiduciary obligation – a trust responsibility – toward tribes. Within this relationship, the federal government’s policy for many years has been to recognize tribal natural resource use and management rights as well as to support tribal self-determination and self-governance with respect to natural resource management programs.

Accordingly, the FWS recognizes tribal nations as valuable stakeholders in conserving and enhancing the nation’s fisheries and aquatic resources. The agency also recognizes its responsibility to fulfill treaty promises, to protect tribal treaty and trust assets, and to interact directly with tribes as governments, not merely as a segment of the public or a “special interest.” As a result, the FWS has the responsibility to consult with tribal governments and their designated governmental representatives before taking actions that may affect tribal lands, resources, people, treaty rights, or other reserved rights.

From the tribal perspective, some of the challenges and opportunities the FWS faces in meeting tribal treaty obligations and trust responsibilities include:

- At present, the federal government recognizes 566 tribal nations. Of these, the FWS estimates that it provides a wide range of services and assistance to more than 200 tribes regarding the management of tribal lands and treaty/traditional use areas. Each tribe and each set of specific treaty obligations represents a unique set of fisheries-related responsibilities and interests. In addition, there is the ongoing challenge of distinguishing the appropriate FWS role given the various roles of the Bureau of Indian Affairs and other federal programs.
- Generally, the FWS does not have dedicated tribal funding. As a result, it is an ongoing challenge to identify funds the agency can dedicate to meeting its responsibilities to tribes.
- Fish and aquatic resource problems, particularly habitat degradation, may disproportionately impact tribal communities. The right to fish is of little value to tribes if there are insufficient resources, or if the resources are degraded or contaminated to the extent that tribal members are not able to use them to meet subsistence, cultural,

medicinal, and spiritual needs. As accelerating habitat loss and climate change continue to exacerbate these threats, the traditions and the culture of these communities are increasingly at risk. The essence of a constitutionally recognized right to fish is not fulfilled by a catch-and-release fishery.

- In many instances, tribal authority is exercised over natural resources or in geographic areas that also are subject to the authority of other governments – federal, state, or foreign. Thus, the coordination of tribal authority with other agencies is a necessary ingredient for the protection and restoration of fisheries and aquatic resources.
- Tribal lands have become fragmented due to the Allotment Act (Dawes Act) complicating aquatic resource management within tribal boundaries.
- Tribal natural resource management programs are particularly vulnerable to budget reductions or reallocation of federal funds to non-tribal programs. The loss of what might be considered a small amount of funding to others could be a large percentage of a particular tribal program and simply amount to *de facto* elimination of that program. This could undermine treaty and other obligations that guarantee tribal nation self-determination and self-governance, as well as the obligations that many tribal nations must fulfill under particular court decisions or statutory schemes. It also could deprive the broader public of the benefits derived from the tribal programs that extend beyond tribal communities.
- There are significant overall public benefits in ensuring that tribal natural resource management programs are supported and enhanced. Fishery and aquatic resource protection and restoration present “same side of the fence” issues for tribal, federal, state, and local governments, as well as for non-governmental entities. If tribal governments fulfill their responsibilities toward their people, the broader community benefits from the resulting conservation and stewardship. And, cooperation between tribal nations and others builds relationships and alleviates problems/disputes associated with the federal/state/tribal jurisdictional maze.
- Fish and aquatic habitat management decisions must take into account the consumption patterns and risk exposures of tribal members who engage in subsistence lifestyles, who use natural resources for medicine and in ceremonies, and whose livelihoods are based upon natural resources. Tribal indigenous or traditional ecological knowledge offers a wealth of information that can enhance overall management efforts by all authorities.
- The duty to consult with tribes on decisions that may affect their rights, responsibilities, or natural resources presents many practical problems in terms of process and timing. Both the FWS and tribes face governmental capacity issues that inhibit sufficient and meaningful consultation before decisions are made and as they are implemented. The struggle to define and carry out an efficient yet effective consultative process on the myriad of decisions and actions taken by the FWS that may affect tribes has been a struggle for both the FWS and for tribes.

Direction and Priorities

The federal government has a special relationship with, and responsibility to, Native American governments. The FWS has an inherent responsibility to fulfill treaty promises, to protect tribal treaty and trust assets, and to interact directly with tribes as governments, not merely as “partners.” While it is tempting to view the more than 200 tribes that the agency works with as a

single homogeneous entity, they represent individual sovereign entities and, as such, represent the FWS's largest set of stakeholders by number of entities.

Given limited resources and multiple mandates, the FWS works to balance its obligations toward tribes with its obligations toward other stakeholders and partners. Many FWS's activities are region-specific, depending on the number of tribes involved and the particular rights or interests at stake. The 2009 evaluation found the majority of reported accomplishments and successes attributable to the particular commitment, attitude, and dedication of the FWS/Fisheries Program personnel involved.

Given its trust responsibility, FWS will continue to proactively consult with tribes on agency decisions or activities that may affect tribes or their rights, interests, and responsibilities. Historically, FWS has played a vital role in working to advance and protect tribal rights and interests in relationships and interactions with non-tribal stakeholders – that role needs to continue. In the future, FWS should seek to implement a more proactive consensus-based process with tribes to identify treaty and trust obligations, and to develop programs and take actions to meet those obligations. At the national level, FWS should consider implementing a tribal advisory body that supports government-to-government consultation and assists FWS in developing policies, programs, and activities designed to meet tribal treaty and trust obligations. Tribal input is an often missing element in cooperative conservation programs, ranging from FHPs to LLCs. Such an advisory body could facilitate tribal participation in inter-governmental partnerships and arrangements in areas of jurisdictional overlap or other shared interests among multiple stakeholders.

At the regional level, FWS will be expected to continue to deliver agreed-upon tribal trust services through FWCO's, NFHs, and other agency programs. This includes providing fish as part of recovery plans for listed species, in support of sustainable fisheries management, and for trust species and ongoing programs to enhance fishing on tribal lands and in treaty ceded areas.

As a result of tribal trust responsibilities and in recognition of the importance of tribal lands aquatic resources, FWS provides technical and other forms of assistance to tribes through FWCOs and other agency programs. FWS will continue to share expertise, technology, personnel and other assets with tribes to help carry out activities to meet tribal needs and priorities. This includes continuing to fund quality proposals under the FWS Tribal Wildlife Grants Program.

Lastly, FWS needs to continue its ongoing efforts to ensure FWS staff are trained in tribal history and culture, and versed in tribal treaty obligations and trust responsibilities. This interest extends to requiring relevant experience and training as a qualification for any position within the FWS that has responsibility toward tribes.

Goal 3: Meet tribal and other trust responsibilities.

Objectives, Strategies, Activities, and Outcomes

Objective 3.1: Implement a consensus-based process with tribes to identify treaty and trust obligations, and develop programs and take actions to meet those obligations.

- Strategy 3.1.1: FWS policies, programs, and activities facilitate agreement between tribes and the FWS on tribal aquatic resource needs and priorities.
 - Activity 3.1.1: At the national level, implement a tribal advisory body that supports (but does not supplant government-to-government consultation) and assists the FWS in developing policies, programs, and activities designed to meet tribal treaty and trust obligations.
 - Outcome 3.1.1.1: Establishment of a tribal advisory council.
 - Activity 3.1.2: At the regional and local level, proactively communicate with tribes and relevant tribal agencies to maintain a general relationship as well as to consult on particular matters.
 - Outcome 3.1.2.1: Routine meetings with tribes leading to an understanding of what services the tribes need that the FWS may be able to provide.
 - Outcome 3.1.2.2: Database of current tribal leadership and natural resource management personnel is created and maintained to assist with communication and consultation.
 - Activity 3.1.3: Maintain tribal liaisons at the national and regional levels to facilitate communication and consultation with tribes, as well as to facilitate communication and interactions between appropriate agency and tribal counterparts on particular matters.
 - Outcome 3.1.3.1: Tribal liaisons effectively promote greater communication and consultation with tribes without supplanting resource staff communicating directly with tribes as appropriate and required.
- Strategy 3.1.2: Proactively consult with tribes on agency decisions or activities that may affect tribes or their rights, interests and responsibilities.
 - Activity 3.1.4: Strive to reach consensus through government-to-government consultation by facilitating tribal participation at all stages of agency decision-making processes.
 - Outcome 3.1.4.1: Tribal information and involvement taken into account in analyzing the effects of proposed decisions or actions and ultimately in making the decisions.
 - Outcome 3.1.4.2: Disputes or disagreements resolved by good-faith discussions between appropriate agency and tribal representatives before implementation of the proposed decision or action.
- Strategy 3.1.3: Work to advance and protect tribal rights and interests in relationships and interactions with non-tribal stakeholders.
 - Activity 3.1.5: Ensure that other stakeholders are informed about tribal rights and interests that might be implicated.
 - Outcome 3.1.5.1: The FWS facilitates communication and consultation between tribes and other stakeholders on decisions or actions that may affect tribal rights or interests, and is prepared to facilitate these interactions as appropriate.

- Strategy 3.1.4: Deliver tribal trust services through FWCOs, hatcheries and other agency programs.
 - Activity 3.1.6: Provide fish and other hatchery products as part of recovery plans and other agreements. Undertake aquatic resource conservation, monitoring, research, and enhancement activities consistent with the needs and priorities jointly identified by the FWS and affected tribes.
 - Outcome 3.1.6.1: Agreed-upon fish and other tribal trust resources are provided by the FWS to tribes.

Objective 3.2: Facilitate tribal participation in inter-governmental partnerships and arrangements in areas of jurisdictional overlap or other shared interests among multiple stakeholders.

- Strategy 3.2.1: Facilitate and support the opportunity for affected tribes to participate as a member of inter-governmental bodies or other multiple-stakeholder partnerships (such as LCCs) that implicate tribal rights or interests in the aquatic resources involved.
 - Activity 3.2.1: FWS documents or by-laws recognize affected tribes as eligible members of the entity involved, and provide funding to enable participation as appropriate.
 - Outcome 3.2.1.1: Increased tribal participation as members of inter-governmental bodies or other multiple-stakeholder partnerships. In the absence of direct participation, demonstrated efforts by participants to consider tribal rights and interests.

Objective 3.3: Support and enhance tribal aquatic resource management capacity.

- Strategy 3.3.1: Provide aquatic resource management technical and other forms of assistance to tribes through FWCOs and other agency programs.
 - Activity 3.3.1: Share expertise, technology, personnel and other assets with tribes to help carry out activities to meet tribal needs and priorities.
 - Outcome 3.3.1.1: Tribes receive training, education, and professional development opportunities for tribal aquatic resource management personnel.
 - Outcome 3.3.1.2: Tribes develop successful hatchery operations, maintain healthy hatchery fish, and develop sound hatchery operating procedures.
- Strategy 3.3.2: Support education, training, and career development opportunities that encourage Native Americans to serve as aquatic resource management professionals.
 - Activity 3.3.2: Assist in developing outreach and education activities directed toward Native American youth that are designed to encourage careers in science, technology, and natural resource management.

- Outcome 3.3.2.1: Tribal internship opportunities in aquatic resource areas are implemented and expanded.
 - Outcome 3.3.2.2: Programs, internships or other arrangements with colleges, universities, and other institutions provide expanded opportunities for Native American students to gain experience in aquatic resource management.²⁰
 - Outcome 3.3.2.3: Native American professionals are recruited to work at the FWS and other stakeholder and partner organizations.
- Strategy 3.3.3: Provide grants and other funding for tribal aquatic resource management programs and projects.
 - Activity 3.3.3: Assist tribes in identifying funding opportunities within the FWS and elsewhere.
 - Outcome 3.3.3.1: Continued funding of quality proposals under the FWS Tribal Wildlife Grants Program.
 - Outcome 3.3.3.2: The FWS and other agencies provide increased funding allocations for tribes.
 - Activity 3.3.4: Strategize with tribes about possible funding opportunities that would be available through statutory amendments to existing programs.
 - Outcome 3.3.4.1: The FWS convenes a forum with tribes to examine avenues for new or expanded funding opportunities for tribes.

Objective 3.4: Ensure FWS staff are trained in tribal history and culture, and versed in tribal treaty obligations and trust responsibilities.

- Strategy 3.4.1: Ensure that FWS staff responsible for working with tribes are trained and qualified to do so.
 - Activity 3.4.1: Require relevant experience and training as a qualification for any position within the FWS that has responsibility toward tribes.
 - Outcome 3.4.1.1: Appropriate FWS personnel are trained on tribal history and culture that addresses integrating Traditional Ecological Knowledge (TEK) into planning, federal laws, and policies related to tribal treaty obligations and trust responsibilities, and cultural sensitivity.
 - Outcome 3.4.1.2: FWS job requirements and position descriptions are revised to include this qualification.
 - Activity 3.4.2: Identify and encourage opportunities for FWS leadership and staff to interact with tribal leadership and staff.
 - Outcome 3.4.2.1: Currently successful events, such as the annual Partners Fishing Outing in Region 5, are built upon in other regions.

²⁰ An example of other programs include the American Fisheries Society's Hutton Program, a paid internship for high school students to get an introduction to and experience in aquatic resource management.

- Outcome 3.4.2.2: FWS personnel attend events in tribal communities, such as pow-wows, youth events, and other gatherings

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Goal 4: Promote recreational fishing and other public uses and enjoyment of aquatic resources.

Needs Assessment

The FWS plays an integral role in providing for public use and enjoyment of America's outdoors and natural resources. For example, the FWS provides support for "world class" public use and recreational opportunities on its NWR lands, welcoming more than 45 million visitors each year who participate in a wide variety of outdoor activities, including recreational fishing.

Recreational fishing remains one of America's most popular outdoor pastimes. An estimated 37.4 million anglers went fishing in 2011, generating \$89.8 billion in expenditures across the country.²¹ Fishing is considered a "gateway" activity leading to involvement in other outdoor activities such as boating.²² Recreational anglers and others generate hundreds of millions of dollars in excise taxes each year (\$349.8 million apportioned to states and territories in FY 2012) that return to states and local communities through the Sport Fish Restoration Program to fund sport fishing, boating, and aquatic resource conservation activities.²³ Recreational fishing opportunities are available on more than 270 of the 540 National Wildlife Refuges.

The FWS's NFHS hatcheries propagate and/or offer refugia to more than 139 species. The NFHS is also responsible for providing fishery mitigation programs arising from the loss of certain recreational and commercial fisheries as a result of the construction of federal locks and dams. Twenty-nine of the 72 NFHs are solely or partially dedicated to the production of fish for mitigation stockings.

The FWS supports public use in a number of ways, including its species and habitat conservation efforts addressed elsewhere in this strategic vision. Three principal activities addressing public use are 1) recreational fishing, 2) fisheries mitigation services in support of recreational fishing, and 3) public education and outreach. The NFHS has an important role in each of these activities.

Recreational Fishing

In 1871 Congress established the U.S. Fish Commission, the precursor of the FWS. Throughout much of its history the FWS has been viewed as the federal entity primarily responsible for supporting recreational fishing, although this has changed over the last half century with creation of the NOAA Fisheries Service in the early 1960s, which now has the major federal role in marine fisheries, and with development of state fisheries management programs with the

²¹ U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau. *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (2012), p. 7.

²² Recreational Boating and Fishing Foundation and The Outdoor Foundation, "Special Report on Fishing and Boating" (2012), page 6.

²³ U.S. Fish and Wildlife Service, Wildlife & Sport Fish Restoration Program, <http://wsfrprograms.fws.gov>

assistance of the FWS's Federal Aid in Sport Fish Restoration Program. In 1995, Executive Order 12962 directed federal agencies to compensate for recreational fishing opportunities lost as a result of agency actions; it directed all federal agencies to improve recreational fisheries and "aggressively work to identify and minimize conflicts between recreational fisheries and their respective responsibilities under the ESA." The executive order also stated that "federal agencies shall, to the extent permitted by law and where practicable, and in cooperation with states and tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities."

As stated in the Mandates for Fish and Aquatic Conservation (page 11), the FWS conducts its program responsibilities under a broad set of authorities handed down in legislation, treaties, and the like. For recreational fishing, in addition to fulfilling the directions of Executive Order 12962, the FWS has the responsibility to stock recreational fish species into selected water courses as mitigation for federal water projects. These species have traditionally been cold water fishes such as rainbow trout and other species judged well-suited and appropriate for rearing, stocking, and angler satisfaction. These often non-native recreational fish are important economic drivers for states and tribes, many of which manage these populations as "wild" self-sustaining stocks. Concurrently, the FWS has a responsibility for conservation of native species, particularly when they are listed under the ESA. Historically, the widespread and often indiscriminate stocking of non-native fish was cited as a factor in the decline of native species. However, today, the recreational value of some imperiled native fish is commonly cited as a prime reason for restoring the imperiled species, as illustrated by Gila, Apache, and Greenback trout. The FWS plays a critical role in bringing leadership, science, and practicality to the table in the debates surrounding native and non-native recreational fisheries.

Successful fish and aquatic species conservation in the United States is directly linked to the support and contributions of recreational anglers. The Dingell-Johnson/Wallop-Breaux Sport Fish Restoration program (SFR) is a prime example. Considered one of the nation's hallmark conservation efforts, SFR utilizes a user pays-public benefits approach with funds allocated to states based on the number of fishing licenses sold and the state's land area. For the period 1952-2012, more than \$7.3 billion (\$11 billion in inflation-adjusted dollars) has been distributed to states and matched by partners under the SFR. In 2012 alone, a total of \$249.8 million was distributed to the states. The SFR is funded by excise taxes paid by the sportfishing manufacturing industry and motorboat and small engine fuel taxes. These excise taxes are passed on to anglers and boaters and paid into the dedicated SFR fund, which is administered by the FWS's Wildlife and Sport Fish Restoration Program (WSFR). In 1984, the Wallop-Breaux amendments to the Federal Aid in Sport Fish Restoration Act greatly increased funds available to state fishery agencies for research and management of recreational fisheries. This allowed the states to provide support necessary to meet the growing demands for fishing opportunities. The program's contribution to on-the-ground projects makes it a significant part of the FWS's fish and aquatic resource conservation efforts.

Table 8 provides selected metrics for recreational fishing and the NFHS which help give a sense of the scope of the NFHS's support of fishery resources. In 2010, the NFHS stocking program generated 13.5 million angler days, \$554 million in retail sales, \$903 million in industry output, and supported 8,000 jobs. This translated into \$256 million in wages, \$37 million in federal tax

revenues, and \$35 million in local tax revenues. Nine NFHs in the southeastern US expend approximately \$5 million annually to stock 15 species of fish in 12 different states. These stockings generated over 3.2 million angler days of fishing effort, \$239 million in total economic output, 3,100 jobs with incomes totaling \$63 million, and \$14.0 million in state and federal taxes.²⁴ In the southwestern United States, a total of \$19 was generated in retail sales for every dollar spent to rear trout at Alchesay-Williams Creek NFH and release them on tribal lands.²⁵

Metric	FY 08	FY 09	FY 10	FY 11	FY 12
Stocking and transfer events in support of recreational fishing.*	4054/461	4423/529	4136/534	4439/522	3785/308
Fish Number (Millions)	124.5	144.8	150.1	144.4	170.4
Fish Weight (Million Pounds)	4.9	5.5	4.9	5.2	5.3
Eggs (Millions)	188.5	260.4	197.2	106.4	73.4

Fisheries Mitigation Services

The FWS is involved in fisheries mitigation services as a result of being the designated agency for providing mitigation for selected federal water projects and the expertise of its NFHS in efficiently and economically providing quality fisheries products.

The approach to mitigating lost fisheries and highly altered aquatic habitats that have been adversely impacted by federal water development projects has been, and continues to be, a topic that often turns to arguments about “native” versus “non-native” fish. Regardless of this debate’s merits, the simple fact is that the activity is not a discretionary activity for the FWS, but mandated by law in site-specific agreements. The FWS has the responsibility to provide disease-free, genetically-sound and efficiently produced mitigation products. For example, 1.1 million Chinook salmon smolts from the Carson NFH are provided annually to help to sustain a recreational fishery in the Columbia River as mitigation for impacts from construction of the Bonneville Dam.

A significant portion of the NFHS budget goes to producing fish for mitigation. The FY 2012 hatchery operations and maintenance budget was \$63.3million, and annual reimbursable mitigation costs were estimated at \$26.9 million, while actual reimbursement was approximately \$24 million. The FWS is forced to cover unreimbursed costs from its general operations budget. As a result of FWS efforts to negotiate with responsible parties, the FY 2012 gap of \$2.9 million is a substantial improvement on past deficits that have approached \$17 million. It was the conclusion of the 2005-09 Evaluation that the FWS’s mitigation activities on behalf of other responsible federal agencies and water beneficiaries should not be a drain on other fish and aquatic conservation activities.

Outreach and Education

²⁴ James Caudill, “Economic Effects of Rainbow Trout Production by the National Fish Hatchery System based on The Economic Effects of Rainbow Trout Stocking by Fish and Wildlife Service Hatcheries in FY 2004,” U.S. Fish and Wildlife Service, Division of Economics, Arlington, Virginia (December, 2005).

²⁵ James Caudill, “The Economic Effects of the Recreational Use of Alchesay-Williams Creek National Fish Hatchery 2004,” U.S. Fish and Wildlife Service, Division of Economics, Arlington, Virginia (2006).

America's youth are increasingly isolated from the outdoors, as Richard Louv and others have eloquently documented.²⁶ Youth involvement is a cornerstone of President Obama's *America's Great Outdoors* initiative. The Department of the Interior and FWS have responded to this challenge by establishing an Office of Youth in Natural Resources and developing targeted campaigns, such as *Youth in the Great Outdoors* (YGO) which seeks to develop the next generation of conservation and community leaders through its engage, educate, and employ strategies. In FY 2012, FWS's *Let's Move Outside* initiative engaged millions of families and children in outdoor activities such as agency projects, trails events, and other learning opportunities; 1.5 million young people participated in FWS environmental education programs, increasing environmental literacy, and providing opportunities to practice natural and cultural resource stewardship on public lands; and the FWS employed 3,573 youth (ages 15 – 25) either directly or through partnerships with nonprofit organizations (a 71% increase over the 2009 baseline).²⁷

Within the FWS, the National Conservation and Training Center (NCTC) and other programs are dedicating energy and resources to these efforts. Public outreach and education have been a part of the NWRs and the NFHS, particularly where facilities are proximal to metropolitan areas. These refuges and hatcheries represent important opportunities for engagements between the public and the FWS. For example, it is not uncommon that a child has his or her first fishing experience at a refuge or hatchery-sponsored fishing event. The number and range of programs and events sponsored by the FWS through its facilities is impressive. Field stations conduct hundreds of events each year with support of volunteers and local community support with little or no dedicated funding. Volunteers provided over 2.15 million hours of service at NWRs and nearly 130,000 hours at NFHs, FTCs and other fisheries program facilities in FY 2012.

NWRs and NFHs provide outstanding opportunities as places of discovery, and as outdoor classrooms for teaching a range of topics, from limnology and ichthyology to plein-air painting and literature. Over 49 million people visited a NWR or NFH in 2012, yet these facilities are too often under-utilized as platforms of discovery and education when compared with their potential. There are currently 30 Fisheries groups representing NFHs in all FWS regions except Alaska. These volunteer organizations support NFHs, FWCOS, and Fish Health and Fish Technology Centers, similar to how NWR Friends organizations work with FWS refuges. While each group operates somewhat individually, all provide volunteer labor; work to organize, sponsor and run community events such as open houses and fishing derbies; provide educational opportunities for the public, often with the focus on children; and assist with other outreach programs that promote aquatic resource conservation. Public outreach activities also offer increasingly important opportunities to educate the public about climate change, invasive species, and the projected impacts to recreational fishing and aquatic habitat.

Direction and Priorities

The FWS has a continuing role in meeting the public's expectation for use and enjoyment of fish and aquatic resources. The FWS supports and promotes public use in many ways—by its actions on behalf of aquatic species and habitats (see Goals 1 and 2, pages 20 and 29, respectively), the

²⁶ Richard Louv, *Last Child in the Woods, Saving Our Children from Nature-deficit Disorder*, Algonquin Books of Chapel Hill (2008), 390 pages.

²⁷ U.S. Fish and Wildlife Service, *Youth in the Great Outdoors, 2012 Annual Report*, page 3.

aquatic resource products produced by the NFHS, the recreational opportunities on its NWRs, and by its efforts to get children outdoors.

An estimated 14 percent of the American public participates in recreational fishing.²⁸ The FWS and its partners need to more proactively translate the magnitude of the positive impact of these anglers to the broader public. Through excise taxes, license fees, and other economic activity, the recreational angler pays for a disproportionately large share of fish and aquatic resources management. The first audience necessary to impress with this impact are the anglers themselves, who often do not recognize the economic contributions they are making to the economy and to aquatic resource conservation. Equally often, anglers fail to recognize the return on investment they receive for buying a fishing license and purchasing equipment that pays excise taxes into the SFR Program. The FWS needs to assume direct responsibility to better communicate the economic and conservation benefits of fish and aquatic resources.

In addition to the positive economic impact of the SFR, Hurricane Irene (2012) and other natural events have demonstrated the benefits of fish-friendly culverts and other aquatic-related actions that minimize economic losses by preventing flood damage to roads and other infrastructure.

Active promotion and support of the SFR program is essential as the program is funded by excise taxes on fishing equipment, motorboat and small engine fuels, and import duties. State and federal conservation agencies, therefore, all have a direct tie to promoting responsible use of aquatic resources. Recreational fishing has also been shown to be a “gateway” activity leading to involvement in other outdoor activities--75% of fishing enthusiasts participate in multiple outdoor activities.²⁹ Recreation anglers generated \$1.45 billion in 2010 alone for fish conservation and management, putting an exclamation point on this unique relationship.³⁰

The FWS has unequalled expertise in the culture of aquatic species, nested within the NFHS, FWCOs and science facilities. Historically, most attention was paid to important sport and commercial fish species, but increasingly the agency has extended its efforts to restoring native species and recovering listed species. For example, the NFHS is a vital contributor to endangered species recovery, a place of research and innovation for aquaculture, efficient supplier of sport fish for systems otherwise unable to sustain recreational fisheries, and a system primed to contribute substantially to aquatic education and outreach. Like NWRs, NFHS are tremendous assets that citizens can visit to see tangible activities directed at conservation, recreation, and environmental services. The FWS and its partners need to feature refuges and hatcheries as part of branding for fish and aquatic conservation within the FWS.

The FWS has increased its efforts to receive reimbursement for the mitigation services it performs on behalf of other responsible parties. The FWS’s efforts to negotiate payment of these reimbursable obligations have helped narrow the gap but without constant prodding and/or direct

²⁸ 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, U.S. Department of the Interior, U.S. Fish and Wildlife Service, and U.S. Department of Commerce, U.S. Census Bureau, p. 8-19.

²⁹ Recreational Boating & Fishing Foundation and the Outdoor Foundation, “Special Report on Fishing and Boating, 2009,” (2009), page 4.

³⁰ American Sportfishing Association, “Sportfishing in America, an Economic force for Conservation” (January 2013), page 3.

authorizations, other responsible parties likely be content to have the FWS bear their monetary obligation in full or in part. In this time of ever-tightening budgets, the FWS must strive for 100% reimbursement to ensure that essential NFHS functions are achieved, but at limited cost to the agency and other fisheries program priorities.

In order to meet the needs of a changing social and economic climate, the FWS has undertaken a comprehensive hatchery and workforce analysis in 2013 to ensure more efficient and effective operation of the system as it moves into the future. The analysis focuses on its 70 propagation hatcheries that was prompted primarily by increasing annual deficits (shortfalls in funding for hatchery operations and maintenance). Regarding mitigation work related to federal water projects, the FWS has stated that it will continue its mitigation fish production programs, proportionally, when reimbursed by the responsible project agency.

Public involvement and support is crucial in the face of declining federal appropriations that support fisheries and aquatic resource programs. It is more necessary than ever to educate and inform/communicate to all segments of the public that recreational fishing and other aquatic resource public uses are not only great recreational and educational opportunities, but are important components of resource conservation and provide direct economic benefits. It is central to the issue of healthy lifestyles, and it is central to addressing change, including global climate change and diminishing water resources. While challenging, FWS needs updated communication tools capable of shaping and delivering materials and messaging that is interesting and compelling to today's public, especially youth and the changing minority demographics.

Thousands of volunteers provide invaluable service to FWS facilities. Staffing visitor centers, acting as docents, and assisting with monitoring, research, and ongoing aquatic resource management activities, these volunteers are increasingly vital to operations. Volunteering affords private citizens meaningful opportunities to assist FWS operations by contributing their time and talent at a refuge or hatchery. At the same time, a well-run volunteer program provides FWS facilities with much needed manpower, a larger constituency, and greater visibility in the community. With declining staff and program budgets, volunteers are increasingly filling the void. In 1980, fewer than 5,000 individuals volunteered in the NWRS; that number has grown to over 56,000 in 2012. Many of these volunteers are part of organized friends groups, which in turn work to assist hatcheries and refuges in meeting public use and natural and cultural resource management goals on a larger scale. However, effective volunteer programs and friends groups need support from FWS staff, including training, mentoring, recognition, and awards. Regressively, positions with primary responsibility for conducting or facilitating volunteer and friends programs are those most likely to be affected by budget reductions. .

The challenges of increasing the effect and impact of outreach and education programs on today's youth should not be underestimated. Over the years, the FWS and hundreds of other organizations have developed and implemented a wide range of programs directed at conservation education. Many of these programs have received acclaim for their innovation, their ability to reach under-served audiences, and ability to connect with the core teaching requirements of math, science, and the arts. Many of these programs have made positive impacts on youths, ranging from pursuing careers in natural resource management to persuading their

families to conserve water at home. Unfortunately, the vast majority of these programs seldom sustain themselves over more than a few years and too often fail to effectively reach a large enough audience to gain long-term traction. The FWS and its partners have the opportunity to develop best practices for outreach and education that builds on lessons learned to forge more impactful and sustained programs in the future. The FWS is encouraged to work with state fish and wildlife agencies, the National Fisheries Friends Partnership and its Fisheries Friends groups, the Recreational Boating and Fishing Foundation, and many other organizations to increase the breadth and impact of fish and aquatic resource education programs directed at youth.

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Goal 4: Support recreational fishing and other public uses and enjoyment of aquatic resources.

Objectives, Strategies, Activities, and Outcomes

Objective 4.1: Support federal land and water management agencies, states, tribes and other partners to enhance recreational fishing opportunities.

- Strategy 4.1.1: Implement FWS roles outlined in executive orders, agreements, and management plans with states, tribes and partners in support of recreational fishing.
 - Activity 4.1.1: Assist stakeholders and partners in meeting agreed-upon recreational demands.
 - Outcome 4.1.1.1: Provide agreed-upon eggs, fish and other hatchery services, maintains brood stocks and egg strain registry for future production, and works to meet requested technical and scientific assistance in support of recreational fisheries.
 - Activity 4.1.2: Promote fishing on FWS lands by assisting in the scientific management of sport fish populations on agency waters.
 - Outcome 4.1.2.1: Public fishing opportunities are made available on all FWS lands/waters as appropriate and deemed compatible.

Objective 4.2: Assist the federal government in meeting its responsibilities to mitigate the impacts of federal water projects, including compensation for lost fishing opportunities.

- Strategy 4.2.1: Assist federal water development agencies in meeting their mitigation responsibilities as outlined in legislation and other authorities.
 - Activity 4.2.1: Continue to utilize units of the NFHS having responsibility to meet commitments made by the United States Government to mitigate the impacts of federal water projects through the production and distribution of alternative fisheries resources.
 - Outcome 4.2.1.1: 100% of FWS mitigation responsibilities are met.

- Outcome 4.2.1.2: FWS fully compensation from all federal agencies that use FWS resources to fulfill mitigation.
- Outcome 4.2.1.3: Cost savings achieved through cost recovery efforts are retained within the NFHS to fully meet recreational outputs for stakeholders and address program priorities.
- Activity 4.2.3. Work with states and responsible parties to properly align mitigation responsibilities and authorize full funding for the delivery of mitigation services for federal water projects.
 - Outcome 4.2.3.1: FWS and NFHS role in providing mitigation services is fully agree-upon among FWS, states, and responsible parties along with clear funding authority.

Objective 4.3: Identify and meet aquatic education and outreach objectives in partnership with other federal agencies, states, tribes, and others.

- Strategy 4.3.1: Provide leadership and support for shared or complementary aquatic education and outreach objectives.
 - Activity 4.3.1: Utilize FWS lands to connect with the public and convey the value of aquatic resources to current and future generations.
 - Outcome 4.3.1.1: NWRs and NFHs used as outdoor classrooms to introduce young people to the outdoors and the values of clean water; the potential impacts of AIS, climate change, etc.; and the enjoyment of recreational fishing and other activities.
 - Outcome 4.3.1.2: Friends groups for NWRs and NFHs continue to expand along with volunteer opportunities.
 - Activity 4.3.2: NCTC and other FWS programs work with educators from states, schools, the Recreational Boating and Fishing Foundation, the outdoor industry and others to develop and effectively share educational information emphasizing the benefits of outdoor recreation, including fishing.
 - Outcome: 4.3.2.1. Best practices from full range of aquatic education experience jointly developed, shared, and implemented.
 - Outcome: 4.3.2.2. Synergistic shared opportunities for educating youth and public about outdoor recreation and aquatic environments.

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Goal 5: Maintain mission-critical capacities, expertise and assets.

Needs Assessment

The FWS conservation mission is dependent on maintaining and supporting an adequately sized, strategically positioned workforce with access to state-of-the-art training, equipment, technologies, and proper facilities. In addition, effective organizational resources need to be in place including leadership, workforce planning, financial resources, budget and performance integration, and policy processes.

Physical assets within the FWS for fish and aquatic resources are significant: the NWRS provides essential habitat as well as public access, and the NFHS encompasses tremendous productive capacity. The primary strength of the FWS, however, lies in its human resources and their expertise is critical to providing the information, products, and services needed to conserve America's fish and aquatic resources.

Five human and physical asset components are examined here: 1) leadership and accountability, 2) human resources, 3) science capacity, 4) facilities and equipment, and 5) budget allocation and trends.

Leadership and Accountability

The mandate to conserve the nation's fisheries resources is a shared responsibility of the FWS, states, tribes, other federal agencies, and international neighbors. As states have the primary responsibility for fish and aquatic resources, the FWS must work cooperatively and effectively with all natural resource agencies to achieve significant fisheries conservation results. Success lies in the FWS's ability to communicate with its stakeholders and partners in a deliberate manner and translate the outcomes of this open and ongoing dialogue into its plans, budgets and activities. The 2009 Evaluation observed that the FWS needed to be in the position to consistently demonstrate a "four corners test:" that is, it understands 1) who its stakeholders/partners are, 2) what responsibilities the agency has to each, 3) what was accomplished for each and 4) what was not accomplished for each.³¹

Within the FWS, leadership is necessary to motivate a talented staff increasingly asked to do more with less. A specific need, regularly advanced by stakeholders and partners, is for the FWS to demonstrate its commitment to fish and aquatic resources by having individuals 1) professionally trained in fisheries and aquatic science, and 2) advanced through the ranks of FWS fish and aquatic resource programs through the FWS's top leadership roles, including regional directors and assistant directors. This single metric underscores the continuing need to keep the "fish in the U.S. Fish and Wildlife Service." Further, having managers trained and knowledgeable in fish and aquatic resources and well represented in the Directorate broadcasts internally and externally that fish and aquatic resources are on par with other FWS programs. It also reinforces to fisheries and other aquatic resource staff that they may aspire to FWS leadership by coming up through the ranks. As of December 2012, among the 22 members in the

³¹ The "4 corners" presumption in law details what falls inside an agreement and what a reasonable person would conclude the parties had in mind in drafting the agreement.

FWS's top management positions (the "Directorate"), there were a total of two managers that have formal training as well as fish and aquatic resource program work experience.³²

Performance is best measured rather than merely professed. As the FWS moves to revise its fish and aquatic resources vision and strategic plans, it needs to develop more meaningful outcome-orientated goals that measure the change in the desired outcome (e.g., three species recovered to the point where they can be removed from the ESA list). The FWS has the opportunity to rise to the challenge to unify its fish and aquatic resources efforts under a set of sharp performance measures. In addition, the FWS's various information system databases can be overhauled to reduce overall data input demands and increase its ability to provide consistent performance reporting, including the ability to produce historical data reports.

Human Resources

A motivated and highly skilled workforce is the agency's most important asset. The FWS employs more than 10,000 FTEs in over 700 stations, from the Director's office in the Main Interior Building in Washington, DC, to field offices from Bristol Bay, Alaska, to the Florida Keys and beyond. Employees are engaged in a diverse set of roles as fisheries and wildlife biologists, administrators, and maintenance workers. Each of these roles is critical to the agency's success, and staff must be trained, equipped, and supported accordingly to perform his or her job safely and effectively. Efforts have been made to recruit a diverse work force that is sensitive to social needs and social change.

Taking care of its employees is critical for accomplishing the day-to-day conservation mission of the FWS. Recruiting and retaining highly qualified professionals, transitioning knowledge from one cohort of employees to the next, creating work places that nourish rather than simply extract units of work, are mandatory for the FWS's long-term conservation success. In its 2004-2008 Strategic Plan, the FWS Fisheries Program pledged to:

- Staff field stations at adequate levels to effectively meet the FWS's goals and objectives for fish and other aquatic resource conservation.
- Provide employees with opportunities to maintain and develop competencies in the expanding knowledge and technologies needed to achieve conservation goals and pursue professional achievement, advancement, and recognition.
- Provide employees with access to facilities and equipment needed to effectively, efficiently, and safely perform their jobs.

The FWS has numerous programs to address important aspects of its human resources including recruitment and retention, development of core competencies, training, and leadership development--all directed at improving its mission readiness. Ultimately, the question comes down to, "Are they working?"

³² "Directorate" is defined in this report as 1 Director, 2 Deputy Directors, 11 Assistant Directors, and 8 Regional Directors.

Staffing Trends

Typical of many natural resource management agencies, FWS employees are increasingly asked to do more with less. Authorized positions lie vacant, not for lack of qualified applicants or workloads, but for cost savings. FWS regions are being forced to use vacancy management to manage their budget shortfalls and field stations are "mothballed" to meet budget reductions. The future offers no relief. Under the current FY 2013 Continuing Resolution and sequestration, the Fisheries Program received a 6.8% reduction from the FY 2012 funding level and, since the FWS falls under Federal discretionary funding, it may be a likely target for additional reductions under future rounds of budget cuts.

FWS fish and aquatic resource programs face a growing staffing deficiency. Numerous personnel are, or will soon become, eligible for retirement (approximately half of the entire federal workforce is eligible to retire by 2013), and these positions may add to the already sizable list of vacancies. For example, FWCOs and AIS underwent a 10% reduction in FTEs, FY 2004-2012. This loss of FTEs directly results in an inability to accomplish mission-critical functions such as tribal trust responsibilities and AIS management activities referenced elsewhere in this report.

As outlined in the species and habitat conservation goals, FWCOs, ESFOs, NFHS, NWRs, and other field offices are FWS "storefronts" for conservation partnerships and technical assistance to a wide range of stakeholders and partners. They are also the "face" of the FWS in local communities, communicating the value of fisheries and aquatic resources to the general public. However, work on fish passage, endangered species restoration, meeting tribal trust responsibilities, and the like cannot be accomplished without sufficient operating funds. Budget trends for these programs are stagnant or diminishing annually, except for specific pass-through projects or reimbursable funding (an uncertain source of funding for effective long-term planning). This erosion of base funding is preventing the FWCOs and other fish and aquatic resource conservation assets from accomplishing core functions.

Examining the Fisheries Program in **FY 2009, 64 percent of the FTEs** were funded by the Congressionally appropriated budget (Resource Management Budget) and 36 percent were funded by reimbursable agreements. **[Updated numbers requested from FWS]** Additionally, one out of every 3.8 FTEs in approved organizational charts lay vacant. While some of these vacant positions were awaiting approved hires, the vast majority were vacant due to lack of budget. This loss of FTEs goes beyond filling seats, representing an ongoing loss of institutional knowledge as experienced field managers retire before replacements can be hired. This situation also places an unnecessary strain on the incoming personnel, as the lack of a proper transition means the new staff members must bring themselves up to speed without the benefit of the outgoing staff's experience and insights. These positions often remain vacant for a significant period of time, allowing relationships with stakeholders and partners to stagnate.

In the past 10 years, the FWS has undertaken several efforts to analyze its workforce and mission readiness. The agency conducted workforce analyses in FY 2004 and FY 2005 on FWCOs and the NFHS, respectively. It is not clear how these analyses were incorporated into workforce management decision-making. While portions of the workforce have been examined, these efforts have not been systematically distilled into a statement of workforce readiness and used to develop a set of staffing priorities or performance metrics. The FWS stated its commitment to

reanalyzing its fisheries workforce needs by FY 2012, but has yet to implement strategies to ensure a qualified and effective workforce, including an analysis of how many additional staff may be required to meet its fish and aquatic resource conservation needs.

Science Capacity

Effective conservation is science-based, and access to sound science from which priorities, action plans, and successful conservation programs can be derived is critical. The FWS relies both on in-house expertise, capabilities, and capacities as well as those of stakeholders and partners in providing scientifically sound products and services to states, tribes, and other partners in support of shared conservation initiatives.

The FWS maintains significant in-house applied science and technology capabilities that support aquatic resource management. This capacity and expertise is often singular and highly valued by stakeholders and partners--the Conservation Genetics Lab, Aquatic Animal Drug Approval Program (AADAP) and Fish Health Centers to name three. Another attribute that distinguishes the FWS's science and technology is a focus on applied science that addresses on-the-ground management needs.

The scientific capacity of the FWS was dramatically altered in 1993 with the creation of a National Biological Survey (NBS).³³ The NBS drew research components from several DOI bureaus, but principally from the FWS (10 research centers, 11 field stations, 38 university-based Cooperative Fish and Wildlife Research Units, and 1,627 employees). In addition, \$110 million in appropriated funds and \$48 million in real and personal property were removed from the FWS budget. The NBS was a short-lived concept due to lack of support in Congress, but had lasting consequences. Ultimately the surviving scientific capacity was transferred to the U.S. Geological Survey (USGS). The FWS now looks to the USGS as collaborators to address many of its science needs, including but not limited to management of the Great Lakes, Chesapeake Bay, Western River ecosystems, and restoration of the aquatic listed or candidate species under the ESA.

Six FTCs provide the field offices, hatcheries, and regional management bodies (including recovery teams) with applied science and research solutions in genetics, ecophysiology, nutrition and fish food development, cryopreservation, statistical analyses, sampling protocols, culture techniques and technologies, and many other areas. The Conservation Genetics Laboratory provides critical information for recovery programs and other fisheries management activities.³⁴ New rapid genetics analysis techniques provide managers with a real-time information basis for informed management decisions.

Nine FHCs provide leadership in fish health management strategies that contribute to the survival, enhancement, restoration, and recovery of fish and other aquatic species in support of national and regional priorities. FHCs provide on-the-ground fish health assessment, diagnostics and control for both wild and hatchery populations.

³³ Interior Secretary Babbitt created a National Biological Survey with Secretarial Order No. 3173.

³⁴ Conservation Genetics network is comprised of five Fisheries Program facilities (Abernathy (WA), Dexter (NM), Lamar (PA), and Warm Springs (GA) FTCs, and the Anchorage Genetics Lab (AK)) and the National Forensics Lab in Ashland, OR (Law Enforcement).

Of the 65 FWCOs, ## are active in original ecologically-based field research to fill knowledge gaps and inform the adaptive management process.

AADAP provides essential and unduplicated services to the USFWS and its partners by providing access to needed drugs and conducting research to secure drug approvals to ensure safe and effective drugs are available to treat disease and aid spawning in the hatchery setting, and facilitate research and fisheries management activities in the field. Without access to safe and effective drugs, fisheries professionals face biological challenges and legal liabilities; the AADAP program addresses this need and facilitates the work of the FWS and its many partners.

In addition to providing the science capabilities and staffing the programs listed above, staff from FTCs, FHCs, and FWCOs also serve as adjunct faculty members at universities. At the individual level, many FWS employees are contributing members in professional scientific societies such as American Fisheries Society and The Wildlife Society, among others, to foster two-way communication of current scientific theory, methods, and results. FWS employees serve in elected posts, contribute to or edit newsletters, give presentations or posters at national or regional meetings, submit work for peer-review publication, and serve as reviewers for journal articles.

Science needs within the FWS are generally developed from the field up. The Fisheries Information System (FIS) provides the central method by which the agency assesses its science needs and capacities and establishes priorities regarding fish and aquatic resources. The Fisheries Operational Needs (FONS) module of FIS documents and ranks needs within the context of specific recovery plans, fisheries management plans, and other obligations, as well as strategic program objectives. Assessment and ranking of needs is conducted annually by regional offices. In 2012, there were 55 projects with year-one funding needs of \$2.4 million directed at developing and sharing applied aquatic science and technology tools with partners. Of these, 10 projects (18% of requested projects) were funded with \$654,142 (27% of requested funding).

While the USGS provides research capacity to FWS aquatic science programs and provides funding support through its Science Support Partnership (SSP), the unmet science needs of the FWS Fisheries Program alone, from 2009 to 2012, are estimated at \$7.5 million.³⁵ While substantial progress has been made in such areas as conservation genetics, many science needs remain unmet, and emerging science needs will further tax current capabilities. Expanded applied research capabilities in population dynamics and modeling, aquatic ecology and physiology, GIS, genetics, and aquatic animal health have been identified by the FWS as high priority needs for addressing emerging management issues. However, flat and eroding base funding has limited the FWS's efforts to partner and meet growing science support needs.

In addition to USGS funding, FTCs, FHCs, and FWCOs receive increasingly important funding support from "soft-money" sources such as grants and fellowships. While a vital source of support, soft money is so-named because of its ephemeral nature. Soft money also has a profound impact on what is considered a "priority:" that is, faced with insufficient base funding, priorities become what can be funded.

³⁵ Pers. Comm., FWS Fisheries Program, March 2013.

The FWS also works with a variety of other academic institutions, partners, and cooperative networks to meet research needs, including the Cooperative Research Units, Cooperative Ecosystem Study Units, and the LCCs. Though relatively new, LCCs are already providing support to the FWS in meeting conservation challenges and addressing science needs. The intention of LCCs is to bring a new level of scientific capability to the table that the FWS and its partners can draw upon as they develop landscape-scale conservation plans and strategies for fisheries and aquatic resources.

Facilities and Equipment

Physical assets such as field offices, fish hatcheries and water supplies, and safe and reliable equipment (field gear, boats, computers, etc.) are essential for the FWS fish and aquatic resource conservation mission.

The FWS's Fish and Aquatic Conservation real property assets alone include 72 NFHS and 65 FWCO offices and their attendant buildings, roads, bridges, levees, and water control and fish culture structures (e.g., reservoirs, ponds, raceways). They include structures on the National Register of Historic Places, such as D.C. Booth Historic NFH and Archives in South Dakota and other historically important buildings such as the Montana FWCO in Bozeman, Montana. In addition, FWS programs maintain millions of dollars of equipment that must be kept in a safe operating condition, including all moveable items such as vehicles, heavy equipment, boats, and shop/laboratory/office equipment. The NFHS has approximately \$35 million and the FWCOs some \$21 million worth of personal property.

The FWS uses the Service Asset Maintenance Management System (SAMMS) to document facility and equipment maintenance needs and deficiencies, justify budget requests, and provide a basis for management decision making. It includes property inventories (for fixed assets \$5,000 and more), condition assessments (providing facility condition index), budget planning, and a management reporting system.

The condition of physical assets is tracked by the Facility Condition Index (FCI), which calculates an asset's repair need as a fraction of its replacement value.³⁶ DOI standards state that mission critical assets should be kept in "acceptable" condition, with a repair need fraction of less than 15 percent (15% acceptable, >15% unacceptable). In FY 2012, the FCI of NFHS mission critical assets was 9%. **[Updated numbers for NWRS requested from FWS]** Within the FWS, a condition assessment process works to ensure that the NFHS and NWRS repair needs are objectively determined. Each station conducts an annual condition assessment with a comprehensive condition assessment undertaken by the FWS every five years.

Given budget realities, the FWS focuses its limited NFHS maintenance budget on high-priority, mission-critical water management projects and human health and safety projects in an effort to maintain current efficiencies and prevent production losses. The NFHS currently has **\$152**

³⁶ For example, if a building's replacement value is \$1,000,000 and the cost of correcting its existing deficiencies is \$100,000, the building's FCI is \$100,000 divided by \$1,000,000; that is 0.10 or 10%. When the FCI is higher, the condition of the facility will be worse. Per DOI Attachment G-FY 2012-2016, constructed assets are either classified in an acceptable or an unacceptable condition.

million in deferred maintenance needs identified. The long-term goal is to get these critical assets into good condition with a repair need under 5%. Unfortunately, water supply failures are likely to continue to impact significant fish production programs at several stations.

For personal property, each station tracks its equipment's useful life, maintenance costs, and replacement needs. Industry standards dictate a minimum of two percent of total asset value be set aside annually for maintenance. For the NFHS with total assets of \$2.2 billion, this would represent \$44 million in annual maintenance. FY2012 maintenance funding, however, was \$16.1 million. Experience from the NWRs amply illustrates how failure to maintain an adequate ongoing maintenance budget quickly results in a growing list of deferred maintenance.

Failure to adequately maintain facilities forces hatcheries and other assets to operate at reduced efficiencies. This causes deferred maintenance costs to increase, and the facility suffers reduced conservation outputs due to such factors as fish losses associated with water supply failures. Failure to maintain these assets translates into lost opportunities as well. When physical assets are in poor condition, fish and aquatic resources are placed at risk. A maintenance-related incident at Craig Brook NFH in 2009, for example, resulted in the loss of an entire cohort of Atlantic salmon broodstock. The impact of such failures extends to the larger community where, for example, every dollar of fish not distributed can cost local economies \$20 to \$60, or delay the recovery of listed species.

Properly managed, annual preventive maintenance is the most logical and cost-effective way to address emerging maintenance issues as they occur. Adequate maintenance funding allows for the routine servicing of mission-critical components, reducing the likelihood of system failures and increasing the life expectancy of facilities and equipment. The use of SAMMS and condition assessments provides the FWS with the tools to proactively track recurring maintenance needs, reduce the number of more costly deferred maintenance deficiencies, and foster successful operations and mission delivery.

Budget Allocation and Trends

In a March 2005 briefing for Senate and House Appropriations Committee staff, the FWS testified:

- Some regions have financial problems that may force closing of field stations in the near future.
- While the Program has enjoyed significant increases over 2001, most increases have been for targeted, regional initiatives.
- Salaries and benefits make up an increasing proportion of available funds, approaching or exceeding 80% in five regions. The situation is most severe in FWCOs, where salary and benefit costs exceed 85% in several regions.
- Financial problems are worse in FWCOs than in the NFHS: more than one-third of FWCO stations had no increases or even decreased budgets from FY 2001 to 2004.
- For NFHS, nearly half the stations have not received FONS funding.
- Scant funding for operations results in unsatisfactory work environments for employees and volunteers, as well as underachievement of performance targets.

These bullet points ring equally true in 2013 as they did eight years earlier. The overall budget of the FWS Fisheries Program increased in absolute dollars for the ten-year period, 2004-2013, from \$109.8 million to \$129.5 million (it was \$148.4 million in FY 2010). When adjusted for inflation, add-ons, and other factors however, the budget is in decline. A significant portion of available funding came in the form of pass-throughs for regional initiatives including the NFHP and NFPP.³⁷ The pass-through funding, however, does not fully cover the costs of the FWS to staff these important conservation programs. For example, while the FWS has received increases for the NFHP and NFPP, only 30 percent of those increases is available for FWS salaries, benefits, and operating costs. Table 9 (page 70) presents the FWS Fisheries Program/FAC budget, FY2003-2012, broken out by the nature of appropriation, budget lines and adjusted for inflation. Table 10 (page 71) presents the overall FWS budget for the same period.

In **FY 2008**, FWS received **\$21.2** million in reimbursable funding for the large-scale projects such as the Lower Snake River Compensation Plan and the Great Lakes Sea Lamprey Control Program, to name two. The role of reimbursable funding is apparent in the FWS Fisheries Program, where of a total of **1,208.8 FTEs (36%) in FY 2009** were supported by reimbursable funding. In many cases, the fish and aquatic resource programs of the FWS are dependent on existing and new reimbursable funding sources to stave off field office closures. In turn, dependence on reimbursable funding has impacts on how priorities are established, and how staffing is conducted.³⁸

Salaries and benefits represent a growing percentage of total budgets with the result that many field stations, once budgets are applied to salaries and benefits, have little or no funding with which to conduct their conservation mission--from fuel for vehicles to field equipment with which to conduct stream assessments. For management purposes, the ratio of salaries to operations is ideally 70:30. **In FY?? This ratio was ##%.** The cumulative impact is a net loss in spending power for fish and aquatic resource programs, forcing them to identify cost savings from vacated positions and reduced operations to cover salaries and benefits of the remaining staff.

Direction and Priorities

The FWS is a central player in the conservation of the nation's fish and aquatic resources. Stakeholders and partners readily acknowledge the critical role the agency plays. Despite the challenges of an uncertain fiscal climate, the FWS must maintain capacities, expertise and assets that are mission-critical. In defining "mission-critical," the FWS recognizes that the needs of its partners must be taken into consideration, as the mission and success of the FWS is linked to the mission and success of its partners. To maintain and expand that role, however, the FWS must

³⁷ While Congressional add-ons provide money for important initiatives, they also represent a drain on the overall FWS budget in terms of workforce. Consistent with Congressional guidance, the FWS does not deduct direct or indirect costs from Congressional adds-ons to assure funding is allocated as fully as possible. Direct and indirect costs incurred by these projects are paid from base funds (funds that otherwise would have gone to address other resource issues throughout the FWS. Programs such as the NFHP and NFPP incur direct program costs for FWS staff to develop funding agreements, administer and monitor agreements, etc. that are not covered by the add-on funding.

³⁸ Sport Fishing and Boating Partnership Council, *Programmatic Evaluation of the Activities of the U.S. Fish and Wildlife Service Fisheries Program, FY 2005-2009*, page 83.

commit to energized leadership, adequate staffing, maintenance of mission-critical facilities, enhanced science capacity, and defense of core budget operations.

Leadership is an abstract asset, not found inventoried in SAMMS or FIS. While difficult to define, the FWS's stakeholders and partners know it when they see it. At present two of the 22 members of the FWS Directorate are "fish" people. Notwithstanding the competencies of other members of the Directorate, it would seem obvious, going forward that the agency needs to ensure individuals trained and knowledgeable on fish and aquatic resources among the senior leadership.

The FWS's fish and aquatic resource programs face a growing staffing deficiency with numerous vacancies within approved organization charts remaining unfilled due to budgets, and workforce metrics do not appear to exist. For example, the FWS has yet to develop metrics to gauge progress toward filling the highest priority staffing positions needed to implement its mission and meet training needs to reach and maintain required competencies.

The overall lack of a comprehensive and useful workforce management analysis severely limits FWS's capability to manage and right-size its workforce in the face of continuing budget shortfalls, and to provide adequate training and work facilities to ensure employees can conduct their jobs safely and effectively. To date, workforce analysis has been conducted in reaction to anticipated budget shortfalls and apart from strategic visioning and planning. Any useful analysis should address such areas as 1) loss of efficiency of conservation output through Headquarters/Regional Directorate silos, 2) how organizational charts might be right-sized, 3) future conservation needs and challenges, and 4) sustainability of budgeting based on core funding rather than reimbursables.

The combination of 1) physical assets in less than operational condition, 2) aging field stations in need of updating and refurbishing to allow the efficient and effective rearing of both current and future species, 3) high energy costs, 4) reduced staffing, and 5) flat-lined budgets all conspire to place a considerable strain on the FWS's capability to consistently meet its aquatic conservation goals. The increasing need to prepare for and respond to impacts from climate change and extreme weather events such as Hurricane Sandy on facilities and equipment will only increase this strain. The NFHS currently has identified **\$152 million** in deferred maintenance needs related to the repair, rehabilitation, or replacement of constructed assets. Given that continued deferment results in the deterioration of assets and greater long-term costs, this approach, while effective in addressing short-term budgetary issues, may ultimately rob assets otherwise available for native species restoration, endangered species recovery, tribal assistance, and public recreation over the long-term. The FWS has the capability to track, prioritize, and account for the physical and personal assets under its care, but lacks adequate funding to maintain them on an ongoing basis.

The FWS continues to work on strengthening the agency's tradition of scientific excellence in the conservation of fish, wildlife, plants, and their habitat. The agency prides itself on using best science, but meeting that goal presents an increasing challenge. The business model, first attempted with the creation of the NBS in 1993, emphasizing the centralized delivery of science support within DOI, appears to have fallen short of supplying the mission-critical science needs

of the FWS fish and aquatic resource programs, as evidenced by an ever-widening gap between science needs and available budget. To the future, FWS needs to work with the USGS to establish a clear set of priorities and process for funding essential fish and aquatic science, not just at the current level, but at a level that provides the necessary support to the FWCO, NFHPs and other field-based efforts requiring these scientific tools.

The FWS's fish and aquatic science capacity is increasingly strained by tight budgets and reduced personnel. While increased attention from the agency to landscape-level conservation including SHC, LCCs, and climate change is critical to meeting long-term management goals for aquatic systems, these initiatives must complement and support the FWS's long-term core fish and aquatic outputs, such as aquatic animal propagation, AADAP, fish health surveys, coordination and facilitation of control of aquatic invasive species, FWCOs working with tribes, etc. Ultimately, this debate will only be resolved by improved communications between the FWS and stakeholders, and by demonstrated results.

The FWS recognizes the funding challenge facing aquatic science capacity. The agency also recognizes the need to fully understand and provide leadership on the effects of climate change on our nation's fish and aquatic resources, including the facilities and fisheries resources for which the FWS is directly responsible. These challenges go beyond the resources of the FWS to address alone. As a result, the FWS will need to increasingly engage stakeholders, FHPs, LCCs and other partners to collaborate effectively, address priority science needs, and leverage existing resources. The fish and aquatic resources activities of the FWS must continually seek innovative ways of addressing resource concerns and constantly evaluate their current activities to ensure that they are the most appropriate use of limited resources.

Budgets for fish and aquatic resources management may have increased in absolute dollars over the last 10-15 years, but they have remained stagnant or are in actual decline when adjusted for inflation and other factors that impact how these funds reach the ground. The overall loss of purchasing power for field stations is profound as a result of increased salary-to-operations ratios. In addition, it is clear that the erosion of base funding is preventing FWCOs and other programs from accomplishing core functions while the pressure to fund field station operations with soft money and reimbursables increasingly dictates priorities. While this erosion of base funding hampers the FWS in accomplishing traditional core functions, it is equally clear that the FWS must meet future conservation challenges and stakeholder/partner expectations within the current budget climate.

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Goal 5: Maintain mission-critical capacities, expertise and assets.

Objectives, Strategies, Activities, and Outcomes

Objective 5.1: Cultivate and maintain a workforce prepared for current and future challenges in fisheries and aquatic resource conservation.

- Strategy 5.1.1: Maintain human resources in a geographically strategic manner and at levels appropriate to workload.

- Activity 5.1.1: Ensure a properly trained and equipped staff to effectively work with partners to meet goals and objectives.
 - Outcome 5.1.1.1: Assistant Director for Fish and Aquatic Conservation, and others in the FWS Directorate as appropriate, are professionally trained and experienced in fisheries and aquatic conservation.
 - Outcome 5.1.1.2: Field stations staffed at levels capable of conducting their expected responsibilities with stakeholders and partners.
- Strategy 5.1.2: Maintain and support a diverse, motivated, and well-trained workforce.
 - Activity 5.1.2: FWS staff are trained and equipped to apply the best scientific standards, principles, and techniques to their work to ensure that FWS programs deliver the highest quality technical assistance within and outside the FWS.
 - Outcome 5.1.2.1: The FWS maintains training and quality improvement programs within the FWS, such as diagnostic method development and “climate literacy.”
 - Outcome 5.1.2.2. The FWS is networked with stakeholders and partners to improve the outcome of their management using resources and tools developed by tribes, universities, other state and federal agencies.
 - Activity 5.1.3: Support membership and encourage active participation in professional organizations relevant to the FWS.
 - Outcome 5.1.3.1: Staff maintain a presence in the broader fisheries community, and maintain interagency networks of professional contacts to facilitate personal growth and agency performance.
 - Outcome 5.1.3.2. FWS uses professional organizations as important vehicles to identify qualified work force, enhance training opportunities and partnerships

Objective 5.2: Maintain mission critical assets.

- Strategy 5.2.1: Staff has access to facilities and equipment necessary to effectively, efficiently, and safely perform their jobs.
 - Activity 5.2.1: Maintain physical assets and equipment in safe and functioning condition.
 - Outcome 5.2.1.1: Facility Condition Index of Mission Critical Assets in “acceptable” condition.
 - Outcome 5.2.1.2: Personal property operates within, and does not exceed, useful life.
 - Outcome 5.2.1.3: Maintenance funding at 2% or better of total asset value.
- Strategy 5.2.2: Effectively address current and future threats to mission-critical assets and capacities.

- Activity 5.2.2: Address water resources, operating costs, and other issues impacting National Fish Hatchery System operations.
 - Outcome 5.2.2.1: Impacts of reduced production and output, rising energy and feed costs, permanent vs. temporary closures, etc. on future productive capacity of NFHS (e.g., loss of water rights) are addressed.

Objective 5.3: Maintain programs and capabilities essential to mission success and that of stakeholders and partners.

- Strategy 5.3.1: Develop and utilize best-available scientific and technological tools in conservation and management efforts.
 - Activity 5.3.1: Work with USGS, LCCs, and others to identify fisheries research needs and to develop and share applied aquatic scientific and technology tools.
 - Outcome 5.3.1.1: The FWS and USGS meet biannually (both nationally and regionally) to establish research priorities on fish and aquatic resources and develop technology transfer strategies.
 - Outcome 5.3.1.2: Skill sets and work outputs of FWS science centers, including FTCs and FHCs, fully aligned with LCCs, FHPs, and the USGS.
 - Outcome 5.3.1.3: Increased research conducted by USGS on FWS fish and aquatic resources priorities.
 - Outcome 5.3.1.4: Priority science needs are adequately met with available staffing and funding.
- Strategy 5.1.2: In collaboration with partners, provide technical guidance, training, and services on aquatic resource issues such as fish passage, cryopreservation, genetics, aquaculture, fish health, climate change impacts, and adaptive measures, particularly regarding those issues with broad regional or national scope.
 - Activity 5.1.2: Provide leadership in regionally and nationally relevant fish and aquatic resources issues.
 - Outcome 5.1.2.1: Technology transfer judged by stakeholders and partners to be timely and of high value.
 - Outcome 5.1.2.2: FWS-provided fish health and other diagnostic capacities and services are commensurate with stakeholder agreement to ensure productive capacities of state and tribal hatchery systems are maintained.
 - Activity 5.1.3: Provide leadership to coordinate activities to obtain U.S. Food and Drug Administration (FDA) approval for drugs, probiotics, and nutraceuticals needed in

aquaculture and fisheries management programs, and ensure fisheries professionals have access to these products.

- Outcome 5.1.3.1: AADAP maintained in accordance with FWS and partner reliance on this program to obtain drug approvals, and increase awareness and compliance with relevant regulations and guidelines regarding legal and judicious use of drugs, vaccines, etc.

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Conclusion

In presenting this Strategic Vision and Needs Assessment, the Sport Fish and Boating Partnership Council (SFBPC) has focused on providing an inclusive assessment of the U.S. Fish and Wildlife Service (FWS) fish and aquatic resource activities, as seen from the perspective of the agency's stakeholders and partners. The report is the product of the hard work of a Steering Committee consisting of members from the SFBPC Fisheries Issues Committee, FWS, and representatives from the larger fisheries community. As this vision is intended to shape the future directions of the FWS, it has been framed with the active participation of FWS staff, across a range of the agency's programs.

The document is designed to provide general guidance, identify overall priorities for the next 10 years, and highlight areas of excellence within the FWS's fish and aquatic resource programs. While the document is not intended to be prescriptive or reduce the agency's management flexibility, it does outline objectives and expected outcomes that are considered important for the future conservation of fish and aquatic resources by the agency's principal stakeholders and partners. The scope of the document was broadened mid-project to encompass all fish and aquatic activities of the FWS, though its focus centers primarily on the activities and scope of the newly reorganized Fish and Aquatic Conservation program.

This Strategic Vision and Needs Assessment is also written with the recognition of the current fiscal climate and the knowledge that the agency's leadership is charged with identifying the agency's most critical roles for fish and aquatic resource conservation. This task is too big to accomplish alone and states, tribes and other federal land management agencies commonly have management primacy over both the species and the land. The FWS must reach decisions and take actions in a collaborative fashion with its stakeholders and partners.

During discussions of priorities, staffing and budgeting, FWS staff and others often stated the overriding need for the agency 'to stanch the bleeding' in the decline of staff and budget. They stressed the need to maintain core functions the agency provides to its state, tribal and other conservation partners, and they recognized the inherent challenge in addressing how to maintain aquatic habitat integrity and resilience in the face of numerous challenges, including a changing population demographic and climate change. Frederick II, King of Prussia, observed "He who defends everything, defends nothing." This military reference from the 1700s underscores an important principle for the FWS. The agency needs to prioritize its actions throughout the agency on behalf of fish and wildlife, work cooperatively with stakeholders and partners, act strategically, and increase (not decrease) its outputs on behalf of fish and aquatic resources by

narrowing its focus and identifying core functions and activities. This strategic vision is one step in providing that focus.

This Strategic Vision outlines an historic, present and future set of responsibilities and actions on behalf of the nation's fish and aquatic resources that are larger and more pressing than the FWS current priorities. Rather than declare that the agency cannot continue to do everything it has been doing given the current fiscal climate and workforce reduction (an oft heard refrain), this Strategic Vision notes the hugely undervalued importance of fish and aquatic resources to the American people, in terms of economic impact, environmental services, and recreational enjoyment; and it demonstrates the invaluable role played by the FWS.

Ultimately, the primary concerns for the FWS's efforts in fish and aquatic conservation now and into the future are leadership and adequate funding. The FWS can write all the plans they want but if the funding and capacity are not present to do the work, then it is for naught. Fish and aquatic resource staff can be pressed to do more with less, to redirect existing funding from one area to other efforts, but if FWS leadership is not pressing for fish and aquatic priorities and the funding remains inadequate, the capacity to initiate, innovate, and enhance will fade along with the fish and aquatic resources themselves.

After more than a decade of FWS Fisheries program reviews and evaluations, the Steering Committee is left with a lasting concern that the FWS Fisheries Program, now Fish and Aquatic Conservation Program, has long been undervalued and under-funded. Now in this present period of budget cutting, these programs are being cut further as part of agency- and department-wide austerity measures. Yet the social and economic value of aquatic resources in the United States demands more of the FWS. The issue of increasing water scarcity and its impacts in an era of climate change is a single example of what is at risk.

The time and commitment of the Steering Committee and dozens of other stakeholders and partners in framing this Strategic Vision is but one indicator of the fish and aquatic community's overarching concern for aquatic resource conservation, and their interest and willingness to work with the FWS to implement a robust Fish and Aquatic Conservation program for the future.

Table 11. Nomenclature & Definitions

Adaptive Management: A deliberate, science-based, process for decision-making in the face of uncertainty. This approach treats management actions as a set of iterative lessons whose outcomes are used to inform and improve future actions. Because it is based on a continual learning process, adaptive management improves long-term management outcomes.

Aquatic Resources: Natural resources as defined in aquatic habitats and aquatic species.

Aquatic habitats. Areas on which an aquatic species depends, directly or indirectly, to carry out the life processes of the species, including an area used by the species for spawning, incubation, nursery, rearing, growth to maturity, food supply, or migration.⁹

Aquatic species. Organisms that depend upon aquatic habitat for one or more stages of their life cycle, such as spawning, incubation, nursery, rearing, growth to maturity, food supply, or migration, including but not limited to fishes, shellfish, amphibians, turtles, and aquatic invertebrates.⁹

Climate adaptation: Preparation for and coping with the effects of a changing climate, including moderating harm or exploiting beneficial opportunities.

Conserve: Activities that protect, sustain, and, where appropriate, restore and enhance populations of fish, wildlife, or plant life or a habitat required to sustain fish, wildlife, or plant life or its productivity.³⁹

Diadromous: Fish species that migrate between fresh and salt waters.

Ecosystem Services: Benefits people get from nature, generally divided into four categories: provisioning services (such as food and water); regulating services (such as flood and disease control); cultural services (such as spiritual renewal and recreational opportunities); and supporting services (such as nutrient cycling).

Habitats: Physical factors of aquatic systems inclusive of the water, its watershed, landscape, connectivity, flow, passage, and quality.

Interjurisdictional: Species or populations managed by two or more nations, states, or tribes as a result of geographical distribution or migratory patterns.

Mission-critical: Systems whose failure or disruption causes an immediate interruption in essential operations. For the NFHS, mission-critical assets have a direct effect on water flows and management, such as wells, pumps, pipelines, raceways, ponds, hatchery buildings, oxygenation/aeration systems, back-up power supplies and delivery systems, and alarm systems.

Partners: Individuals, organizations, and agencies sharing similar missions and/or common goals. Partners have a stated interest in fish and aquatic resource conservation, but their participation is voluntary.

Priority Species: Set of species used for planning purposes comprised of threatened and endangered species (including distinct population segments and evolutionarily significant units), species of management concern (native, non-listed), and recreational species. Designating priority species also provides for improved performance reporting and accountability for fish and aquatic resource activities.

Recover: Improve status of listed species to the point at which listing is no longer appropriate under the criteria set out in federal, state, and tribal management plans, including section 4(a)(1) of the Endangered Species Act.

Resilience: Capacity of an ecosystem to respond to change or disturbance by resisting damage,

³⁹ National Fish Habitat Partnership, National Fish Habitat Action Plan, 2nd Edition, www.fishhabitt.org, page 26.

retaining key functions and components, and recovering quickly. Such perturbations and disturbances can include stochastic events such as fires, flooding, disease, and human activities such as water withdrawals or habitat modifications. Resilience is maintained by conserving key ecosystem structures, functions, and connections.

Restored: Return of species status to integral, self-sustaining populations, no longer in need of listing under the ESA and other special management considerations.

Stakeholders: States, tribes and other entities having a vested interest in an outcome and that may disagree on priorities and/or goals. Stakeholders have a direct stake in fish and aquatic resource conservation mandated by legislation, treaty, and the like. States, tribes and neighboring Mexico and Canada are the four principal stakeholders in fish and aquatic resource conservation.

Substitution value for subsistence activity: Value of goods purchased instead of derived from subsistence harvest. A disruption of subsistence activities can result in a real loss of economic well-being to participants and its value extends beyond the price paid for substitute food bought from the market (e.g., a way of life).

Surrogate Species: A species used to represent other species or aspects of the environment. Selecting a suite of surrogate species can help represent the habitat and/or management needs of larger groups of species. It includes various categories (focal, umbrella, representative, keystone, indicator, flagship), and its use is well documented in the scientific literature.

Tribal Trust Resources: Those natural resources, either on or off Indian lands, retained by, or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by a fiduciary obligation on the part of the United States.

Planning Vocabulary

Goals are clear statements of what the organization aims to achieve. They summarize the principal program elements the organization hopes to accomplish in support of its mission and vision. Objectives answer the question “how will we obtain our goal?”

Objectives are specific, clear, measurable, and easy to grasp statements linking goals to strategies and activities.

Strategies are approaches taken to achieve objectives, including actions to mitigate threats and build on assets.

Activities are detailed sets of tasks or actions to implement a strategy.

Outcomes are specific, vital, positive changes that move the organization toward its desired future. They often employ the terms “increase”, “maintain”, or “decrease.” Outcomes indicate intended change: change in status, change in knowledge, change in behavior, etc. It is important to distinguish between outcomes and outputs. Outputs are the production of widgets, a process that creates a product (e.g., write a fisheries management plan). These are more properly considered Activities.

Table 12. Acronyms & Abbreviations Used in This Report			
AADAP	Aquatic Animal Drug Approval Program	HACCP	Hazard Analysis and Critical Control Point
AFS	American Fisheries Society	IJ	Interjurisdictional
ARD	Assistant Regional Director	INRMP	Integrated Natural Resource Management Plan
AFWA	Association of Fish and Wildlife Agencies	LAPS	Land Acquisition Priority System
AIS	Aquatic Invasive Species	LCC	Landscape Conservation Cooperative
ANILCA	Alaska Native Interest Lands Conservation Act	NCTC	National Conservation Training Center
ANCSA	Alaska Native Claims Settlement Act	NFBW	National Fishing and Boating Week
ANSTF	Aquatic Nuisance Species Task Force	NFPP	National Fish Passage Program
BIA	Bureau of Indian Affairs	NFH	National Fish Hatchery
BLM	Bureau of Land Management	NFHAP	National Fish Habitat Action Plan
BPA	Bonneville Power Authority	NFHP	National Fish Habitat Partnership
BR	Bureau of Reclamation	NFHS	National Fish Hatchery System
BRD	Biological Resources Division, USGS	NISA	National Invasive Species Act of 1996
CCP	Comprehensive Conservation Plan	NGO	Non-Governmental Organization
CHMP	Comprehensive Hatchery Management Plan	NMFS	National Marine Fisheries Service
COE	Army Corps of Engineers	NOAA	National Oceanic and Atmospheric Administration
CSC	Climate Science Center	NWR	National Wildlife Refuge
DOD	Department of Defense	NWRS	National Wildlife Refuge System
DOI	Department of the Interior	OMB	Office of Management and Budget
DQA	Data Quality Act	PART	Program Assessment Rating Tool
DPS	Distinct Population Segment	PFW	Partners for Fish and Wildlife Program
EPA	Environmental Protection Agency	QAQC	Quality Assurance Quality Control
ESA	Endangered Species Act	RBFF	Recreational Boating and Fishing Foundation
ESFO	Ecological Service Field Office	RO	Regional Office, FWS
ESU	Evolutionary Significant Units	SAMMS	Service Asset Maintenance System
FAC	Fish and Aquatic Conservation Program	SFR	Sport Fish Restoration
FHC	Fish Health Center	SHC	Strategic Habitat Conservation
FHP	Fish Habitat Partnership	SFBPC	Sport Fish and Boating Partnership Council
FIS	Fisheries Information System, FWS	TEK	Traditional Ecological Knowledge
FMP	Fishery Management Plan	TVA	Tennessee Valley Authority
FTC	Fisheries Technology Center	USGS	U.S. Geological Survey
FTE	Full Time Employee	WMD	Wetland Management Districts
FONS	Fisheries Operational Needs System	WSFR	Wildlife and Sport Fish Restoration Program
FWCO	Fish and Wildlife Conservation Offices	YGO	Youth in the Great Outdoors
FWS	U.S. Fish and Wildlife Service		
GPRA	Government Performance and Results		

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Table 9. U.S. Fish and Wildlife Service Fisheries Program Appropriation & Budget, FY 2003-2012 (in thousands of \$)

Fisheries Program 13XX	2003 Actual	2004 Actual	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Enacted
Congressional Appropriation Enacted	103,604	114,321	115,172	116,488	117,778	126,499	131,831	148,345	138,939	135,317
Congressional Earmarks	-	6,815	5,423	5,073	2,239	492	2,469	6,950	0	0
Regional Initiatives	-	26,707	27,240	26,457	26,444	27,952	26,475	30,444	30,419	30,227
National Fish Passage Program	-	3,792	3,639	3,646	5,000	10,828	10,828	10,828	10,828	11,310
National Fish Habitat Action Plan	-	0	158	985	2,985	5,153	5,153	7,153	7,153	7,142
Marine Mammals	-	4,569	4,572	4,370	3,162	2,976	3,371	5,815	5,960	5,831
Other Expenses	-	23,878	24,301	23,376	23,492	23,474	23,990	25,501	25,321	25,921
General Program Activities	-	48,560	49,839	52,581	54,456	55,624	59,545	61,654	59,258	54,886
Fisheries Program 13XX	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Hatchery Operations (1311 & 1312)	35,070	39,014	37,925	45,735	45,808	45,919	48,649	54,421	48,856	46,075
Hatchery Maintenance & Rehabilitation (1313/1321) ¹	17,449	18,979	18,987	16,468	16,565	17,167	17,654	17,835	17,655	17,513
Hatchery Operations & Maintenance (1321)	52,518	57,993	56,912	-	-	-	-	-	-	-
FWCO Maintenance & Equipment (1322)	-	-	-	1,335	1,334	1,394	1,394	532	-	-
Total Maintenance & Equipment (1320)	-	-	-	17,803	17,899	18,561	19,048	18,367	18,180	18,031
Anadromous Fish Management (1331)	9,512	10,291	10,215	-	-	-	-	-	-	-
Fish & Wildlife Assistance (1332)	37,997	41,468	43,473	-	-	-	-	-	-	-
Marine Mammals (1333/1337)	3,577	4,569	4,572	4,370	3,162	2,976	3,371	5,815	5,960	5,831
Habitat Assessment & Restoration (1334)	-	-	-	10,624	13,878	22,257	22,923	27,087	27,061	24,553
Population Assessment & Cooperative Mgt. (1335)	-	-	-	32,521	31,577	31,463	32,488	34,411	32,638	31,991
Aquatic Invasive Species (1336)	-	-	-	5,435	5,454	5,323	5,352	8,244	6,244	8,836
Fish & Wildlife Mgt/Aquatic Habitat & Species Con. (1330)	51,086	56,328	58,260	52,950	54,071	62,019	64,134	75,557	71,903	71,211
Subtotal-Fisheries	103,604	114,321	115,172	116,488	117,778	126,499	131,831	148,345	138,939	135,317
Cumulative Rate of Inflation (based on 2003 dollars)	0.000%	-2.594%	-5.786%	-8.730%	-11.258%	14.539%	14.234%	15.618%	18.200%	19.858%
CPI Inflation Adjusted (for CY2003 dollars)	\$103,604	\$111,356	\$108,508	\$106,319	\$104,519	\$108,107	\$113,066	\$125,176	\$113,652	\$108,446

¹ In FY 2008, Hatchery Maintenance & Rehabilitation (1313) changed to NFHS Maintenance & Equipment (1321)

Table 10. U.S. Fish and Wildlife Service Resource Management Budget, FY 2003-2013 (in thousands of \$)

Ecological Services	2003 Actual	2004 Actual	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 *Enacted	2013 CR
Endangered Species	\$131,757	\$136,756	\$141,403	\$148,398	\$144,979	\$150,508	\$157,973	\$179,309	\$175,446	\$175,955	\$175,592
Habitat Conservation	\$85,070	\$87,117	\$93,443	\$98,357	\$94,865	\$100,906	\$105,055	\$117,659	\$112,524	\$110,637	\$109,052
Partners for Fish and Wildlife (subset of Habitat Conservation)	\$37,825	\$42,247	\$46,982	\$50,151	\$45,838	\$50,135	\$52,943	\$60,134	\$55,304	\$54,768	\$55,539
Other Activities (Environmental Contaminants)	\$10,710	\$10,659	\$10,736	\$10,874	\$11,046	\$11,982	\$13,242	\$13,987	\$13,316	\$13,128	\$11,495
Subtotal-Ecological Services	\$227,537	\$234,532	\$245,582	\$257,629	\$250,890	\$263,396	\$276,270	\$310,955	\$301,286	\$299,720	\$296,139
FTEs	1,872	1,891	1,799	1,745	1,687	1,688	1,704	1,727	1,823	1,842	1,788
National Wildlife Refuge System	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Refuge Operations	\$271,275	\$295,331	\$242,968	\$249,036	\$264,028	\$296,634	\$323,308	\$362,456	\$352,527	\$346,741	\$348,334
Refuge Maintenance	\$97,094	\$95,891	\$132,785	\$133,465	\$134,187	\$137,490	\$139,551	\$140,349	\$139,532	\$138,950	\$138,160
Subtotal-National Wildlife Refuge System	\$368,369	\$391,222	\$375,753	\$382,501	\$398,215	\$434,124	\$462,859	\$502,805	\$492,059	\$485,691	\$486,494
FTEs	2,964	3,067	3,013	2,946	2,845	2,811	2,914	3,048	3,244	3,213	3,224
Migratory Bird Management	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
North American Waterfowl Management Plan (xxxx)	\$7,369	\$10,225	\$10,124	\$10,800	\$10,873	\$10,893	\$12,942	\$14,054	\$12,890	\$14,025	\$14,092
Other Activities	\$21,328	\$22,361	\$24,886	\$27,436	\$29,479	\$29,548	\$37,904	\$40,429	\$39,285	\$37,428	\$36,764
Subtotal-Migratory Bird Management	\$28,697	\$32,586	\$35,010	\$38,236	\$40,352	\$40,441	\$50,846	\$54,482	\$52,175	\$51,453	\$50,856
FTEs	207	208	205	200	217	232	253	256	249	246	243
Law Enforcement	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Subtotal-Law Enforcement	\$51,591	\$53,647	\$54,703	\$56,062	\$57,299	\$59,640	\$62,667	\$65,778	\$62,930	\$62,143	\$62,272
FTEs	445	478	485	472	298	277	292	281	296	282	294
Fisheries Program (see Table 9 for detail)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Subtotal-Fisheries	\$106,636	\$114,321	\$114,569	\$116,488	\$117,778	\$126,499	\$131,831	\$148,214	\$138,939	\$135,317	\$137,982
FTEs	785	813	797	778	783	764	799	793	789	782	775

Table 10. U.S. Fish and Wildlife Service Resource Management Budget (continued)

Cooperative Landscape Conservation & Adaptive Science	2003 Actual	2004 Actual	2005 Actual	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Enacted	2013 CR
Cooperative Landscape Conservation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000	\$14,727	\$15,475	\$15,534
Adaptive Science	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000	\$16,243	moved to new Science Support	moved to new Science Support
Subtotal-Cooperative & Adaptive Science	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,000	\$30,970	\$32,198	\$37,027
FTEs	0	0	0	0	0	0	0	24	55	83	79
General Operations											
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Central Office Operations	\$14,474	\$17,062	\$39,253	\$39,530	\$39,293	\$38,977	\$39,652	\$40,485	\$42,720	\$38,605	\$41,846
Regional Office Operations	\$24,060	\$23,494	\$40,423	\$40,690	\$41,331	\$41,480	\$42,305	\$43,340	\$42,836	\$40,951	\$40,726
International Affairs	\$8,313	\$8,472	\$9,420	\$9,880	\$9,990	\$11,555	\$13,204	\$14,379	\$13,119	\$12,971	\$13,037
National Conservation Training Center	\$16,037	\$16,772	\$16,817	\$17,966	\$18,282	\$18,743	\$19,171	\$24,990	\$23,930	\$23,564	\$23,570
Subtotal-Operations	\$128,636	\$130,374	\$137,324	\$153,609	\$156,833	\$139,678	\$143,285	\$152,792	\$153,383	\$146,684	\$149,874
FTEs	905	861	862	845	854	775	781	805	843	864	824
Total: Resource Management	\$931,466	\$971,978	\$974,023	\$1,004,525	\$1,021,367	\$1,082,616	\$1,143,462	\$1,273,406	\$1,245,861	\$1,226,177	\$1,233,681
Cumulative Rate of Inflation (2003 dollars)	0.000%	-2.594%	-5.786%	-8.730%	-11.258%	-14.539%	-14.234%	-15.618%	-18.200%	-19.858%	-20.953%
CPI Inflation Adjusted (2003 dollars)	\$931,466	\$946,765	\$917,666	\$916,830	\$906,382	\$925,214	\$980,702	\$1,074,525	\$1,019,114	\$982,683	\$975,188
Total FTEs	7,178	7,318	7,161	6,985	6,684	6,606	6,806	7,000	7,371	7,389	7,302