



United States Department of Agriculture

RISE TO THE FUTURE: NATIONAL FISH AND AQUATIC STRATEGY





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The Forest Service has an important role in stewardship of exceptional fish and aquatic resources for the benefit of the American people.

Message From the Chief

When people think of the national forests and grasslands, they often think of spectacular scenery, including wild rivers and mountain lakes. They might remember seeing a deer, hearing an owl, or catching a fish in a clear mountain stream. Such memories can last a lifetime, and they are integral to what the national forests and grasslands mean to the American people.

President Theodore Roosevelt and other visionaries who founded the National Forest System did so, in part, to conserve America’s heritage of fish and aquatic resources. Since the beginning, the Forest Service has found that conserving healthy fish habitat and restoring aquatic resources is central to its mission to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.

Healthy streams, lakes, and rivers benefit Americans in a myriad of ways, from clean drinking water to diverse recreational opportunities. One in five Americans relies on water that comes from National Forest System lands. Abundant clean water that gives life to human communities is clearly connected to

healthy habitats for fish and other aquatic species. The national forests and grasslands include some of the Nation’s best remaining habitats for many threatened and endangered fish species. Such habitats are vital for sustaining fish populations important for commercial, recreational, and subsistence uses.

This strategy will guide the Forest Service to work with our partners to sustain these valuable resources. Our work to protect, restore, and enhance natural resources has become increasingly integrated across Forest Service mission areas and disciplines and ever more collaborative. As we carry out this strategy, we will ensure that abundant fish and aquatic resources and healthy aquatic habitats are available for Americans to enjoy both now and for generations to come.

–TONY TOOKE
Chief

Introduction

Forest Service Motto:

Caring for the Land and Serving People

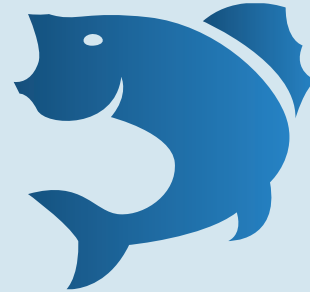
Image © Freshwaters Illustrated

Founded more than 100 years ago, the Forest Service, an agency of the U.S. Department of Agriculture (USDA), plays a key role in the stewardship of fish and aquatic resources. The agency oversees protection, management, use, and stewardship of natural and cultural resources on 154 national forests and 20 national grasslands, containing more than 193 million acres from New England to Florida and Alaska to California. The Forest Service has a unique role to foster healthy watersheds and aquatic habitats that sustain abundant, uniquely adapted fish and wildlife

populations for the ecological, social, and economic needs of the American people. In order to do this, the agency relies upon and cooperates closely with many branches of State governments, especially fish and wildlife agencies, and other Federal agencies and tribal governments; each having their own unique authorities and roles. The Forest Service also partners with many nongovernmental organizations, private landowners and water users, the private sector, and others to fulfill its role in stewarding fish and aquatic resources on national forests and grasslands. These lands, making up the National Forest System,

contain some of the Nation's healthiest intact aquatic ecosystems that contribute to sustaining the Nation's fish and aquatic resources. The agency's work in stewarding fish and aquatic resources is integrated across its three primary mission areas: National Forest System, Research and Development, and State and Private Forestry. These primary mission areas and many of the program areas within each mission area are involved in achieving fish and aquatic stewardship at all levels of the agency. Across all aspects of the agency, the Forest Service improves the lives of people in local communities, rural and urban, by conducting cutting-edge research on fish and aquatic ecology and working collaboratively to improve the condition of fish and aquatic resources for the benefit of the American people.

The Forest Service, working in collaboration with many others and seeking input from a broad constituency, has updated its Rise to the Future Fisheries Strategy herein as the Rise to the Future: National Fish and Aquatic Strategy. A team of nearly 60 participants across the agency and with representatives from the American Fisheries Society, American Sportfishing Association, Association of Fish and Wildlife Agencies, National Fish Habitat Partnership, National Fish and Wildlife Foundation, Recreational Boating and Fishing Foundation, The Nature Conservancy, The Wilderness Society, and Trout Unlimited developed this update (see appendix A). This strategy builds on three decades of success and lessons learned from the original Rise to the Future Fisheries Strategy developed in 1987. The updated strategy was called for by cooperators and partners. The updated strategy is needed to integrate Forest Service programs and actions related to fish and aquatic stewardship in all parts of the agency, particularly through watershed-scale restoration and partnerships. Additionally, it better aligns with and complements the agency's strategic plan (see Appendix B). The updated strategy is more relevant to the agency's cooperators and partners, underscores and recommits the agency to promoting recreational fishing and outdoor aquatic activities, and better addresses the economic value and benefits of fish and aquatic resources to the public.



Fish and aquatic species are among the most endangered groups of organisms in the United States. National forests and grasslands provide more than half of the habitat for federally protected freshwater fishes, mollusks, and amphibians.



*More than **220,000 miles** of rivers and streams and more than **10 million** acres of lakes, reservoirs, and ponds on national forests and grasslands provide a wide range of fishing opportunities for the American people.*

FOREST SERVICE

Mission

The Forest Service is guided by a principle of sustainable multiple use and has an eloquent and progressive mission: *To sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations.*

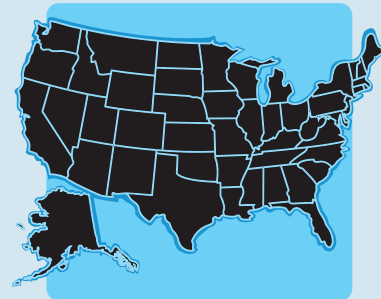


CHALLENGES AND OPPORTUNITIES

The Nation's forests and grasslands are undergoing vast ecological and socioeconomic change, partly due to a confluence of stressors, including large wildfires; outbreaks of insects and disease; invasive species; land use changes; and increased drought, flooding, and water temperatures. However, many aquatic habitats on national forests and grasslands are of high quality despite legacy impacts from historical mining, timber harvesting, grazing, and development. Demand is growing for the many aquatic resources and services that people get from watersheds on national forests and grasslands, including water that is clean, abundant, and cold enough to support habitat for aquatic species. As the country changes and grows, the Forest Service and its cooperators and partners will continue to sustain and restore fish and wildlife habitat, recreational infrastructure, and healthy watersheds by using the best available science to integrate stewardship of fish and aquatic resources into land management. Restoring watershed health and function is critical to sustaining the clean and reliable water supplies and the fish and aquatic resources that communities value, use, and appreciate.

The Forest Service is working to increase the pace of restoration to meet its stewardship mandate while creating more jobs on the national forests and grasslands. To do so, the agency is investing in partnerships and bringing people together to achieve shared objectives. Partners contribute millions of

dollars and tens of thousands of volunteer hours annually to ecosystem restoration projects on and off National Forest System lands. A renewed, collaborative focus on restoring habitat, fish populations, water quality, and natural processes helps to improve aging infrastructure and feeds both recreation and restoration economies, particularly in rural communities.



Millions of people fish on national forests and grasslands, providing more than \$2.2 billion of economic activity each year. National forests in Alaska support a world-renowned, billion-dollar commercial salmon industry, as well as culturally important subsistence fisheries for Alaska Native communities.



OVERVIEW OF STRATEGY AND HIGH-PRIORITY ACTIONS

This strategy contains six goals:

1. Conserve fish and aquatic resources.
2. Connect people to the outdoors through fishing, boating, and other aquatic activities.
3. Strengthen partnerships and work across boundaries.
4. Deliver and apply scientific research.
5. Build capacity through mentoring and training.
6. Communicate the value and benefits of fish and aquatic resources.

Each goal contains multiple objectives, providing a long-term foundation to address current and future challenges, including invasive species; impacts from drought, floods, and other extreme weather events; increasing public demands; and limited resources. The goals and objectives contained in this strategy will better enable the Forest Service to take advantage of new opportunities such as emerging research technologies and innovative and nontraditional partnerships.

Eight specific actions are highlighted as near-term priorities to strategically focus implementation of the strategy with current resources. The Forest Service will work in cooperation with States, especially State fish and wildlife agencies, other Federal agencies, and tribal governments and in partnership with nongovernmental organizations, private landowners and water users, the private sector, and others to implement these near-term priorities. Each action is associated with a clear deliverable or quantifiable accomplishment and an associated timeframe. Realizing the actions in coordination with cooperators and partners will demonstrate the strategy is producing intended results.

1. Increase the number of youth and adults connecting to the outdoors through recreational fishing and other aquatic activities by 50 percent, from fiscal year 2017 levels, by 2023.
2. Increase partnerships with States, other Federal agencies, tribal governments, water providers, corporations, and multistakeholder groups that result in meaningful fish and aquatic stewardship outcomes with multiple benefits by 20 percent, from fiscal year 2017 levels, by 2023.
3. Identify barriers to increasing recreational fishing participation and identify high-priority actions that will yield the greatest increase in participation by 2019.
4. Develop a coarse-scale national assessment of aquatic biodiversity by 2019.
5. Develop criteria for identifying conservation watersheds for fish and aquatic species on national forests and grasslands. Select conservation watersheds by 2020. Update the list as needed. [See goal 1 for a description of conservation watersheds.]
6. Conduct and distribute a national fish and aquatic ecology research needs assessment by 2019.
7. Develop business practices and protocols for effective mentoring of fisheries biologists and aquatic ecologists by 2018.
8. Work with experts to develop and implement a communications and outreach plan by 2018.

STRATEGIC GOALS

The Forest Service is committed to working agency-wide in an integrated manner to accomplish all six goals in this strategy. More importantly, the Forest Service cannot do it alone and is strongly committed to working in cooperation with States, especially State fish and wildlife agencies, other Federal agencies, and tribal governments and in partnership with nongovernmental organizations, private landowners and water users, the private sector, and others to accomplish specific objectives and tasks identified in the six goals of this strategy. The practice of working in cooperation and in partnership with others is implicit throughout objectives and tasks identified under each of the six goals; however, in some instances additional emphasis is added.



Healthy watersheds and clean water on national forests and grasslands improve opportunities for people to explore and enjoy the aquatic world.
Credit: Image © Freshwaters Illustrated

GOAL 1:

Conserve Fish and Aquatic Resources

Sustaining healthy watersheds and aquatic ecosystems that support an abundance and diversity of fish, other aquatic species, and their habitats is part of the Forest Service’s mission. To achieve its mission, the Forest Service protects, restores, and enhances watersheds and aquatic ecosystems upon which populations of fish and other aquatic species depend. The agency’s strategies and actions are designed to help aquatic species and ecosystems adapt to multiple stressors, including drought, floods, increasing water temperatures, changes in precipitation patterns, invasive species, fire, and disease.

To conserve fish and aquatic resources, the Forest Service will identify watersheds important for the stewardship of fish and other aquatic species. These “conservation watersheds” will help managers strategically plan and prioritize activities for the greatest ecological, social, and economic benefits. Conservation watersheds are intended to help identify and sustain both common and rare species and habitats as well as natural processes at multiple scales (forestwide, regionwide, and nationwide), helping build a network of healthy, functioning watersheds across the landscape. Conservation watersheds will represent a strategic, long-term approach to working with cooperators and partners to improve aquatic conditions.

Conservation watersheds will complement, not replace or take away from Priority Watersheds identified through the agency’s 2011 Watershed Condition Framework. Through the Watershed Condition Framework, the Forest Service assessed and classified watershed conditions in more than 15,000 6th field subwatersheds (HUC12) on National Forest System lands and works with cooperators and partners to protect and maintain functioning watersheds and to restore degraded watersheds. By definition, high-priority watersheds under the Watershed Condition Framework are designated as such for relatively short periods of time, generally 3 to 5 years. In contrast, identification of conservation watersheds is intended to help protect and maintain the most intact aquatic systems as well as restore degraded watersheds of high importance for stewardship of fish and aquatic resources over the long term. There will likely be some overlap among conservation watersheds and Watershed Condition Framework high-priority watersheds.

In cooperation with States, other Federal agencies, and tribal governments, the agency will monitor the populations of fish and other aquatic species, along with their habitats. Knowledge gained from monitoring will help the agency better understand the complex and ever-changing ecosystems it manages, as well as evaluate approaches and formulate new strategies for sustaining and restoring them.

LONG-TERM VISION

Watersheds and aquatic ecosystems across the national forests and grasslands are in a healthy condition characterized by complex, interconnected, and diverse habitats. They contain self-sustaining assemblages of fish and aquatic species and have a high level of resilience in the face of multiple stressors, including natural disturbances.

OBJECTIVES

OBJECTIVE A: Evaluate the current status and diversity of fish and other aquatic species and their habitats on National Forest System lands in cooperation with States, other Federal agencies, and tribal governments and in partnership with nongovernmental organizations and others.

- i. Develop a coarse-scale national assessment of aquatic biodiversity and associated visualization tools by 2019, including identification of important fish and other aquatic species, their conservation status and trends, public use, and critical information gaps using available data and assessments from State fish and wildlife agencies, tribal governments, other Federal agencies, and nongovernmental organizations. Update the assessment every 10 years.
- ii. Encourage development and updates of regional assessments of aquatic ecosystems on the national forests and grasslands that tier to the national assessment and contribute to forest plan revision and subsequent monitoring. Create or update regional geospatial fish and aquatic species distribution maps, including migration barriers, and enter Forest Service aquatic survey data into appropriate corporate databases for long-term data stewardship and sharing with other agencies and interested partners.
- iii. Encourage development and updates of finer scale assessments of aquatic ecosystems on the national forests and grasslands that tier to regional assessments and contribute to forest plan revision and subsequent monitoring.

OBJECTIVE B: Identify conservation watersheds to help the Forest Service strategically focus on protecting, restoring, and enhancing fish and other aquatic species.

- i. Cooperate with States, other Federal agencies, and tribal governments and partner with nongovernmental organizations and others to develop criteria for identifying conservation watersheds on the National Forest System. Select conservation watersheds by 2020, informed by results from the national assessment of aquatic biodiversity. Update the list as needed.
- ii. Assist others as requested in identifying important areas outside of the National Forest System for stewardship of fish and other aquatic species.
- iii. Develop regional vulnerability assessments of fish and other aquatic resources on National Forest System lands with respect to extreme weather events, including other stressors such as fire, invasive species, and disease. The assessments should specify high-priority management actions in conservation watersheds and assist land managers with implementation of adaptation actions to increase resiliency to environmental stressors.

OBJECTIVE C: Participate in and contribute to developing and updating protection, conservation, and restoration plans.

- i. Participate in the development, updates, and reviews of conservation strategies and recovery plans for at-risk fish and other aquatic species (for example, National Fish Habitat Partnership assessments as well as State-led and tribally-led plans).
- ii. Incorporate measures from established protection, conservation, and restoration plans (for example, the Northwest Forest Plan, the Sierra Nevada Framework, PACFISH, and INFISH) into existing or new Forest Service strategies and into forest plan revisions. Refer to established protection, conservation, and restoration plans when selecting conservation watersheds.

OBJECTIVE D: Carry out strategic protection, restoration, and enhancement actions and demonstrate beneficial outcomes for fish and aquatic communities.

- i. Perform watershed- and site-specific protection, restoration, and enhancement activities based on watershed and threat assessments. Where appropriate, emphasize postfire watershed restoration and water quality best management practice (BMP) implementation and monitoring. Work in an integrated, interdisciplinary manner in collaboration with partners.
- ii. Plan and carry out road-related restoration activities, including BMP implementation and monitoring, to reduce risks and damage to aquatic resources, protect transportation infrastructure, and ensure safe access for communities.
- iii. Work with the ranching and irrigation communities and encourage new partnerships for working-lands solutions on National Forest System lands to improve riparian and aquatic habitats.
- iv. Limit and reduce the impacts of invasive species on the Nation's fish and aquatic resources by implementing best practices, including decontamination of boats and gear, and support public outreach and education to prevent the spread of invasive species. Work closely in cooperation with States, other Federal agencies, and tribal governments and in partnership with nongovernmental organizations to prevent the introduction and spread of invasive species. Participate in multipartner monitoring and surveillance programs to detect new invasions and to rapidly respond.
- v. Track restoration actions and associated performance outcomes using official databases, including updating and tracking of watershed restoration actions plans as part of the agency's Watershed Condition Framework.

OBJECTIVE E: Monitor populations of fish and other aquatic species, along with their habitats.

- i. Monitor and assess populations of fish and other aquatic species at multiple scales, as well as habitat conditions over time. Coordinate monitoring and assessment in cooperation with States, other Federal agencies, and tribal governments and in partnership with nongovernmental organizations.
- ii. Monitor the effectiveness of management actions and apply the results to adapt and change management practices and strategies where needed (such as forest plans).

- iii. Support and expand a network of long-term monitoring sites, including sentinel and reference watersheds, to track watershed and aquatic habitat conditions over time. Sentinel and reference watersheds are those where there is a commitment to long-term, continuous monitoring of fish, other aquatic species, and their habitats, often integrated together or with other physical or biological components, to evaluate trends in status or health of aquatic resources.



Installing a sign on the Pisgah National Forest to inform the public not to move river rocks in order to protect the hellbender, an important aquatic species that depends on cold, clean water.

Credit: Image © Freshwaters Illustrated



Public fishing access provides cherished family time and a multi-billion dollar economy.
Credit: S. Dingman

GOAL 2:

Connect People to the Outdoors Through Fishing, Boating, and Other Aquatic Activities

*F*ishing, boating, and other aquatic activities afford economic, social, and cultural benefits to communities across the Nation. The Forest Service will enhance recreational fishing and other aquatic recreational activities on National Forest System lands across America through access, facilities, and programs that connect people, especially those in urban, rural, and underserved communities, with the outdoors. Personal and cultural awareness of and appreciation for the beauty and value of nature build public support for public lands and their stewardship. Through increased public recognition of the value of healthy, sustainable fisheries and aquatic resources, the Forest Service will engage more people in the conservation of natural resources.

LONG-TERM VISION

Everyone has opportunities to enjoy fishing and other aquatic activities on National Forest System lands, including youth, adults, and others with limited access to the outdoors. The next generation of natural resource stewards understands and appreciates the value of public lands and the benefits of clean water, aquatic recreation, and healthy aquatic environments.

OBJECTIVES

OBJECTIVE A: Increase recreational fishing and fishing opportunities on the national forests and grasslands.

- i. Identify the social, cultural, and economic barriers to recreational fishing (for example, accessibility, transportation, lack of prior experience, loss of interest, and language).
- ii. Maintain and improve public access and eliminate other barriers to increase recreational fishing on national forests and grasslands in high-priority locations.
- iii. Support and expand partnerships locally, regionally, and nationally to increase recreational fishing.
- iv. Introduce youth and adults to recreational fishing through activities such as family-friendly fishing events and educational campaigns. Host 50 percent more family-friendly events in 2023 than in 2017.
- v. Inform the public about the sustainable use of recreational fisheries and about fishing and boating safety.
- vi. Build an effective public information portal to share and promote angling opportunities on National Forest System lands with the public.
- vii. Promote development and use of apps and other digital user platforms to share information about fishing access, opportunities, and regulations.
- viii. Endorse and contribute to State recreational fishing programs, including those targeting sustainable fisheries.

OBJECTIVE B: Connect people to the outdoors, public lands, and the Forest Service through aquatic recreation, stewardship, citizen science, and educational activities.

- i. Support volunteer opportunities for youth and adults to engage in citizen science, aquatic restoration, and educational programs and projects.
- ii. Work with the Forest Service's conservation education programs to help people learn about relationships among forests, watersheds, water, fish, and aquatic health (for example, through freshwater snorkeling, educational programs, and youth art contests).
- iii. Inform the public about conservation ethics through programs and workshops.



*Fishing is fun and helps promote the next generation of natural resource stewards.
Credit: Trout Unlimited*



Partnerships are key to success.
Credit: USDA Forest Service, Fremont-Winema National Forest

GOAL 3:

Strengthen Partnerships and Work Across Boundaries

State governments, other Federal agencies, and tribal governments are important cooperators, and nongovernmental organizations, private landowners and water users, the private sector, and others are important partners—all of whom are critical to the Forest Service’s ability to achieve its strategic goals, as the Forest Service is to achieving theirs. Cooperators, partners, and the Forest Service support each other’s work by lending credibility and sharing resources. Collectively, all organizations help each other to achieve shared objectives for collaborative stewardship across boundaries. The Forest Service will expand and refine its cooperator and partner networks and work to achieve shared objectives across jurisdictional boundaries and multiple landownerships.

LONG-TERM VISION

Cooperators and partners support and lend strength and credibility to Forest Service science and fish and aquatic stewardship activities. Cooperators and partners play an essential role in achieving desired outcomes across multiple landownerships. Cooperation and partnerships yield a wide range of benefits and are essential to meeting Forest Service strategic goals. The agency has a large and diverse cooperator and partnership portfolio and is a partner of choice for large public–private ecosystem restoration and education outreach projects.

OBJECTIVES

OBJECTIVE A: Cooperate with tribal governments to form stronger and more effective relationships.

- i. Support subsistence use and fulfill treaty obligations, in cooperation with relevant State and other Federal agencies. Engage with tribal governments on a government-to-government basis and seek early involvement.
- ii. Incorporate traditional ecological knowledge into planning and design of restoration and other projects, as well as into monitoring and research, in cooperation with relevant State and other Federal agencies.
- iii. Improve cooperation with tribal governments in areas of mutual interest related to stewardship of fish and aquatic resources (such as aquatic restoration, youth education, citizen science, recreational fishing, invasive species management, scientific research, and training).

OBJECTIVE B: Cooperate with State governments, especially State fish and wildlife agencies, to form stronger and more effective working relationships.

- i. Improve cooperation with all pertinent branches of State governments, especially State fish and wildlife agencies, to discuss and address areas of mutual interest related to stewardship of fish and aquatic habitat (such as aquatic restoration, youth education, citizen science, recreational fishing, invasive species management, scientific research, and training).

- ii. Collaboratively leverage available expertise and resources of State fish and wildlife agencies and of the Forest Service to achieve mutual goals for the Nation’s forests and grasslands, including sustainable fisheries, increased participation in recreational fishing, and improved boating and fishing access.

OBJECTIVE C: Cooperate with other Federal agencies to form stronger and more effective working relationships.

- i. Work with other USDA agencies and agencies from other Federal Departments to increase alignment and efficiencies for stewardship of fish and aquatic resources (such as aquatic restoration, infrastructure improvement, youth education, citizen science, recreational fishing, invasive species management, scientific research, and training).
- ii. Coordinate with responsible Federal agencies to achieve greater fish and aquatic conservation and recovery outcomes and also improve processes for regulatory streamlining.

OBJECTIVE D: Partner with nongovernmental organizations, private landowners and water users, industries, private businesses, water providers, multistakeholder groups, and others to form stronger and more effective working relationships.

- i. Engage in partnerships and initiatives for collaborative stewardship of fish and aquatic resources that result in expansive outcomes with multiple benefits, utilizing such efforts as the Collaborative Forest Landscape Restoration Program, Watershed Condition Framework, Joint Chiefs’ Initiative, and National Fish Habitat Partnership.
- ii. Partner with nongovernmental organizations, private landowners and water users, industries, private businesses, water providers, multistakeholder groups, and others to coordinate fish and aquatic stewardship activities in areas of shared interest, such as youth education, citizen science, recreational fishing, invasive species management, scientific research, and training.
- iii. Pursue partnerships that integrate objectives for restoring upland, terrestrial, and aquatic ecosystems with the forest products, ranching,

and irrigation and agricultural industries as well as adjacent willing private landowners and water users.

OBJECTIVE E: Improve business practices to create strong and effective partnerships through durable and long-lasting relationships.

- i. Invest in establishing and maintaining strong relationships with partners to develop a clear understanding of their unique perspectives, as well as of mutual interests, strengths, and assets.
- ii. Establish and update formal agreements that specify mutual benefits, clear expectations, and deliverables for all parties involved.
- iii. Identify internal processes that reduce effectiveness of cooperative and collaborative efforts and develop remedies to address such barriers.
- iv. Promote the use of multiple authorities for ecosystem and aquatic restoration (such as Stewardship Contracting, Good Neighbor, and Wyden Amendment).

- v. Use the best available science to locate the best opportunities for large-scale investments in restoring aquatic and terrestrial communities while also yielding social and cultural benefits.



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Stewardship of fish and aquatic resources is widely recognized and embraced as an important part of who the Forest Service is and what the agency does. The agency actively engages with government and nongovernment partners at local, regional, and national levels to ensure that efforts support the stewardship and public use and enjoyment of fish and other aquatic resources.



*Forest Service fisheries biologists and aquatic science researchers collaborate on field studies at Deer Creek on the Willamette National Forest to promote more effective stewardship of fish and aquatic resources.
Credit: USDA Forest Service, Jim Capurso*



Science is the foundation for collaborative fish and aquatic stewardship.
Credit: USDA Forest Service, Craig Roghair

GOAL 4:

Deliver and Apply Scientific Research

Science is critical to stewardship of fish and aquatic resources. The Forest Service produces and relies on high-quality science to help formulate strategies and actions to steward fish and aquatic species. The agency contributes to and supports scientific progress in fisheries and aquatic ecology by ensuring data consistency and quality and by sharing knowledge both internally and externally. Forest Service employees support the stewardship of fish and aquatic resources by applying science and technology, building research partnerships, and creating and maintaining reliable databases.

Forest Service scientists and natural resource managers will formulate and investigate the highest priority research questions related to fisheries and aquatic ecology. Agency researchers will advance the science of aquatic ecology and produce impartial and reliable data, analyses, and syntheses that managers and decision makers can use at local, State, regional, national, and international levels. Agency researchers will use peer-reviewed scientific journals to share research results with the broader fish and aquatic conservation community. Forest Service scientists and natural resource managers will communicate the value of research, align research priorities in fish and aquatic ecology with management needs, and apply the best available science to inform policy and management decisions.

LONG-TERM VISION

The Forest Service excels in science and science-based stewardship of aquatic resources. Agency research is reliable, advances scientific understanding of aquatic ecosystems, and helps decisionmakers. National, publicly accessible databases document the status and trends of aquatic species and habitats across the national forests and grasslands. The public, other agencies, and Congress are well informed about the status of fish and aquatic resources on national forests and grasslands and recognize the importance of these lands for aquatic resource conservation.

OBJECTIVES

OBJECTIVE A: Prioritize research projects on fish and aquatic ecology needed to sustain the health and diversity of aquatic life on the Nation's forests and grasslands.

- i. Conduct, distribute, and track progress on meeting the needs identified in a national fish and aquatic ecology research needs assessment every 5 years.
- ii. Develop and apply methods and protocols to meet inventory and monitoring requirements related to fish and aquatic resources at multiple levels.

OBJECTIVE B: Produce, support, and synthesize science, including social science, needed to sustain the health and diversity of aquatic life on the Nation's forests and grasslands.

- i. Encourage the formation of high-performance groups of researchers, managers, and partners with complementary expertise and supported by professional staff with necessary technical skills (that is, in taxonomy, natural history, relational databases, geospatial databases, web design, and technology transfer).
- ii. Motivate researchers and managers to work together on high-priority research and management projects related to the stewardship of fish and aquatic resources.

OBJECTIVE C: Use science to inform decisions and help managers achieve desired outcomes related to fish and other aquatic resources.

- i. Link research activities to management needs. Establish mechanisms for staff on the national forests and grasslands and for cooperators and partners from other agencies and organizations to engage agency scientists in meeting their research needs, in particular addressing specific uncertainties related to the outcomes of management actions.
- ii. Hold regular meetings across Forest Service mission and program areas. Establish regular channels of communication among scientists and managers.
- iii. Maintain and expand the Forest Service's ability to share knowledge internally and externally through innovative approaches to technology transfer.

OBJECTIVE D: Improve practices for data collection and stewardship to increase transparency and opportunities for partnerships inside and outside the Forest Service.

- i. Develop and use nationally standardized protocols to collect, report, manage, and share data about fish and aquatic resources on the national forests and grasslands. Build on the Forest Service's capacity to collect and analyze large datasets from various partners and across diverse landscapes
- ii. Use coordinated monitoring programs and corporate databases to improve the usage, interoperability, stewardship, and accessibility of aquatic resources data.
- iii. Create database task force teams to work with the national forests and grasslands and partners to compile, organize, and integrate large legacy datasets and new datasets to address issues related to the stewardship of fish and aquatic resources at broad scales.



The Forest Service is committed to a skilled and well-trained workforce empowered to champion fish and aquatic stewardship.
Source: USDA Forest Service, Mike Schwartz

GOAL 5:

Build Capacity Through Mentoring and Training

Competent, motivated, and well-networked professionals and technicians are essential to successful aquatic resource stewardship. The Forest Service gives employees training and opportunities to effectively manage aquatic resources on the national forests and grasslands and to advance science to improve aquatic resource stewardship. The agency will improve the skills, capabilities, and professionalism of its workforce in support of the stewardship of fish and aquatic resources. The Forest Service will recruit and maintain a diverse workforce with opportunities, training, technologies, and toolsets to increase its effectiveness. Forest Service managers will foster an inclusive work environment, recognizing and valuing the diverse perspectives and contributions of all employees. Formal and informal networking with peers and mentors will accelerate capacity building and adaptability, transferring institutional knowledge throughout the workforce. The Forest Service will create opportunities for professionals and technicians to grow and develop throughout their careers.

LONG-TERM VISION

Forest Service employees are well trained and possess the specialized skills and resources needed to meet the agency's responsibilities pertaining to aquatic stewardship. They demonstrate leadership, working in an interdisciplinary manner in support of fish and aquatic resource stewardship by planning and executing integrated resource projects and scientific investigations. They are part of an active network of professionals who support and advise one another. They work well together and with others, and they are sensitive to the concerns of others, both internally and among external constituencies. Resources are available for training and professional development. Peers, supervisors, program leaders, and mentors encourage staff to participate in developmental opportunities, raise their visibility, and showcase their technical skills and professional achievements. The diversity of Forest Service fisheries biologists and aquatic ecologists reflects the public the agency serves.

OBJECTIVES

OBJECTIVE A: Recruit and maintain employees from diverse backgrounds to meet current and future needs for fish and aquatic resource research and management.

- i. Assess staffing needs for current and future workloads. Develop coordinated plans to meet needs nationally, regionally, and locally.
- ii. Adopt efficient and effective consolidated hiring practices for positions related to fisheries biology and aquatic ecology.
- iii. Support entry-level and career-ladder positions throughout the agency.
- iv. Recruit from underrepresented groups to diversify workforce perspectives.
- v. Reach out to students at all levels by offering workshops and distributing information at professional conferences.
- vi. Develop and support career opportunities for youth and young adults through internships, summer work programs, and seasonal jobs.

OBJECTIVE B: Offer training and mentoring for technical and professional development.

- i. Assess technical and professional training needs and opportunities. Encourage employees to complete training in aquatic ecosystem management, as well as other relevant disciplines (for example, hydrology and silviculture). Work with professional societies and other agencies to coordinate training schedules and opportunities for continuing education.
- ii. Develop and offer training in aquatic stewardship to staff from all resource areas on national forests and grasslands to foster well-coordinated and integrated program delivery.
- iii. Emphasize active collaboration and knowledge transfer within the agency, including communication among regions and national forests and grasslands about effective approaches to stewardship and restoration, planning, and external partnerships.
- iv. Use Intergovernmental Personnel Act agreements to enhance technical and professional development and to cross-train agency staff.
- v. Expand mentoring opportunities across mission and program areas at all agency levels.
- vi. Expand opportunities for fisheries biologists and aquatic ecologists to take communications training to help them network and tell their stories.
- vii. Offer leadership development through formal programs (such as the Forest Service Middle Leader and Senior Leader Programs), training, detail assignments, and job shadowing.
- viii. Emphasize the importance of individual development plans.

OBJECTIVE C: Foster an environment of professional excellence.

- i. Encourage employees to participate in and contribute to professional societies (such as the American Fisheries Society and the Society for Freshwater Science) at national, regional, and local levels, including serving in leadership positions.

- ii. Hold agency meetings among researchers and managers in fisheries biology and aquatic ecology in conjunction with external professional meetings to encourage internal and external coordination and networking.
- iii. Recognize and reward exceptional contributions to fish and aquatic stewardship and science and to an integrated fish and aquatic conservation community through the annual Rise to the Future awards program.
- iv. Maintain, develop, or expand technical assistance teams comprising skilled restoration practitioners to assist national forests with highly complex and expensive aquatic restoration projects.



*Oregon Department of Fish and Wildlife fisheries biologist conducts in-the-field training on Oregon chub recovery success to U.S. and international fish passage specialists.
Credit: USDA Forest Service, Jim Capurso*



*Forest Service fisheries biologists and aquatic science researchers learn new techniques for monitoring and evaluating the health of streams and aquatic habitat.
Credit: USDA Forest Service, Jim Capurso*



Fish and aquatic resources from national forests and grasslands have tremendous economic value.

Credit: USDA Forest Service, Ron Medel

GOAL 6:

Communicate the Value and Benefits of Fish and Aquatic Resources

The Forest Service will communicate the value of fish and aquatic resources on national forests and grasslands and the benefits they provide to the American people. The agency is committed to awakening and strengthening the connection of all people to aquatic ecosystems. Accordingly, Forest Service employees will tell stories that highlight the value of fish and aquatic resources and will do so in local, national, and global arenas. Employees will listen and respond to the needs and desires of the public and will effectively communicate the value of stewarding fish and aquatic resources.

LONG-TERM VISION

A wide range of local, national, and global audiences understand the value of fish and aquatic resources, and the public and agency partners appreciate the Forest Service's stewardship role. Forest Service employees listen and respond to the public and to partners.

OBJECTIVES

OBJECTIVE A: Develop and share media and information to increase public awareness of and engagement with fish and aquatic resources on the national forests and grasslands.

- i. Develop and share coordinated messages that underscore the connection between healthy fish and aquatic resources and abundant clean water.
- ii. Work with experts to develop and carry out a communications and outreach plan that delivers key messages through film, social media, and other formats to various audiences.
- iii. Update fisheries-related Forest Service websites regularly and use social media to communicate more effectively with the American people.
- iv. Encourage upward reporting of success stories related to fish and aquatic stewardship at the forest, region, station, and national levels.
- v. Highlight stories about integrated fish and aquatic resource stewardship across multiple disciplines and varying geographies, including urban areas.
- vi. Motivate Forest Service researchers to share their findings through social media and networks in both scientific and nontechnical language.

OBJECTIVE B: Communicate the value of partnerships in achieving fish and aquatic stewardship outcomes.

- i. Track partner support and diversity and communicate the corresponding benefits to stakeholders, the public, and Congress.
- ii. Promote effective partnerships and collaboration through awards, outreach material, and media, illustrating models and components for success.

- iii. Quantify and communicate the ecological, social, and economic benefits of fish and aquatic resources on National Forest System lands, such as the return on investments from ecosystem restoration projects.

OBJECTIVE C: Listen and respond to partners and the public.

- i. Find opportunities to interact with various audiences, including in urban communities, to get people's perspectives about fish and aquatic resources and Forest Service stewardship activities.
- ii. Invite individuals and communities to use social media and other interactive communication platforms to tell their stories and express their values with respect to fish and aquatic resources.
- iii. Incorporate partner and public feedback into program direction, public outreach and education activities, stewardship projects, and youth programs.



Sockeye salmon from southeast Alaska's national forests support highly valued commercial, sport, and subsistence fisheries.

Credit: Image © Freshwaters Illustrated

MEASURING PROGRESS

A strategy implementation steering committee will give guidance and ensure accountability in achieving results. The purpose of the steering committee is to evaluate the effectiveness of the Rise to the Future: National Fish and Aquatic Strategy and its alignment with, and contributions to meeting, the broader goals of the Forest Service and the fish and aquatic conservation community. The steering committee will include national and regional directors, National Forest System unit-level line officers, research station assistant directors or program managers, and representatives from cooperator and partner organizations. The national fisheries program leader and the national program leader for fish and aquatic ecology research will meet with the steering committee every 2 years, beginning in the first quarter of fiscal year 2020, to report on strategy implementation. The steering committee or a subgroup will conduct periodic reviews at the region, forest, and station levels to measure progress towards strategy implementation, including identification of barriers to success and feedback on the strategy. The steering committee will receive written progress reports at the meetings, and the reports will be shared widely, internally and externally.

Credit: USDA Forest Service, Alan Dyck

APPENDIX A. CONTRIBUTORS

Numerous participants across the agency at all levels contributed to the development of this strategy, including participants from all three mission areas (National Forest System [NFS], Research and Development [R&D], and State and Private Forestry [S&PF]). Several key partner organizations also contributed and many tribal governments provided input. The names and affiliations of all who contributed follow below.

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APPENDIX B. ALIGNMENT OF RISE TO THE FUTURE: NATIONAL FISH AND AQUATIC STRATEGY GOALS WITH AGENCY GOALS

The Rise to the Future: National Fish and Aquatic Strategy's six goals, along with their supporting objectives and action items, will help the agency to carry out its strategic plan. As regional offices, research stations, and national forests and grasslands tier their respective fish and aquatic conservation plans and activities to this national strategy, the Forest Service will make progress locally, regionally, and nationally in achieving the goals of this strategy. The agency will meet the ecological, social, and economic goals of the Rise to the Future: National Fish and Aquatic Strategy by working together across mission and program areas to achieve multiple benefits at all levels. Equally important is collaborating and aligning priorities with tribal governments, State fish and wildlife agencies, other Federal agencies, private landowners and water users, and the many diverse stakeholders and partner organizations who use and value National Forest System lands to meet collective expectations. It is crucial not only to align priorities with those of partners but also to work together to complement each other's strengths, skills, and assets.

The goals of the Forest Service's Rise to the Future: National Fish and Aquatic Strategy are well aligned with the goals of the USDA Forest Service Strategic Plan: 2015–2020.

The four goals of the Forest Service strategic plan are:

- Sustain our Nation's forests and grasslands
- Deliver benefits to the public
- Apply knowledge globally
- Excel as a high-performing agency

The descriptions below specify how each of the six goals of the Rise to the Future: National Fish and Aquatic Strategy align with one or more of the four Forest Service strategic goals.

Goal 1. Conserve fish and aquatic resources.

Fish and aquatic resources are integral parts of the Nation's forests and grasslands. As agency employees steward healthy fish populations and restore aquatic resources on national forests and grasslands, they contribute to *sustaining our Nation's forests and grasslands*.

Goal 2. Connect people to the outdoors through fishing, boating, and other aquatic activities.

Fishing, boating, and other aquatic activities that connect people to the aquatic world are enjoyable and valued experiences that offer a wide range of personal and social benefits from relaxation to exhilaration to education to making positive memories with friends and family. As people participate in these activities on national forests and grasslands, Forest Service employees *deliver benefits to the public* and foster a caring, engaged public with a sense of stewardship to ensure that all collectively *sustain our Nation's forests and grasslands*.

Goal 3. Strengthen partnerships and work across boundaries.

No single agency or organization can do all that needs to be done to steward the Nation's fish and aquatic resources. Cooperating with other Federal agencies, States, and tribal governments and partnering with nongovernmental organizations and private landowners and water users is vital to fish and aquatic stewardship and is essential to *sustaining our Nation's forests and grasslands*. With rich and diverse partnerships, Forest Service employees are able to accomplish more than they would be able to do alone, increasing their ability to *deliver benefits to the public and to excel as a high-performing agency*.

Goal 4. Deliver and apply scientific research.

The fish and aquatic ecology research the Forest Service conducts serves as the foundation for fish and aquatic stewardship at multiple scales. This scientific foundation is necessary to *apply knowledge globally* and to manage aquatic resources effectively so the agency *excels as a high-performing agency*.

Goal 5. Build capacity through mentoring and training.

A well-trained, highly motivated diverse workforce is a critical component of the Forest Service's organizational capacity to *excel as a high-performing agency* which allows the agency to *sustain our Nation's forests and grasslands, deliver benefits to the public, and apply knowledge globally*.

Goal 6. Communicate the value and benefits of fish and aquatic resources.

Communication is key in all that the agency does. Effectively communicating the value of work lends relevance and credibility to efforts to *sustain our Nation's forests and grasslands, deliver benefits to the public, apply knowledge globally, and excel as a high-performing agency*.



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Dave Herasimtschuk © FI

*Wildlife also benefit from well-managed resources.
Credit: Image © Freshwaters Illustrated*

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