

2022-2026
Regional Implementation Plan



Partners for Fish & Wildlife



ALASKA



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Front Cover: Katrina Liebich/USFWS

Executive Summary

In Alaska, the Partners for Fish and Wildlife (PFW) Program focuses on species conservation, habitat connectivity, and resilient ecosystems for the benefit of federal trust species. Pacific salmon, migratory birds, and pollinators are used to guide our planning decisions for on-the-ground projects within the program's defined geographic focus areas. Each of these species groups serves an ecological role that influences the productivity of the other and the ecosystem overall. For example, Pacific salmon are connected to people and all components of their watersheds. Salmon are an ecosystem driver and the ecological health of entire ecosystems, including everything from soil microbes to the plant community to apex organisms like bears, relies on healthy salmon populations. Thus, because all components of the ecosystem are connected, actions to restore or enhance habitat for one species benefits a multitude of others. During this strategic planning period, we will prioritize activities that result in multiple species/habitat benefits, while maintaining our emphasis on building partnerships to achieve mutual goals.

Fish and wildlife biologists and managers in Alaska are faced with a monumental challenge and opportunity: to preserve the natural diversity of species and habitats such that each will be sustainable for generations to come. On the whole, Alaska is composed of intact, functioning habitats that support abundant fish and wildlife resources; many of these habitats are protected within State or Federal conservation units. Yet, human impacts on the Alaska landscape are real and increasing, whether it's through urban development, climate change, or natural resource extraction such as transboundary mining or oil and gas development. The PFW Program focuses on the restoration of private lands at this intersection of functioning habitat and human impact. The program conducts conservation actions to prevent species declines by addressing stresses and threats as soon as possible, with the aim of maintaining self-sustaining populations or restoring declining populations to avoid the need for Endangered Species Act listing or other expensive restoration actions.



Pacific salmon, migratory birds, and pollinators offer tremendous opportunities to further the Service's mission and form robust conservation partnerships across Alaska. The Alaska PFW Program will leverage these partnerships to address priority conservation needs on private lands, which are key to sustaining resilient fish and wildlife populations.

Regional Director Message

In Alaska, we are shared stewards of fish, wildlife, and lands that people love and have depended on for time immemorial. The Partners for Fish and Wildlife Program is the Service's flagship voluntary stewardship tool for fish and wildlife conservation on private lands. The conservation needs of Alaska's fish and wildlife resources are diverse, ranging from protection of intact, functioning habitats to restoration of habitats degraded by human impacts such as habitat fragmentation, invasive species, and climate change. Private lands conservation is vital to the health and sustainability of the Alaska's fish and wildlife resources, focusing on the needs of Pacific salmon, migratory birds, and pollinators. Our success will be measured by our ability to unite around conservation needs, work together toward common conservation goals, and share a sense of purpose. This will only be possible if we collaborate with one another and leverage the resources and talents of our dedicated partners to address our highest conservation priorities. This regional implementation plan provides the context and framework for the Service's staff, partners, and Tribes to prioritize our conservation actions over the next five years. Because of these efforts, we hope that each generation has the opportunity to live with, live from, discover, and enjoy the wildness of this awe-inspiring land.



Photo: Sara Boario
Alaska Regional Director
(USFWS)

About this Document

In Alaska, we are shared stewards of fish, wildlife, and lands that people love and have depended on for time immemorial. The Partners for Fish and Wildlife Program is the Service's flagship voluntary stewardship tool for fish and wildlife conservation on private lands. The conservation needs of Alaska's fish and wildlife resources are diverse, ranging from protection of intact, functioning habitats to restoration of habitats degraded by human impacts such as habitat fragmentation, invasive species, and climate change. Private lands conservation is vital to the health and sustainability of the Alaska's fish and wildlife resources, focusing on the needs of Pacific salmon, migratory birds, and pollinators. Our success will be measured by our ability to unite around conservation needs, work together toward common conservation goals, and share a sense of purpose. This will only be possible if we collaborate with one another and leverage the resources and talents of our dedicated partners to address our highest conservation priorities. This regional implementation plan provides the context and framework for the Service's staff, partners, and Tribes to prioritize our conservation actions over the next five years.



Photo: Rock sandpipers in
flight over Kachemak Bay.
(Lisa Hupp, USFWS)

REGIONAL OVERVIEW

The Alaska Region delivers an integrated voluntary conservation partnerships framework that includes the PFW Program, Coastal Program, National Fish Passage Program, and the National Fish Habitat Partnership. Each program has unique capabilities and together create an effective model for cooperative conservation delivery. By combining the four programs under a single Assistant Regional Director for Fisheries and Ecological Services and a single Regional Habitat Restoration and Conservation Partnerships Coordinator, we create significant programmatic and administrative efficiencies. This structure empowers the collective implementation of these programs to strategically focus on Service conservation priorities. This structure also enables the four programs to be managed seamlessly and allows for cost effective conservation outcomes delivered through our Fish and Wildlife Conservation Offices (FWCOs). Also, having a single state Region is unique nationally and provides added continuity in program conservation delivery.



Photo: A Kodiak Brown Bear catches a Coho Salmon in her jaws.
(Lisa Hupp, USFWS)

Photo: Kenai River Sockeye Salmon are a big draw for personal use, sport, and commercial fishers.
(Jess Straub, USFWS)



Across the US, about 75% of fish and wildlife species depend on functioning private lands for their life history and habitat needs – private lands are key to sustaining diverse fish and wildlife populations. The PFW Program is the Service’s primary tool to provide technical and financial assistance to create, restore, or enhance upland, riparian, wetland, or aquatic habitats on private lands. The program works directly and voluntarily with landowners interested in improving fish and wildlife habitat, who commit to maintain the improvement for at least 10 years while retaining complete control of their land. By implementing partner-supported habitat restoration projects, the PFW Program safeguards important habitats for the present and future benefit of fish, wildlife, and the American public.

Alaska PFW Program funds on-the-ground habitat restoration projects and supports Service biologists, hydrologists, and engineers who provide technical assistance to partners and assist with project design, planning, implementation, and monitoring. We establish our substantial involvement in projects through this direct contribution to on-the-ground conservation or provision of technical assistance. Leveraging of PFW resources with partner resources and expertise multiplies the positive impact on conservation priorities of mutual interest. The Alaska PFW Program operates under an effective delivery model

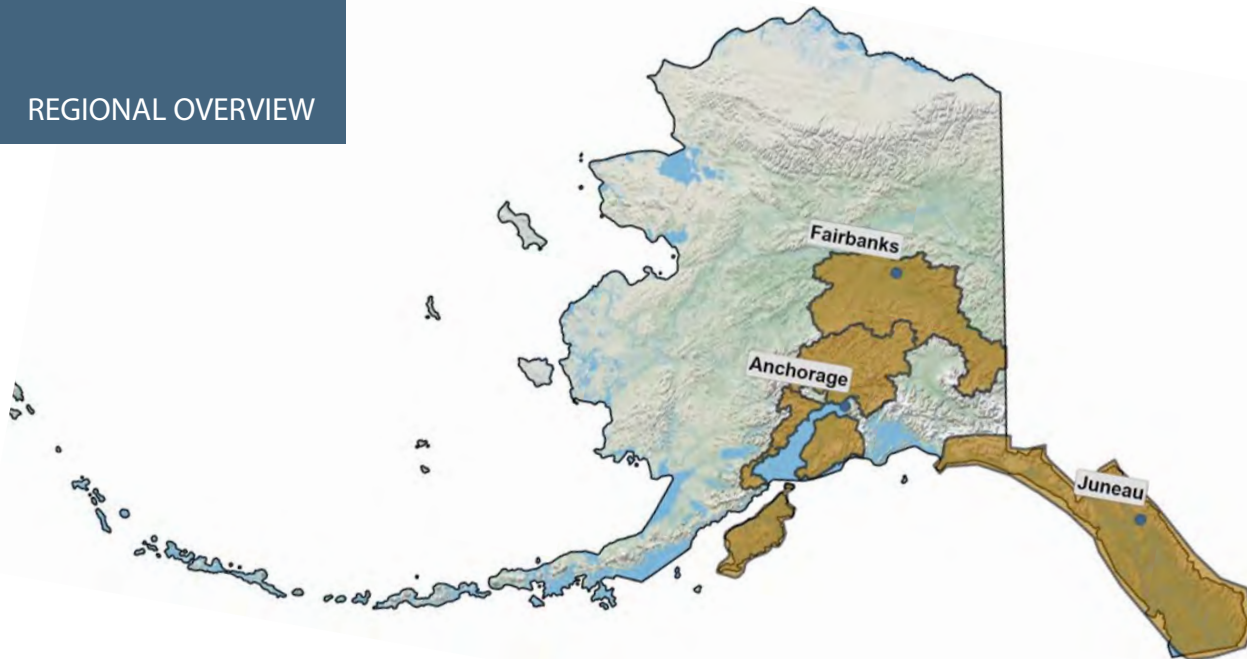


Figure 1. Alaska Region geographic focus areas for the Partners for Fish and Wildlife Program.

that includes geographic focus areas (Figure 1), voluntary conservation partnerships, technical assistance, cross-program and interagency coordination, leveraging of program resources, and continuous improvement through Strategic Habitat Conservation (Figure 2; NEAT 2006). PFW staff actively work together with partners to identify opportunities, develop project goals and objectives, and prioritize, implement, and monitor projects. Based on external partner feedback, our PFW biologist’s technical expertise and contributions are vital to project success. This expertise and professional background of program staff, combined with the local knowledge and community connections of our partners, results in more efficient delivery of program resources, greater project success, and more positive impact for Alaska’s native fish and wildlife and the public enjoyment and use of these resources.

“Having worked with the Partners for Fish and Wildlife Program on a variety of projects in interior Alaska over the past 5 years, I have found that this partnership greatly enhances our ability as a small non-profit to achieve tangible conservation successes. The Partners Program has not only fostered new partnerships within our local conservation community but has also boosted our individual capacity to accomplish high quality conservation outcomes by providing assistance in funding, logistics, and on the ground work.”

Katie McClellan, Youth for Habitat Program Manager
Fairbanks Soil and Water Conservation District

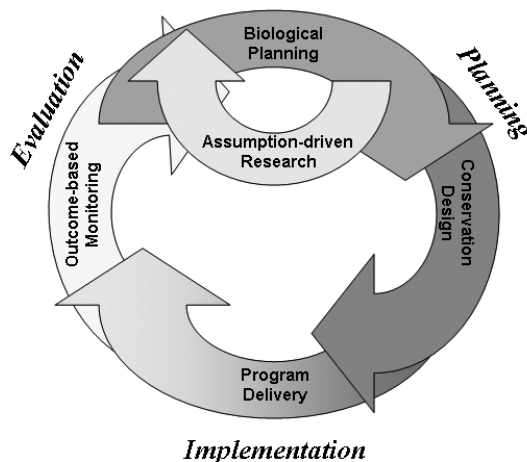


Figure 2. The four elements of Strategic Habitat Conservation.

Mission

The mission of the Alaska PFW Program is to assess, prioritize, restore, and maintain aquatic, riparian, and terrestrial habitats for the benefit of Federal trust species. We strive to protect existing high-quality functioning habitat and address the highest priority habitat restoration needs.

National Priorities

The National Wildlife Refuge System, Branch of Habitat Restoration, established a common set of priorities to improve the strategic nature of the PFW Program and communicate a unified message about program focus at the national level. For this strategic planning period, the national priorities are:

1. **Species Conservation:** Implement habitat projects within priority areas that prevents decline or supports recovery of species of greatest conservation concern.
2. **Habitat Connectivity:** Integrate projects at a landscape level to improve habitat connectivity and functionality. Interconnected habitats and migration corridors are vital to fish and wildlife conservation.
3. **Resilient Ecosystems:** Advance ecosystem health and resilience to climate change related impacts benefitting communities of fish, wildlife, plants, and people. Climate change affects all parts of the ecosystem, including those in which humans depend.

For some time, these national priorities have been the impetus driving conservation decisions in the Alaska PFW Program. While much of Alaska can be generally characterized as a landscape of intact, functioning ecosystems that support migratory birds, marine and terrestrial mammals, and resident, anadromous, and marine fish, the PFW Program works at the intersection of these habitats and an expanding human footprint. Alaska is experiencing many of the same anthropogenic impacts as those observed across the Nation, which has decreased species productivity in some areas. By focusing our conservation efforts at the habitat/human interface, we maximize our impact by proactively preventing further species declines and addressing declining populations through focused conservation actions. As we concentrate efforts on restoring and maintaining connected landscapes through streambank restoration, fish passage, and invasive species prevention and response, our goal is to maintain the natural resilience associated with functioning habitats. Further, because climate change is manifesting in the Arctic three times faster than the global rate of change, we incorporate climate change predictions (e.g., increased river flows/flooding) and adaptations into our nature-based solutions for streambank and fish passage restoration.



Photo: Eversmann's parnassian pollinating on avens. (USFWS)

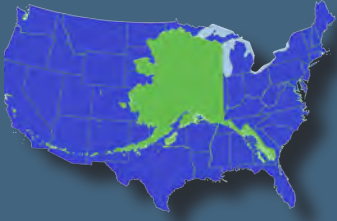
Program Policy

The Alaska PFW Program operates according to Service policy 640 FW 1, Partners for Fish and Wildlife Program; program authorities include the Fish and Wildlife Coordination Act (16 U.S.C. 661), the Fish and Wildlife Act of 1956 (16 U.S.C. 742a-j), and the Partnerships for Wildlife Act (16 U.S.C. 3741). The policy identifies program responsibilities at the Field, Regional, and National levels. Further, the policy describes objectives of the PFW Program, defines applicable habitat improvement practices and project-specific requirements, outlines an implementation model, and provides guidance on eligibility of PFW Program expenditures.

REGIONAL OVERVIEW

586,412

Alaska's size, in square miles



3million

lakes in Alaska >5 acres

47,300

miles of coastline
(>50% US total)

174.7million

acres of wetlands
(>60% US total)

>12,000

rivers (fifth-order and larger) and many more streams

Alaska has more than 40% of the nation's surface water resources and more than 50% of the nation's total coastline. Tens of thousands of miles of streams throughout Alaska support self-sustaining anadromous and resident fish populations.

Photo: Salmon begin their journey of migrating upstream. (USFWS)



Implementation Plan

The Alaska PFW Program is successfully and effectively working to address our conservation priorities; thus, few changes are proposed for this regional implementation plan. Staff are strategically located in the Northern and Southern Alaska Fish and Wildlife Conservation Offices, allowing for direct local contributions to conservation projects. The species and geographies where we work continue to be high priority conservation needs. Our on-the-ground conservation actions benefit federal trust species such as interjurisdictional fish and migratory birds. Further, our conservation actions align with specific Service responsibilities through national policy, such as the Fish and Wildlife Coordination Act, as well as Alaska-specific Service responsibilities under the Alaska National Interest Lands Conservation Act.

The PFW Program's strategic planning process identified several geographic focus areas based on the intersection of existing quality fish and wildlife habitat, known habitat threats or observed habitat degradation, and the presence of private lands that provide opportunity for conservation. Consistent with Landscape Conservation Design (LCD) approach to conservation planning, these geographic focal areas provide the landscape context for the PFW Program. Within each focal area, we have identified strategies and actions to benefit our identified focal species: Pacific salmon, migratory birds, and pollinators. The program's LCD approach complements other LCDs in effect throughout Alaska (Table 1).

Table 1. PFW Program conservation actions complement the conservation goals of other landscape conservation designs (LCDs) in effect across Alaska.

EXISTING LCDs	LCD Focus
National Fish Habitat Action Plan	Provides a programmatic framework and conservation focus for partnerships across the country addressing fish habitat conservation and restoration needs.
Strategic Plans of Alaska-based Fish Habitat Partnerships	Using the Nature Conservancy Conservation Action Planning process as a guide, locally-based fish habitat partnerships (i.e., Matanuska-Susitna Basin, Kenai Peninsula, Southeast Alaska, Southwest Alaska) identified habitat/species threats and determined conservation strategies and goals to address habitat and focal species needs within each geography.
Chena River Watershed Resource Action Plan	Created using the Nature Conservancy Conservation Action Planning process, this LCD prioritizes habitat conservation and restoration for Chinook and Chum salmon in the Chena River watershed.
National Fish and Aquatic Conservation Program Strategic Plan	This plan identifies broad conservation goals for the Service’s FAC Program across the nation – aquatic connectivity, habitat restoration, and outreach/communication goals are particularly relevant to Alaska.
Kenai Mountains to Sea Land Conservation Strategy	This strategy identifies 20 priority rivers on the Kenai Peninsula that originate within a Federal conservation unit (e.g., National Wildlife Refuge, National Forest) and flow through private lands enroute to the ocean – the strategy identifies actions to protect, restore, and steward these river corridors for fish and wildlife benefits.
The Coastal Forests and Mountains Ecoregion of SE Alaska and the Tongass National Forest	This assessment focuses on conserving biological diversity and ecological integrity in the temperate coastal rainforest ecosystem in SE Alaska – it identified priority conservation areas and developed a strategy to protect the highest value habitats.
Ecological Atlas of Southeast Alaska	The Atlas describes the regions ecosystems, species status, and human presence, and provides recommendations for holistic ecosystem conservation.
Alaska Bee Atlas	The purpose of the Atlas is to improve our understanding of Alaska pollinator distribution, abundance, trends, and habitat needs in order to make informed decisions on effective and high priority conservation actions to benefit pollinators.
Alaska Migratory Bird Co-Management Council	The Service, the Alaska Department of Fish and Game, and Alaska Native representatives from the subsistence regions of Alaska work collaboratively to co-manage the spring/summer migratory bird subsistence harvest. The Council respects the relationship we all share with migratory birds, sets annual harvest recommendations, monitors populations and harvest, promote research, recommend habitat protection policies, and provide education/outreach.
Conservation Framework for Yukon River Chinook Salmon	The purpose of the framework is to: ensure biodiversity of the Yukon River Chinook Salmon stock complex; provide subsistence opportunities for federally qualified subsistence fishers; work cooperatively with partners to implement priority actions; and evaluate the progress of actions, account for new information, and make appropriate adjustments.

Table 1. PFW Program conservation actions complement the conservation goals of other landscape conservation designs (LCDs) in effect across Alaska.

EXISTING LCDs	LCD Focus
Fisheries Resource Monitoring Program	Through the Department of Interior, Office of Subsistence Management, this program was established to help provide data for informed management of subsistence fisheries on Federal public lands in Alaska.
Alaska Sustainable Salmon Fund Framework	Through strategic use of the State’s allocation of the Pacific Coast Salmon Recovery Fund, this framework focuses on the protection and restoration of Pacific salmon habitats and monitoring/management of salmon populations used for subsistence.
Alaska Wildlife Action Plan	This plan guides the State of Alaska Department of Fish and Game in proactively addressing the conservation needs of non-game wildlife with the underlying goal of preventing listings under the Endangered Species Act.
Escapement-based Fishery-specific Management Plans	The State of Alaska Board of Fisheries has established escapement-based fishery-specific management plans to manage fisheries in the best interest of the economy and people, consistent with the goal of sustained yield.



Photo: A bohemian waxwing perches and tosses an ash berry into its mouth.
(Lisa Hupp, USWFS)



The Alaska PFW Program has demonstrated many conservation successes over the years. For example, one area of long-term investment is the restoration of streambanks and riparian areas to increase stability and resilience of the aquatic corridor and floodplain connection, as well as provide cover and slow water habitat along river margins that are critical to juvenile salmon growth and survival. On the Kenai Peninsula, in partnership with the Alaska Department of Fish and Game and private landowners, the PFW Program has completed over 750 streambank restoration projects since 1995, removing countless detrimental structures and in-river debris, and restoring miles of streambank using bioengineering and native vegetation establishment (Walter et al. 2005). This restoration approach remains a core component of our PFW Program on the Kenai Peninsula, the Matanuska-Susitna basin, and the Tanana Valley. As a testament to continuing this work, our recent survey of external partners identified streambank and riparian habitat restoration as one of the most important conservation needs to address over the next five years.

Watershed Approach

As described in subsequent sections of this plan, salmon are an ecosystem driver and the ecological health of Alaska ecosystems relies on healthy salmon populations. The marine-rich nutrient source of returning adult salmon improve the productivity of both freshwater and terrestrial ecosystems. Salmon are connected to people and all components of the landscape. Because of this connectedness, we intend to broaden our conservation focus for the strategic planning period, 2022-2026. In support of this approach, 80% of respondents from our external partner survey believed that we should expand our program focus to the entire watershed, rather than retaining the narrow focus directly on aquatic habitat.

REGIONAL OVERVIEW

57 million

breeding birds annually

174

global important bird areas

58,000

jobs annually supported by commercial fisheries

26.5 million

dollars (net value) generated from sportfishing licenses purchased in 2021

838,000

sportfish licenses sold in 2021

As described below under Goal 1, Conserve Habitat, our conservation actions will be applied in stream, riparian, wetland, and upland habitat for the benefit of Pacific salmon, migratory birds, and native pollinators. To maximize the impact of our conservation actions, we will prioritize activities that result in multiple species/habitat benefits. For example, the Alaska PFW Program has invested in streambank restoration for years – this conservation action improves habitat for juvenile salmon while providing ecosystem resilience for people living within the floodplain. By improving our understanding of the plant preferences of Alaska pollinators, we can adjust the vegetation used during streambank restoration to achieve fish habitat restoration benefits while also maximizing benefits to pollinators (Mitchell et al. 2021).

Proactive Conservation

The Alaska PFW Program defines proactive conservation as: anticipating and reducing threats to species or habitats before they become imperiled; collecting information that contributes to actionable conservation with specific, measurable, achievable, and relevant objectives; and developing conservation strategies that focus on shared values, support community-led efforts, and engage partners. In addition, proactive conservation can inform broad-scale land use decisions by highlighting areas with high conservation value and implementing strategies that minimize risk to those habitats/species. Proactive work has been shown to be both more efficient and cost-effective than traditional reactionary restoration methods, which can be costly and ineffective in achieving the desired species/population response.



Photo: Overlooking the middle part of the Kenai River System. (Ali Curtis, USFWS)

In general, Alaska has diverse, intact, functioning, and connected landscapes that support healthy aquatic and terrestrial communities. However, Alaska's fish and wildlife populations and the habitats that support them are not immune from the impacts that come from human presence on the landscape, such as overutilization and habitat fragmentation and degradation. These impacts are expected to increase as Alaska's population continues to expand. Yet, the Alaska PFW Program is faced with the exciting opportunity to maintain current functioning habitats and productive fish and wildlife populations, prevent future impacts, and ensure habitat and population resilience and sustainability. There is significant urgency to act now, before the number and cost of addressing impacts prohibits our ability to have a significant effect on conservation.

Alaska Salmon – Cultural, Economic, and Ecosystem Driver

Alaska's fish, and the habitats that support them, are world-class. They sustain Alaska's culture and economy. They are an important ecological and economic resource nationally and internationally. They are worth protecting.



Photo: Father showing daughter salmon after a silver salmon derby.
(Lisa Hupp, USFWS)

Five species of Pacific salmon call Alaska home: Chinook (*Oncorhynchus tshawytscha*), Coho (*O. kisutch*), Sockeye (*O. nerka*), Pink (*O. gorbuscha*), and Chum (*O. keta*). Pacific salmon are at the core of Alaska's character. Alaska is one of the last places on earth where wild salmon still thrive. Salmon are the foundation for subsistence ways of living and cultural traditions that have been around since time immemorial. Salmon also support major sport and commercial fisheries (Southwick Associates Inc. et al. 2008, DCCED 2013, Knapp et al. 2013, Sethi et al. 2014a, Sethi et al. 2014b, Loeffler and Colt 2015, Knapp 2019, McDowell 2020, ASMI 2021, Watson et al. 2021). Drawing visitors from every U.S. state and around the world, wild salmon are the lifeblood of Alaska's economy. The value of salmon for sustaining Alaska's culture and economy can never truly be measured.



Photo: Measuring flows at a fish passage barrier. (Jess Straub, USFWS)

In 2017, rural Alaska residents harvested an estimated 34 million pounds of wild foods for subsistence purposes (Fall et al. 2020); salmon account for 32.3% of the harvest and other finfish account for 21.4% (Fall 2018). The subsistence fisheries harvest provides about 155 lbs. of food per person annually in rural Alaska (Fall 2018). The estimated total subsistence harvest of salmon in 2017 was 862,930 fish, with Chum and Sockeye Salmon contributing 73.4% of the catch (Fall et al. 2020). In addition, personal use fisheries harvested 577,732 salmon in 2017, of which, 96.1% were Sockeye Salmon (Fall et al. 2020).

In the 2017-18 commercial fishing season, the seafood industry directly employed about 58,700 workers (37,700 FTE) in Alaska, second only to the oil and gas industry. During this same time period, the seafood industry contributed an annual average of \$5.6 billion in economic output to the Alaska economy (ASMI 2021). Salmon accounted for 14% of the total ex-vessel volume (816 million pounds) and 37% of the total ex-vessel value (\$744 million) of all commercial fisheries.

Salmon are central to Alaska's sportfishing industry. In 2007, sportfishing generated \$1.4 billion in angler spending and supported about 16,000 Alaska jobs (Southwick Associates Inc. et al. 2008). Also that year, 475,534 resident and non-resident licensed anglers fished 2.5 million angler days throughout Alaska.

Alaska's landscapes, fish, and wildlife are also the heart of Alaska's tourism industry. In 2017, Alaska welcomed 2.24 million visitors. The tourism industry employed 43,300 people during the peak of the 2017 season and contributed an economic impact of \$4.5 billion to the state's economy (McDowell 2018). Specifically, the outdoor recreation industry in Alaska annually generates \$3.2 billion of economic activity (not including gear purchases) and 38,100 jobs; \$655 million of this economic activity is specifically attributed to fishing and boating (CED 2019).

Alaska's aquatic habitats which support these fishery resources are fundamental to the economic, social, cultural vitality of the State. About one quarter of Alaska's jobs (84,000) depend on the state's fish, wildlife and healthy ecosystems (Colt 2001). The protection and restoration of ecosystems can often be more valuable than any proposed human development because of the existing and future economic, social,

cultural, and ecosystem services benefits provided by intact, functioning ecosystems (Thomas et al. 2016, Samonte et al. 2017, Dasgupta 2021). Jobs created through restoration activities have direct effects on the local economy and can create more jobs than other investment sectors such as fossil fuel energy development or transportation infrastructure (Kellon and Hesselgrave 2014). Estimates vary by location and project type, but every \$1 million invested in ecosystem restoration generates between 15 and 35 jobs and \$2 to \$3.5 million of economic output (Nielsen-Pincus and Moseley 2010, Thomas et al. 2016).

Salmon are an ecosystem driver and the ecological health of Alaska ecosystems relies on healthy salmon populations. Returning adult salmon provide an essential food and marine-rich nutrient source for both freshwater and terrestrial ecosystems (Bilby et al. 1996, Cederholm et al. 1999, Nakano and Murakami 2001, Gende et al. 2002, Wipfli et al. 2003, Polis et al. 2004, Chaloner et al. 2004, Hicks et al. 2005, Wipfli and Baxter 2010). Salmon are an important food source for bears, wolves, and small mammals. Also, mammals often carry and leave salmon carcasses in riparian and upland habitats where the carcasses serve as a plant fertilizer (Ben-David et al. 1998). Postspawning, decaying salmon provide nutrients to the freshwater ecosystem, increasing overall food web productivity. Decaying salmon are also a direct food source for myriad migratory birds and fish, including juvenile salmon, thereby perpetuating the cycle.



Photo: Back of a spawning Sockeye Salmon.
(Katrina Liebich, USFWS)

Specific research efforts have focused on the importance of estimating the value of ecosystem services (e.g., biodiversity, resiliency in a changing climate, clean water, thriving local economies, or nutrient cycling) and the need to incorporate these values into land planning decisions (NRC 2005, Duffield et al. 2007, ECONorthwest 2014, Whiting 2014, Comberti et al. 2015, Ristroph and Hussain 2015, Hjerpe and Hussain 2016, Samonte et al. 2017). Other research investigates how to account for benefits that are difficult to measure, such as quality of life and mental/physical health (CED 2019, LTA 2019). Access to recreational opportunities is a major consideration for residents of Alaska; 81% of Alaskans participate in outdoor recreation (ranked 1st in the nation) compared to the national average of 48% (CED 2019). Intact, functioning ecosystems, in particular healthy aquatic systems and fish populations, are essential for providing these ecosystem services and the quality of life desired by many.

Migratory Birds

Alaska is vital to the life cycle of hundreds of species of migratory birds, who depend on habitats ranging from temperate rainforest in Southeast Alaska northward to the Arctic tundra. Annually, about 570 million birds come to Alaska to breed – many species breed nowhere else in the U.S. Audubon describes Alaska as “the breeding ground for the avian flyways of the world”. Birds from all North and South American flyways come to Alaska to breed (Figure 3). There are 174 global (106.6 million acres), 8 continental (3.2 million acres), and 31 state (9.7 million acres) Important Bird Areas in Alaska – the most of any state (<https://www.audubon.org/important-bird-areas/state/alaska>). Many of these important habitats are along the coastline, along river corridors, or associated with Alaska’s vast wetland resources – all of these habitats are also extremely important to Pacific salmon.

The Service’s Migratory Bird Management Program released a Birds of Conservation Concern report in 2021. The Migratory Bird Program is responsible for identifying the species, subspecies, and populations of migratory nongame birds that, without additional conservation action, are likely to become candidates for listing under the Endangered Species Act. The goal of the report was to identify those bird taxa that represent the highest conservation priorities of the Service - birds already designated as federally threatened or endangered were not included in the assessment. The assessment of conservation need was based on several factors, including population abundance and trends, threats on breeding and nonbreeding grounds, and size of breeding and nonbreeding ranges. For the terrestrial and marine bird conservation regions exclusive to Alaska, 37 birds of conservation concern were identified, including waterbirds, shorebirds, and landbirds (Table 2). Also, 34 birds of conservation concern were identified in the bird conservation region that included coastal habitats of Southcentral and Southeast Alaska – this region also included coastal areas of British Columbia, Washington, Oregon, and northern California, broadly encompassing northern Pacific Rainforest habitats. Any additional birds of conservation concern specific to the Southcentral and Southeast Alaska coastal habitats cannot be distinguished within this broader bird conservation region, based on the presentation of data in the report.

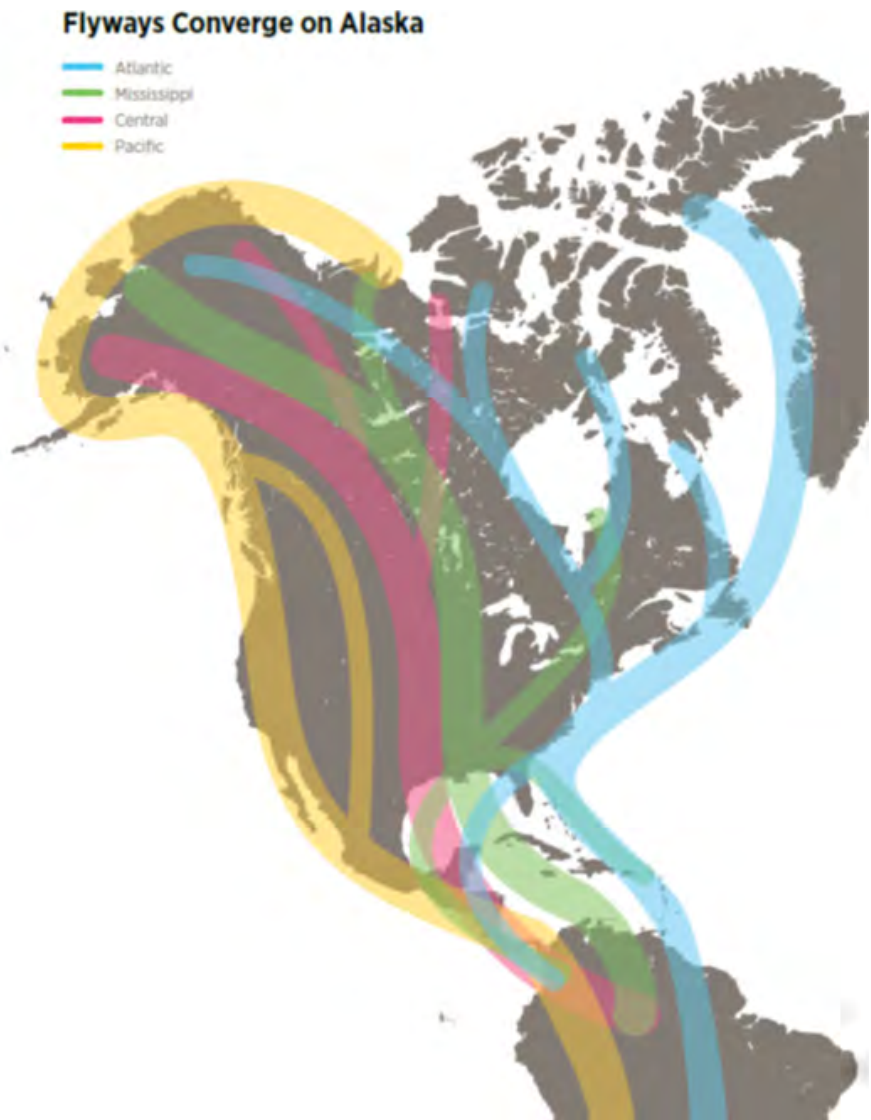


Figure 3. Migratory birds from all major North/South American flyways converge on Alaska in the summer to breed and feed in Alaska’s highly productive habitats.

REGIONAL OVERVIEW

Table 2. 2021 Birds of Conservation Concern identified in marine and terrestrial bird conservation regions exclusively located within Alaska

SPECIES	Aleutian Bering Sea Islands	Western Alaska	Arctic Plains and Mountains	NW Interior Forest	Chukchi and Beaufort Seas	East Bering Sea	Gulf of Alaska
Black Oystercatcher							
American Golden Plover							
Bristle-thighed Curlew							
Bar-tailed Godwit							
Hudsonian Godwit							
Marbled Godwit							
Black Turnstone							
Red Knot (Pacific)							
Dunlin (Northern Alaska)							
Rock Sandpiper (Pribilof)							
Buff-breasted Sandpiper							
Pectoral Sandpiper							
Short-billed Dowitcher							
Solitary Sandpiper (Western)							
Wandering Tattler							
Lesser Yellowlegs							
Marbled Murrelet (Alaska)							
Kittlitz's Murrelet							
Ancient Murrelet							
Whiskered Auklet							
Red-legged Kittiwake							
Ivory Gull							
Ross's Gull							
Aleutian Tern							
Yellow-billed Loon							
Laysan Albatross							
Black-footed Albatross							
Murphy's Petrel							
Mottled Petrel							
Buller's Shearwater							
Pink-footed Shearwater							
Red-faced Cormorant							
Snowy Owl							
Short-eared Owl							
Olive-sided Flycatcher							
Gray-headed Chickadee (Alaska)							
McKay's Bunting							

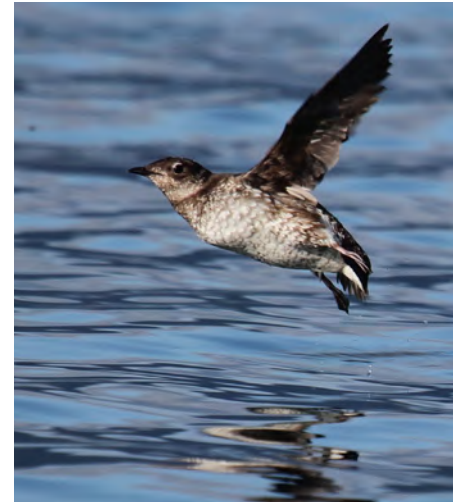


Photo: A marbled murrelet near Kodiak Island. (Robin Corcoran, USFWS)



Photo: A Ross's Gull. (Shiloh Schulte, USFWS)



Photo: A Bar-tailed Godwit. (Kristine Sowl, USFWS)

Pollinators

Baseline information on distribution, relative abundance, and habitat associations are incomplete for many pollinator species in Alaska. Synthesizing existing data and prioritizing pollinator survey needs are a significant conservation need. An Alaska pollinator partnership (Alaska Pollinator Coordination Group) composed of agency, university, and non-profit organization experts, recently formed with the mission to “improve conservation and management of pollinators and their habitat in Alaska through information sharing, collaboration, and the coordination of research and monitoring, public outreach, and education.”

One fundamental effort of this group is the Alaska Bee Atlas (Burns et al. 2021, Fulkerson et al. 2021) – surveys and specimen collection for the Atlas increased beginning in 2020, although many high priority areas and habitats remain in need of survey (Figure 4). The need for pollinator conservation in Alaska is now, before habitats and species are lost. *Bombus occidentalis* (a bumble bee in Alaska) has already declined across its range and was petitioned for listing under the Endangered

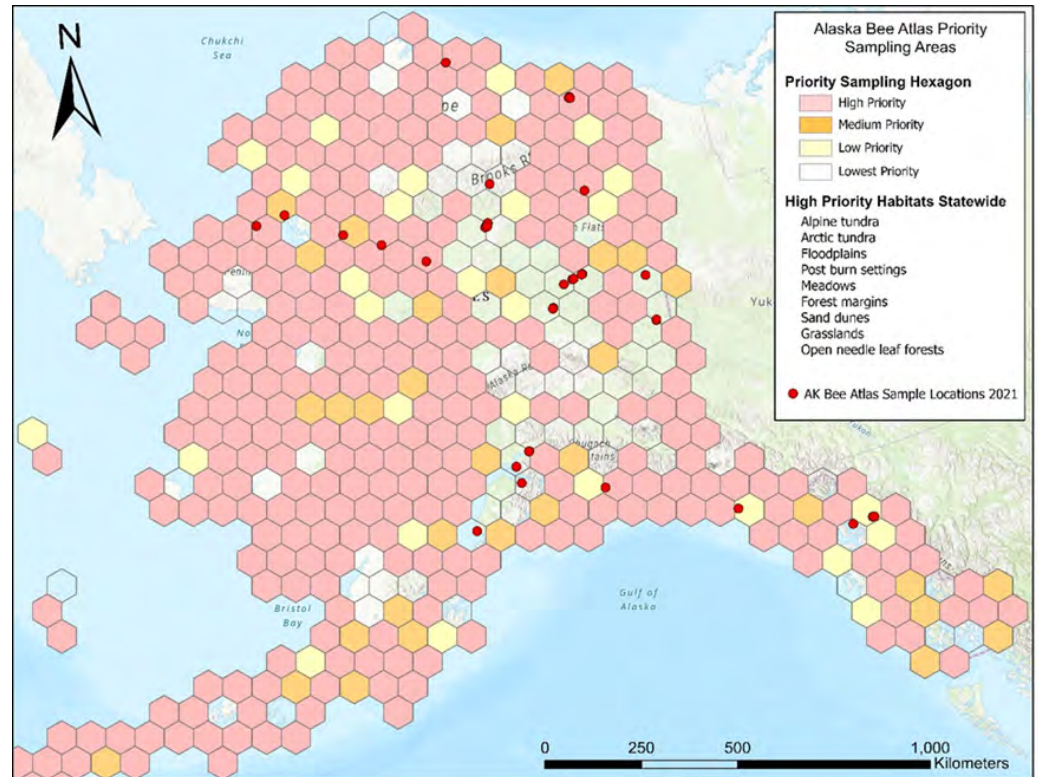


Figure 4. Alaska Bee Atlas survey and sampling locations in 2021.

Species Act. We need to increase our understanding of pollinator distribution, abundance, and habitat needs, and implement informed conservation actions to benefit Alaska’s pollinators.

Threats/Challenges

As previously stated, Alaska can be generally characterized as a landscape of intact, functioning ecosystems. The reason Alaska still has productive wild salmon is because it still has a diversity of quality, intact freshwater habitats. But these habitats are experiencing many of the same human stressors that have resulted in the decline and extirpation of salmon in Europe, New England, and the Pacific Northwest (Montgomery 2003). Conserving this habitat biodiversity is paramount to maintaining resilient habitats and stability in fish and wildlife populations (Hilborn et al. 2003, Moore et al. 2010, Schindler et al. 2010, Colvin et al. 2018, Walsworth et al. 2020). Further, maintaining Alaska’s intact, functioning habitats is globally significant for biodiversity and climate stabilization (Vynne et al. 2021). Minimizing impacts from human-caused stressors is essential to sustaining vibrant subsistence cultures, supporting Alaska’s economy, and preventing the need for listings under the Endangered Species Act (i.e., keeping common species common) (AFS 2016).

Urban Development/Expansion

Statewide, Alaska has a unique watershed conservation challenge. The headwaters of many of Alaska's river systems are in some type of state or federal conservation unit, such as a state critical habitat area, a national park or preserve, or a national wildlife refuge. In these areas, human activities are limited and fish, wildlife, and habitat conservation are paramount. Yet, the private land areas in the lower reaches of Alaska's watersheds are often developed and suffer from habitat loss, habitat fragmentation, and degraded water quality. Further, development in Alaska's coastal areas can have a disproportionate impact on the watershed's productivity by blocking fish and wildlife movements through the river corridor or by degrading the critical freshwater-saltwater transition habitats that are important for Pacific salmon, other anadromous fish, and migratory birds. Therefore, our private land conservation actions are essential to maintaining the fish and wildlife benefits provided by conservation units across Alaska.

The U.S. Census Bureau projects Alaska's population will increase 38.4% between 2000 and 2030; recent year growth has been slow, but Alaska's population continues to increase. The population in 2019 was 731,545, with 80% living in five population centers: the Municipality of Anchorage, the Matanuska-Susitna Borough, the Fairbanks North Star Borough, the Kenai Peninsula Borough, and the City and Borough of Juneau. The Matanuska-Susitna Borough continues to be among the fastest growing counties in the nation, exhibiting 21.7% growth from 2010 to 2019. Urbanization, with the continued development of infrastructure and public services, is a real threat to Alaska's fish, wildlife, and habitats. For example, only a single road was completed on the Kenai Peninsula in 1951; by 2014, the Kenai Peninsula was a network of residential and industrial development concentrated along coastal areas, with over 1,000 miles of mapped roads (Figure 5). Maintaining functioning and connected habitat in the face of urbanization is a conservation priority for Pacific salmon (Sethi et al. 2021).

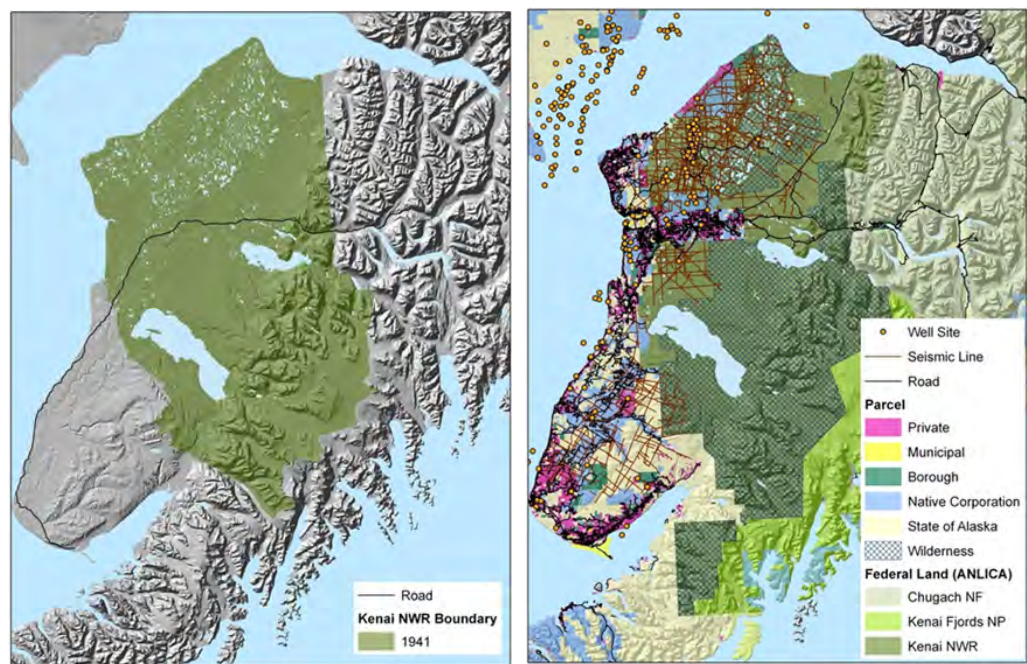


Figure 5. Human development footprint on the Kenai Peninsula in 1951 compared to 2014.

Alaska's concentrated, limited road network can constrict access to fish and wildlife harvest to a limited number of areas resulting in habitat damage or loss. Small planes, boats, and off-road vehicles provide modes of access that result in their own habitat/management challenges. Outdoor users can damage streambanks, riparian habitats, and instream habitats from foot traffic, off-road vehicles use, and boat wakes. Recreational user encroachment and illegal trail networks can also damage aquatic habitats. Road building and these modes of transportation are also known vectors for invasive species, both aquatic and terrestrial.

Resource Extraction

Natural resource extraction and use are a major part of Alaska’s history and economy; these activities have had a positive effect on Alaska’s economy (DCCED 2013). Oil and natural gas production, hardrock (e.g., gold, copper) mining, placer mining, coal mining, and timber harvest industries can also have measurable adverse impacts on Alaska’s fish, wildlife, and habitats. Poorly located or designed natural resource development can threaten the quality and sustainability of Alaska’s fish and wildlife resources. Hydropower, both traditional and hydrokinetics, is a major development interest in Alaska, with the potential for significant impacts to aquatic habitats and species.

“Working with the Partners for Fish and Wildlife has been so gratifying because of the inherent appreciation for the collective impact we have when we work toward a shared goal. That sounds simple, but in reality, overwhelming targets like addressing invasive species on the entire Kenai Peninsula would be impossible for any one organization to tackle.”

Kyra Wagner, District Manager
Homer Soil and Water Conservation District

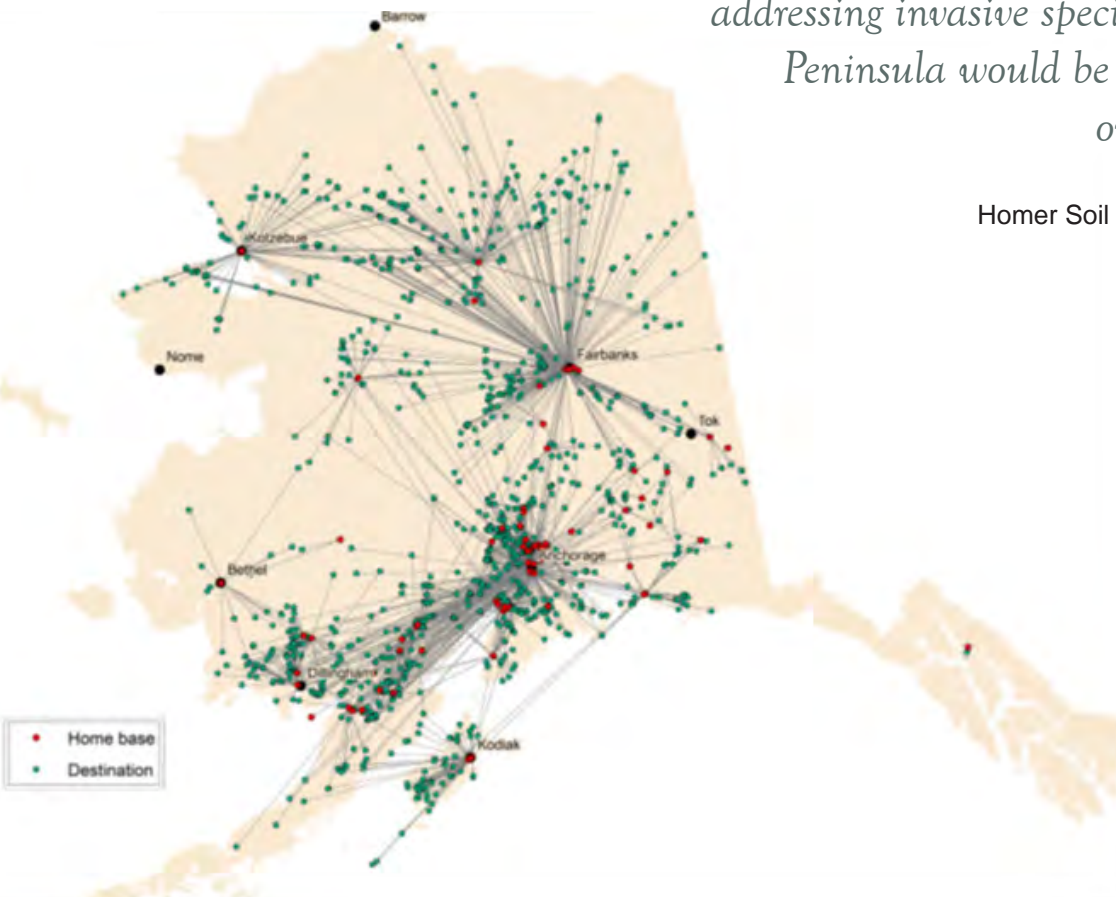


Figure 6. Home base locations and destinations of some commercial float plane operations - in Alaska float planes are a primary invasive species dispersal vector.

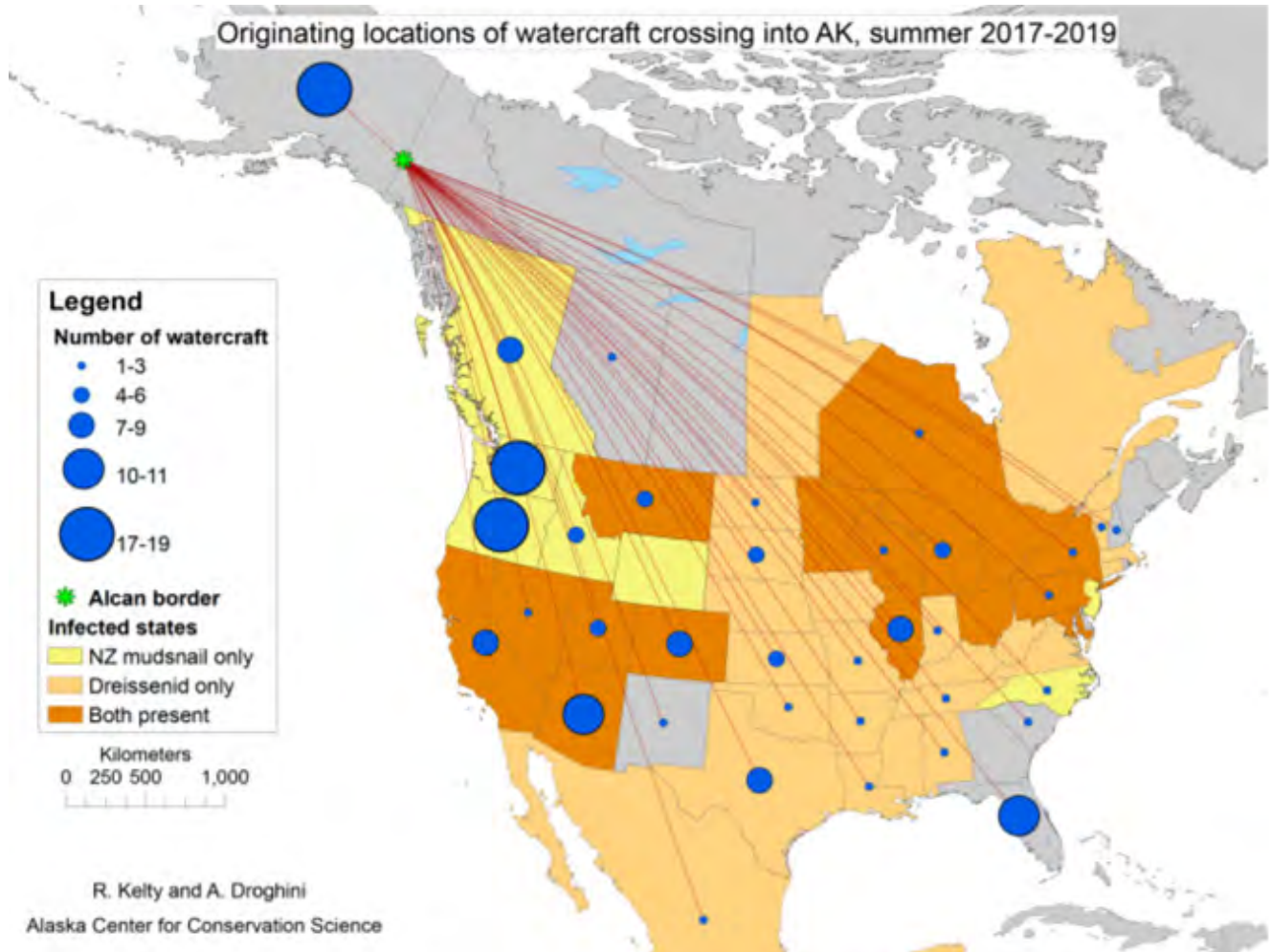


Figure 7. Number and location of origin of watercraft entering Alaska through the Alaska-Canada border during brief inspection periods in the summer, 2017-2019.

Invasive Species

Along with human presence comes the increased risk of the introduction and spread of invasive species. Concern over aquatic invasive species has grown in Alaska as surveys and detections have increased over time, and a changing climate may be creating a more hospitable environment for invasive species establishment. Aquatic invasive plants are impacting habitat connectivity and quality in waterways throughout Alaska. While past impacts of invasive plants like Reed canarygrass, Purple loosestrife, and Elodea have been concentrated around urbanized areas, species like these are becoming more commonly found in areas historically considered remote due to the connectedness of Alaska waterways through vectors such as floatplanes, watercraft, and fishing gear (Figure 6) (Schwoerer et al. 2019a). Established invasive species such as Northern Pike in Southcentral AK, have had profound effects on salmon population productivity. Other serious aquatic invasive species, such as New Zealand mudsnails and Dreissenid mussels, have been detected at the Alaska-Canada border and continue to be monitored with the goal of preventing entry (Figure 7). To put the threat of invasive species in context, recent research has evaluated the significant impact invasive species can have on Alaska's habitats, ecosystem services, and economy (Larsen et al. 2020, Schwoerer 2017, Schwoerer et al. 2019b, Schwoerer et al. 2020). Further, invasive species prevention and eradication was identified in our survey of external partners as the highest priority conservation need over the next five years.

Climate Change

Climate change disproportionately impacts higher latitudes; climate change is manifesting in the Arctic three times faster than the global rate of change (Maddox 2021). Alaska's permafrost is melting, releasing stored carbon, which increases greenhouse gases and their effect on our climate – a negative feedback loop. Climate change adaptation was identified in our survey of external partners as one of the most important conservation needs over the next five years.

Most glaciers are undergoing a rapid loss of mass and the impact on Pacific salmon can be both positive and negative (Pitman et al. 2020, Pitman and Moore 2021, Pitman et al. 2021, Schoen et al. 2017). Compared



to non-glacial rivers, glacially influenced rivers typically have higher midsummer streamflows, lower water temperature, greater concentrations of nutrients and organic carbon, and elevated sediment loads. Increased sediment can decrease microorganism, algae, and benthic macroinvertebrate production and can decrease the quality of spawning habitat. Conversely, glacial inputs can maintain connectivity across a mosaic of mainstem and off-channel habitats (vital to juvenile salmon rearing) and moderate water temperatures, which may become increasingly important as the climate warms. Receding glaciers may also increase overall watershed productivity as

areas of new river and lake habitat can be colonized by Pacific salmon.

Climate models predict significant increases in freshwater temperatures throughout the state and ongoing stream temperature monitoring projects are validating these water temperature predictions (Mauger 2013, Mauger et al. 2017, Shaftel et al. 2020, von Biela et al. 2020). Water quality standards indicate that water temperatures exceeding 13°C are deleterious for salmon spawning, incubation, and fry emergence while temperatures greater than 18°C negatively impact juvenile salmon rearing and adult migration. In Southcentral Alaska, summer water temperatures regularly exceed 13°C, suggesting chronic effects to spawning and incubation. Water temperatures exceed 18°C less frequently, but still occur consistently, indicating negative impacts to adult migration and juvenile rearing. In the Yukon River, heat stress was observed in migrating adult salmon, with water temperature regularly greater than 18°C. While it is useful to understand simple temperature thresholds, thermal regimes that define the magnitude, variability, frequency, duration, and timing of temperature events have more biological relevance to salmon and other aquatic organisms. Interaction between climate and local landscape features drive patterns of these thermal regimes, identifying the thermal diversity available to aquatic organisms.

Alaska experienced an extremely warm summer in 2019; observed water temperatures were consistent with climate model predictions for 2060. Pacific salmon mortality events were reported from around the state. The largest documented en route adult mortality event occurred with Chum Salmon returning to the

Koyukuk River, within the Yukon River watershed (Westley 2020). Through a visual survey of 275km of river, 1,364 dead salmon were observed, most of which died prior to complete maturation and spawning. Considering survey methods, observations of dead salmon represent a small fraction of the total magnitude of mortality.

Documenting regional-scale climate drivers, coupled with the role of local landscape conditions, are the foundation for understanding potential impacts to salmon populations. Climate-driven changes are likely to reduce the productivity of certain fish populations while benefitting others (Jones et al. 2020, Lisi et al. 2015, Littell et al. 2020, Leppi et al. 2014, Murdoch et al. 2020, Shanley et al. 2015, Wobus et al. 2015). Jones et al. (2020) evaluated a number of climate variables, including stream temperature, precipitation/discharge, ice breakup, and marine conditions, on life-stage specific impacts to Chinook salmon in the Cook Inlet region. Across all populations, maximum monthly precipitation elicited the strongest and most consistent response: productivity declined with increased precipitation during fall spawning and early incubation while productivity increased with above-average precipitation during juvenile rearing. Meanwhile, increased stream temperature during spawning and rearing had negative effects on warmer stream systems and positive effects in some colder stream systems – the highly variable salmon productivity response to stream temperature accentuates the importance of thermal habitat diversity. For Alaska, climate models predict continually increasing stream temperature, increased precipitation during August and September (spawning/early incubation), a transition to rain-dominated systems in winter months (instead of snow-dominated), and an increase in the frequency and severity of storm events. The sum total of these climate variables on salmon productivity will vary by watershed (Jones et al. 2020, Lisi et al. 2015, Leppi et al. 2014, Murdoch et al. 2020) and can be best moderated by resilient and diverse habitat conditions at the local scale.



Photo: Two dead adult salmon prior to spawning, Koyukuk. (USFWS)



Photo: Heavy rains, flooding, and a washed out culvert in Girdwood, October 2021. (Dave Leval, KTUU)

Despite these existing threats, we have a genuine opportunity to enhance and sustain Alaska’s fish and wildlife for many generations to come. Intact habitats can be protected and preserved and degraded habitats can be restored. Through strategic habitat conservation, we can influence the trajectory of Alaska’s salmon and other fish and wildlife resources to provide ecological, economic, and cultural benefits for the American people for years to come.

GOAL 1 CONSERVE HABITAT



THREATS

- Habitat Fragmentation
- Fish Passage Barriers
- Stream Corridor/ Lakeshore Development
- Off-Road Vehicles
- Aquatic Invasive Species
- Limited Land Use Planning
- Climate Change

24,500

square miles in size

1.1 million

acres of private land

47,863

sportfish anglers in 2019



Matanuska-Susitna Basin

At 24,500 square miles, the Matanuska-Susitna Basin is roughly the combined size of Vermont, New Hampshire, and Massachusetts. Three mountain ranges ring the Basin: Alaska, Talkeetna, and Chugach. The Basin's largest river systems, the Susitna and the Matanuska, originate in these mountains and terminate in broad estuarine areas along Cook Inlet.



The Matanuska-Susitna (Mat-Su) Basin remains the fastest growing area of Alaska and one of the fastest growing regions in the country. From 2015 to 2045, the Mat-Su Basin population is expected to increase from 100,178 to 182,836 (DLWD 2016). Growth in the Basin appears to be driven by the proximity to the Anchorage job market and the growing Alaska tourism industry. As population expansion continues, there is increasing development pressure along the many streams and lakes throughout the Matanuska-Susitna Basin. Land uses in the Basin include outdoor recreation, farming, and natural resource extraction (e.g., gravel, minerals, timber, and petroleum). Given these land use pressures, the habitat quality and aquatic connectivity of the Basin is at risk because of habitat degradation associated with urban growth and development.

Matanuska-Susitna Basin

4

salmon stocks of concern

\$165 million
sportfishing value 2019

-  State Parks
-  National Park Service

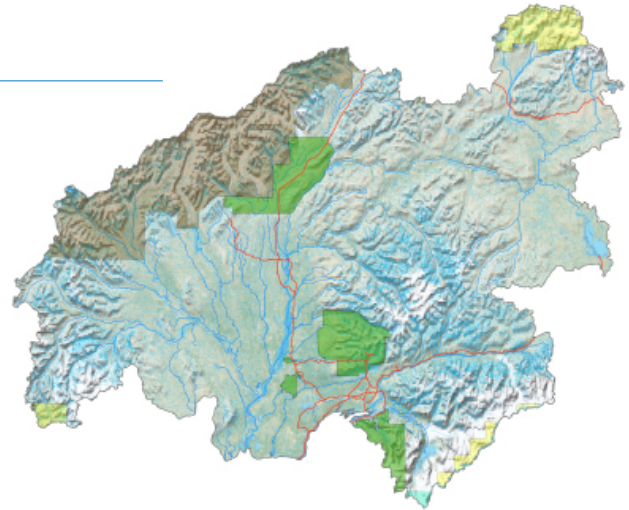


Table 3. Mat-Su Focus Area strategies, conservation actions and outcomes, and 5-year performance targets.

Focal Species	Strategy	Conservation Actions	Conservation Outcomes	Objectives (5 year targets)
Pacific salmon; migratory birds; native pollinators	Prevent new aquatic connectivity barriers	Provide partners with technical review of fish passage construction plans and permits to improve designs and construction practices	Applying aquatic connectivity principles prevents habitat fragmentation and supports ecological processes	7 new crossings that meet fish passage standards as a result of technical assistance or review
	Remove barriers to restore aquatic connectivity	Use staff engineering expertise to complete site surveys and designs for fish-friendly road-stream crossings in-house	Removing barriers increases population productivity and resilience by providing fish access to blocked habitat; barrier removal also improves flood resilience and sediment transport	Complete 5 in-house fish passage designs
		Provide technical assistance on partner-led inventory and prioritization of fish passage barriers		Remove 5 fish passage barriers
	Remove fish passage barriers			
Restore, enhance, or protect riparian, wetland, or upland habitat to maintain ecological functions		<p>Provide technical assistance on partner-led inventory and assessment of habitat in priority watersheds</p> <p>Promote vegetation diversity to benefit native pollinators</p> <p>Improve water quality through technical assistance and construction of bioswales at fish passage, streambank, and upland restoration projects</p>	<p>Maintaining functioning riparian, wetland, and upland habitat provides habitat/food for juvenile salmon, migratory birds, and pollinators, promotes connectivity among habitats within a watershed, increases habitat resilience during extreme flow events, mitigates lethal and sub-lethal stormwater impacts to aquatic organisms, and supports many ecological functions (water storage, water quality)</p>	<p>Restore, enhance, or protect 2 acres and 0.25 miles of riparian habitat</p> <p>Restore, enhance, or protect 1.5 acres of wetlands</p> <p>Restore, enhance, or protect 2 acres of uplands</p> <p>Remove infrastructure/debris from 200 ft of aquatic habitat</p>
Manage/eradicate invasive species that threaten ecological function of priority habitats	Provide technical assistance on partner-led inventory and prioritization of invasive plant species that threaten important habitat	<p>Control priority invasive plant infestations by applying the principles of integrated pest management</p> <p>Monitor treated sites and re-treat infestations as necessary to ensure eradication</p>	Minimizing impacts from invasive species allows natural ecological processes to continue, promoting native species productivity and sustainability through life history diversity	Control 1 acres of invasive plants
				Post-control monitoring of 1 acre of invasive plant infestations

Kenai Peninsula

THREATS

- Habitat Fragmentation
- Fish Passage Barriers
- Stream Corridor/ Lakeshore Development
- Aquatic Invasive Species
- Riparian Impacts from Recreational Users
- Overexploitation of Salmon Runs
- Climate Change

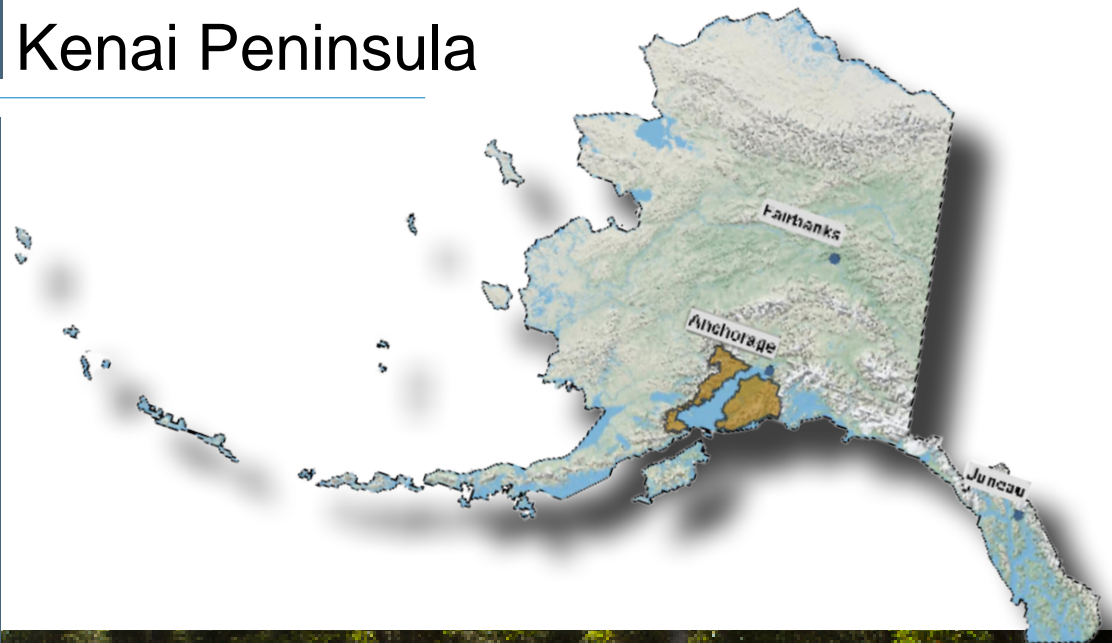


Photo: Russian River angler.
(Berkley Bedell, USFWS)

A large part of the Kenai Peninsula is within existing federal or state conservation units; the Kenai National Wildlife Refuge is a key contributor to conservation actions on the Peninsula. Alaska Native corporations are also a significant landowner. Most of the population resides in communities on the western Kenai Peninsula throughout the Kenai lowlands, from Nikiski to Homer.

The Kenai Peninsula is surrounded by the saltwaters of Cook Inlet, the Gulf of Alaska, Prince William Sound, and Turnagain Arm; the connection to the Alaska mainland is only about 9 miles wide. The Kenai Mountains run north to south covering the central and eastern side of the Peninsula and the Kenai lowlands cover the west side. Land uses across the Peninsula are varied, including timber harvest, oil and gas extraction, mining, community/land development, tourism, recreation, and subsistence activities. The Kenai National Wildlife Refuge and the Chugach National Forest bisect much of the Kenai Peninsula. As a result, the headwaters of many Kenai Peninsula river systems originate on protected federal lands. While the headwaters are protected, many of the lower river corridors are held in private land ownership. Restoration and protection of 20 priority river corridors is identified as a significant conservation need through the landscape-scale Kenai Mountains to Sea conservation strategy.

Kenai Peninsula

14,500
square miles in size

135,398
sportfish anglers in 2019

4.4million
Commercially harvested
salmon in 2019

-  State Parks
-  National Park Service
-  U.S. Forest Service
-  U.S. Fish & Wildlife Service
-  Bureau of Land Management

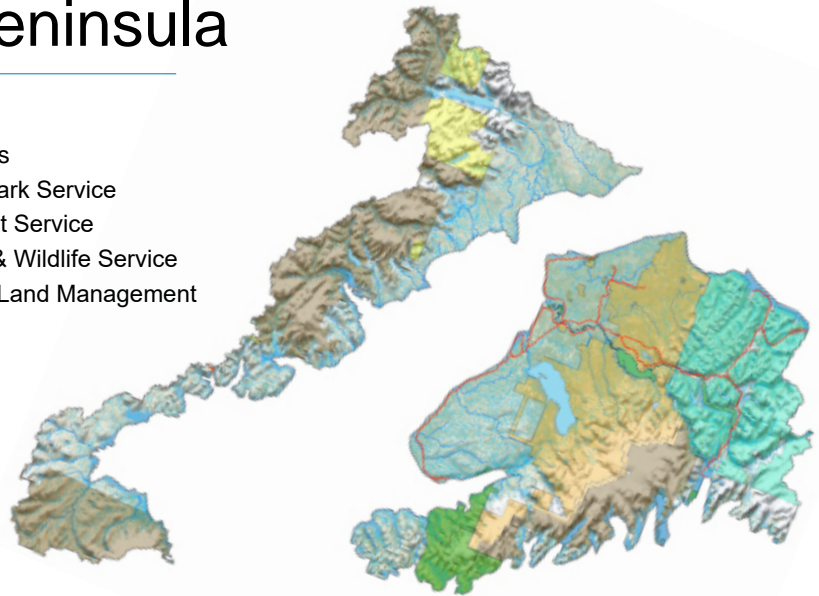


Table 4. Kenai Peninsula Focus Area strategies, conservation actions and outcomes, and 5-year performance targets.

Focal Species	Strategy	Conservation Actions	Conservation Outcomes	Objectives (5 year targets)
Pacific salmon; Steelhead; migratory birds; native pollinators	Prevent new aquatic connectivity barriers	Provide partners with technical review of fish passage construction plans and permits to improve designs and construction practices	Applying aquatic connectivity principles prevents habitat fragmentation and supports ecological processes	2 new crossings that meet fish passage standards as a result of technical assistance or review
	Remove barriers to restore aquatic connectivity	Provide technical assistance on partner-led inventory and prioritization of fish passage barriers Remove fish passage barriers	Removing barriers increases population productivity and resilience by providing fish access to blocked habitat; barrier removal also improves flood resilience and sediment transport	Remove 2 fish passage barriers
	Restore, enhance, or protect riparian, wetland, or upland habitat to maintain ecological functions	Provide technical assistance on partner-led inventory and assessment of habitat in priority watersheds Restore/enhance/protect riparian, wetland, and/or upland habitat in priority watersheds Promote vegetation diversity to benefit native pollinators Improve water quality through technical assistance and construction of bioswales at fish passage, streambank, and upland restoration projects	Maintaining functioning riparian, wetland, and upland habitat provides habitat/food for juvenile salmon, migratory birds, and pollinators, promotes connectivity among habitats within a watershed, increases habitat resilience during extreme flow events, mitigates lethal and sub-lethal storm-water impacts to aquatic organisms, and supports many ecological functions (water storage, water quality)	Restore, enhance, or protect 2 acres and 1 mile of riparian habitat Restore, enhance, or protect 2 acres of wetlands Restore, enhance, or protect 12 acres of uplands Remove infrastructure/debris from 500 ft of aquatic habitat
	Manage/eradicate invasive species that threaten ecological function of priority habitats	Provide technical assistance on partner-led inventory and prioritization of invasive plant species that threaten important habitat Control priority invasive plant infestations by applying the principles of integrated pest management Monitor treated sites and re-treat infestations as necessary to ensure eradication	Minimizing impacts from invasive species allows natural ecological processes to continue, promoting native species productivity and sustainability through life history diversity	Control 12 acres of invasive plants Post-control monitoring of 12 acres of invasive plant infestations

Kodiak Archipelago



THREATS

- Habitat Fragmentation
- Fish Passage Barriers
- Stream Corridor/ Lakeshore Development
- Aquatic Invasive Species
- Climate Change



Photos: Uganik Bay and mountains on the north coast of Kodiak Island.
(Lisa Hupp, USFWS)

The Kodiak Archipelago is a series of mountainous islands in the northwest Gulf of Alaska. The Archipelago is characterized by rugged coastlines and abundant lake and river systems that support rich marine and freshwater fish and wildlife populations.

There are many small communities scattered throughout the Kodiak Archipelago. The City of Kodiak is the most populated community in the region, which includes a large U.S. Coast Guard Base. The estimated regional population in 2015 was 13,889; population growth is expected to remain flat. The primary industries throughout the region include commercial fishing, timber harvest, agriculture (livestock), tourism/recreation, and military operations. Much of the Federal estate is contained within conservation units, such as national wildlife refuges, although there is considerable acreage in other federal ownership. The Kodiak National Wildlife Refuge is a key contributor to conservation actions in the Archipelago.

Kodiak Archipelago

5,000

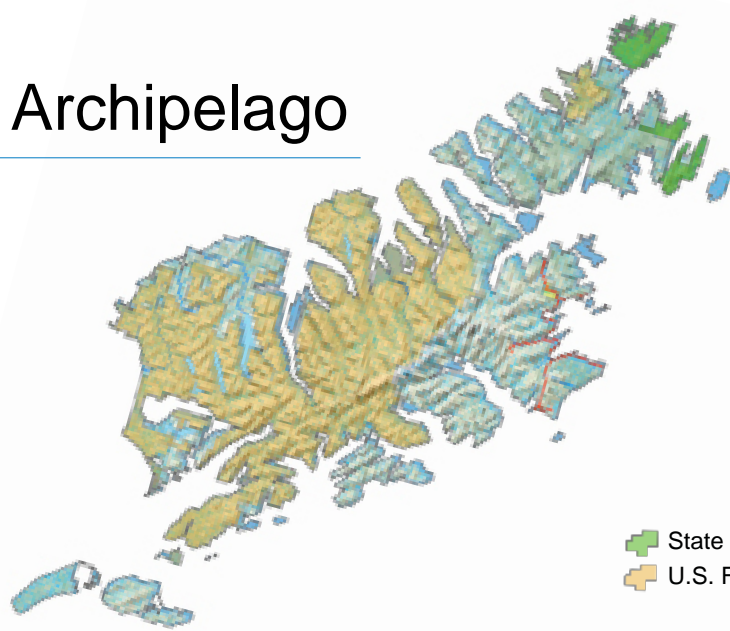
square miles in size

15,303

sportfish anglers in 2019

34.4 million

commercial salmon harvest



■ State Parks
■ U.S. Fish & Wildlife Service

Table 5. Kodiak Archipelago Focus Area strategies, conservation actions and outcomes, and 5-year performance targets.

Focal Species	Strategy	Conservation Actions	Conservation Outcomes	Objectives (5 year targets)
Pacific salmon; migratory birds; native pollinators	Prevent new aquatic connectivity barriers	Provide partners with technical review of fish passage policies, construction plans, and permits to improve designs, design criteria, and construction practices	Applying aquatic connectivity principles prevents habitat fragmentation and supports ecological processes	3 new crossings that meet fish passage standards as a result of technical assistance or review Work with the Kodiak Island Borough to adopt fish passage design standards to prevent new barriers
	Remove barriers to restore aquatic connectivity	Use staff engineering expertise to complete site surveys and designs for fish-friendly road-stream crossings in-house	Removing barriers increases population productivity and resilience by providing fish access to blocked habitat; barrier removal also improves flood resilience and sediment transport	Complete 2 in-house fish passage designs
		Provide technical assistance on partner-led inventory and prioritization of fish passage barriers Remove fish passage barriers		Remove 2 fish passage barriers
	Restore, enhance, or protect riparian, wetland, or upland habitat to maintain ecological functions	Provide technical assistance on partner-led inventory and assessment of habitat in priority watersheds Restore/enhance/protect riparian, wetland, and/or upland habitat in priority watersheds Promote vegetation diversity to benefit native pollinators Improve water quality through technical assistance and construction of bio-swailes at fish passage, streambank, and upland restoration projects	Maintaining functioning riparian, wetland, and upland habitat provides habitat/food for juvenile salmon, migratory birds, and pollinators, promotes connectivity among habitats within a watershed, increases habitat resilience during extreme flow events, mitigates lethal and sub-lethal stormwater impacts to aquatic organisms, and supports many ecological functions (water storage, water quality)	Restore, enhance, or protect 1 acre and 0.1 miles of riparian habitat Restore, enhance, or protect 0.5 acres of wetlands Restore, enhance, or protect 0.25 acres of uplands
Manage/eradicate invasive species that threaten ecological function of priority habitats	Provide technical assistance on partner-led inventory and prioritization of invasive plant species that threaten important habitat Control priority invasive plant infestations by applying the principles of integrated pest management	Minimizing impacts from invasive species allows natural ecological processes to continue, promoting native species productivity and sustainability through life history diversity	Control 2 acres of invasive plants	
	Monitor treated sites and re-treat infestations as necessary to ensure eradication			Post-control monitoring of 2 acres of invasive plant infestations

Southeast Alaska

THREATS




- Fish Passage Barriers
- Timber Harvest (riparian and in-stream impacts)
- Stream Corridor, Wetland, and Shoreline Development
- Aquatic Invasive Species
- Mine Development in Transboundary Rivers
- New Roads and Energy Corridors
- Climate Change



Much of Southeast Alaska is federally managed land, consisting of the 17.8 million acre Tongass National Forest and Glacier Bay National Park and Preserve. The remaining 4 million acre land base is split among state, municipal, and private (including Native Corporations) ownership.

Southeast Alaska features rainforests, fjords, a myriad of rivers and streams, estuaries, mountains, and glaciers. The region ranks as one of the largest, most complex, and intact estuarine and temperate rainforest systems on Earth. Riverine wetlands are a critical habitat providing estuarine rearing habitat for juvenile salmon and other species, major migratory bird stopover areas, and nesting sites for waterfowl. Land uses throughout Southeast Alaska are varied, including timber harvest, mining, community/land development, tourism/recreation, and subsistence activities. An important challenge for conservation is that some of the most productive habitats (coastal forelands and coastline) are also the most desirable lands for development, constrained by the extreme topography between the Coast Range and the Pacific Ocean. Further, the island geography results in distinct, autonomous communities whose independent infrastructure creates a large regional development footprint. Years of road building during the pioneering days of the timber industry has left a legacy of over 2,000 fish-bearing streams bisected by improperly designed or placed culverts, impacting habitat connectivity and aquatic organism passage.

Southeast Alaska

-  National Park Service
-  U.S. Forest Service
-  Bureau of Land Management

41,000
square miles in size

1 million
acres of private land

33.5 million
2019 total commercial
salmon harvest

16,000
miles of shoreline



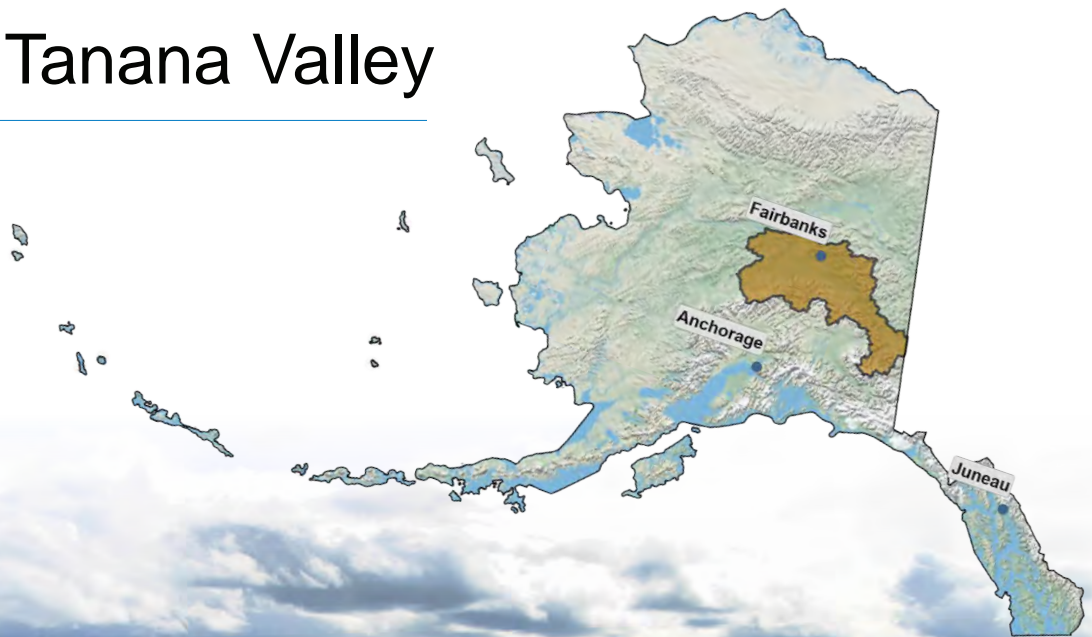
Table 6. Southeast Alaska Focus Area strategies, conservation actions and outcomes, and 5-year performance targets.

Focal Species	Strategy	Conservation Actions	Conservation Outcomes	Objectives (5 year targets)
Pacific salmon; Dolly Varden char; Coastal Cutthroat trout; migratory birds; native pollinators	Prevent new aquatic connectivity barriers	Provide partners with technical review of fish passage construction plans and permits to improve designs and construction practices	Applying aquatic connectivity principles prevents habitat fragmentation and supports ecological processes	6 new crossings that meet fish passage standards as a result of technical assistance or review
	Remove barriers to restore aquatic connectivity	Use staff engineering expertise to complete site surveys and designs for fish-friendly road-stream crossings in-house	Removing barriers increases population productivity and resilience by providing fish access to blocked habitat; barrier removal also improves flood resilience and sediment transport	Complete 5 in-house fish passage designs
		Provide technical assistance on partner-led inventory and prioritization of fish passage barriers		Remove 4 fish passage barriers
	Remove fish passage barriers			
Restore, enhance, or protect riparian, in-stream, wetland, or upland habitat to maintain ecological functions	<p>Provide technical assistance on partner-led inventory and assessment of habitat in priority watersheds</p> <p>Restore/enhance/protect riparian, wetland, and/or upland habitat in priority watersheds</p> <p>Promote vegetation diversity to benefit native pollinators</p> <p>Improve water quality through technical assistance and construction of bioswales at fish passage, streambank, and upland restoration projects</p>	<p>Maintaining functioning riparian, wetland, and upland habitat provides habitat/food for juvenile salmon, migratory birds, and pollinators, promotes connectivity among habitats within a watershed, increases habitat resilience during extreme flow events, mitigates lethal and sub-lethal stormwater impacts to aquatic organisms, and supports many ecological functions (water storage, water quality)</p>	<p>Complete 4 watershed restoration opportunity assessments</p> <p>Restore, enhance, or protect 1.5 miles of riparian habitat</p> <p>Restore, enhance, or protect 16 acres of wetlands</p> <p>Restore, enhance, or protect 100 acres of uplands</p>	
Manage/eradicate invasive species that threaten ecological function of priority habitats	Provide technical assistance on partner-led inventory and prioritization of invasive plant species that threaten important habitat	Control priority invasive plant infestations by applying the principles of integrated pest management	Minimizing impacts from invasive species allows natural ecological processes to continue, promoting native species productivity and sustainability through life history diversity	Control 15 acres of invasive plants
	Monitor treated sites and re-treat infestations as necessary to ensure eradication			Post-control monitoring of 15 acres of invasive plant infestations

Tanana Valley

THREATS

- Habitat Fragmentation
- Fish Passage Barriers
- Stream Corridor Development
- Aquatic Invasive Species
- Climate Change



The dominant ecosystem is boreal forest that includes black spruce bogs, fen wetlands, white spruce forest, and birch forest. The boreal forest region is a large and diverse patchwork of distinct ecosystems and flora with a range of habitat types that vary from closed forest to open shrub and herbaceous communities that inhabit both uplands and wetlands.

Two important Pacific salmon rivers in the Tanana Valley Watershed are the Salcha and Chena rivers; together, they account for about 20% of U.S. Yukon River Chinook salmon escapement (Eiler 2014). The Salcha River is mostly undeveloped; most of the upper Chena River is undeveloped, while the lower reaches of the river flow through the communities of North Pole and Fairbanks. The current population is over 100,000, with continued growth expected. There are many land uses throughout the Tanana Valley, including mining, farming, military operations, urban development, and recreation. Mining has been a significant part of interior Alaska's history; former mining activities represent a major aquatic habitat restoration opportunity in the area. Conservation actions on the Chena and Salcha rivers that maintain or improve Chinook salmon productivity are a direct benefit to Yukon River subsistence fisheries and assist the Service in meeting our obligations under the Yukon River Salmon Agreement of the Pacific Salmon Treaty with Canada.

Photo: Looking out at the Tanana River.
(Katrina Liebich, USFWS)

Tanana Valley

44,000





square miles in size

2.9million

acres of private land

18,709

sportfish anglers in Fairbanks in 2019

-  State Parks
-  U.S. Fish & Wildlife Service
-  National Park Service
-  Bureau of Land Management

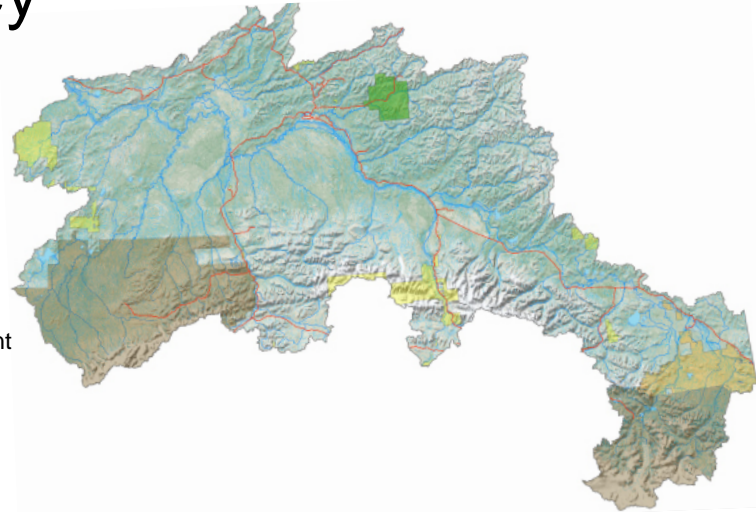


Table 6. Fairbanks/Tanana Valley Focus Area strategies, conservation actions, and 5-yr performance targets.

Focal Species	Strategy	Conservation Actions	Conservation Outcomes	Objectives (5 year targets)
Pacific salmon; migratory birds; native pollinators	Prevent new aquatic connectivity barriers	Provide partners with technical review of fish passage construction plans and permits to improve designs and construction practices	Applying aquatic connectivity principles prevents habitat fragmentation and supports ecological processes	4 new crossings that meet fish passage standards as a result of technical assistance or review
		Provide technical assistance to local government public works and land planning departments regarding stream simulation design criteria for road-stream crossings	Proactively establish infrastructure practices that are protective of aquatic organisms and habitats	Work with the Fairbanks North Star Borough to adopt fish passage design standards to prevent new barriers
	Remove barriers to restore aquatic connectivity	Use staff/contracted engineering expertise to complete site surveys and designs for fish-friendly road-stream crossings in-house	Removing barriers increases population productivity and resilience by providing fish access to blocked habitat; barrier removal also improves flood resilience and sediment transport	Complete 3 fish passage designs
		Provide technical assistance on partner-led inventory and prioritization of fish passage barriers		Remove 4 fish passage barriers
	Remove fish passage barriers			
Restore, enhance, or protect riparian, or in-stream habitat to maintain ecological functions	<p>Provide technical assistance on partner-led inventory and assessment of habitat in priority watersheds</p> <p>Restore/enhance/protect riparian or instream habitat in priority watersheds</p> <p>Promote vegetation diversity to benefit native pollinators</p> <p>Promote the implementation of BMPs to protect/improve water quality where applicable</p> <p>Provide technical assistance to Fairbanks North Star Borough to develop a zone of limited development along the Chena River corridor and its tributaries to protect fish habitat</p>	Maintaining functioning riparian and instream habitat provides habitat/food for juvenile salmon, migratory birds, and pollinators, promotes connectivity among habitats within a watershed, increases habitat resilience during extreme flow events, mitigates lethal and sub-lethal stormwater impacts to aquatic organisms, and supports many ecological functions (water storage, water quality)	<p>Restore, enhance, or protect 2 acres and 2 miles of riparian habitat</p> <p>Restore, enhance, or protect 30 acres of wetlands</p> <p>Restore, enhance, or protect 20 acres of uplands</p> <p>New Fairbanks North Star Borough ordinance that establishes buffer zones on the Chena River by 2026</p>	
Manage/eradicate invasive species that threaten ecological function of priority habitats	<p>Provide technical assistance on partner-led inventory and prioritization of invasive plant species that threaten important habitat</p> <p>Control priority invasive plant infestations by applying the principles of integrated pest management</p> <p>Monitor treated sites and re-treat infestations as necessary to ensure eradication</p>	Minimizing impacts from invasive species allows natural ecological processes to continue, promoting native species productivity and sustainability through life history diversity	<p>Control 4,000 acres of invasive plants</p> <p>Post-control monitoring of 1,000 acres of invasive plant infestations</p>	



Table 6. Regional performance targets by geographic focus area.

Geographic Focus Area	5-year Performance Targets			
	Acres Riparian, Instream, Wetlands, Upland Habitat	Miles Riparian, Stream, Shoreline Habitat	# Barriers	# Technical Assistance Activities
Mat-Su Basin	6.5	0.3	5	7
Kenai Peninsula	28	1.1	2	2
Kodiak Archipelago	3.75	0.1	2	3
Southeast Alaska	131	1.5	4	6
Tanana Valley	4,052	2.0	4	4
Totals	4,221.25	5.0	17	22

GOAL 2

BROADEN & STRENGTHEN PARTNERSHIPS

Partnerships are the foundation of the PFW Program; without them, conservation actions cannot be implemented. The Alaska PFW Program is fortunate to have a group of strong conservation partners dedicated to protecting and restoring Pacific salmon, migratory bird, and pollinator habitats. Existing partners include four Fish Habitat Partnerships, the Alaska Department of Fish and Game, municipalities and boroughs, land trusts, National Resource Conservation Service (NRCS), local Soil and Water or Tribal Conservation Districts, local watershed councils, Native regional corporations, Native village corporations and councils, private landowners, local businesses, and a variety of non-profit organizations. It is our goal to broaden and strengthen those partnerships over the strategic planning period.

“Working in a partnership with USFWS has been a valuable experience that supports our community and its resources. Their knowledge, expertise, and patience has developed a strong and lasting foundation with us on which to build quality collaborative relationships that support a common goal.”

Teri Diamond, District Manager
Kenai Soil and Water Conservation District

Given the value we place in partnerships, the first step in developing this regional implementation plan was to solicit input from our external partners on past program/staff performance and future expectations. We distributed an 18-question survey directly to 62 existing PFW partners and received 31 responses. Respondents were representative of our Geographic Focus Areas, but were primarily from State government and non-profit organizations; our responses from local government and Tribal organizations were limited.

We specifically asked our partners two open-ended questions: “How can USFWS be a better conservation partner?” and “If there was one thing about our Program that you could change, what would that be?” The following responses provide us with areas to improve our program and partnerships over this strategic planning period:

- Improve Communication: simpler lines of communication, consistent and well communicated priorities (one voice from all FWS staff), transparency about how funding decisions get made, and more interaction/face time with the public to improve public image
- Improve Administrative Process: Grant Solutions remains difficult, timeliness of funding/reimbursement process, stay committed financially to multi-year agreements
- Increase Diversity in Project Types: watershed/landscape approach, work beyond federal trust species, get involved with diverse habitat projects, expand geographic focus into the Arctic
- Increase Capacity: additional funding and staff capacity needed all across Alaska, but particularly in Southeast Alaska.

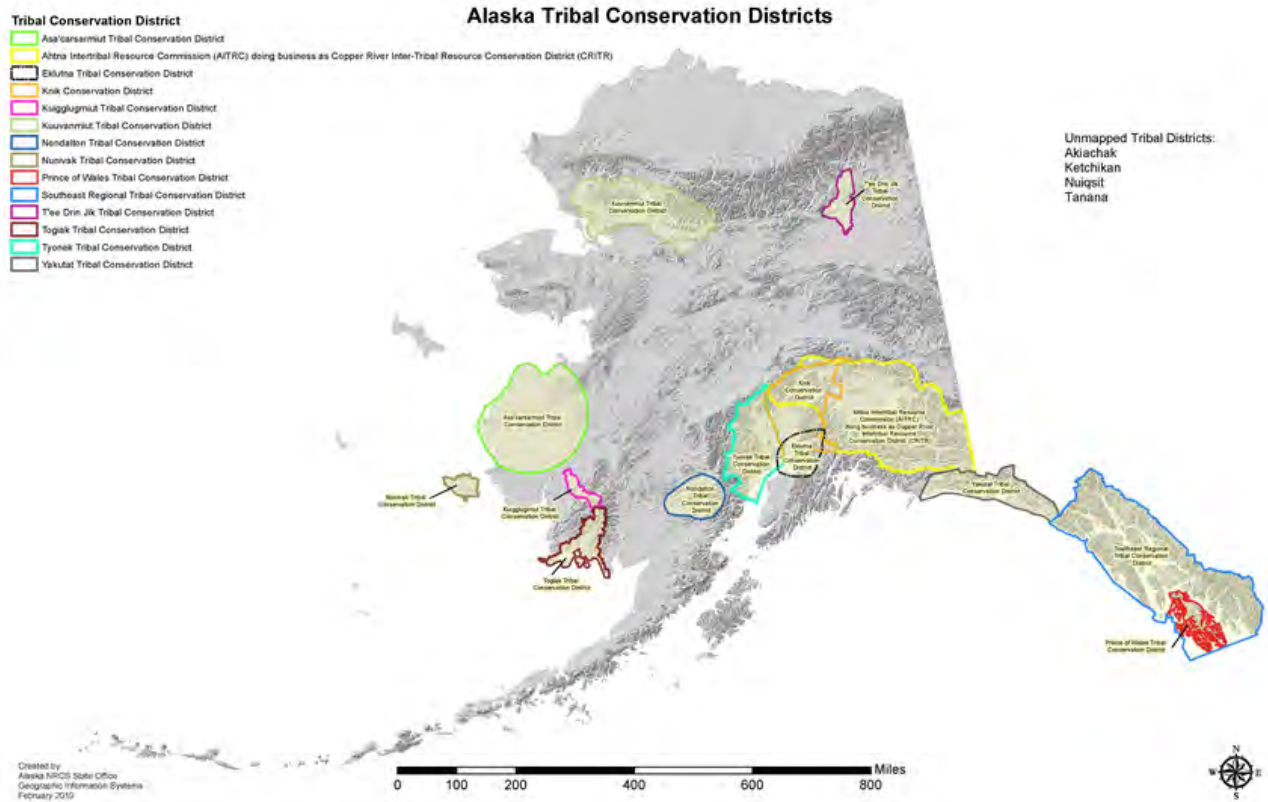


Figure 8. Existing Tribal Conservation Districts (TCD) in Alaska as of February 2019 – many TCD boundaries and conservation interests overlap with PFW Program geographic focal areas.

Of particular interest to the PFW Program, we are committed to strengthening our partnership with NRCS Alaska. Both agencies have consciously focused on relationship building in recent years, resulting in a partnership that is creatively working to address Alaska’s conservation needs by leveraging both agency’s technical and financial resources. Recent conservation successes include a funded Working Lands for Wildlife project addressing salmon conservation needs on the Kenai Peninsula and a Regional Conservation Partnership Program addressing aquatic connectivity needs in the Copper River Basin. The PFW Program will continue to support NRCS Program decisions through engagement at the state level in the State Technical Committee and at the local level through Local Working Groups. Our PFW biologists will remain informed on evolving Farm Bill Programs and find opportunities to utilize them on our unique Alaska circumstances. Further, we will continue to provide technical assistance to NRCS partners (i.e., Soil and Water or Tribal Conservation Districts (Figure 8)) to build capacity and accomplish shared conservation goals.

Through the Alaska Native Claims Settlement Act (ANCSA), twelve Alaska Native regional corporations were formed and given the opportunity to select lands within areas of traditional and historical uses (Figure 9). These corporations are private landowners of a combined 44 million acres and they understand the value of conservation. ANCSA also created over 200 village corporations, each with local area interest and authority. Over this strategic planning period, the PFW Program will continue to proactively reach out to Alaska Native corporations within our Geographic Focus Areas to strengthen these relationships.

In recent years, there has been a much needed, growing awareness of environmental justice issues. For example, the Environmental Protection Agency has developed an Environmental Justice Screening and Mapping Tool that estimates a community’s vulnerability based on a number of environmental (e.g., proximity to contaminants, density of development) and demographic (e.g., age distribution, education

level, income metrics) indicators (<https://ejscreen.epa.gov/mapper/>). Similarly, the Centers for Disease Control and Prevention has developed a social vulnerability index that measures a community’s potential negative impacts caused by external stressors such as natural disasters or anthropogenic events (e.g., contaminant spill) – community factors such as poverty, density, or mobility influence the community’s vulnerability (<https://svi.cdc.gov/map.html>). As we develop and implement PFW Program conservation actions, we will consider environmental justice factors, proactively seeking to partner with and maximize benefits for disadvantaged communities in Alaska.

Over the strategic planning period, we will focus on sustaining and strengthening both our existing internal and external partnerships and will also work toward developing new and lasting ones. Internally, we will intentionally pursue collaboration opportunities with Service programs such as Refuges, Fisheries and Aquatic Conservation, Ecological Services, Science Applications, and Migratory Bird Management. Externally, we will continue to implement established, proven approaches for sustaining partnerships such as regular and frequent communication, providing continual opportunity for feedback, and providing partners with technical support and educational opportunities (e.g., technical workshops or webinars). Further, we value the dedication and contributions of our program partners and will annually nominate partners for conservation awards.



Figure 9. Regional Native Corporation boundaries established by the Alaska Native Claims Settlement Act.

The National PFW Program developed common metrics for all Regions to track to provide corporate measures of success at achieving our goals around Broadening and Strengthening Partnerships. The common metrics, and Alaska’s regional performance targets, for these goals are included in Table 8.

Table 8. National metrics for broadening and strengthening our partnerships.

METRIC	ANNUAL PERFORMANCE TARGET
Number of Annual Partnerships	10 Partnerships
Number of Private Landowner Partnerships	10 Private Landowner Agreements
Non-Program Dollars Leveraged for Projects	1:1

GOAL 3

IMPROVE INFORMATION SHARING & COMMUNICATION

We live in an information age. The speed of information exchange and the method of delivery are constantly changing. Effective information sharing and communication with our partners, stakeholders, decision makers, and others is a major goal of the Alaska PFW Program. We endeavor to remain current and relevant in the dynamic world of outreach and communication. To effectively communicate, we will use a combination of traditional and cutting edge outreach tools to communicate our PFW Program actions and successes to keep our partners and others informed. We recognize that outreach and communication must occur at multiple scales: locally, regionally, and nationally. In addition, we will continue to proactively seek input from our conservation partners and will adapt our strategies accordingly.

The Alaska PFW Program is committed to improving how we communicate with our partners and share information. Over the strategic planning period, we will purposefully maintain open communication with internal and external partners. Internally, we will proactively communicate PFW Program successes and challenges to the Fisheries and Ecological Services Assistant Regional Director, the Regional Directorate Team, the Alaska Region Regional Director, and leadership of Refuges and other Service Programs. Externally, we will maintain our current comprehensive level of coordination with other agencies (local, state, federal), National Fish Habitat Partnerships, community-based watershed organizations, Alaska Native organizations, and other stakeholders in the implementation of PFW Program conservation actions. To inform various audiences about the

PFW Program's actions and accomplishments, we will use a variety of outreach tools as described in the Alaska Region Outreach Strategy. These tools maximize the number and diversity of people reached, and include tactics such as social media, blogs, podcasts, websites, traditional publications, informal presentations, and formal presentations at local/regional/national conferences. Our outreach material will be tailored to the audience and desired messaging. In particular, we will support Service headquarters staff in developing national program materials to garner Agency and Congressional program support and we will produce social media material to build interest in conservation locally, regionally, nationally, and globally.

Through our survey of external partners, we posed two questions specifically targeting outreach and communication: "What themes are most effective in communicating the purpose, value, and benefits of conservation to others?", and "What is the best method for sharing stories about these themes?" The top three themes in order of importance were: (1) economic value of healthy habitats/species, (2) ecological services provided by healthy functioning habitat, and (3) the value of fish and wildlife for human use (e.g., fishing, hunting). Somewhat to our surprise, our partners felt like the top three most effective ways to share conservation stories were: (1) holding specific education/outreach events (e.g., workshops, speaker

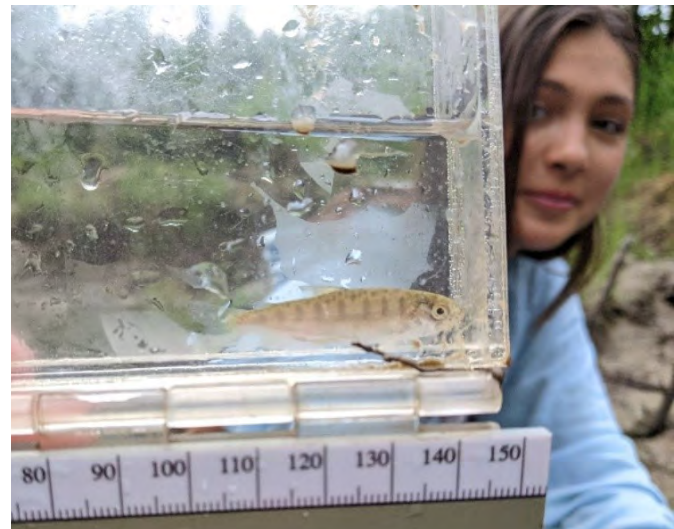


Photo: Juvenile Chinook caught in summer of 2021.
(Mitch Osborne, USFWS)

series), (2) social media, and (3) having an in-person presence (e.g., interactive booth) at community events, industry conferences, or trade shows. We will use this feedback to structure our information sharing and communication efforts over this strategic planning period.

The National PFW Program common metric, and Alaska’s regional performance target, for improving information sharing and communication is included in Table 9.

Table 9. National metric for improving information sharing and communication.

METRIC	5-YEAR PERFORMANCE TARGET
Number of Outreach Activities	10 Outreach Activities

GOAL 4 DEVELOP OUR WORKFORCE

Alaska Region Habitat Conservation Program staff are dedicated, effective professionals that accomplish significant conservation actions with limited resources. Staff possess technical expertise and devote a high level of personal attention to projects and partners, both of which have been identified as significant strengths of our PFW Program. Through our formal survey distributed to external partners, we learned that our partners were confident about our staff technical expertise and professionalism:

- 91% ‘Possess technical knowledge and expertise of species and habitats’,
- 96% ‘Possess technical knowledge of project design, implementation, and permitting’,
- 94% ‘Are professional in how they go about their work’, and
- 91% ‘Are accessible and responsive’.

Further, the top five areas (in order of importance) in which our partners requested technical assistance from our staff are: (1) information about long-term habitat protection, (2) information about project-specific technical/financial resources that may be available, (3) species-specific scientific/biological project support, (4) information about habitat restoration or enhancement, and (5) support for prioritizations or strategic planning. Over this strategic plan period, our goal is to maintain and improve upon our technically capable and highly functioning workforce and we will emphasize providing technical assistance that addresses partner-identified needs.

The Alaska Region Habitat Conservation Program’s organizational structure is designed to foster collaboration among staff and serves as an informal mentoring program. Staff expertise includes biology, hydrology, habitat restoration, and engineering; staff regularly consult one another to discuss project-specific and programmatic strengths and challenges. In addition to the within-program collaboration, we are committed to proactively seek perspectives and input from other Service programs, such as Fisheries, Wildlife and Sportfish Restoration, Refuges, Ecological Services, Migratory Bird Management, and Science Applications.

Alaska Region PFW staff are committed to develop and expand their skills and abilities. Staff are encouraged to actively participate in professional societies and to seek out and attend professional technical training to hone and expand their expertise. Based on external partner feedback from our pre-planning survey, we identified three areas of professional development for our PFW staff: creative problem solving, communication skills, and establishing/fostering partnerships. Survey respondents indicated that they disagreed or

were unsure of our staff capability in these areas (12%, 9%, and 12% respectively).

To develop leadership from within the PFW Program, staff are encouraged to participate in leadership development, such as Stepping Up to Leadership, Advanced Leadership Development Program, LEAD Alaska, or other external leadership training. Alaska Region staff are also encouraged to participate in temporary details in other Service regions to learn more about the PFW Program nationally, to understand how other regions implement the PFW Program, and to bring these lessons back to Alaska for PFW Program improvements.

Alaska Region PFW staff are committed to developing the next generation of natural resource professionals by connecting people with nature and educating today’s youth about the natural world. Staff are encouraged to mentor young and diverse professionals by providing practical opportunities to engage in conservation efforts. In Alaska, there are a number of existing programs available to create these opportunities, including Alaska Native Science and Engineering Program, Directorate Fellows, Arctic Youth Ambassadors, Soul River, and the King Career Center.

The National PFW Program common metric, and Alaska’s regional performance target, for developing our workforce is included in Table 10.

Table 10. National metric for developing our workforce.

METRIC	5-YEAR PERFORMANCE TARGET
Number of Employee Development Activities or Events	10 Employee Development Activities



Photo: Data collection through eDNA sampling.
(Katrina Liebich, USFWS)

GOAL 5 ENSURE ACCOUNTABILITY

Accountability and transparency are tenets of functional government. In the Alaska Region PFW Program, we are committed to wisely using our resources to have the greatest conservation impact in Alaska. We will regularly monitor PFW Program activities and operations to ensure Alaska Region alignment with national program objectives and requirements.

The Service uses the Habitat Information Tracking System (HabITS) to document and report all PFW Program project accomplishments, specifically connecting each accomplishment to restoration actions and Service initiatives. In the Alaska Region, field and regional PFW Program staff work together to enter project information and review data for accuracy. Prior to the close of the federal fiscal year (September 30), annual project accomplishments are submitted to Headquarters for review to confirm compatibility with HabITS and national PFW Program requirements. Our PFW Program goal is 100% error-free HabITS reporting each year.

The Alaska Region PFW Program is committed to other standard business practices to ensure the program satisfies national program requirements and delivers effective conservation actions. Operationally, staff will conduct annual FWCO management control reviews to ensure efficient operations and will track the annual PFW budget to ensure that on-the-ground project funds are maximize and program operational funds are minimized. Further, to maximize the impact of our conservation actions and increase leveraging opportunities, we will demonstrate how PFW Program conservation actions link with local, regional, or national strategic conservation plans or LCDs. Finally, as we conduct project compliance monitoring, PFW Program staff will aim for 100% alignment with guidelines in the Alaska Region Habitat Restoration Program Monitoring Plan.



Photo: Post monitoring of fish passage projects. (Katrina Liebich, USFWS)

The National common metrics to ensure program accountability, and our regional performance targets, are described in Table 11.

Table 11. National metric for ensuring accountability.

METRIC	ANNUAL PERFORMANCE TARGET
100% of Projects Have Completed Level 1 Monitoring: Implementation and Compliance Monitoring	100% compliance with Metric
Produce or publish an Annual Accomplishment Report	100% compliance with Metric

Monitoring and Biological Outcomes

The Alaska PFW Program is committed to national program policy directing the majority of program funds for on-the-ground conservation actions; the remainder is available for program administration. Program staff currently conduct compliance monitoring and are continuously exploring collaboration opportunities for long-term monitoring options with key partners.

Effectiveness monitoring of our conservation actions is an important component of SHC (Figure 2). Monitoring determines whether conservation actions meet intended habitat or biological objectives and informs planning and design of future conservation actions. In the field of conservation and restoration biology, there has been a growing need to demonstrate that on-the-ground conservation actions achieve the desired biological outcome for the species or habitat targeted for restoration. The need to document successful restoration efforts is heightened by the progressively decreasing money available for restoration through federal/state agencies or other funding sources.

As an example, the desire and need to monitor stream and watershed restoration actions has been a considerable focus of Pacific salmon recovery efforts throughout the Pacific Northwest and California (Roni 2005, Bennett et al. 2016). Specific to the discipline of aquatic organism passage, the U.S. Geological Survey convened a panel of national experts to provide protocols and guidelines for effectiveness monitoring of aquatic organism passage at road-stream crossings (Hoffman et al. 2012). Hoffman et al. (2012) evaluated the utility of four broad categories of methods (individual movement, occupancy models, abundance, and molecular genetic markers) for the purpose of evaluating three components of aquatic organism passage restoration: 1) the level of passage impairment at culverts and road-stream crossing structures; 2) the ecological conditions that either rule-out or support repairing or replacing structures; and 3) the effectiveness of stream connectivity and passage restoration efforts.

A number of themes emerged from this workshop:

- The fundamental reality is that monitoring projects require discrete/significant long-term funding and partnerships among researchers and resource managers to be successful.
- Choosing the most appropriate method depends on the specific questions being asked; each method has strengths and limitations and a combination of methods is often required.
- An ideal approach includes two primary elements: impact and reference sites; before and after sampling and evaluation.
- A number of factors that can modify the response of aquatic organisms to changes in passage conditions need to be considered, including stream size, the life history and movement characteristics of the species of concern, the landscape context of the crossing site, design and condition of the crossing structure, physical-hydrological-biological characteristics of the stream at the crossing, and time since crossing conditions have changed substantially.

Consistent with the findings of Hoffman et al. (2012), Roni et al. (2008) and Bennett et al. (2016) describe the challenges of measuring population-level responses of stream habitat restoration efforts throughout the Pacific Northwest. The fundamental problem is that effectiveness monitoring is typically not conducted at the population scale – most restoration monitoring has been conducted on a reach scale over short time frames (<5 years). Further, restoration efforts are often small relative to watershed size, which limits the power to detect a response. Bennett et al. (2016) and Neville et al. (2016) identify that population responses to restoration can be measured, provided that effectiveness monitoring programs take a watershed-scale approach over long periods of time.

During the 2017-2021 strategic planning period, the Alaska Region staff from our integrated conservation partnership programs (e.g., Coastal, PFW, and Fish Passage programs) and our Fisheries and Aquatic Conservation program collaborated on a pilot monitoring study to investigate the biological impact of our fish passage restoration work on Kodiak Island. In 2017 and 2018, we sampled the resident/juvenile fish community above and below 19 culverts trying to answer the research question: do stream reaches upstream of good culverts support more fish than reaches above bad culverts? We hypothesized that fish abundance would correlate with culvert passability. For Dolly Varden and juvenile Coho Salmon, results indicated that there was no relationship between fish abundance and culvert passability and among-site variation was very high. After statistical analysis of the data, we determined that large sample sizes (~400 sites) would be required to detect significant differences in Coho Salmon and Dolly Varden abundance. Given our program capacity and resources, the pilot monitoring project was abandoned rather than scaled up 20-fold.

In December 2019, the Alaska Region conservation partnership programs and staff from the Fisheries program went through a 2-day facilitated structured decision making process (Steps 1-4 from Reynolds et al. 2016). We considered each of the primary conservation actions we conduct, developed problem statements for each, then determined the need for monitoring based on program capacity and whether or not monitoring would address specific management or policy actions identified in the problem statement. The outcome of this meeting was a commitment to evaluate a pilot project to monitor the response of habitat and fish to our streambank restoration work on the Chena River, near Fairbanks.



In 2019, we conducted a pilot study to determine the suitability of using Dual-frequency Identification Sonar to detect differences in fish use between bioengineered streambanks and hardened streambanks (riprap). While fish detection was feasible, video evaluation time was significant and large sample sizes are required to detect statistical differences in fish use between the two habitat types. To address the sample size challenge, in 2021 and beyond, we are evaluating whether side scan mobile sonar technology is feasible for documenting different habitat types and detecting differences in fish abundance/use of these habitats. Recognizing the challenges detailed by Hoffman et al. (2012), Roni et al. (2008), and Bennett et al. (2016), we are committed to finding creative, low-cost solutions to demonstrating the biological impacts of our restoration actions.

Photo: Installation of piezometers for sediment transport research. (USFWS)

Conclusion

This regional implementation plan provides focus for the Alaska PFW Program for 2022-2026. Our program aligns with the National Priorities of species conservation, habitat connectivity, and resilient ecosystems for the benefit of federal trust species. We intend to address priority conservation needs of Pacific salmon, migratory birds, and pollinators within our geographic focus areas that are located at the intersection of functioning habitat and growing habitat threats. We will strive to continually improve the Alaska PFW Program by broadening and strengthening partnerships, improving information sharing and communication, developing our workforce, and increasing accountability. Through the Alaska PFW Program, we hope to be a positive influence in the communities where we both live and work: developing meaningful relationships, addressing habitat/species needs, protecting and providing ecosystem services, improving community resilience, maintaining the connection between people and the land, and improving the quality of life for all Alaskans.



Photo: Mat-Su Valley
salmon.
(Anderson, USFWS)

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