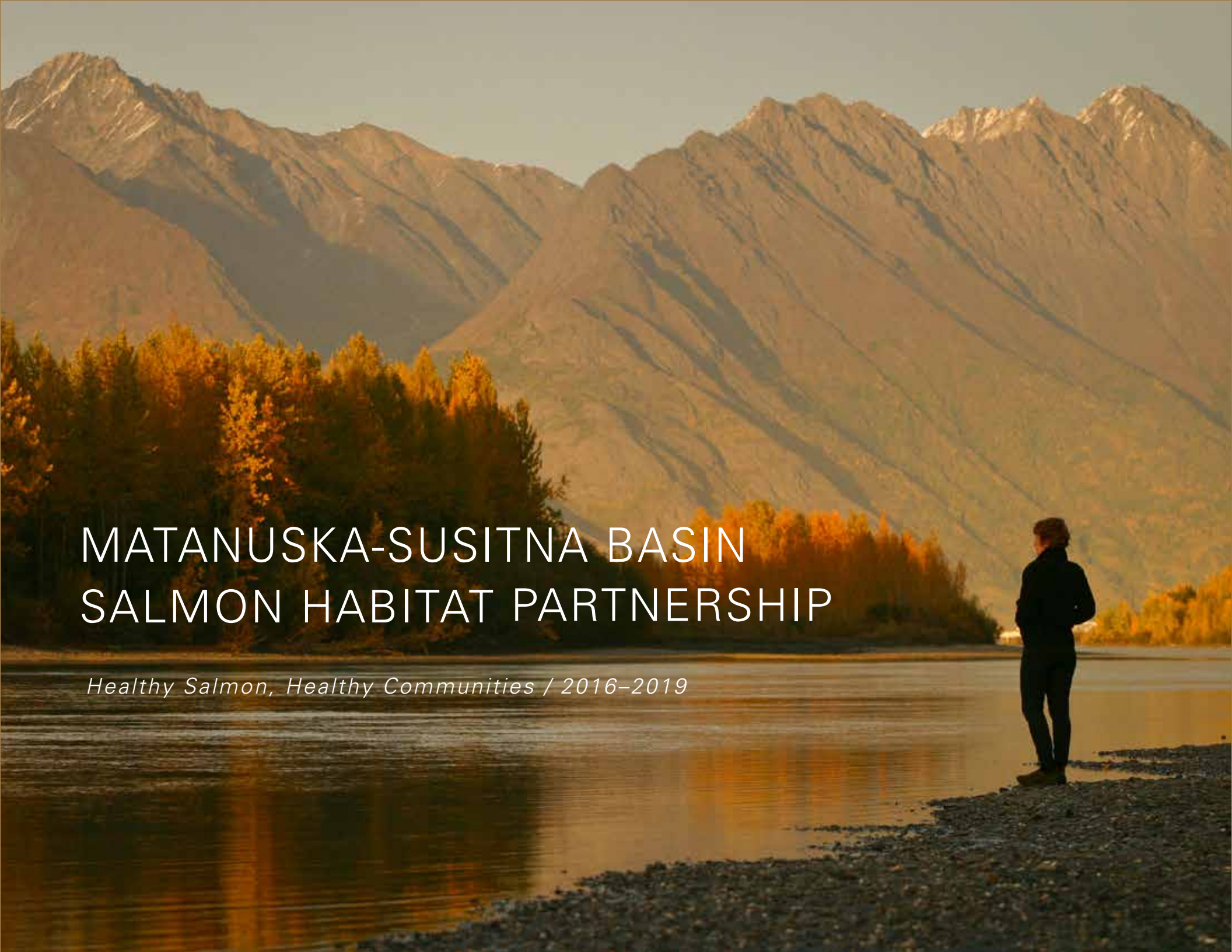
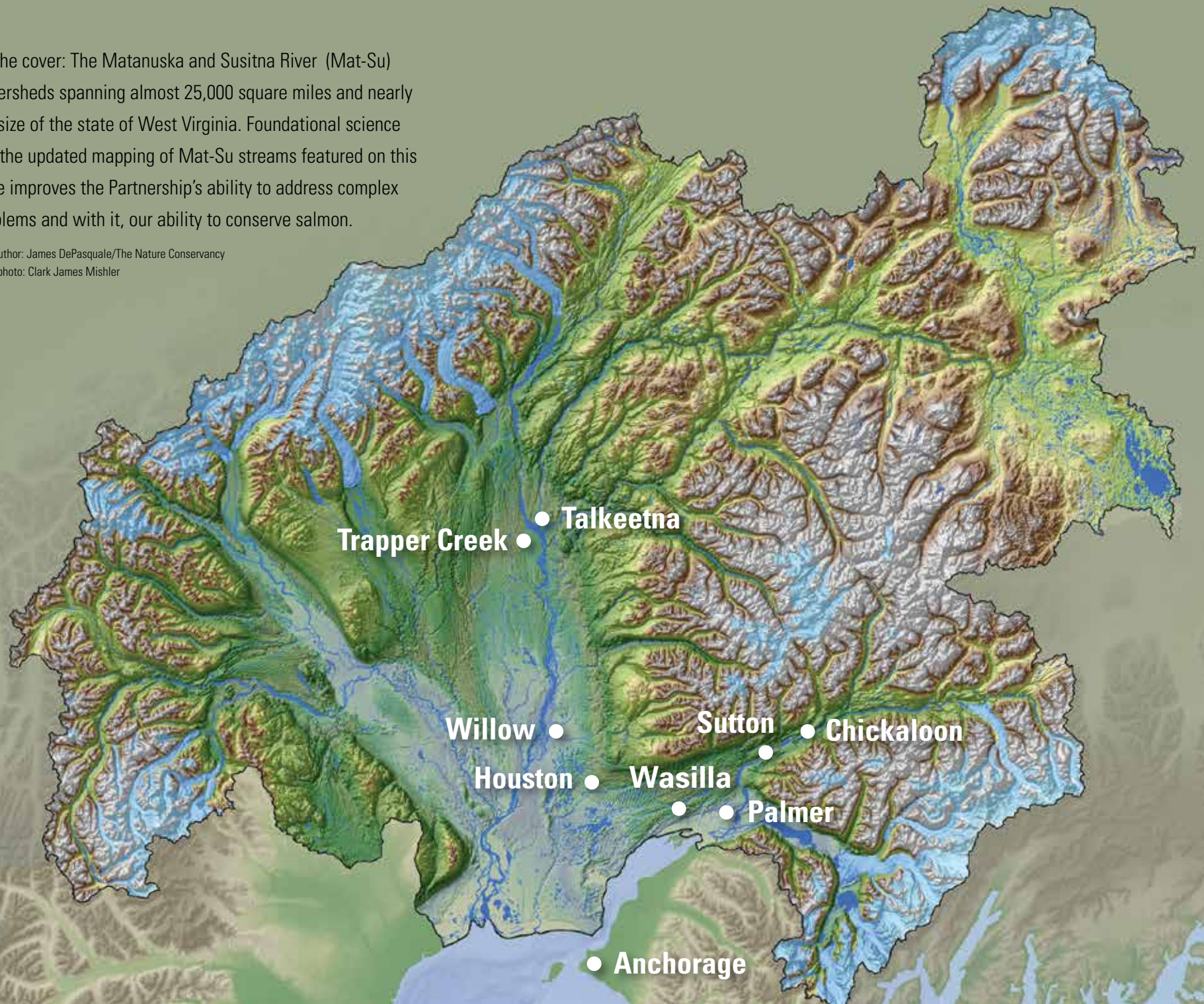


MATANUSKA-SUSITNA BASIN SALMON HABITAT PARTNERSHIP

Healthy Salmon, Healthy Communities / 2016–2019

On the cover: The Matanuska and Susitna River (Mat-Su) watersheds spanning almost 25,000 square miles and nearly the size of the state of West Virginia. Foundational science like the updated mapping of Mat-Su streams featured on this page improves the Partnership's ability to address complex problems and with it, our ability to conserve salmon.

Map author: James DePasquale/The Nature Conservancy
Cover photo: Clark James Mishler



The allure of rivers, streams, and the fish within them provides some solace and stability in changing times. There is a stable comfort living in a place that, despite a pandemic, political turmoil, and a warming climate, young salmon remain in our winter waters, and adults return, year after year, providing us a steadiness in our lives, and the security of food in our freezers and on our pantry shelves.

Another stable comfort is the work of the Mat-Su Basin Salmon Habitat Partnership (Partnership). Just as young salmon remain, and adult salmon return to Mat-Su waters year after year, so the work of our many partners reliably continues. Through conservation, research and restoration efforts, we've worked to support salmon as they follow their millennial-old pattern of returning to freshwaters throughout the Mat-Su.

This report provides highlights from 2016-2019, in areas of science, conservation, restoration and perhaps the Partnership's most valuable role, bringing together a diverse group of people to share information and collaborate.

While the Partnership has achieved steady progress on many of our salmon conservation goals, the last four years have also brought continued expansion of aquatic invasive species in the Mat-Su, and record breaking stream temperatures and low water levels. These are reminders of the importance of our work, and its time sensitivity.

The work accomplished by our Partnership, everyday Alaskans as well as decision makers, will be essential to maintain our connection to the wild fish, and the land, as the Mat-Su Borough continues its rapid growth. The work described in this booklet shows a vibrant partnership where salmon bring a growing number of partners together on a common goal to keep wild salmon abundant in the Mat-Su. Thank you for your part.

Sincerely,
Mat-Su Basin Salmon Habitat Partnership Steering Committee and Coordinator

BY THE NUMBERS:

The shared vision of the Partnership has led to important resource and information sharing, and collaborative projects. Check out our work by the numbers.

96 **Mat-Su Salmon Partnership Funded Projects in the Mat-Su Basin since 2006**

25 **With funding from the National Fish Habitat Partnership, the Partnership has provided over $1million for 25 salmon habitat projects in the Mat-Su from 2016 to 2019, with over $9 million in direct match and leveraged funds from private and public sources.**

5 **5 new partners in 2016-2019 (66 total partners as of 2019)**

Trout Unlimited
Innovative Funding
Susitna River Coalition
Turkey Red
1 private individual

PARTNERSHIP

In 2005, a small visionary group of people from a handful of organizations came together to talk about salmon in the Mat-Su Valley. Before this, most salmon science, conservation and restoration projects happened in isolation. What if, these founding members thought, we could collaborate and cooperate on the work that we are doing? What would happen then? Since the beginning, the Partnership has sought to include anyone concerned about conserving salmon in the Mat-Su Basin. As of 2019, the organization has grown to 66 members and funded 96 projects across the basin. This is a brief look at Partnership work accomplished from 2016-2019.

Partnership Site Tours

Since 2015, the Partnership has hosted annual summer site tours. These day long trips help educate community leaders about what the Partnership is doing and why it matters and are a great way to get out on the land together – celebrating the magic of this place while learning.

"The story of salmon is steeped in who we are. Doesn't matter if you've been here ten years or your entire life. The returning cycle of the salmon, it's a life cycle that grounds you to the land and this tour shares that," said Palmer City Councilman, Richard Best. There were over 135 summer site tour participants from around the Cook Inlet Basin over the past four years, including representatives from the Alaska State Legislature, state, federal, borough and city agencies, Alaska Native organizations, corporate partners, fishing interests, non-profits and private citizens.

Tours have included: a focus on Cottonwood Creek in Wasilla, looking at challenges and solutions to meet the needs of both salmon and people in a rapidly urbanizing landscape; Matanuska River watershed, looking at the importance of connectivity both up and downstream, across floodplains, and across cultures; Knik River Public Use Area, exploring outdoor recreation and salmon habitat, and a focus on how fisheries science has informed conservation and restoration efforts along the Parks Highway from Montana Creek to Big Lake.

The Mat-Su Salmon Partnership was honored to host visiting U.S. Fish and Wildlife Service (USFWS) Principal Deputy Director Margaret Everson during her recent visit to Alaska. Through a roundtable and site visit held at the Mat-Su Borough Assembly Chambers, 33 partners highlighted the importance of Mat-Su Salmon and the good work of the Mat-Su Salmon Partnership. Photo credit: Stefan Hinman/Mat-Su Borough.

In photo: USFWS Principal Deputy Director Margaret Everson pictured with representatives from Mat-Su Borough, The Nature Conservancy, USFWS, The Alaska Center, Tyonek Tribal Conservation District, Alaska Department of Environmental Conservation, Great Land Trust, and Alaska Department of Fish and Game (ADF&G), including Mat-Su Borough Mayor Vern Halter, Assembly Members Tam Boeve and Jim Sykes, and ADF&G Director of Sportfish Dave Rutz.

"Our area is so vast. There are so many nooks and crannies. The opportunity to go out and look at the work that was being done was incredible," said Richard Best, Palmer City Councilman and participant on the 2018 Matanuska River Site Tour. Best and tour participants learned more about what was happening to conserve salmon in their community. The 38 people who attended visited six locations on the Matanuska river watershed looking at the importance of connectivity both up and downstream, across floodplains, and across cultures.

Annual Mat-Su Salmon Science and Conservation Symposium:

Celebrating the Love of Science and Salmon

The annual Mat-Su Salmon Science and Conservation Symposium convenes more than 25 presenters and well over 100 attendees each year. These events foster collaboration and communication on the latest science, conservation and restoration of fish habitat in the Mat-Su, as well as healthy dialogue amongst diverse stakeholders and an opportunity to introduce new and different ideas.

As part of the 2019 Symposium the "Wild, Local, and Traditional Foods Dinner" was curated by Angela Wade from Chickaloon Native Village and prepared by the staff of Turkey Red restaurant. With 45 people in attendance, this event featured wild, local, and traditional dishes, and looked at the community history of food and people, and closed with a beading activity directed by Wade. **"We always must consider the archaeology of place and how we connect to place. One way in which we connect to place is through food,"** said Wade.

Community Education

Wildlife Wednesdays

In 2015, the Mat-Su Salmon Habitat Partnership teamed up with Alaska Department of Fish and Game, Alaskans for Palmer Hay Flats, The Nature Conservancy and Musk Ox Farm to offer a lecture series celebrating the wonder of Southcentral Alaska's fish and wildlife resources. From 2016-2019, these lectures reached well over 200 community members annually.

Outreach in Schools and Community Venues

Partnership staff and contractors provided education activities and staffed booths at 3 schools and 7 community events, and provided formal presentations to a local chamber of commerce and rotary club. These efforts provided salmon education to more than 200 students and well over 300 community members.

Additional Outreach Events

In 2018, in conjunction with other Alaska Fish Habitat Partnerships, we hosted a fishy film festival as part of the American Fisheries Society Meeting. In 2017, we presented at the Alaska Board of Fisheries for Cook Inlet, highlighting the critical role of habitat in healthy salmon fisheries and supported the hosting of UAA's salmon and society workshop.

Created Salmon-Friendly Development Guidelines

Partners completed salmon-safe standards for residential and commercial development in the Mat-Su. You can find it at this link: bit.ly/salmonsafeguidelines

SCIENCE

Foundational science around salmon and salmon habitat has largely been limited in the Mat-Su. Since the start of the Partnership however, our knowledge of Mat-Su salmon and their habitats has continued to expand. Over the years partners have helped fill in gaps, expanded interdisciplinary collaboration and grew our ability to utilize more powerful tools that can help us understand the complexity of salmon and their habitat.

Stream Temperature

Cool water is a defining feature of salmon habitat and the survival of each life stage -- from spawning adults to incubating embryos to rearing parr. Each are maximized by temperatures within a relatively narrow range. To document current temperature patterns, Cook Inletkeeper monitored the mainstems of 48 salmon streams in the Mat-Su Basin and elsewhere around Cook Inlet. Collaborations with other partners, including the University of Alaska and the U.S. Fish and Wildlife Service, have produced three recent journal articles that analyze how ongoing warming may be affecting salmon:

- Lowland salmon streams in the Mat-Su Basin are warming rapidly and parts of these watersheds have already reached temperatures that are considered harmful to salmon during warm summers. Read the report: bit.ly/warmingmatsustreams

- Mat-Su Basin salmon streams are predominantly cold, but temperature regimes will be warmer, more variable, and less diverse in the coming decades. Read the report: bit.ly/thermaldiversity

- Recent declines in Cook Inlet's Chinook salmon populations can be attributed in part to climate-driven changes in temperature and streamflow in freshwater habitats. Read the report: bit.ly/climateandchinook

Ongoing work is focused on predicting how the future extent and distribution of thermally suitable salmon habitat will change across the Deshka and Little Susitna watersheds. This same group of partners is monitoring basin-wide water temperature, streamflow, and the summer distribution of juvenile Chinook and coho salmon in each of these historically productive salmon streams that differ in terms of watershed topography and temperature regimes. This information will guide conservation efforts by identifying areas that will remain cool enough to function as salmon habitat well into the future and highlighting stream segments that are key to maintaining connectivity among these areas.

USFWS field crew collecting temperature and juvenile salmon distribution data on a tributary of the Deshka River. Photo: Katrina Liebich/USFWS

Wetland loss in the Mat-Su Borough

An assessment by Kenai Watershed Forum comparing historic aerial photos with those from 2018 found that 1305 acres of wetland within the most populated, core area of the Mat-Su Borough has been filled since the era of modern settlement. These filled acres mostly occurred in the Meadow Creek, Lucile Creek, Wasilla Creek, and Cottonwood Creek watersheds. Ten percent of all of the wetlands in the Lucile Creek Watershed have been filled; and in three other watersheds more than 10% of seven different types of wetlands have been filled. Many of these water bodies now have "impaired" water quality designations by the State of Alaska's Department of Environmental Conservation.

A Look at Why Water Quality Declines with the Loss of Wetlands

Wetlands maintain water quality and quantity by providing natural storm water management, flood control, and water filtration, as well as providing important feeding and sheltered rearing habitat for young salmon. As development occurs and pavement replaces wetlands, a sharp decline in water quality can result. Numerous studies in small urbanized watersheds find that where hardened surfaces exceed anywhere from about 2-15% of the land, declines in stream quality can be expected that will impair local water bodies. In the Mat-Su, some watersheds have met or exceed this hardened surface percentage and changes in water quality may be occurring.

Recurring Imagery Program

Due to the vast area of the Mat-Su Basin and limited road system, recurring aerial imagery is a critical asset for managing and assessing freshwater salmon habitat in remote areas, and allows us to better understand how and where salmon systems are stressed in urbanized areas. Mat-Su Borough's recurring aerial photo missions continue to support Partnership members and other organizations to develop projects related to wetlands and vegetation assessments, stream bank stability, erosion mapping, land use mapping, and impervious surface mapping, and more.

USFWS staff monitor distribution of juvenile salmon. Wetlands support maintenance of clean, cool and adequate levels of water that young salmon need. Different wetland types serve different functions, and provide different services, so though overall wetlands loss may be only 2%, specific losses to different wetland types in a watershed may be more significant. Photo: USFWS

RESTORATION

While much of the habitat in the Mat-Su Basin is intact, areas that overlap with developed locations are generally more degraded. Threats, including from climate change and aquatic invasive species, also exist in remote areas of the Basin. The Partnership will continue to restore impacted habitat, open fish passage between habitats and prevent new aquatic invasive species infestations while addressing those that currently exist.

Fish Passage Program

Some species of juvenile salmon spend up to three years in fresh water. During that time, they move up and downstream or between watersheds to access favorable habitat for food or shelter, and in response to a variety of factors including high or low flow events and changes in stream temperature. Fish passage barriers can reduce or eliminate access to preferred habitats for returning spawning adult salmon, but also smaller and weaker swimming juveniles.

A cost-benefit fish passage prioritization completed in 2016 indicated that 290 barriers to salmon passage remain in the Mat-Su, with 63 barriers accounting for 75% of the total impacted upstream miles. This effort is helping partners continue to work with private landowners, local and state governments to replace the highest priority barriers that block salmon passage in the Mat-Su. From 2016-2019, six barrier removal projects opened access to upstream habitat on Cottonwood Creek, Lucile, Caswell Lakes Road and Eklutna River with at least 10 additional improvement sites. To date, over 113 assessed culverts have been replaced in the Mat-Su with fish friendly designs, which improve both fish passage and road infrastructure resiliency to flood impacts. In addition to culvert replacements, a nearly 90-year-old defunct hydroelectric dam on the Eklutna River was removed in 2018 opening seven miles of habitat to five species of salmon.

Ongoing fish passage assessment efforts are focused on trail systems, particularly off-road vehicle trails. Both USFWS and ADF&G offer technical assistance to culvert designers and in 2016, more than 50 people attended a fish passage training on fish friendly culvert design. The Mat-Su is one of the most populous and rapidly growing areas of Alaska. One consequence of such growth has been the rapid development of local road networks. Ensuring free passage for both adult and juvenile salmon is a critical part of supporting healthy salmon populations.

In 2018 a defunct hydroelectric dam was removed from the Eklutna River, just northeast of Anchorage, reconnecting seven miles of upstream habitat for five species of wild Pacific salmon and Dolly Varden. **"With the important step of the Lower Eklutna River dam removal, salmon and wildlife are steadily moving back into the Eklutna River canyon,"** said Brad Meiklejohn, of The Conservation Fund, who helped spearhead the dam removal in coordination with the leadership of Eklutna, Inc. The river is coming back to life and in 2020, ADF&G reported finding adult and juvenile Coho salmon further upstream in the river than previously known. Photos: Ryan Peterson

Aquatic Invasive Species

Aquatic invasive species can have significant impacts on salmon and their habitat. Elodea, a freshwater plant, and Northern pike are two such species that immediately threaten salmon in the Mat-Su. Elodea currently occurs in three Mat-Su locations: Alexander, Sucker, and Big Lakes, which each continue to receive herbicide treatments with the goal of eradication. Treatments have reduced overall elodea biomass and coverage area, thus reducing potential for further spread. Over 100 high risk waterbodies were surveyed in the last three years, with surveys continuing annually. Additionally, an Elodea task force was formed, and permitting for herbicide treatments has become very efficient, making rapid response to newfound infestations possible.

Northern pike are extremely widespread in many of the Mat-Su's complex and connected habitats, therefore complete eradication is not considered feasible. Suppression projects generally take place in open systems, such as Alexander Creek, which was historically a premier Chinook salmon fishery. In 2019, Chinook counts were the highest they've been in 14 years, likely as a direct result of a decade of pike removal. Mat-Su's first pike eradication project took place in Kings and Anderson Lakes, the headwaters of the Cottonwood Creek drainage, which supports valuable salmon and trout habitat.

Stream Bank Restoration

Healthy shorelines are vital for the overall health and function of streams. Given this, ADF&G and USFWS work with private property owners through a cost share program designed to improve funding and technical capacity for implementing habitat restoration projects that stabilize shorelines. From 2016-2019, eight projects restored over 1,500 feet of streambank and over 100 people attended streambank restoration workshops. The Partnership will use riparian assessment data collected in 2015 on 35 priority lakes and streams to continue to prioritize riparian restoration needs to achieve the Partnership's goal to restore an additional 5% of impacted priority riparian areas before 2024.

CONSERVATION

We know from lessons learned elsewhere, that maintaining high functioning intact habitats is far cheaper and more effective, than trying to restore them once degraded. In the Mat-Su, there is still high quality, intact salmon habitat, and our top priority is to conserve and maintain that habitat – so salmon can successfully complete each life stage, from egg to adult.

Conserving Habitat in Perpetuity

From 2016-2019, member organization, Great Land Trust (GLT), and partners conserved nearly 400 acres of priority estuaries, wetlands, riparian areas, and uplands important for salmon spawning, rearing and overwintering through conservation easements. This contributes to the more than 9,100 acres conserved in perpetuity since 2005. Great Land Trust has continued to promote salmon habitat stewardship through campaigns like 'Baby Salmon Live Here' that increase public awareness about where juvenile salmon live through signs placed at priority waterbody/road crossings. This program has expanded, with signs now ringing Cook Inlet on the Kenai Peninsula to the east, and Tyonek to the West.

Stream Protection

From 2016 to 2019, over 350 stream miles were surveyed and added to the Anadromous Waters Catalog (AWC), improving salmon distribution information and protections under state law afforded to listed waters. This includes sampling results of over 50 unmapped streams discovered during fish passage assessment surveys, where although waters were not shown on topographic maps, they were likely to support sea-run fish. These waters are now in the catalog and added to the national stream map data set. The catalog currently contains more than 5,100 miles of the total 50,000 miles of streams that have been mapped in the Mat-Su. Partners continue to survey and apply for inclusion of salmon distribution into the AWC.

Water Reservations

The Mat-Su Water Reservation Program quantifies and conserves stream flows required to sustain salmon habitat and production across the Mat-Su Basin, and is a coordinated effort by ADF&G, USFWS and USGS. These partners and others are working to collect stream flow data and complete water reservation applications on priority streams vulnerable to development. With this, as the region grows and demand for water resources increases, water will be maintained specifically to support salmon production. Applications covering the most populated 'core area', which includes Palmer-Wasilla-Knik area and along the Parks Highway from Willow to Talkeetna, were completed in 2017. Since then, program partners have identified and begun work on a new set of priority streams that includes index sites in the Deshka, Little Su and Knik River drainages. Data from this work is also being used in salmon habitat productivity modeling efforts as part of the Deshka River temperature monitoring project that will help identify important salmon habitat in a warming climate. Between 2016-2019, 16 applications were filed for instream flow protection, data collection occurred on 22 streams, and nine water reservations were issued water right certificates by the state of Alaska. These efforts continue substantial progress in ensuring salmon are reserved adequate streamflow on priority streams, vulnerable to development.

293-acre Settlers Bay Coastal Park contains two salmon streams that support populations of coho and sockeye salmon and priority estuarine salmon habitat. GLT holds a conservation easement on the property to ensure its open space and habitats are protected and conservation values are upheld in perpetuity. We know from lessons learned elsewhere, that maintaining high functioning intact habitats is far cheaper and more effective, than trying to restore them once degraded. Photo: Great Land Trust

Conservation Easements as a Tool for Vulnerable Salmon Habitat

The creation of the 293-acre Settlers Bay Coastal Park in 2017 by partner Great Land Trust was part of a strategic conservation of priority salmon habitat that the Partnership helped identify. In 2013, owners of the Settlers Bay Golf Course, LLC approached Great Land Trust about conserving some of the undeveloped property within the Settlers Bay neighborhood as public open space.

"It was high on our priority list," said Libby Kugel, Communications and Administration Manager with Great Land Trust. This project protects important salmon and other wildlife habitat while also creating new recreational opportunities for the public, and specifically for residents of this area that don't have any other natural public open spaces nearby.

"This project also continues to be a great Partnership project," said Kugel. "We rely on these good partnerships to be able to do our work and meet our mission of conserving the lands and waters essential to the quality of life and economic health of Alaskans."

Conclusion

The Mat-Su Salmon Habitat Partnership plays a valuable role bringing people together, enhancing collaborative work, and funding science, habitat conservation, and restoration. It provides a forum for organizations, businesses, and individuals to share their unique knowledge, expertise and resources to achieve together what we could not alone. To our partners whose many accomplishments could not be highlighted on these pages - thank you!

Our landscape will continue to transform as the area experiences a changing climate and continued growth. It is up to us to determine what changes are acceptable, and which aren't, if we are to ensure that Mat-Su salmon keep running in our local waters year after year. Their survival connects us to the past and gives hope for the future.

Mat-Su salmon PARTNERSHIP

Learn more and get in touch!

www.matsusalmon.org

Email: matsusalmon@tu.org

Phone: 907-865-5713

Facebook:
https://www.facebook.com/MatSuSalmon

Mat-Su Salmon Habitat Partners

Alaska Department of Commerce, Community and Economic Development
Alaska Department of Environmental Conservation
Alaska Department of Fish and Game*
Alaska Department of Natural Resources
Alaska Department of Transportation & Public Facilities
Alaska Outdoor Council
Alaska Pacific University
Alaska Railroad Corporation
Alaska Salmon Alliance
Alaska Trails
AlaskaChem Engineering
Alaskans for Palmer Hay Flats
Aquatic Restoration & Research Institute
Bureau of Land Management
Butte Area Residents Civic Organization
Chickaloon Village Traditional Council
City of Palmer
ConocoPhillips Alaska, Inc
Cook Inlet Aquaculture Association
Cook Inletkeeper
Eklutna Tribal Conservation District
Environmental Protection Agency
Envision Mat-Su
Fishtale River Guides
Glacier Ridge Properties
Great Land Trust*
HDR Alaska, Inc
Innovative Funding
Knik River Watershed Group
Knik Tribal Conservation District *
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Mat-Su Anglers
Mat-Su Conservation Services
Mat-Su Trails & Parks Foundation
Montana Creek Campground
National Marine Fisheries Service*
National Park Service
Native Village of Eklutna
Natural Resources Conservation Service
Palmer Soil and Water Conservation District
Pioneer Reserve
Pound Studio
SAGA
Sierra Club
Susitna River Coalition*
Sustainable Design Group
The Alaska Center
The Conservation Fund
The Nature Conservancy
The Wildlifers
Three Parameters Plus, Inc
Trout Unlimited *
Turkey Red
Tyonek Tribal Conservation District
United Cook Inlet Drift Association(UCIDA)
United Fishermen of Alaska
Upper Susitna Soil & Water Conservation District
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service*
U.S. Geological Survey
U.S. Forest Service
Wasilla Soil and Water Conservation District
Valley Community Recycling Solutions

* Steering Committee member organizations