



# Fish & Wildlife *News*



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(PHOTO BY USFWS)

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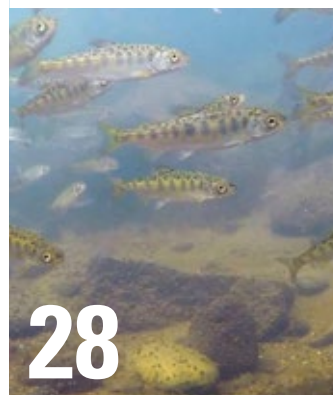
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Martha Williams,  
Director

# Conservation on Indigenous Land

Over the course of my life, I have been to 49 states (Louisiana, I'm coming). And no matter where I go in America—Alaska, Hawaii, Florida, Maine, and everywhere I have set foot in between—I am on Indigenous land.

It is important to recognize that every place in America is an ancestral home for Native people, but that's not enough. We must also connect with today's descendants in a substantial way.

The U.S. Fish and Wildlife Service is well-positioned to do so, and in this issue of *Fish & Wildlife News*, you'll get a look at our work on that connection.

Members of the Native American, Alaska Native, and Native Hawaiian communities were the first conservation stewards of the country's lands and still keep watch over more than 100 million acres of Tribal lands, holding some of the most important conservation lands in the country. I know their participation is key to the future of fish and wildlife conservation.

In this issue, you'll learn how the Winnemem Wintu Tribe of Northern California used their traditional ecological knowledge to help partners move salmon above a dam in the face of drought (p. 28).

"When talking about returning salmon to historical habitats above high-head dams, it's not uncommon to hear claims that it's too difficult," says a fisheries biologist for NOAA Fisheries. "And that is fundamentally untrue. The traditional knowledge shows us that fish can be moved and that people have been doing it since time immemorial."

The wisdom passed down over the ages gave us a solution to a current crisis, climate change. Doesn't that give you hope for the future?

We've assisted Tribes with restoration projects on black-footed ferrets (p. 9), California condors (p. 16), burbot (p. 24), and more. Often, as you will see, we are following the conservation leadership of Tribes.

That is a goal.

The U.S. Fish and Wildlife Service supports Tribes as they exercise their sovereignty in the management of fish and wildlife resources.

And we are committed to respecting that sovereignty.

We are providing financial backing for the hiring of four wildlife biologists by the Native American Fish and Wildlife Society. We helped fund a new program at the University of Montana to better support Native American graduate students. Our Tribal Wildlife Grants are expanding Tribes' natural resource capacity (p. 13). We are working with other Department of the Interior agencies to use a portion of the Deepwater Horizon settlement money to fund a Tribal Youth Conservation Corps with six Tribes on the Gulf Coast (p. 20).

More than that, I have signed several Director's Orders to improve Tribal relations, and we have revised, or are revising, key policies in dealing with Indigenous people.

Looking at the successful projects in this issue, it is clear the keys are communication, relationship-building, and cooperation, and we're getting better at all of those.

We aren't there yet, but I am committed to transforming our Service culture to one of belonging for our employees and partners who have felt marginalized for too long.

Yes, we have a moral, ethical, and often legal responsibility to welcome Tribes to the table where conservation decisions are made. But, as with our work on Diversity, Equity, Inclusion, and Accessibility, it is also about finding effective solutions to our conservation challenges.

Working with Tribal professionals brings new wisdom to a problem, and that can bring a solution.

The Winnemem Wintu Tribe, for instance, shared their traditional ecological knowledge to guide the salmon move.

Strengthening Tribal relations is one of my top priorities. More than that, it is necessary in 21st century conservation on Indigenous land (America). □

## Service, Partners Help NCDOT Ensure Safe Passage for Wetland Animals



A frog trying to safely cross a busy highway makes for a classic video game, but in real life, it's a losing battle for the frog, which doesn't get three lives.

North Carolina wetlands are home to myriad small animals—snakes, frogs, even lemmings—and when a highway bisects wetlands, crossing that road poses risks not only to individual animals but the well-being of the entire population if enough individuals are killed. While deer and bear on the road quickly get the attention of drivers, few may notice these smaller animals crossing the road.

Over the years, Mike Knoerr has worked with small animals across western North Carolina with several

A wildlife tunnel installed in North Carolina allows small animals passage beneath the road, avoiding vehicle strikes. (PHOTO BY KEVIN HINING/NCDOT)

organizations, including The Nature Conservancy, the federal National Resources Conservation Service, and Tangled Bank Conservation, an Asheville-based conservation organization. As a biologist with Tangled Bank Conservation, he was in the midst of field work at a study site in western North Carolina when he noticed a high amount of roadkill on a highway dividing patches of wetlands. He raised this issue with Service biologist Susan Cameron, setting in motion a chain of events leading to the N.C. Department of Transportation's installation of a passage allowing small animals to safely cross the road.

"When we think about animals and roads, we often think about vehicle-animal collisions, which can be costly to both people and wildlife. However, roads can also isolate animals from important habitats and food sources," says Kevin Hining, the NCDOT environmental officer working on the project. "This project offers NCDOT a chance to work with several partners to reduce animal mortalities and connect two unique habitats. It's also a great opportunity to evaluate this type of structure, which hasn't been used in North Carolina before. If successful, it may lead to future uses in other locations."

The passage isn't a grandiose animal bridge over the highway, but rather a small, simple tunnel beneath it—concrete bottom and sides with a grated metal top allowing sunlight through. The casual driver likely won't notice anything more than a gentle break in the rhythm of the road. Both entrances to the tunnel have fencing guiding animals toward the tunnel.

The design stems from lessons learned by the Ohio Department of Transportation, which installed a tunnel designed for animal movement beneath a state highway. Ohio University researchers determined the passage was falling short of expectations, and it was replaced with an off-the-shelf road crossing trench more likely to be found on an industrial site. The general-purpose trench proved far more successful and is the design the NCDOT is using.

"We are grateful to the staff at the North Carolina Department of Transportation," says Service biologist Laura Fogo. "This is an excellent example of how a community of partners leveraged labor and expenses to protect unnoticed wildlife in need."

By providing engineering and installation services, the NCDOT was the lynchpin agency for the effort, though several organizations came together to pull off the project. We provided technical assistance and funding for the materials through our Partners for Fish and Wildlife habitat restoration program. The N.C. Wildlife Resources Commission provided technical assistance. The Nature Conservancy provided site access and will help with maintenance. Tangled Bank Conservation purchased materials and assisted with installation. To gauge the effectiveness of the tunnel, the Service, The Nature Conservancy, the N.C. Wildlife Resources Commission, and Tangled Bank Conservation will monitor the road for roadkill and use trail cameras to document use of the passage by small animals. □

GARY PEEPLES, External Affairs, Southeast Region





## Kealia Pond National Wildlife Refuge Blesses Mural at the Education Pavilion

As summer was beginning, Kealia Pond National Wildlife Refuge announced the addition of a mosaic mural to the refuge's education pavilion. The mural was made possible through a robust partnership with the Friends of Kealia Pond National Wildlife Refuge and refuge visitor services staff.

Created and installed by O'ahu based artist Leah K. Riggs, the mural depicts Kealia Pond's ahupua'a land division, Waikapu, from the mountains to the sea and highlights the seasonality of the wetlands and its native animal and plant species. The mural is intended to provide a tactile and aesthetic learning experience inviting visitors to look closer and realize how much there is to discover at the refuge.

Refuge staff and the Friends of Kealia Pond National Wildlife Refuge gathered for a blessing with Native Hawaiian cultural practitioner Kimokeo Kapahulehua. Kapahulehua called upon the ancestors of air, land, and sea to entrust those who will care for and pass on the knowledge and value the mural holds to visitors, especially keiki, or children.

Established in 1992, the refuge protects over 700 acres between Kihei and Ma'alaea. The refuge has walking trails and a coastal boardwalk across part of Maui's largest lowland wetland. Kealia Pond is home to over 30 species of birds, including migratory waterfowl, and provides nesting, feeding, and resting habitat to Hawaiian waterbirds including the endangered 'alae ke'oke'o.

Mosaic mural at Kealia Pond National Wildlife Refuge. (PHOTO BY USFWS)

'Alae, in general, are all culturally significant. They are considered the children of Hina, the moon goddess, and are in a number of traditional stories and legends. Most famously, 'alae are known to have held the secret of fire, as told in the legends of Maui. Stop inside the Kealia Pond National Wildlife Refuge visitor center and learn more about these stories from friendly docents or staff before heading out to see the mural and the ponds.

"Kealia Pond National Wildlife Refuge welcomes the community to visit, enjoy the mural, discover more of what the refuge has to offer and connect with this important Maui wetland," says refuge manager Bret Wolfe. □

## Bipartisan Infrastructure Law Protects Largest Lek in Washington State for Future Generations

Lorianna Breiler speaks with a smile audible in her voice when she talks about the future of her family on Badger Mountain in Douglas County, Washington.

"We don't think of this land as ours. We think of it as belonging to our future children. We are simply stewards of their inheritance," the owner of Breiler Farms says. Six generations of her family have lived on the 2,480-acre farm.

Many things make this landscape special for Breiler: rolling mountains, abundant sunshine, diverse wildlife, and now, a partnership protecting one of the last strongholds of greater sage-grouse in Washington.

Sage-grouse are a charismatic symbol of the West, best known for the "dance" they do to attract a mate. These chicken-sized birds are famous the world over for their ostentatious displays in which the males puff up and "pop" their white ruff to inflate yellow air sacs in the hopes of catching a female's eye. This show takes place on a lek—a large patch of bare ground where grouse nest—from March to May. The remainder of the year, outside lek season, the sage-grouse is inconspicuous but remains dependent on lek areas and is extremely sensitive to disturbance in habitat. »

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Over the years, leks have become few and far between in Washington. Breiler's area of Douglas County is currently home to the largest lek in Washington, more than twice the size of the average lek in the state. Due to the conversion of natural habitat to human development, sage-grouse occupy only 8% of their historic range in Washington.

"The spread of invasive plants like cheatgrass and wildfire have further reduced this small habitat holdout for the greater sage-grouse," says Kimberly Veverka, a wildlife biologist with the Service. "As a result, any remaining habitat—largely the Badger Mountain Plateau—is vital to sustaining and recovering this state endangered bird."

The loss and fragmentation of habitat is a formidable threat to the stabilization and recovery of this population of sage-grouse. Thankfully, powerful partners are working together to protect this land in perpetuity. Driven by the Bipartisan Infrastructure Law, this partnership builds on an existing collaborative effort with public and private partners to conserve the sagebrush ecosystem of the American West and the nationally significant biological, cultural, and economic resources it supports.

We're joining forces with the Natural Resource Conservation Service, the Chelan Douglas Land Trust, and three working ranches. With the \$186,000 from the Bipartisan Infrastructure Law, the Chelan Douglas Land Trust



will purchase three agricultural land easements, including one on Breiler's farm, to protect 10,000 acres of greater sage-grouse habitat.

The easements will allow the Breiler farm and others to remain as working farms while enhancing conservation efforts for today and the future.

In addition to protecting this crucial piece of sage-grouse habitat, Mickey Fleming, lands program manager for the Chelan Douglas Land Trust, explains that these easements will serve as connections to other established greater sage-grouse lands managed by the Bureau of Land Management and Washington Department of Natural Resources.

"Right now, the habitat is sort of like a patchwork of disparate and disconnected spots of good sagebrush habitat," Fleming says. "The ultimate goal is to get as many entities as possible to come together on these easements and provide an expansive, connected landscape for the greater sage-grouse."

Thanks to the funding from the Bipartisan Infrastructure Law and the tenacious teamwork of those on the landscape, this goal is one step closer.

Greater sage-grouse near Seedskaadee National Wildlife Refuge. (PHOTO BY TOM KOERNER/USFWS)

"It's definitely a boots-on-the-ground type of conservation," says Breiler. "We rotate our crops and plan what we plant around making sure the grouse can get back to their native nesting ground year after year—future generations of sage-grouse for future generations of people!" □

AMANDA SMITH, External Affairs, Pacific Region



## Chesapeake Bay Nutria Eradication Project Marks Success After 20 Years of Efforts

After 20 years of work, the Chesapeake Bay can finally bid goodbye and good riddance to the invasive nutria—who for years has wreaked havoc on marsh landscapes.

On September 16, the Chesapeake Bay Nutria Eradication Project invited leadership from the Service, state and federal leaders, and local partners to celebrate the eradication of the rodent and tour the Chesapeake Bay marshes to learn more about the removal efforts.

“The Chesapeake Bay Nutria Eradication Project is an excellent example of foresight and collaboration,” said Service Director Martha Williams at the celebration. “This project is a powerful case study for how federal and state agencies can work closely together to achieve a shared goal that benefits the environment and the community.”

Nutria and their destructive feeding habits have destroyed thousands of acres of marshes since the 1940s when they were introduced to the Delmarva Peninsula in Maryland from South America for the fur market.

Blackwater National Wildlife Refuge in Maryland has seen some of the worst of this destruction. It has lost over 5,000 acres of wetlands due to the combined siege of nutria impacts, sea level rise, and land subsidence.

In 2004, the total annual economic, environmental, and social services losses due to nutria damage were estimated at \$5.8 million with projections to drastically increase if nutria were not addressed.

In order to address the problem, the Service along with U.S. Department of Agriculture’s Wildlife Services and the Maryland Department of Natural Resources formed the Chesapeake Bay Nutria Eradication Project, which worked closely with private landowners and other public partners.

Half of the 14,000 nutria removed during the project were from private lands, thanks to over 700 participating landowners, which ultimately protected over 250,000 acres of marshes on the Delmarva Peninsula.

To detect and remove the rodents, the project deployed specialized detector dogs, who were trained to detect nutria scat. The dogs and their handlers were key to confirming the absence of nutria in previously trapped areas.

“Traditional tools, such as trapping and wildlife surveys, were integrated by wildlife biologists with new technology and detector dogs. These tools were applied by dedicated individuals to put every nutria at risk, every day of the year,” Kevin Sullivan, USDA-Wildlife Services state director, said at the celebration.



The project was the first of its kind—attempting to eradicate an aquatic mammal from a non-island locale. The group has worked for 20 years to fully eradicate nutria from the region.

In 2015, the last known Maryland nutria was captured.

Since then, project members have been monitoring and revisiting historic nutria areas to ensure eradication through statistical monitoring. The team has moved into a scaled-down biosecurity phase to respond to any reported sightings and assist other states like Virginia that are experiencing an increase in nutria that could potentially invade the Delmarva if not controlled. »

The invasive nutria rodent has plagued the Chesapeake Bay for decades. Now, they are finally gone. (PHOTO BY USDA)

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The removal of nutria reinforces other ongoing efforts to bolster marsh resilience in the Chesapeake, where sea level rise and ditching and diking efforts of the past are quickly converting acres of marsh into open water. Managers have also been placing native plants, depositing thin-layer sediment, and restoring hydrology to help rebuild marsh processes that will help the landscape keep up with climate change. These resiliency efforts would not be possible if nutria remained on the Delmarva Peninsula.

The project was funded by the Service through the National Wildlife Refuge System and Partners for Fish and Wildlife Program, and supported by 27 partner organizations. The Service's Chesapeake Bay Field Office and Chesapeake Bay Marshlands National Wildlife Refuge Complex administered the project, implemented by a crew of 17 federal wildlife specialists from the Department of Agriculture's APHIS Wildlife Services.

Specially trained dogs and their handlers were essential to locating nutria and determining their absence from the salt marshes. (PHOTO BY USDA)

“Maryland’s wetlands, particularly in this region, are special because of their ecological and economic importance but also because of their historic and cultural significance, and we have successfully protected them from this threat,” said Maryland Department of Natural Resources Secretary Jeannie Haddaway-Riccio at the event. □

OLIVIA GIEGER, External Affairs, Northeast Region

## A Surprise Sighting During Louisiana’s Chandeleur Islands Restoration

Twelve years ago, the *Deepwater Horizon* oil spill caused catastrophic damage to the Louisiana coast, its barrier islands, and the birds and other wildlife that call them home.

Among the areas most heavily oiled were the Chandeleur Islands of Breton National Wildlife Refuge. These islands constitute some of the most essential habitat for water birds and nesting birds off the coast of Louisiana.

A proposed restoration project funded by the *Deepwater Horizon* settlement aims to restore the island chain to improve nesting habitat for water birds. As project managers surveyed the site this summer from a seaplane, they spotted a rare sight: tracks from nesting Kemp’s ridley sea turtles. Someone from the Louisiana Coastal Protection and Restoration Authority actually saw a hatchling scurrying toward water and captured it on film. This exciting sighting marked the first time in 75 years that Kemp’s ridley sea turtle nests had been found on the islands.

On September 14, the restoration team found more good news. They had hosted guests from the Louisiana House of Representatives, the Louisiana House Natural Resources and Environment Committee, the Pontchartrain Conservancy, the National Wildlife Federation, and others. The team had talked about the ongoing engineering and design work for the proposed restoration project and the evidence of sea turtle nesting.

After the guests’ site visit, the team discovered a previously hatched Kemp’s ridley sea turtle nest. The team worked quickly to recover the nest and concluded that 76 hatchlings emerged from the nest. Another Kemp’s ridley sea turtle nesting on the islands!

While the news spurred the proposed projects, these discoveries highlighted that »

A newly hatched Kemp’s ridley sea turtle makes its way to the Gulf of Mexico from Louisiana’s Chandeleur Islands. (PHOTO BY LOUISIANA COASTAL PROTECTION AND RESTORATION AUTHORITY)







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Chandeaur Islands restoration isn't just for the birds! The whole ecosystem will benefit from our collaborative restoration work with our partners. The dedication and hope for the project's success continues to grow with each new discovery. □

BRYNN GARNER, External Affairs  
Southeast Region

(Top) Nest recovery work concluded that 76 Kemp's ridley sea turtle hatchlings emerged from the nest. (PHOTO BY USFWS) (Bottom) Todd Baker, of Louisiana's Coastal Protection and Restoration Authority, explains the goals of the Chandeaur Islands Restoration Project. (PHOTO BY USFWS)

## Gulf of Mexico Restoration Continues: Working to Restore Louisiana Wetlands

The Louisiana wetlands in the Barataria Basin estuary act as critical foraging, nursery, and nesting grounds for hundreds of species of fish and other wildlife. Land loss, saltwater encroachment and sea level rise have left the wetlands and the fish and wildlife that call them home in danger. The 2010 Deepwater Horizon oil spill and the resulting response accelerated the ongoing trend of coastal land loss in the Barataria Basin estuary.

On September 21, the Deepwater Horizon Louisiana Trustee Implementation Group released the Mid-Barataria Sediment Diversion (MBSD) Final Restoration Plan. After decades of discussion and 40,000 public

comments, this first-of-its-kind project, represents one of the largest and most innovative coastal habitat restoration efforts ever undertaken, if the project is ultimately permitted and funded.

The permitting decision is anticipated to be made later this year.

"We're ecstatic," says Bren Haase, executive director of the Louisiana Coastal Protection and Restoration Authority. "We're not at the finish line yet. It's been said we're at about the two-yard line." »

LA Gulf Spill Mid-Barataria Wetlands.  
(PHOTO BY LOUISIANA COASTAL PROTECTION AND RESTORATION AUTHORITY)



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MBSD would reconnect the Mississippi River to Louisiana's Barataria Basin estuary, restore wetlands, and contribute to the broader restoration of its ecosystem. Over 50 years, the sediment carried by the river is projected to restore more than 13,000 acres of wetland habitat—which is 20 square miles, or the size of nearby Breton National Wildlife Refuge.

Concerns about the effects of an influx of fresh water from the project on marine species near Delta National Wildlife Refuge, such as dolphins and oysters, have been forefront in planning discussions. The project is estimated to cost more than \$2 billion, which include funds for monitoring and evaluation and a suite of stewardship and mitigation measures to offset adverse impacts where possible.

Despite the concerns, the potential benefits to the ecosystem are significant. The restored wetlands would contribute to protecting communities and infrastructure, reducing impacts from storms, supporting healthier Gulf fisheries, and benefitting many species important to the region's economy and environment. □

BRYNN GARNER, External Affairs  
Southeast Region

## Service Celebrates Conservation Partnership with U.S. Marine Corps

On Marine Corps Base Camp Pendleton in California, a promontory of land overlooks the expanse of the base, including the Santa Margarita River flowing next to the flightline. In October, a group of Service employees joined their Marine Corps counterparts on the promontory to present the base with our 18th annual Military Conservation Partner of the Year award.

The base was recognized for its commitment to conservation in developing sustainable natural resource management and protection strategies balanced against military training needs. The base's Environmental Security Department collaborates with the Service, California, and multiple public and private organizations to restore and protect habitat for 19 federally threatened and endangered species that live on the installation.

"Camp Pendleton is a conservation leader and shining example of what can be accomplished for species recovery on military land," says Paul Souza, Regional Director of our Pacific Southwest Region. "We are grateful for their dedication and stewardship and look forward to a continued partnership."

For some in attendance, the ceremony was reminiscent of almost 27 years ago when former U.S. Secretary of the Interior Bruce Babbitt and then-commander Maj. Gen. Claude Reinke stood on the same



Brig. Gen. Jason Woodworth (center), commanding general of Marine Corps Installation West, Marine Corps Base Camp Pendleton, joins representatives from Camp Pendleton's Environmental Security Department and the Service. (PHOTO BY LANCE CPL. NATALY ESPITIA, U.S. MARINE CORPS)

promontory celebrating the issuance of the first programmatic biological opinion for the Department of Defense that provided take coverage for federally protected species while addressing current and future training on Camp Pendleton.

The use of Camp Pendleton as a military training installation has prevented large-scale development within the area along the Southern California coast, maintaining habitat for an array of rare species.

Its 125,000 acres is a biodiversity hotspot encompassing coastal lagoons and estuaries, coastal dunes, native grasslands, coastal sage scrub, chaparral, oak woodlands, salt- and freshwater marsh, vernal pools, riparian scrubland and woodland, arroyos, streams, rivers, ponds, lakes, and 17 miles of coastline.

"The Environmental Security Department uses creative solutions to challenging problems for recovering species while maintaining its training mission,"

says Jonathan Snyder, our Carlsbad Fish and Wildlife Office assistant field supervisor. "Camp Pendleton has provided leadership and integration of base activities into regional conservation efforts and is one of our most important partners."

Its aggressive conservation of riparian, beach, and estuarine ecosystems supports recovery of the tidewater goby, coastal California gnatcatcher, and numerous other fish and bird species, as well as the last remaining coastal populations of the arroyo toad.

Its fish passage projects on the Santa Margarita River and other waterways are contributing to recovery of southern California steelhead and other fish.

Conservation and management of the least Bell's vireo, California least tern, and western snowy plover have resulted in significant increases to on-base populations of these species. Predator control efforts have also brought »



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the Pacific lamprey back to Camp Pendleton after decades of absence.

Through the Readiness and Environmental Protection Integration (REPI) program, Camp Pendleton has also expanded conservation efforts outside its boundaries in exchange for increased training flexibility on the installation, contributing to the protection and management of key properties supporting species such as the coastal California gnatcatcher, Pacific pocket mouse, and Stephens' kangaroo rat.

"Here at Marine Corps Installations-West, our mission is to support, sustain, and train the deploying warfighter," says Brig. Gen. Jason Woodworth, commanding general, Marine Corps Installations West-Marine Corps Base, Camp Pendleton. "We do that every day while remaining good stewards of our environment and our natural resources, thanks to the support and coordination from the U.S. Fish and Wildlife Service and our Environmental Security experts."

"We are honored to receive this award and are excited to continue our partnership with the U.S. Fish and Wildlife Service for years to come," he says.

Our Fish and Aquatic Conservation Program established the award in 2004 to recognize military installations for their outstanding work to conserve important wildlife and their habitats on military land. □

JESSICA D'AMBROSIO, External Affairs, Pacific Southwest Region

## Standing Rock Sioux and Service Partner to Bring the Black-Footed Ferret Back to Tribal Lands

The black-footed ferret once roamed the lands of the Standing Rock Sioux Tribe's reservation in North and South Dakota. But as ferret numbers dropped across the Great Plains, it disappeared from the reservation.

The species has been protected as endangered since 1967. It has even been declared extinct... twice... before a population was discovered on a ranch Meeteetse, Wyoming, in 1981 by a dog named Shep. That enabled a successful captive-breeding program.

Today, black-footed ferret numbers are encouraging, but more reintroduction sites are needed to recover the species. Last year, the Standing Rock Sioux reservation became one of those reintroduction sites, which are spread across the ferret's range.

Tribal partners have played an outsized role in black-footed ferret recovery and reintroduction efforts, and the Standing Rock Sioux reservation has high quality grassland habitat, which is necessary for the ferret.

The black-footed ferret relies on prairie dog colonies to survive as 90% of its diet consists of prairie dogs. Currently, prairie dogs occupy 2% of their overall historic range.

The Standing Rock Sioux have always valued and respected the black-footed ferret as an apex predator. Its services aid ecosystem health, including the management of prairie dog



colonies, and it helps create a balanced ecosystem for all wildlife that live on and utilize prairie dog towns. Since 2013, Director of Standing Rock Game and Fish Jeff Kelly had been on a mission to bring the ferret back to the Tribe's lands, and his dream finally turned into reality in October 2021.

With a renewed partnership, Standing Rock Game and Fish and the Service spent 2020 working together to return black-footed ferrets to the landscape. This effort began by mapping prairie dog colonies across the reservation for the first time since 2012. This was done to gain an understanding of potential ferret habitat. Between schedules, one month was all the team had to map, so the largest and most easily accessible prairie dog colonies on Tribal land

A black-footed ferret kit about to be released. (PHOTO BY JESSICA JOHNSON/USFWS)

were targeted (with landowner permission). A total of 8,565 acres were mapped during that one month.

Once the mapping was done, the next step was to identify if any suitable reintroduction habitat for black-footed ferrets existed. After much analysis, it was discovered that—YES!—there was suitable habitat where black-footed ferrets could potentially thrive.

Now that suitable habitat was identified, Service staff provided a reintroduction plan to the Standing Rock Sioux Tribal Council for review. With approval from the Tribal Council, Standing Rock Game and Fish Ranger Waylon Little Eagle »

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and the Service's Lauren Toivonen met with people in and near the suitable habitat to discuss the black-footed ferret reintroduction plan and received input for the effort.

After informing stakeholders, the Standing Rock Sioux and the Service signed a Safe Harbor Agreement, a voluntary conservation tool for private landowners who wish to support recovery of plants and animals protected under the Endangered Species Act.

Then the long-awaited moment finally arrived: 28 black-footed ferrets (16 male and 12 female) traveled via SUV from the Black-footed Ferret Conservation Center in Colorado, to McIntosh, South Dakota. Surrounded by a team of excited Tribal and community members and biologists, the first black-footed ferret was reintroduced onto Standing Rock Sioux lands on October 20, 2021. The ferret might not have understood the significance surrounding its

presence as it began exploring its new home.

The team then broke into three groups to release the remaining 27 black-footed ferrets in five areas of suitable habitat. It was forecast to be a drab, rainy day, but Mother Nature had other plans for this special moment. It ended up being a beautiful, sunny day that would go down in history for the Standing Rock Sioux Tribe as one of America's most celebrated species, the black-footed ferret, was finally brought back home. Though this was just the first step, Standing Rock Game and Fish and the Service continue to work together to manage this new population and hope to see continued success.

Partners released 26 more ferrets in October 2022. □

LAUREN TOIVONEN, Ecological Services, and MIKAELA OLES, External Affairs, Mountain-Prairie Region

Two black-footed ferret kits look out from their burrow at the National Black-footed Ferret Conservation Center in Colorado. (PHOTO BY KIMBERLY FRASER/USFWS)



## 1,000 acres in Central New York Will Be Returned to the Onondaga Nation



A settlement agreement as part of a Natural Resource Damage Assessment and Restoration (NRDAR) will return more than 1,000 acres of ancestral land to the Onondaga Nation, one of the largest returns of land to an Indigenous nation by a state.

The June 2022 agreement is a result of the March 2018 NRDAR settlement between the Natural Resource Trustees and Honeywell International regarding the Onondaga Lake Superfund site.

For decades, mercury and other hazardous substances were released into Onondaga Lake, its tributaries, and uplands. The responsible parties must pay for the damages to natural resources this contamination has caused.

The settlement directs Honeywell to transfer the title to more than 1,000 acres of open space in central New York's Tully Valley

The South Forest NRDAR property in Tully, New York, is part of the property that will be managed by Onondaga Nation, in accordance with traditional ecological knowledge.

(PHOTO BY AMY ROE/USFWS)

to the Onondaga Nation. With the title and full ownership of Honeywell's former land, the Nation will restore and steward the property.

The Service and New York State Department of Environmental Conservation served as Natural Resource Trustees for the settlement.

"It is with great joy that the Onondaga Nation welcomes the return of the first substantial acreage of its ancestral homelands," says Onondaga Nation Chief Tadodaho Sidney Hill. "The Nation can now renew its stewardship obligations to restore these lands and waters and to preserve them »



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for the future generations yet to come. The Nation hopes that this cooperative, government-to-government effort will be another step in healing between themselves and all others who » live in this region, which has been the homeland of the Onondaga Nation since the dawn of time.”

The Tully Valley property includes the headwaters of Onondaga Creek, more than 45 acres of wetland and floodplains, and approximately 980 acres of forest and related fields. The cold waters of Onondaga Creek support a small population of brook trout, a population that may be fully restored with proper stewardship. The wetlands, floodplains, forests, and fields are home to wildlife such as great blue herons, songbirds, waterfowl, hawks, bald eagles, frogs, bats, and white-tailed deer.

The federal-nation-state partnership that led to the return of this property to the Onondaga people will include a conservation easement with the New York agency. The easement will prohibit commercial development, provide for the protection and restoration of natural areas in accordance with traditional ecological knowledge, and allow compatible outdoor recreational and educational uses. □

## Arizona's Apache Trout Nears Removal From Endangered Species List

The White Mountain Apache Tribe was working to recover the Apache trout long before the fish was protected as endangered by the Service in 1967. The Tribe closed Apache trout streams to fishing in the 1940s.

Now, all the years of conservation—both on their own and with state, federal, and nongovernmental organizations—are paying off. Our latest five-year status review recommends removing the trout from the list of species protected by the Endangered Species Act. A proposed rule to delist the Apache trout is expected to publish by the end of 2022.

“We are excited to say the recovery actions by the White Mountain Apache Tribe and other partners have led to the recommendation to delist the species from the ESA,” says Amy Lueders, Southwest Regional Director for the Service.

The implemented conservation actions, such as non-native trout removal, fish barrier construction, and Apache trout reintroductions, made recovery possible and will continue to drive conservation. The Service is committed to the continued conservation of the Apache trout, whether the fish is delisted or not.

A major threat to Apache trout populations has been the introduction of non-native trout. The gene pool was threatened by hybridization with non-native rainbow and cutthroat trout. Additionally, non-native brook and brown trout pose threats through competition



and predation. Much of the conservation work has involved removing these introduced trout from Apache trout habitat and constructing barriers to block further non-native introductions.

Additionally, thanks to over \$2 million from the Bipartisan Infrastructure Law, the Apache Trout Recovery Fish Passage Infrastructure project will remove barriers on several creeks and replace culverts, most of which are on Tribal land. The barriers are no longer needed, due to non-native trout removal. This will open 52 stream miles of Apache trout habitat for new populations.

The Service, along with White Mountain Apache Tribe, Arizona Game and Fish Department, USDA Forest Service, and Trout Unlimited, share responsibilities under a 2021 Apache Trout Cooperative Management Plan. That plan outlines goals to reach recovery and delisting of the Apache trout, and if delisted to maintain a recovered status, while providing sportfishing opportunities.

Williams Creek National Fish Hatchery has the leading role in the production of the Apache trout. (PHOTO BY USFWS)

Apache trout is Arizona's state fish and is native exclusively to the streams around the White Mountains in the eastern part of the state. It was originally considered the same species as the Gila trout, which was protected under the Endangered Species Preservation Act in 1967. Apache trout was first described as a unique species separate from Gila trout in 1972. A year later, it gained protection under the Endangered Species Act of 1973, and it was subsequently downlisted to threatened in 1975. □

## Confederated Salish and Kootenai Tribes Help Make Lost Trail Conservation Area in Montana a Reality

In partnership with the Trust for Public Land and the Confederated Salish and Kootenai Tribes, the Service purchased a 38,052-acre conservation easement that became Lost Trail Conservation Area in northwest Montana.

In July, Secretary of the Interior Deb Haaland announced the establishment of the conservation area as the 568th and newest unit of the National Wildlife Refuge System. This expansion—the first unit for the Refuge System under Secretary Haaland’s leadership—is the culmination of a 20-year locally led effort to conserve important big game corridors and recreational areas in the region. It’s also a model for the Biden-Harris administration’s ongoing efforts to conserve and restore our nation’s lands and waters.

“The Lost Trail Conservation Area will help guarantee that future generations have access to the same woods and waters as we enjoy today for hunting, fishing, hiking, and wildlife viewing,” says Secretary Haaland. “National wildlife refuges are one of the most important ways that we can connect all Americans to public lands with little to no entry fees. I am grateful to the U.S. Fish and Wildlife Service and its partners for the locally led collaboration that led to this important milestone.”

Southern Pine Plantations Montana continues to own the private timberland covered by the easement, but now the land will retain public recreational access in perpetuity. The Lost Trail Conservation Area will allow sustainable commercial timber harvests and provide wildlife-dependent recreational opportunities such as hunting, fishing, hiking, and wildlife viewing.

It will also protect crucial wildlife habitats and migration corridors for elk, mule deer, grizzly bear, wolverine, and Canada lynx among Glacier National Park, the Cabinet Mountains Wilderness, the Selkirk Mountains, and into the Coeur d’Alene Mountains in Idaho.

Conservation areas are national wildlife refuges that



Permanent easements on up to 100,000 acres may be added to Lost Trail Conservation Area. (PHOTO COURTESY OF CHRIS BOYER/KESTREL AERIAL SERVICES)

consist primarily or entirely of conservation easements on private lands.

“The Service is grateful for incredible partnerships with the Trust for Public Land and the Confederated Salish and Kootenai Tribes,” says Service Director

Martha Williams. “Locally led conservation efforts such as this provide a lasting impact on our efforts to protect crucial wildlife habitat for threatened, endangered and priority species while prioritizing recreational access.” □



### Connected to the Land Since Time Immemorial

[Sattie Whitefoot-Fisher](#), [Ken Edmo](#), and [Xavier Lovato](#) (at left) are in the first cohort of a new program at the University of Montana funded by the U.S. Fish and Wildlife Service, through its Science Applications Program, and Sloan Indigenous Graduate Fellowship Program. The program is designed to better support Native American graduate students. (PHOTO COURTESY OF XAVIER LOVATO)



## Qawalangin Tribe of Unalaska Using Tribal Wildlife Grant to Help Blue Mussels

With our 2022 Tribal Wildlife Grants, Alaska Native communities will work with salmon, moose, blue mussels, invasive species, and two culturally and ecologically significant seabirds.

All told, seven Alaska Native communities will share about \$1.3 million of the nearly \$6 million awarded.

Tribal Wildlife Grants do more than benefit fish and wildlife resources and their habitats. They help to fulfill federal trust responsibilities and achieve Tribal sovereignty by expanding Tribes' natural resource capacity.

Since its inception in 2003, including this year's grants, the competitive Tribal Wildlife Grants Program has awarded more than \$111.6 million to Native American and Alaska Native Tribes, providing support for 626 conservation projects.

For the Qawalangin Tribe of Unalaska, the \$199,000 grant will help develop a restoration plan for blue mussel habitat within Unalaska Bay.

The Tribe has relied on blue mussels as a food source for over 8,000 years. But the changing climate threatens that.

Warming ocean temperatures are linked to harmful algae blooms. Those blooms, in turn, hurt blue mussel habitat and lead to more paralytic shellfish poisoning,



which killed a community member in 2020. But the toxins hurt more than people because mussels are an integral part of the food web, feeding birds and aquatic species.

The Tribe is no stranger to blue mussel conservation. A grant from NOAA's National Centers for Coastal Ocean Science in 2020 supported testing for paralytic shellfish poisoning. The Qawalangin Tribe continued the testing after funding ended, and tests this summer show twice in June and once in July paralytic shellfish toxins were substantially above limits set by the U.S. Food and Drug Administration.

"The island of Unalaska does not have the medical capacity to treat individuals with severe symptoms" of shellfish poisoning, the Tribe says in one of its application documents. They "must be flown approximately 3.5 hours to Anchorage for supportive treatment."

The Qawalangin Tribe then has set this as one goal for the restoration plan: reducing paralytic shellfish poisoning in people and wildlife.

Enabling safe, noncommercial harvest—Alaska requires commercial harvesters to test products regularly—would also provide cultural and Tribal subsistence food security. "Ocean harvesting is an integral aspect

The Qawalangin Tribe of Unalaska has relied on blue mussels as a food source for over 8,000 years. (PHOTO BY L. SLATER/USFWS)

of the Alaskan way of life," the Tribe says. They see "a strong and urgent need to develop and implement restoration efforts."

NOAA Fisheries calls mussels beneficial, "removing excess nutrients and improving water quality." So, a successful restoration plan would also help improve water quality and aquatic ecosystem health.

We're proud to fund the Qawalangin Tribe's work and look forward to its results. □



**spotlight:** working with tribes


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**WORKING**

**WITH**

**TRIBES**





One of our top priorities is working together with those who have stewarded the country's lands and wildlife since time immemorial. Native American Tribes have long dedicated themselves to management and conservation of fish, wildlife, and their habitats. Read about a few of the projects where we have been partners. »

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Keweenaw Bay Indian Community wildlife coordinator Kyle Seppanen sets up an ultrasonic acoustic microphone and monitoring station to record the calls of passing bats within the L'Anse Indian Reservation in Baraga County, Michigan (Story, p. 34). (PHOTO BY KBIC NATURAL RESOURCES DEPARTMENT)

# HOMECOMING

*Service works with Yurok Tribe to bring Prey-go-neesh (California condors) back to Pacific Northwest.*

By REBECCA FABBRI





“Prey-go-neesh keech ke-me’-yehl—Condors have come home.”

—YUROK TRIBE

For the first time in more than a century, endangered Prey-go-neesh (California condors) can be seen flying over Northern California’s redwoods.

On May 3, 2022, the Yurok Tribe successfully released the first of four condors in Redwood National and State Parks, establishing the northernmost condor release area to date and reclaiming a significant part of their historic range, from which they’ve been absent since 1892.

“This journey toward restoration began in 2003, when a panel of Yurok elders made the decision that Prey-go-neesh was the highest priority land-based animal to return to Yurok ancestral territory due to the Yurok’s deep cultural connection to the birds,” says Yurok Wildlife Department Director Tiana Williams-Claussen.

The reintroduction effort builds on over a decade’s worth of planning and preparation initiated by the Yurok Tribe with support by the U.S. Fish and Wildlife Service, the National Park Service, and state and other partners.

“For countless generations, the Yurok people have upheld a sacred responsibility to maintain balance in the natural world,” Joseph L. James, chairman of the Yurok Tribe, said in the days leading up to release. “Condor reintroduction is a real-life manifestation of our cultural commitment to restore and protect the planet for future generations. It is a historical moment in the Yurok Tribe, as we introduce our condors back home, providing that balance for us. Our prayers are answered.”

The four condors — one female and three males — were between 2 and 4 years old, an age range when they would leave the care of their parents in the wild. Although it will take several years until these birds are at an age to reproduce in the wild, we believe we have a model for success with future northern reintroduction efforts.

A second cohort of four condors, again one female and three males, arrived on August 16, 2022. The Northern California Condor Restoration Program traditionally allocates captive bred birds to the release

sites each summer for fall release. All eight condors are currently flying through the heart of the majestic bird’s former range in the Pacific Northwest as of November 16, 2022.

According to the Yurok Tribe, “Monitored seven days a week, the young condors are flourishing in the redwood region. The birds consistently exhibit healthy behaviors, such as feeding, soaring, and finding safe roosts.”

Composed of biologists and technicians from the Yurok Tribe and Redwood >>

Five prey-go-neesh (California condors), including the mentor bird, in the flight pen. Three of the first four released condors can be seen sitting outside of the pen on the top. (PHOTO COURTESY OF THE YUROK TRIBE)



(Previous page) Condor A5 stands in the flight pen.

(PHOTO COURTESY OF THE YUROK TRIBE.)





Two California condors stretch their wings in the Northern California Condor Restoration Program's flight pen. (PHOTO COURTESY OF MATT MAIS/YUOK TRIBE)

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National Park, the Northern California Condor Restoration Program will collaboratively manage this flock from a newly constructed condor release and management facility in northern California near the Klamath River in Redwood National and State Parks.

The program plans to reintroduce one cohort of prey-go-neesh every year over the next two decades. This reintroduction effort was initiated by the Yurok Tribe in 2008, with funding support from the Service and other partners.

“The return of the condors to the skies over the Redwoods represents a significant milestone in the restoration of

this magnificent forest to its former glory,” says Redwood National and State Parks Superintendent Steve Mietz. “This project is a model for listening to and following the lead of the park’s original stewards, healing both our relationship with the land and its original people.”

With the release of these birds, the Northern California Condor Restoration Program team officially joins the larger California Condor Recovery Program led by the Service. The recovery efforts have three additional release sites in California, one in Arizona and one in Baja Mexico. Each release site is championed by a partner in condor recovery.

“The reintroduction of condors into northern California is truly a monumental moment,” says Paul Souza, Regional Director for the Service’s Pacific Southwest Region. “This effort builds >>





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upon the program’s collective knowledge and history of releasing condors and showcases the benefit of partnering with tribes and others to implement recovery of listed species. We are proud to support this collaborative and innovative partnership with the Yurok Tribe and Redwood National Park. Together we can recover listed species for future generations.” □

REBECCA FABBRI, External Affairs, Pacific Southwest Region

Yurok Condor Restoration Program Manager and Northern California Condor Restoration Program Manager Chris West and Makayla Golden from the Yurok Wildlife Department attach a wing tag. (PHOTO COURTESY OF THE YUROK TRIBE)







# ONE OIL SPILL AND SIX TRIBES

*Deepwater Horizon settlement money is funding the Tribal Youth Conservation Corps.* | BY NANJIANN REGALADO



When the Deepwater Horizon oil spill occurred in 2010, most people probably thought only about the devastation at hand. And for the past 12 years, conservation partners have dedicated themselves to Gulf restoration. (You can read about some of the latest work at the Department of the Interior's Deepwater Horizon Restoration [webpage](#).) But the historically large Global Settlement funds can be used for a broader range of purposes than traditional restoration, including bolstering community resilience and sustainability along the Gulf Coast.

To mitigate the oil spill's harmful impacts on Gulf communities, the Department of the Interior is using the money to fund the Tribal Youth Conservation Corps. Managed by the Bureau of Indian Affairs, the program has granted \$50,000 a year to six Tribes with lands and cultural connections to the Gulf Coast.

With the grants, the Coushatta Tribe of Louisiana, the Mississippi Band of Choctaw Indians, the Poarch Band of Creek Indians, the Miccosukee Tribe of Indians, the Seminole Tribe of Florida, and the Chitimacha Tribe of Louisiana have conducted multiple years of Youth Conservation Corps sessions that help high school-age Tribal youth learn more about ecology, environmental restoration, the relationship of their native culture to the environment, and the skills that may lead to careers in the natural sciences.

"We are so pleased to fund Tribal after-school and summer programs that teach youth about the environment and the natural resources that figure so prominently in their cultures," says Mary Josie Blanchard, the Department's Director of Gulf of Mexico Restoration. "We hope that through the Tribal Youth Conservation Corps program, youth gain job skills and the knowledge needed to promote restoration, not only on Tribal lands, but across the Gulf."

(Previous page) A member of the Coushatta Tribe of Louisiana Youth Conservation Corps plants a dune grass plug. (PHOTO BY COUSHATTA TRIBE OF LOUISIANA)

Our Gulf Restoration Office is joining forces with our National Conservation Training Center to increase awareness of the program by producing a video. "We want to get the word out about the benefits of programs like the Tribal Youth Conservation Corps—programs that use active, hands-on learning to teach students about the environment. In the video, we'll ask the students about what they learned and ask if they have ideas about what we might do in the future to restore the Gulf. We hope these students will be our future colleagues," says Michelle Eversen, Assistant Regional Director of our Gulf Restoration Office.

The Tribes have tailored their programs, lessons and activities to their own restoration needs and goals:

### Seminole Tribe of Florida

With reservations in the historic Everglades watershed, the Tribe focuses, year after year, on monitoring water quality on their reservations. Venturing out from their classrooms, Seminole youth have learned how to properly test wetlands and other water bodies for temperature, dissolved oxygen, and pollutants. "Some of their trips into the field required the students to wade in waist-deep water with their buckets," says Harold Peterson, natural resources officer for the Bureau of Indian Affairs. "But the students took it all in stride, learning and practicing good sampling techniques and getting accurate results."

### Miccosukee Tribe of Indians

Also in Florida, Miccosukee Tribe youth have learned multiple ways they can support their Tribe and care for local natural areas. One of their projects includes cultivating their own community garden. Starting early in the year, they plant an array of vegetables. They >>

Mississippi Band of Choctaw Indians Youth Conservation campers clear fallen trees and branches from a cultural mound. (PHOTO BY MISSISSIPPI BAND OF CHOCTAW INDIANS)





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maintain the garden throughout the growing season, and then in the shade of a thatch-roofed and open-sided chikee hut next to their garden, they collect their harvested crops before sharing them with their community. The Miccosukee youth have also learned the importance of periodic fires to maintain-ing healthy ecosystems and have learned and practiced prescribe burn techniques.

### **Coushatta Tribe of Louisiana**

Rutherford Beach, in Creole, Louisiana, was the site of an ambitious restoration project completed by the Coushatta Tribe's youth. With expertise and materials provided by the USDA's Soil and Water Conservation District, the students planted 4,000 clumps of dune grass to reduce erosion and protect nesting habitat for shore birds. The smiles on the kids' faces at the end of a long and hot day of planting revealed a deep sense of pride in their work.

### **Mississippi Band of Choctaw Indians**

The Mississippi Band of Choctaw Indians hires the youth as interns while they learn about the importance of respecting their Tribal lands, their cultural connections to those lands, and their responsibility to maintain natural areas free of debris, such as fallen trees and branches. They conserve their historic Tribal mounds, interpretive trails, and waterways while also learning about local game and wildlife laws in classes taught by an instructor from the Mississippi Department of Wildlife, Fisheries, and Parks.

### **Chitimacha Tribe of Louisiana**

The Chitimacha Tribe Youth Conservation Corps Program means "providing Tribal youth with working skills while gaining Tribal/community pride through work aimed at maintaining and beautifying the Chitimacha community," according to the Tribe's youth program coordinator. Over the years, youth have constructed a wheelchair-accessible path that leads to a boat landing at Bayou Teche, a water >>

The completed Coushatta Tribe of Louisiana dune restoration project is ready to help reduce erosion and provide bird nesting habitat. (PHOTO BY COUSHATTA TRIBE OF LOUISIANA)



Tribal youth cultivate river cane, a plant used to weave the Poarch Band of Creek Indians' traditional baskets. (PHOTO BY POARCH BAND OF CREEK INDIANS)





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body of historic and cultural importance to the Tribe. They have also learned to cultivate river cane, a plant used for generations by the Chitimacha for basket making, and conducted a river cleanup.

**Poarch Band of Creek Indians**

The Poarch Band of Creek Indians in Alabama also learned how to cultivate river cane, the importance of land stewardship, and the role fire plays in maintaining healthy ecosystems. Their hands-on field experience included participating in prescribed burns on Tribal lands.

The Deepwater Horizon oil spill was a devastating blow to the Gulf of Mexico, not only to its wildlife and habitats but also to the economy that supports Gulf Coast communities. The spill’s Global Settlement funds allow us to help those communities in myriad ways, including giving the youth of Gulf Coast Native American Tribes hands-on experiences that expand their knowledge, increase their job skills, and promote the understanding that everyone who wants to can have a role in restoring the Gulf of Mexico. □

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 NANJIANN REGALADO, USFWS Gulf Restoration Office, Southeast Region



(Top) Poarch Band of Creek Indians youth learn how to conduct ecologically important prescribed burns on their land. (PHOTO BY POARCH BAND OF CREEK INDIANS)

(Left) Youth members of the Chitimacha Tribe Youth Conservation Corps built a wheelchair-accessible path to a boat landing on the historic and culturally important Bayou Teche in Louisiana. (PHOTO BY CHITIMACHA TRIBE OF LOUISIANA)



# BURBOT ACROSS THE BORDER

*Kootenai Tribe, Service, and other partners work together on international effort to recover fish.* | By Cheri Anderson

Adult burbot swim in holding tanks.  
(PHOTO COURTESY OF KOOTENAI TRIBE OF IDAHO)



It's three o'clock in the morning on May 17, 2022, and Nate Jensen and his crew prepare to depart Twin Rivers Tribal Sturgeon and Burbot Hatchery with 68 bags of precious cargo. Jensen is the conservation aquaculture supervisor for the Kootenai Tribe of Idaho.

The clock is ticking, and time is of the essence. Everything is in place to transport millions of burbot larvae over the Canadian border from the hatchery near Bonners Ferry, Idaho, to Kootenay Lake, British Columbia. This is the 13th year of a multiyear effort that has taken great determination by Jensen, Director of the Kootenai Tribe's Fish and Wildlife Department Dr. Shawn Young, the Service, and multiple other agencies dedicated to navigating all the regulations surrounding in-state and international shipments of aquatic species.

"By the time we start bagging up the fish, all of us with the Kootenai Tribe of Idaho are beyond stressed. Everyone needs to be on-point to get this done," Jensen says. "This is not the first time we have followed through with all the requirements only to be rejected at the last minute. Everything rides on a stack of export, import, and transport permits. All those permits aside; one document stands out above the rest... the U.S. Department of Agriculture-APHIS Aquatic Animal Health Export Certificate. That one document, and everything required to get it in my hands, makes or breaks this effort."

Burbot are a freshwater member of the cod family, a keystone species in the Kootenai River. The burbot shipment is important because this native species once sustained a culturally significant fishery and winter food source for the Tribe.

Modifications of the Kootenai River in the 1970s caused a significant decline in Kootenai sturgeon and burbot populations. After the completion of Libby Dam in 1975, the Tribe's ability to exercise their treaty-reserved fishing rights was all but eliminated. As fish populations declined, Kootenai sturgeon were protected by the Service as endangered under the Endangered Species Act in 1994, and the burbot became a species of concern in Idaho and red-listed (at risk of extinction) in British Columbia.

In response to this burbot and sturgeon crisis, the Tribe partnered with the British Columbia Ministry of Environment, Idaho Department of Fish and Game, and the University of Idaho to investigate burbot aquaculture. In 2014, the multimillion-dollar Twin Rivers hatchery facility was built at the confluence of the Kootenai and Moyie rivers to produce both burbot and sturgeon. The dedication was a joyous occasion with drumming, celebrating, speakers, and tours of the new 35,000-square-foot hatchery.

The Tribe's burbot program is focused on re-establishing a natural reproducing, self-sustaining population, using genetically similar stock from within the subbasin. Since the creation of the burbot aquaculture program, the burbot population in the river has grown from an estimated 50 fish to more than 50,000. The success of the program allowed the re-opening of a harvest fishery in 2019, but the fishery is dependent on transfers of burbot from the Tribal hatchery to north Idaho and Canada.

Developing hatchery methods and bringing burbot back from near extinction is miraculous, but the convoluted regulatory process the Tribe must navigate to move fish internationally is a major barrier to continued success. The Kootenai Basin crosses the U.S.-Canada border and both countries have their own complex rules and regulations for the transport and release of live animals. To make matters more complicated, those regulations had never been applied to anything like the Tribe's burbot program. Add COVID-19 into the equation and the complications increase exponentially. Canadian releases were blocked the past several years.

The Tribe must adhere to regulations and proper permitting for species listed under the Endangered Species Act to comply with the Convention of International Trade in Endangered Species of Wild Fauna and Flora, the Canadian Species at Risk Act, and complex international fish health regulations. Seven permits are required to move burbot across the >>



One of the 68 bags of minuscule burbot larvae that were transported into Canada for release. (PHOTO COURTESY OF KOOTENAI TRIBE OF IDAHO)

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border, which is where the Service comes into this carefully orchestrated mad dash.

“The lengthy process involves all kinds of dashing about for testing, inspections, and certificates with raised seals, which are only required for aquatic species. It’s all carefully orchestrated with tight deadlines,” says Andy Goodwin, our Pacific Region Fish Health Program manager.

The final process for the 2022 shipment to Canada was the result of years of negotiation. Our staff played an essential part to establish the required official disease-free status for international movement.

Service fish pathologist Laura Sprague drove 5½ hours from her office in Orofino, Idaho, to the hatchery to collect 175 samples for disease testing. The burbot larvae were the size of black pepper flakes and each sample consisted of thousands of fish that together had to match a target weight.

Sprague then drove the samples to the only laboratory in the Northwest with the special accreditation for export—the Washington Animal Disease Diagnostic Laboratory (WADDL) in Pullman, Washington.

The laboratory completed the testing and provided the required paperwork.

Sprague then returned to the hatchery and conducted a video tour and interview between hatchery staff and Service Veterinary Medical Officer Dr. Christine Parker-Graham in Lacey, Washington. This had to take place within 96 hours of the shipment time.

Parker-Graham then used the testing and inspection results to produce the export paperwork and drove the paperwork to the regional U.S. Department of



Agriculture Animal and Plant Health Inspection Service office in Tumwater, Washington, for review and a seal. Only a USDA Type II-accredited veterinarian can sign the health certificate for fish.

Next, Parker-Graham drove to Tacoma, Washington, to meet a Tribal representative to physically hand them the original, signed, and sealed paperwork, which is required at the Canadian border.

Within 72 hours of the export/import, the Service’s regional wildlife inspector was notified, and an Electronic Declaration was filed and approved. Exports are also subject to inspection at the discretion of the Service’s wildlife officer and/or U.S. Border Patrol.

More than 6 million burbot larvae were transported and released into their new home in British Columbia, Canada, where they can do their part to continue the recovery of this keystone species. This larvae is in the palm of a biologist’s hand. (PHOTO COURTESY OF KOOTENAI TRIBE OF IDAHO)

Finally, the Tribe made an appointment at the border so the required Canadian government inspector would be present to approve the import. Only British Columbia Ministry personnel are allowed to schedule this appointment.

To make sure the 2022 shipment succeeded, Parker-Graham, Sprague, the Tribe, and WADDL had many meetings with U.S. and Canadian import/export officials. They also developed and >>





Nate Jensen, the conservation aquaculture supervisor for the Kootenai Tribe of Idaho, shows an adult burbot. (PHOTO COURTESY OF KOOTENAI TRIBE OF IDAHO)

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reviewed draft paperwork, and even ran practice paperwork through the APHIS office to make sure the raised-seal process would work. All the years of negotiation, trials, planning, and practice all came to fruition this time. Just a few hours after the paperwork got final approval, more than 6 million burbot larvae were transported and released into their new home in British Columbia, Canada, where they can do their part to continue the recovery of this species.

“Kootenay Lake consists of a significant portion of the recovery area for native fish species,” Jensen says. “It is extremely important for the Kootenai River Native Fish Conservation Program to produce fish for Kootenay Lake because it consists of approximately half of the defined recovery area and has a multitude of productive habitats. Kootenay Lake itself is not only important to the program as a recovery area, but also a major part of the altered ecosystem that the Kootenai Tribe and sister Tribes have a covenant with the Creator to take care of and protect.”

International fish movement regulations are designed to protect endangered

species and to prevent the movement of reportable pathogens to new countries, but they are often ambiguous, especially when the export involves something as unique as a Kootenai burbot.

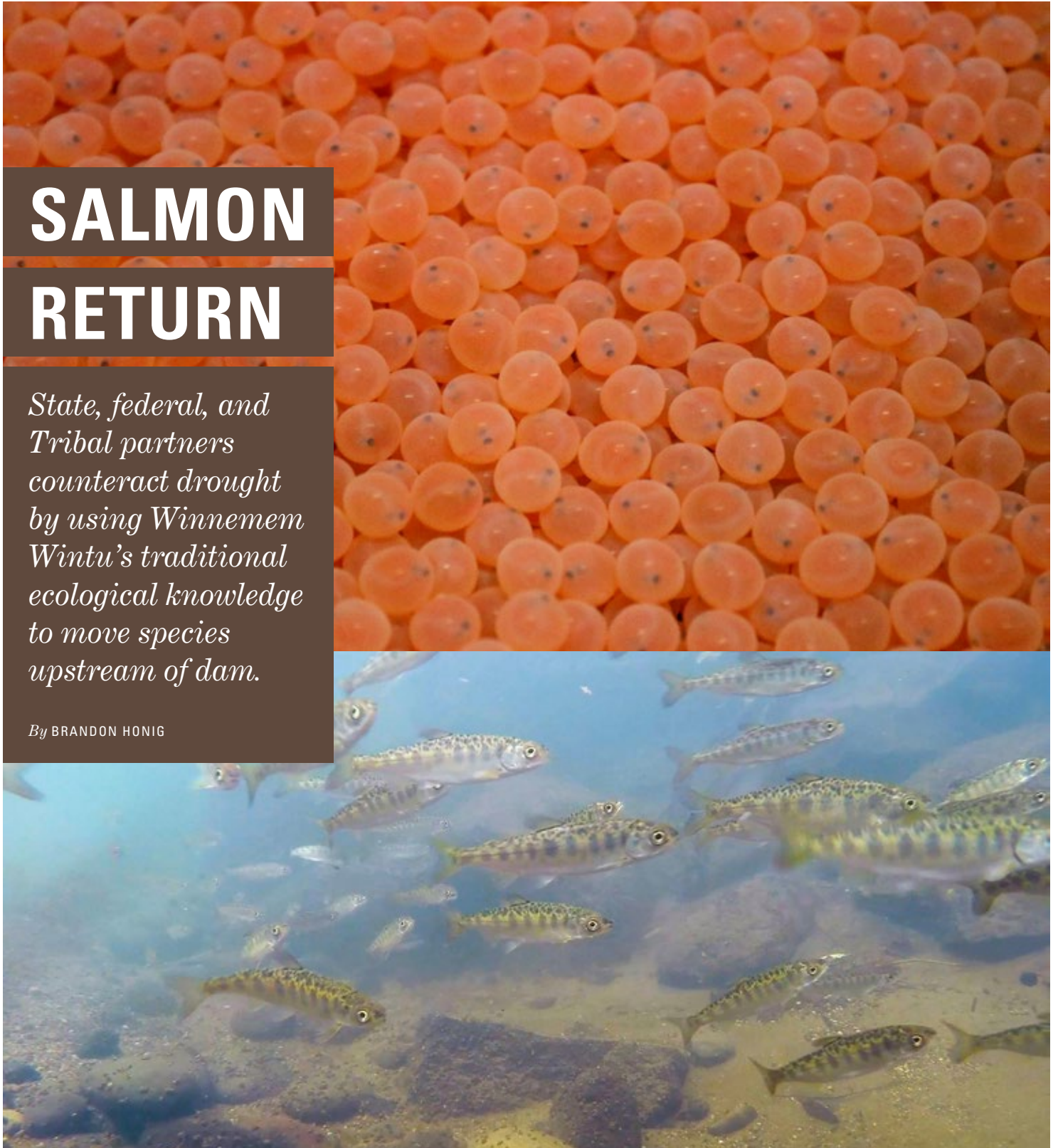
The spectacular success of the 2022 shipment is a real credit to the expertise and determination of the Kootenai Tribe, and to the importance of their partnership with fish health experts from the Service and the U.S. Department of Agriculture Animal and Plant Health Inspection Service. □

CHERI ANDERSON, EXTERNAL AFFAIRS,  
Pacific Region

# SALMON RETURN

*State, federal, and Tribal partners counteract drought by using Winnemem Wintu's traditional ecological knowledge to move species upstream of dam.*

By BRANDON HONIG





When scientists proposed moving endangered winter-run Chinook salmon into historical habitat upstream of Shasta Dam this summer, they expected some people would doubt the seemingly new idea could work. But it wasn't a new idea at all, and it had been proven long ago.

**“**When talking about returning salmon to historical habitats above high-head dams, it's not uncommon to hear claims that it's too difficult,” says Stacie Fejtek Smith, fisheries biologist for NOAA Fisheries. “And that is fundamentally untrue. The traditional knowledge shows us that fish can be moved and that people have been doing it since time immemorial.”

As an urgent response to a third straight year of drought, the Service, NOAA Fisheries, and the California Department of Fish and Wildlife joined the Winnemem Wintu Tribe of Northern California to move winter-run Chinook to the McCloud River, where the fish historically spawned until Shasta Dam cut them off from their habitat in the 1940s. The Winnemem Wintu, known as the Middle Water People of the McCloud River, have a centuries-long history of transporting salmon past barriers.

“Before dams like this existed, the Winnemem Wintu people would bring these fish with them in baskets above barriers or waterfalls, so they would have that food source,” Smith says. “They have been doing fish introductions for many centuries and are the caregivers to these fish.”

They would even light fires alongside the river to mimic stars in an effort to guide fish upstream.

Over the centuries, they passed down valuable knowledge about fish introductions, the overall landscape, the mudflows in the McCloud River, and the ways salmon benefit the entire ecosystem.

### Return and Exchange

On July 11 and again on August 8, biologists transported about 20,000 winter-run Chinook eggs from Livingston Stone National Fish Hatchery to the Shasta-Trinity National Forest's Ah-Di-Na Campground. A rotating team from the California agency stayed at the campground around-the-clock for months (as of mid-October, they were still there), monitoring the eggs' condition every few hours.

In a sacred riverside ceremony July 11, Winnemem Wintu Chief and spiritual leader Caleen Sisk led a group in song, dance, and prayer for salmon eggs that had been brought to the McCloud from Livingston Stone.

“We are asking that the river receive these eggs. We are asking that the old-time ways continue and that they grow in that way,” she says. “We put down that song so they have a fighting chance.”

On the banks of the McCloud that day, the first 20,000 eggs were placed in the tank of a remote-site incubator, which held the eggs on a screen in circulating river water.

Unfortunately, only four days after the eggs went in the incubator, water melting off a Mount Shasta glacier inundated the river with mud, which can suffocate developing eggs. The on-site team >>

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Scientists from the U.S. Fish and Wildlife Service, NOAA Fisheries, and California Department of Fish and Wildlife participate in a July 11 ceremony with Caleen Sisk, chief and spiritual leader of the Winnemem Wintu. The agency representatives were invited to receive a Tribal blessing and share their thoughts on the day, when winter-run Chinook salmon were returned to habitat they hadn't swum in since the 1940s.





Hatchery Manager Taylor Lipscomb and fisheries biologist Kaitlin Dunham show the difference between a live egg and a dead one at Livingston Stone National Fish Hatchery on July 11, 2022.

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continually cleared sediment from the incubator and removed dead eggs to prevent the spread of fungus. But the sediment presented a problem.

“A remote-site incubator is a proven tool to incubate eggs, but when we had such high siltation in the water, it became quite clear it wasn’t the best tool for the job,” says Matt Johnson, senior environmental scientist with the California agency. “We’re rapidly responding on a daily timestep to changing conditions in the river. We were aware of Mud Creek’s history and its effect on water clarity in the lower McCloud River, but were unprepared for how much siltation would occur in the remote-site incubator and the jeopardy the eggs would be in due to the heavy sediment load.”

The agencies quickly set up a system of incubation trays from California’s Mount Shasta Fish Hatchery, to use alongside components of the remote-site incubator. All the eggs were switched to the trays before hatching. Each incubation tray maintains a shallow pool of circulating river water, which can be periodically drained of sediment.

The new system also makes eggs and alevins much easier to see and reach. Staff can identify and remove dead eggs, and agitate the water around live eggs with air or a feather to waft sediment off of them. Eggs can also be temporarily removed from a tray to clean it.

Once the alevins develop into fry in the trays, they are released into a quiet alcove of the river. The fry then swim downstream about 20 miles toward rotary screw traps set up by California agency in consultation with the Winnemem Wintu. The large, floating, conical traps collect the fry, which are loaded into coolers and driven to a release site in the Sacramento River downstream of Shasta Dam. From there, the salmon continue their journey to the ocean.

As of mid-October, the August eggs have started to hatch and those fish are being released into the river. Juvenile salmon are showing up in the rotary screw traps 20 miles downstream from the egg incubation site every day and are being driven to the Sacramento River and released.

“The trapped fish will give us life history information on what these juveniles do in the McCloud River; such as when they will be entering Shasta Lake,” Johnson says. “This will inform future operation of a more permanent juvenile salmon collection system, which is on a parallel track for implementation with the McCloud River salmon reintroduction project.”

### Emergency Response

State, federal, and Tribal plans call for re-establishing winter-run Chinook populations in historical, cold-water habitats upstream of dams. This year’s transfer of salmon to the McCloud River will contribute valuable information toward that long-term effort, but it was not planned for that purpose.

The McCloud River project is one of several actions the agencies planned this spring to help stave off the species’ extinction in the face of ongoing drought and rising water temperatures.

“Winter-run Chinook salmon are one of the most endangered salmon species in the nation, and one of the nine endangered species highlighted by NOAA nationwide,” Smith says. “This year we anticipated seeing a very high mortality rate because of the back-to-back drought years, and these actions were pulled together to prevent the species from inching closer to extinction.”

Livingston Stone National Fish Hatchery significantly increased its winter-run Chinook salmon production as part of this effort, which will help maintain genetic diversity through the drought years. The hatchery typically collects 180 adult salmon from the Sacramento River each year to raise about 250,000 juvenile fish. >>





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This year the hatchery and interagency partners gathered 463 fish, which raised potential production to as many as 900,000 juveniles.

Federal and state biologists also moved adult winter-run Chinook salmon from the Sacramento River upstream of a dam and into the upper reaches of Battle Creek, where the water is cold enough for their offspring to survive.

“This is an all-hands-on-deck situation,” Smith says. “This is an urgent emergency action, and it has relied on strong collaborations and the will of our partners to make it happen.”

### Part of the Ecosystem

Throughout the planning and execution of this project, Winnemem Wintu members shared valuable information gathered over centuries. NOAA Fisheries’ Zayleen Kalalo spoke in depth with Tribal members to document their traditional ecological knowledge and history of fish-moving efforts.

The Tribe’s connection with the land and its natural resources was also of great importance.

“As conservationists, we are part of the ecosystem that we are caring for,” says Taylor Lipscomb, hatchery manager at Livingston Stone. “We can become so focused on the scientific aspects of conservation, we can overlook that we are a part of the landscape as well as stewards of it. By the same token, the resources we are protecting are part of us, too.”

Lipscomb is Salish and grew up on the Flathead Reservation in western Montana. There, he and his Native American community participated in ceremonies to honor and celebrate the life-bringing aspects of the Flathead River and its life-giving contents, as well as other parts of the natural environment.

“Taking some time and pausing to recognize the significance of these events, like what happened at Ah-Di-Na on July 11, needs to be a part of the equation,” he says.

Winnemem Wintu Chief and spiritual leader Caleen Sisk speaks July 11, 2022, about the importance of returning winter-run Chinook salmon to their historical habitat in the McCloud River. She was joined that day by members of the Winnemem Wintu and by federal and state agency scientists including Stacie Fejtek Smith, fisheries biologist for NOAA Fisheries (in blue shirt and hat); Matt Johnson, senior environmental scientist for the California Department of Fish and Wildlife (in green); and Taylor Lipscomb, manager of Livingston Stone National Fish Hatchery (in tan).

Lipscomb’s federal and state peers similarly felt the day’s significance and were impacted by its events.

“Getting a glimpse into Winnemem Wintu culture was very powerful and moving,” Johnson says. “I feel honored that I got to be a part of this ceremony and see how they continue their traditions.”

As part of the July 11 ceremony, the Winnemem Wintu invited the federal and state representatives on hand to receive a Tribal blessing and share their thoughts. Several scientists spoke emotionally about returning an endangered species to habitat it hadn’t swum in decades.

“This is what people get into conservation work for,” Lipscomb says. “To see something like this come to fruition — to put heads together, work hard, and work through barriers to bring about conservation change — is super-rewarding.”

BRANDON HONIG, External Affairs, Pacific Southwest Region



# SAVING THE TRICOLORED BAT

*All hands on deck as  
conservationists race to  
preserve species.* | BY SYDNEY GIULIANO





As the heat of the day burns off and the pink summer sunset stains the horizon, tiny fur balls flutter from road culverts into the cool evening breeze. The first to emerge at night, tricolored bats could almost be mistaken for moths. At only three inches long and the weight of a quarter, the tricolored bat is one of North America's smallest.

(Above) A trio of dew-covered tricolored bats.

(PHOTO BY GARY PEEPLES/USFWS)

(Previous page) A tricolored bat with visible symptoms of white-nose syndrome. (PHOTO BY PETE PATTAVINA/USFWS)

Unfortunately, it's also one of several bat species experiencing dramatic declines due to white-nose syndrome. On September 13, 2022, the Service proposed to protect the tricolored bat as endangered.

### The Little Bat That Could

Once common across eastern North America, tricolored bats are now rare across their range. It takes a keen eye and considerable patience to spot these bats today.

Tricolored bats are some of the hardest-working bats around and spend a ton of energy just to maintain their body temperature. Unlike most bat species,

they roost alone, meaning they don't benefit from the warmth of other bats. Despite their small size, these over-achievers give birth to twins. During pregnancy, the pups can make up more than half the mother's body weight and even a non-reproductive individual can eat half its body weight in insects each night.

### White-nose Syndrome

The first among North American bats to hibernate and the last to emerge in late spring, tricolored bats are secluded in culverts and caves for many months. This long hibernation period increases their exposure, and vulnerability, to a threat that is driving dramatic population declines across their range.

First documented in North America in 2006, white-nose syndrome has since spread to 38 states and eight Canadian provinces. The disease is caused by the pathogen *Pseudogymnoascus destructans* (Pd), a fungus not native to North America and unknown to science until it began >>

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decimating bats in New York. Pd often presents itself as white fuzz on the noses of bats, giving the disease its common name.

Thriving in the same cool, dark spaces where bats like to hibernate, Pd has caused white-nose syndrome in 12 of North America's 47 bat species. The fungal infection causes strange behaviors, including waking early from hibernation. With nothing to eat on the winter landscape, victims burn through their fat stores and starve to death before spring arrives. According to a study published in *Society for Conservation Biology*, the disease has killed more than 90% of affected northern long-eared, little brown, and tricolored bat populations in less than 10 years.

### Fighting the Fungus

The ability to document these devastating losses is itself a scientific achievement. Until 2015, bat-monitoring data collected separately by state and federal agencies was compiled only for federally protected species. When white-nose syndrome began wreaking havoc on North American bats, all three of the hardest-hit species were abundant. In response to the disease, the U.S. Geological Survey, the Service, and many partners launched the North American Bat Monitoring Program (NABat) to improve conservation science for bats. This program has been integral to the collection and assessment of historical data that helps us better understand what is affecting bats today.

The development of NABat is one of many accomplishments stemming from a Service-led international response to white-nose syndrome that coordinates the actions of more than 150 partnering nongovernmental organizations, institutions, Tribes, and state and federal agencies. With all hands on deck, this community >>

## Keweenaw Bay Indian Community Keeps a Keen Eye on Apakwaanaajinh (Bats)



One group now using NABat to monitor Apakwaanaajinh, or bats, is the Keweenaw Bay Indian Community of the Upper Peninsula of Michigan.

The data they collect will inform population status and trends for all six species of bats detected on the reservation: silver-haired bats, hoary bats, big brown bats, little brown bats, eastern red bats, and tricolored bats.

Preliminary analysis of their data shows a decrease in both little brown bats and big brown bats since the start of the monitoring program, keeping with national trends.

Initially funded by a program through the Bureau of Indian Affairs, the Community's monitoring efforts began in 2015 and got a boost in 2019 from the White-nose Syndrome Grants to States and Tribes Program. This annual funding opportunity aims to fulfill data needs and implement management actions for bats susceptible to white-nose syndrome. The grant enabled the Community to align their monitoring protocols with those of the North American Bat Monitoring Program, or NABat, and purchase additional equipment and software to support the expansion of monitoring efforts.

The NABat survey protocol uses a standardized monitoring approach that prioritizes long-term data collection at

randomly selected sites across North America. One of these sites—on the Baraga side of the Community's L'Anse Indian Reservation—has been a focus for their efforts. Each year between June 1 and July 31, biologists monitor bats in this area by recording their calls at dusk. In addition to setting up stationary recording devices, they drive along survey routes traversing the L'Anse Indian Reservation and some of the surrounding land with microphones affixed to the roof of a pickup truck.

Being part of the large network of state, federal, tribal, and nongovernmental organizations facilitated by NABat is helping the Community advance their monitoring work. The Community has found the network to be tremendously helpful in providing technical support for data uploads and analyses—including when a rare tricolored bat call was recorded during one of the surveys. The find highlighted the valuable contributions Tribes are making to increase knowledge of bats across the North American landscape.

But in keeping with the Community's stewardship approach—they support a healthy co-existence between people and the land, water, and all other beings—the Community's wildlife team also focuses on ensuring bats and people share the lands they live on. They work closely with the Community's forester, who gladly enlists their help to identify trees that may benefit bats or other wildlife, and they have plans to increase outreach and education efforts to inform the Community about the bats at L'Anse Indian Reservation.

While the science has provided valuable insights into bats, it builds on a reverence for Apakwaanaajinh that dawned at creation. □

MARILYN KITCHELL, External Affairs, Headquarters, and KAREN SOTO, NPS



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of bat conservationists is bounding from breakthrough to breakthrough in the race to protect these incredible animals. An unknown fungal pathogen in wildlife has never been so quickly characterized. Together, we are:

- Testing white-nose syndrome treatments and other disease management measures—including but not limited to vaccination and treatment with probiotics to reduce mortality—in nine states and British Columbia

- Closely studying bat populations to determine health and survival of bats that have repeatedly contracted white-nose syndrome and estimate vulnerability of bats recently or not yet exposed to the fungus

- Conducting genetic investigations to determine the potential for species to develop white-nose syndrome resistance, which could lead to gene therapies or biotechnological solutions

- Aiding recovering bat populations by identifying and protecting roosts important to susceptible bats and treating hibernation sites to reduce fungal loads and improve bat survival

- Investigating ways to boost post-infection healing, including heated bat boxes and artificial light lures that attract insects and habitat restoration projects that increase insect prey for bats

“We have developed an entire community of practice with transportation engineers, mycologists [fungal biologists], microbiologists, and bat biologists to talk about what is going on with bats as a whole,” says Service biologist Laci Pattavina. “These partnerships are so important to bat conservation because in order to



gather essential information, we need boots on the ground and folks coming at the issue from all angles.”

### Crucial Critters

Help can't come soon enough. Bats are essential pest-control agents. A recent study confirmed that white-nose syndrome costs the agriculture industry between \$426 million and \$495 million annually in lost revenue and production. It is estimated that bats contribute at least \$3 billion annually to the U.S. agriculture economy through pest control and pollination. □

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 SYDNEY GIULIANO, External Affairs,  
 Northeast Region

The tricolored bat is one of North America's smallest bats. (PHOTO BY PETE PATTAVINA/USFWS)

# BREAKING GROUND IN ALASKA

*First fish passage project  
funded by Bipartisan  
Infrastructure Law  
will help people, fish.*

By KATRINA LIEBICH

Greek philosopher Heraclitus once said, “No man ever steps in the same river twice, for it’s not the same river and he’s not the same man.”

Alaska’s rivers are no exception. One day they’re a trickle, the next a torrent, carving up lands and jumping their banks. When they encounter culverts that don’t respect change, they will force change, taking the roads along with them.

The failure of a road-stream crossing during a high flow is a violent, forceful event. The culvert becomes a firehose and eventually clogs with debris that the river plucked from its banks and floodplain. With nowhere to go, water overtops and saturates the road until the pressure mangles the culvert’s corrugated metal and carries the road and everything in the culvert downstream in a whoosh of turbid, angry water:

In 2006, this happened on the Little Tonsina River when it reached flood stage and overwhelmed an access road in Alaska’s Valdez-Cordova Borough—homelands to the Ahtna people and an area that Sugpiaq and rural Alaskans depend on for access to hunting and fishing, wild food security, and cultural ties to the

land. It’s also a major regional access points for the Trans Alaska Pipeline.

The ruined culverts that carried the Little Tonsina through the road before 2006 still rest downstream in its riverbed today. Following the catastrophic road failure, an “emergency fix” of similar, undersized culverts were quickly installed where the river met the road. These necessary short-term patch jobs maintained access to crucial resources. However, they can’t be a permanent solution. Those failed, rusty relics offer a preview of inevitable things to come.

## The River

Fast forward to 2022 and there is a sense for this river’s true potential—gravelly, clean, and cold—perfect conditions for Coho and Chinook salmon. You do, though, have to look beyond the current undersized double culverts. Downstream is the Tonsina >>



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River proper—a class III-IV whitewater with excellent fishing for Pacific salmon, Dolly Varden, and Arctic grayling. These waters eventually meet Alaska’s Copper River, home to what many people consider one of the world’s finest sources of sockeye and king salmon.

Standing on the road and looking upstream, the water is pooled, a common symptom of a fish passage barrier created by an undersized road-stream crossing and the associated disruption of natural flow. Over 70 miles of glacier-fed salmon nursery habitats extends upstream to the horizon.

### Breaking Ground

Before 2022, the prospect of fitting the road with a bridge to accommodate the Little Tonsina and its varied flows was already attracting attention and funding from multiple state and federal partners—the current culvert design is not expected to survive a 50-year flood event.

It takes many hands to build a bridge. The Chugach Alaska Corporation entered into a land transfer and right of way agreement that ultimately makes this work possible. Herculean partner funding efforts have raised several million dollars, including \$1 million from the Alaska Department of Transportation and \$1.3 million from the Bipartisan Infrastructure Law. The nonprofit partner Copper River Watershed Project has kept communication going between partners and shepherded this project to construction phases. This collaboration and additional financial and technical support from many partners, will finally let the Little Tonsina flow free as it should and provide a reliable ribbon of access for hunters, anglers, and infrastructure maintenance in a sparsely roaded area.

The two-lane, 100-foot floodplain-friendly bridge to be installed in 2023 is designed for a 100-year flood and employs our



comprehensive Alaska design guidelines for building road-stream crossings that have fish and flood resiliency in mind.

Initial groundbreaking activities in 2022 include clearing and grubbing, creating access lanes, building the platforms that will be the bridge embankments, and installing rootwads upstream for bank stability and fish habitat. The existing undersized culverts will act as cofferdams so in-channel construction (including in the riverbed and its banks) can take place “in the dry”—a plus for equipment operation—and water quality issues associated with construction can be minimized. And what of the old culverts downstream? They will be plucked out by the Alaska-based contractor, a woman-owned small business.

### For Fish, First and Foremost

As climate change continues to disproportionately impact northern locales like Alaska, it’s ever important to provide salmon unimpeded access to all habitat options. Culverts and bridges designed with flows and fish in mind do this, keeping salmon runs resilient, fisheries stable, and roads reliable for local communities and economies.

The Little Tonsina has the honor of being the first Bipartisan Infrastructure Law-funded fish passage project to break ground in the USA. The project is one of 40 across the country that received financing in 2022 as part of a five-year \$200 million commitment to removing in-stream barriers and providing technical assistance under our National Fish Passage Program. Millions of dollars have been already invested in fish-friendly roads across Alaska with more to come, including two additional projects in

Before removal, the existing culverts act as cofferdams for in-channel construction (bed and banks) to take place “in the dry” as much as practicable. (PHOTO BY JACOB MILLS/ALASKA DEPARTMENT OF TRANSPORTATION)

Tyonek and Gustavus that were funded by the Bipartisan Infrastructure Law and were previously financially unattainable. Good work also tends to increase funding opportunities and boost momentum to address additional barriers and unstable infrastructure.

Thanks to fish-friendly road standards being adopted at local level and major investments in fish passage statewide, a barrier-free Alaska is within reach. □

KATRINA LIEBICH, External Affairs, Alaska Region



One of the undersized culverts that was carried downstream during a 2006 flood event on the Little Tonsina River in Alaska. (PHOTO BY JACOB MILLS/ALASKA DEPARTMENT OF TRANSPORTATION)

# Crocodile vs. Climate

*Not even the American crocodile  
escapes rising temperatures, seas.*

*By* DAN CHAPMAN



A handful of baby crocodiles at  
Turkey Point Nuclear Power Plant.

(PHOTO BY FLORIDA POWER & LIGHT)



If Florida is the poster child for climate change in the contiguous United States, then the Keys — the fragile, low-lying string of tropical islands that curves out into the Atlantic Ocean and the Gulf of Mexico — are the even more troubled siblings struggling against rising seas and saltwater intrusion.

Nowhere along the 150-mile-long archipelago does the elevation rise above 18 feet. Average height: 3.2 feet above sea level. It doesn't take a rocket scientist to discern what harm a projected 3- to 8-foot rise in the Atlantic Ocean by 2100 will do to the Keys.

Or the crocodiles.

Even the armored and menacing-looking American crocodile, which lives only in south Florida, can't escape the ravages of a warming world. The federally threatened species, kin to the darker-skinned and more plentiful American alligator, suffers from rising temperatures and rising seas.

Yet, paradoxically, there are more crocodiles in Florida today than at any time in the last half century. Protections offered by the Endangered Species Act surely help boost their numbers. A robust artificial-nest building program also ensures the survival of more baby crocs. And, like many animals and plants, migration northward toward fresher water and more stable habitats has become a life-saving necessity.

Still, the climate threat is only expected to worsen with a particular harsh prognosis for the mangrove habitats crocodiles call home. And, with south Florida building out its coastal property, crocodiles may struggle to find room to nest.

"The seas are rising much faster than they have the last three millennium, and that's having a profound effect on natural communities, vegetation, and wildlife," says Chris Bergh, the south Florida program manager for The Nature

Conservancy, who grew up in the Keys. "If we fail to address the root causes of climate change or fail to slow down the pace, the islands as we know them today will be under water."

### Refuge Rock Star

American crocodiles get a bad rap. Shy and secretive by nature, crocs go out of their way to avoid conflict with humans, belying Tarzanesque depictions of large, toothy reptiles chomping on unsuspecting explorers. They inhabit the coastal mangrove forests of Cuba, Jamaica, Mexico, and Ecuador. South Florida is their northernmost reach. They can live past 50. Males can grow beyond eight feet. Crocs are distinguished from their more ubiquitous cousin, the alligator, by their olive-green skin, slender snouts, and the visibility of the fourth tooth on their lower jaw when their mouths are shut. We protected them as endangered in 1975.

Back then, a few hundred crocs inhabited the brackish ponds, coves, and creeks of Florida's mangrove swamps. Coastal crocodiles were hunted to near extinction to satisfy the demand for purses, wallets, shoes, and belts. Florida's unrelenting sprawl wiped out most of the reptiles' habitat. Starting in the 1960s, developers began buying up waterfront properties in North Key Largo with hopes of building massive resorts and bedroom communities. They gouged out canals and stacked the spoils into neat rows to serve as marinas. Recessions, bankruptcies, illegal permits, and a heightened awareness of the need to conserve land for a variety of threatened and endangered species doomed some of the developments.

Out of the developers' broken dreams, in 1980, rose Crocodile Lake National Wildlife Refuge. Much of the refuge that hugs U.S. 1 atop the Keys housed anti-aircraft missiles intended to shoot down Soviet bombers approaching Florida from Cuba. In addition to the mangroves and salt marshes, the refuge is renowned for hardwood hammocks that provide much-needed habitat for a slew of threatened and endangered species, including the Key Largo wood rat, the Schaus' swallowtail butterfly, and the Florida semaphore cactus. Today, the 6,700-acre refuge is off-limits to the public, though a butterfly garden is open daily and more intrepid visitors can volunteer to track invasive pythons.

The crocodile, though, is the refuge's rock star. And its habitat is under siege. The state of Florida's Climate Adaptation Explorer reports that the crocodile's habitat "is expected to become significantly inundated," with at least a third of its home turf disappearing by 2100.

"I've been here nine years, and I can definitely tell you that the water's coming up quick," says Jeremy Dixon, the refuge manager standing amid a field of artificial crocodile nests. "On the water's edge, where the salt water is moving in, we're transitioning from upland species to wetland species. At some point buttonwoods can't withstand saltwater inundation so it's transformed into mangroves. Change is happening so fast. We're seeing huge impacts."

The Atlantic Ocean off Florida has risen almost a foot over the last century and will likely rise at least another foot by 2050. Key Largo sits, on average, seven feet above sea level and could lose hundreds, if not thousands, of acres of coastal habitat.

"Florida is among the most vulnerable states to climate change impacts, primarily due to a combination of increasing ocean temperatures, sea level rise, extreme weather events, low elevation, and heavy >>

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coastal human development,” reads the 2021 update to the National Fish, Wildlife, and Plants Climate Adaptation Strategy from the National Fish, Wildlife, and Plants Climate Adaptation Network.

A warming world melts glaciers and causes seas to rise. Hotter weather also warms the oceans. And, because water expands as it heats up, the seas rise even higher.

A 2020 study in the *Journal of Thermal Biology* tracked the relationship between sea surface temperatures and the time when crocodiles hatch in south Florida. Scientists with the Service, the U.S. Geological Survey, and other partners found that, over the last four decades, temperatures have increased, on average, 0.05 degrees centigrade per year. Consequently, at one test site in Everglades National Park, crocodile babies hatched 1.5 days earlier every two years. The scientists didn’t explore potential ramifications of the earlier hatchings. Other studies, though, show that higher temperatures produce more male than female crocodiles.

### **Anthropogenic Irony**

Yet the very factors that harm the American crocodile’s survival—people and their modern ways—afford previously unheard-of opportunities for the reptile’s survival. Fifty years ago, the remaining crocs nested in Key Largo and the northeastern corner of Florida Bay in the Everglades National Park. Running out of space, and fresh water, the crocs adapted by moving north and west. Today, they’re found as far north as Key Biscayne, below Miami, and Marco Island on the Gulf. They inhabit public beaches, marinas, golf courses, even an airport.

The “Croc Docs” are on their tails. The University of Florida scientists have tracked the reptiles’ whereabouts—and notched their successes—for 50 years.



They tallied 93 nests in the 1970s—and a total of 3,013 nests by 2020. More importantly, the nesting success rate rose from 61% to almost 90%.

And here’s where it gets interesting. While the Endangered Species Act and the creation of croc-friendly habitats like Crocodile Lake Refuge deserve much credit for the animal’s survival, so too do man-made canals and man-made maternity wards. Consider the Turkey Point nuclear power plant in Homestead. The company that owns the plant, Florida Power and Light, maintains the artificial, flood-proof berms that crocodiles prefer for nesting. And the 40 cooling ponds afford the fresh water the hatchlings need. Only two nests were counted at Turkey Point in the 1970s; 540 have been tallied since, according to the University of Florida.

Or consider the Cape Sable area of Everglades National Park. Freshwater marshes and lakes once covered the southwestern corner of Florida until settlers in the early 1900s drained the

Jeremy Dixon, who manages Crocodile Lake National Wildlife Refuge, stands alongside a field of artificial crocodile mounds. (PHOTO BY DAN CHAPMAN /USFWS)

land for farms. Two of the major canals, though, were plugged in the 1980s and the crocodiles began nesting on the levees. There were no nests in Cape Sable during the 1970s and, in the 2020s, there were 1,180.

And then there’s Crocodile Lake Refuge. Dixon, the refuge manager, tours a stripped-bare field alongside a red mangrove forest. Canals, intended for a marina that was never built, stretch a half-mile into Barnes Sound. Twenty man-made mounds of packed sand, five feet long and two feet high, sit close enough to the water, yet far enough upland to avoid most of the damage wrought by rising seas.

“The really cool thing is we have nesting sites right next to great hatchling habitat,” Dixon says. “Crocodiles will use what’s >



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available. You put sand out there and they'll be happy." >>

The reptiles nest between March and May. Dixon and crew counted eight active nests this year and tagged 48 hatchlings. Over the last 15 years, the Service, along with state, federal, and nonprofit partners, has built 40 maternity wards for expectant croc moms on the refuge. Crocodile Lake has totaled 258 nests over the years.

In 2007, the American crocodile in Florida was downlisted from endangered to threatened. An estimated 2,700 crocs live in the Keys and the Everglades.

"What we're doing is working," Dixon says.

### Numbers Leveling

But for how long? In this century's first decade, 59 nests were counted at Crocodile Lake, according to a UF study published in the June 2022 edition of *Frontiers in Ecology and Evolution*. In the last decade, the number of nests dipped to 55. The drop-off is similar at Turkey Point: 202 to 192 nests. (Nest numbers continued to rise at Cape Sable.)

In all, five of the 12 sites studied by UF showed lower nesting levels the last two decades.

"We have no explanation, or even a good speculation, for why the increase in nesting leveled off during 2010 to 2020," the UF scientists write before offering a few possible explanations.

Nests fail primarily due to flooding or drought, extreme weather events that are hallmarks of climate change. As seas rise, more low-lying nests flood.

In 2015, higher-than-usual temperatures caused water temperatures—and salinity levels—to rise, making for a very bad year for nests.



(Top) Dixon, the refuge manager, displays the skull and spine of a baby crocodile that didn't survive at Crocodile Lake National Wildlife Refuge. (PHOTO BY DAN CHAPMAN /USFWS)

(Left) Manmade structures can help the crocodile. (PHOTO BY G. LYNN WINGARD/USGS)

Rising seas, temperatures, and salinity levels appear to push the crocodiles farther and farther north. Steven Bertone, an environmental specialist with the Florida Department of Environmental Protection, says crocs from Cape Sable appear to be moving up Florida's west coast nearing Goodland and Marco Island. There they find mangrove forests and freshwater marshes a good distance from the saltier estuaries found along the coast.

If they keep migrating, though, they'll hit the subdivisions and highways—stuff made by people—that is endemic to south Florida, and bad for crocodiles. It remains

to be seen whether other anthropogenic things, like canals and levees, offer enough of a benefit to keep the reptiles from going extinct as the climate warms.

"The adaptive capacity that American crocodiles exhibited in Florida gave the species advantages to face changes in climate and landscape over the last 50 years," the UF scientists write. "However, it does not imply that the adaptive capacity of the species to face these changes...cannot reach a limit if changes continue." □

DAN CHAPMAN, External Affairs, Southeast Region





MUSEUM OBJECTS COME TO LIFE

In this series we highlight the "Treasures of the Service" from the museum collections of both the U.S. Fish & Wildlife Service Museum and Archives and the Service's National Fish and Aquatic Conservation Archives. We feature submissions from Steve Floray, curator of the U.S. Fish & Wildlife Service Museum and Archives, and April Gregory, curator of the National Fish and Aquatic Conservation Archives.

The Oldest Item at the Museum

The U.S. Fish and Wildlife Service Museum and Archives manages a collection of more than 50,000 objects. The overwhelming majority of the collection consists of documents, photographs, and other archival materials, along with thousands of historic artifacts that tell the history of the Service. Virtually all of these items are from the 20th century. However, the oldest object in the collection is more than 10,000 years old!

In October 2004, staff at Iroquois National Wildlife Refuge in New York, recovered the antlers of an eastern elk (*Cervus canadensis canadensis*) during a construction project. Radiocarbon dating revealed its age to be 10,000+ years.

Eastern elk have been extinct since the early 1800s, due to overhunting. Extinctions in the 1800s and early 1900s, such as the eastern elk, passenger pigeon, Carolina parakeet, and other species led to the establishment of state fish and game commissions, conservation organizations, and the predecessor agencies of today's U.S. Fish and Wildlife Service. (STEVE FLORAY)



Keeping it Cool

Raising fish at national fish hatcheries is year-round work, and winter is no exception. A common winter chore at hatcheries was to cut ice blocks from the ponds in winter to be stored in an icehouse and covered in sawdust. The ice, which would last until late summer, was crucial for stocking fish, transporting eggs, and cooling meat products used for fish food. Eventually electric refrigerators replaced ice blocks and icehouses. This photo is from Spearfish Fish Cultural Station in South Dakota, now D.C. Booth Historic National Fish Hatchery. (APRIL GREGORY)

'Treasure Island' Rachel Carson

Our latest discovery is this photograph of a young Rachel Carson, our most famous staff member. In the summer of 2022, Rebecca Henson with the Springsong Museum, a partner of the Service, was studying the Rachel Carson Book Collection at the U.S. Fish and Wildlife Service Museum and Archives. While examining Rachel Carson's copy of *Treasure Island*, Henson discovered this photograph of a young Rachel Carson (she is the girl on the left, the girl on the right is unknown) that Carson had placed between the pages of the chapter titled "How I Began my Sea Adventure." After additional research, Henson believes that the photograph may have been taken at Pulpit Rock, at Van Buren Point, along the shore of Lake Erie, just west of Fredonia, New York. (STEVE FLORAY)



(PHOTO COURTESY OF REBECCA HENSON)

G. Hoofnagle's Nightmare

This 1926 photo from Meadow Creek National Fish Hatchery, 1.5 miles east of McAllister, Montana, illustrates one of the challenges of operating a fish hatchery during harsh Montana winters. The employee house was located between two forks of Meadow Creek. During the night, leaves flowed into the grates that fed water to the ponds. The water backed up and caused a frozen flood in the yard and house. This was a one-man station, so the sole employee, G. Hoofnagle, woke up to a lot of extra work! Established in 1918, the hatchery was closed in 1941, and ownership transferred to Montana in 1956. Over 100 years later, it is not uncommon for some of our staff to deal with leaves flowing into grates and impacting water flows at hatcheries.



(APRIL GREGORY)





# Monuments to the Passing Seasons

*Sunflowers along New Mexico's rural routes tell the time of year.* | *By* CRAIG SPRINGER

The morning light has a new quality about it, somewhere between platinum and gold as summer starts its vanishing act in August. New Mexico's summer monsoon showers have tailed off. July's first summer storms turn tawny prairies from the color of a mule deer's pelt to a refreshing blue-green akin to an algae-laden pond. Blue grama grass and neon-orange Indian paintbrush and lemony-yellow sunflowers soak it up.

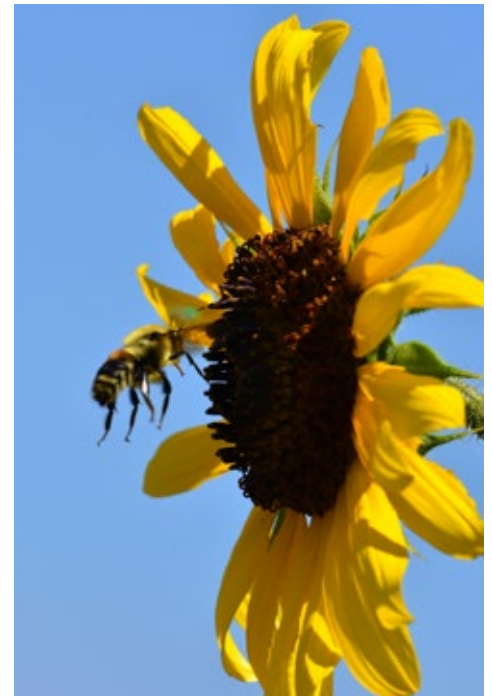
**B**right sunflowers along our rural roads south of Santa Fe where I live are monuments to the passing seasons. My home is on the edge of the piñon-juniper woods at 6,800 feet where the shortgrass prairie starts and bounds endlessly eastward through the gulf of the Plains States. Sunflowers first grow straight, fast, wiry to seven feet tall in July and put out leaves as big as hearty pancakes, coarse to the touch. They branch out to what amounts to a bush come August, and that is when the first blooms show themselves. When I see the yellow discs, I know then that change is coming. Even the most casual observer will note the progress of the season as measured by sunflowers.

What a joy it is to watch white, blue, or multicolored butterflies with the most curious of names—swallowtail, fritillary, sulfur, admiral, sister, cloak, and hairstreak—flit about clusters of sunflowers like winged confetti in a roadside ticker-tape parade. They scatter in a flurry when I bicycle past them on my rural county gravel roads. Bees big and small land on the crayon-brown bulbous

discs winged in yellow petals that will become autumn seed heads. Bees take a more staid and steady approach in pollinating plants. They earn dual credit with making amber honey and ensuring that plants reproduce. Bees always fly a little bit backward first, as if to gain steam to zip off to the next stand of sunflowers.

Sunflowers year after year grace my rural routes in part by the actions of road graders, school buses, and snowplows that disturb the shoulders. How often do I see clusters of sunflowers on the prairie away from the roadside edge? Nearly never, save for a cattle wallow around a tank. And it is a bit of a letdown to see their gleaming summer petals wilt and trend slowly toward an autumn hue like the cornhusks that swaddle tamales my family makes at Thanksgiving. By then the sunflowers are bony and brittle—completely exhausted crusty hulls of their former self.

The Stoics come to mind. Seasons come and seasons pass and children grow up. I have watched three children blossom into young adults with the sometimes-heavy



A bee comes in for a landing on a sunflower at Rio Mora National Wildlife Refuge in New Mexico. (PHOTO BY ANNA WEYERS BLADES/USFWS)

expectancy of any parent. These ceaseless progressions remind any thinking being to enjoy what you have where you are right now—to “live in the immediacy” as Seneca put it.

As fall comes on fully, the flowers that fed bees and butterflies nourish seed-eating birds. Lesser goldfinches dressed in black and lime-tinged yellow feathers migrating to warmer climes land on the dry brown casing of an exhausted sunflower, pinch out a few seeds and flit on toward Mexico with a hushed parting whisper as they take to the air. A school bus or snowplow in December will push leftover seeds into the gravelly roadside soil setting the stage for next August when sunflowers touch a domed cobalt blue sky while summer starts to slip away. □

CRAIG SPRINGER, Wildlife and Sport Fish Restoration, Southwest Region

## transitions

### Pacific Region



**Sarena Selbo** has been named the chief of the National Wildlife Refuge System

in Hawai'i, Idaho, Oregon, Washington, and the Pacific Islands, including America Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. With over 20 years in conservation, Sarena has worked for the Service at the field, regional, and national levels.

"The Pacific Region of the U.S. Fish and Wildlife Service protects unparalleled natural resources and wildlife—from the Mariana Trench to the Great Basin," says Hugh Morrison, acting Regional Director for the Service's Pacific Region. "Sarena Selbo's proven leadership skills, expertise in natural resource management and dedication to inclusive partnerships and community involvement will ensure that the National Wildlife Refuge System continues to thrive."

Throughout her career, Sarena has focused on partnership with communities, effective conservation across landscapes, connecting people with the outdoors and including new and diverse audiences in conservation. She started her career as an ecologist for the state of Ohio and has since held positions with the Service's Ecological Services Program and as Chief for conservation planning and policy for the National Wildlife Refuge System, Deputy Chief of the National Wildlife Refuge System in Alaska, Assistant Regional Director of Science Applications, and most recently, project leader for the Minnesota Valley National Wildlife Refuge and Wetland Management District Complex.

"The people, places, and wildlife of the Pacific Region are inspiring," says Sarena. "Working with communities, we are protecting some of the last best habitat and places for wildlife—and people to enjoy them—in the world. I am thrilled to serve in this position, to build on the great work already taking place, and find new ways to support the teams managing our public lands and water and the communities that count on them."

She received her Bachelor of Science in biology and chemistry from the University of North Dakota and Master of Science in ecology and evolution from the Ohio State University. □

### Southeast Region



**Tom Augspurger's** passion for restoration (and many of his freckles) began on Gulf Coast beaches.

After six years as the deputy project leader in the Raleigh Ecological Services Field Office, Tom has set his eyes back toward the Gulf. The Gulf Restoration Office is excited to welcome Tom Augspurger as its new Deputy Assistant Regional Director.

Growing up in Florida helped Tom foster a deep appreciation for conservation that led him to a career with us. He began his Service journey as a contaminants specialist working to reduce pollution and its impact on fish and wildlife. Tom then worked alongside a dedicated team focused on threatened and endangered species recovery and furthering the Service's mission in North Carolina as the deputy project leader in the Raleigh Ecological Services Field Office.

Tom's decades of experience make him a valuable addition to the Gulf Restoration Office and the entire team is looking forward to his leadership as we continue our restoration work in the Gulf. Welcome aboard, Tom! □

## honors

### Mountain-Prairie Region



**Amy Coffman** has been awarded the Department of the Interior's Environmental

Achievement award in Environmental Justice for her work with the transfer of National Bison Range.

The Consolidated Appropriations Act of 2021 restored the Bison Range to the Confederated Salish and Kootenai Tribes. As then-refuge manager of the Bison Range, Amy provided leadership and coordination that proved vital to the transfer. Her passion and skills were instrumental in leading Service staff through this change, while continuing to build and maintain vital Tribal relationships and ensuring a positive outcome for the wildlife and habitat at the Bison Range. Her honesty and compassion helped the staff remain positive through this transition, which had many uncertainties. The relationships that Amy built with the Tribes during the prior two years as refuge manager aided the transition process and made this historic event a success. On January 2, 2022, the Service formally left the Bison Range and turned over full management to Confederated Salish and Kootenai Tribes.



The transition to Tribal management has been smooth and that was largely due to the efforts of Amy Coffman.

In October, she brought her skill and passion to the regional office as one of the Mountain-Prairie Region's Native American Liaisons. **Cassie Powell** recently joined the Service in a second Liaison position. □

## Pacific Region



The Oregon State Land Board recognized the Three Rivers Fish Passage Restoration Project, funded in part by our **Columbia River Fish and Wildlife Conservation Office National Fish Passage Program**. This project is one of the first fully compliant fish ladders for adult Pacific lamprey, an anadromous fish native to the Pacific Northwest.

Designed and overseen by Oregon Department of Fish and Wildlife engineering staff, the project received funding, technical and species expertise, and permitting compliance from the Service. The team is hopeful that this collaboration will increase the attention to the unique Pacific lamprey passage needs in future passage projects in the region.

Located at the Oregon Department of Fish and Wildlife's Cedar Creek Hatchery, the nearly \$2.5 million project resulted in 14 miles of upstream passage for federally listed Coho and three species of concern—winter steelhead, Pacific lamprey and coastal cutthroat trout. □



**Kendra Maty**, lead cartographer for the Pacific Region's Realty Program, was

awarded the annual Rudolf Dieffenbach Award for her outstanding contributions to the Refuge System's land protection mission. The first secretary of the Migratory Bird Conservation Commission, Dieffenbach acquired more land for fish and wildlife than any other figure.

Throughout her 20-year career with the Service, Kendra has made a difference for conservation. She has provided exceptional cartographic support for the Realty Program, often going above and beyond to support field and Realty staff both regionally and nationally. The award recognized Kendra for providing support for two regions of the Service, mentoring new colleagues, and implementing regional and national tracking systems that resulted in more efficient and effective workload management. She is working to ensure the accuracy of cadastral data regionally and as a part of the Cadastral Data Working Group to create and improve an approved acquisition boundary data layer.

The award also recognized the important role she played in the eradication of yellow crazy ants from Johnston Atoll National Wildlife Refuge, including 20 deployments over 10 years to the remote Pacific island. Confirmed in 2021, this is the first time an invasive ant species has been eradicated at this scale in the United States, providing a road map for others battling similar invasive species. □

## Service-wide

In September, the Department of the Interior honored colleagues who have gone above and beyond the call of duty and exemplify the spirit and mission of the Department with the DOI Honor Awards, the most prestigious recognition that can be granted by the Department for career accomplishments, exceptional support of the Department's mission, or heroism.

### Distinguished Service Award

The highest honorary recognition an employee can receive within Department. It is granted for an outstanding contribution to science, outstanding skill or ability in the performance of duty, outstanding contribution made during an eminent career in the Department, or any other exceptional contribution to the public service.

**Laurel M. Barnhill**  
**Gina M. Shultz**  
**Michael Stroeh**  
**Michael D. Sciortino**  
**Barbara W. Wainman**  
**Priscilla (Polly) Wheeler**  
**Christopher E. Wilcox**

### Valor Award

This award is presented to Interior employees who have demonstrated unusual courage involving a high degree of personal risk in the face of danger.

**Jeremy B. Marble**  
**Jeremy V. Nguyen**

### Secretary's Diversity Award

The Secretary's Diversity Award recognizes and honors employees or groups of employees of the Department who have provided exemplary service and/or have made significant contributions to the Department in its efforts to increase diversity at all levels.

#### Individual

**Lorena Wada**

#### Group

**Edward J. Grace**  
**Corey W. Grant**  
**Victoria A. Owens**  
**Mynetta (Denise) Shorter**  
**Keith A. Toomey**

### Meritorious Service Award

Established in 1948, the Meritorious Service Award is the second highest honor award a career employee can receive for an important contribution to science or management, superior service in administration or in the execution of duties, or initiative in devising new and improved work methods and procedures.

**Roy C. Averill-Murray**  
**William B. Brooks**  
**Ora W. Dixon**  
**Katherine A. Garrity**  
**Judith A. Gordon**  
**Roxanna L. Hinzman**  
**Heather L. Johnson**  
**Kevin M. Kilbride**  
**Gwendolyn J. Kolb**  
**Carlos R. Martinez**  
**Paul M. Meyers**  
**Michael M. Morse**

# Fish & Wildlife News

Division of Marketing  
Communications  
U.S. Fish and Wildlife Service  
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Falls Church, VA 22041-3803

## parting shot



### Near-direct Hit

J.N. "Ding" Darling National Wildlife Refuge on Sanibel Island bore the brunt of Hurricane Ian in Florida when the hurricane made landfall in late September. The storm damaged areas throughout the Southeast. Recovery began soon after. It followed Hurricane Fiona, which hammered Puerto Rico. There, the Puerto Rican parrot team spent extra effort ensuring the endangered bird's safety. (PHOTO BY USFWS)

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