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Fish & Wildlife News

SPOTLIGHT

what's inside

features

On the cover: A damselfly in Anchorage, Alaska.

(PHOTO BY KATRINA LIEBICH/USFWS)

MORE FEATURES

departments

Martha Williams,
Director

Focusing on Collaborative Partnerships and Natural Infrastructure

So much can change in a year.

When we wrote about the Bipartisan Infrastructure Law in March 2022, we knew that the law:

- Was a once-in-a-generation investment that would help local, state, and Tribal communities tackle the climate crisis, all while boosting local economies.

- Provided the U.S. Fish and Wildlife Service with $455 million in direct funding over the next five years for the Service's programs related to America the Beautiful, as well as additional funding that would go to the states and Tribes for ecosystem restoration, wildland fire management, and other activities.

Over the last year we've coordinated with our conservation partners, Tribal nations, and communities to continue to enhance locally led conservation efforts and increase recreational opportunities on public lands through Bipartisan Infrastructure Law investments.

In 2022, we allocated nearly $111 million for just over 300 projects across the country. There are so many positive impacts resulting from this funding, and we're excited to highlight some of these in the following pages.

In the Bipartisan Infrastructure Law's inaugural year, we identified 12 projects in the Delaware River Basin, 33 in the Klamath Basin, and five in the Lake Tahoe area that will provide habitat restoration, invasive species control, conservation of at-risk species, and other benefits to these significant ecosystems.

The Service and partners also started work on 40 National Fish Passage Program projects, which are restoring habitat connectivity for aquatic species and reducing flooding risks and public safety hazards. And, we co-sponsored a National Fish Passage Bipartisan Infrastructure Law workshop to pull together diverse groups, including more than 100 practitioners from federal and state agencies, Native American Tribes, conservation organizations, and other partner organizations, to identify shared goals in an effort to make the most of this opportunity.

Through our Legacy Pollution efforts, we are creating climate resiliency by plugging 175 orphan wells on six national wildlife refuges in Louisiana and Oklahoma that are actively leaking hydrocarbons, methane, and contaminated water, posing a threat to wildlife, their habitats and people living nearby. Our Sagebrush Conservation Program is implementing 49 projects in the western states to conserve strategic areas within the sagebrush ecosystem and restore and safeguard precious water resources for neighboring communities and wildlife.

It's been an unprecedented year and I'm excited as we move into year two. Before us is exceptional opportunity to develop and build even stronger relationships with Tribal governments, Indigenous communities, state agencies, landowners, and many other partners. And, since these investments dovetail with the Department of the Interior's America the Beautiful, Inflation Reduction Act, and Great American Outdoors Act initiatives, they are collectively improving natural infrastructure and enhancing work we are already doing. We are also using Bipartisan Infrastructure Law natural investments as an avenue to encourage broader and more diverse communities to come together in partnership and make an impact.

In my book, the Bipartisan Infrastructure Law is a win-win-win for the U.S. Fish and Wildlife Service, the wildlife we are entrusted to conserve, and the public we serve. □

Boosting Bat Immunity

Through grants from the National Science Foundation and the Paul G. Allen Family Foundation, we're teaming up with the University of Wisconsin-Madison and the U.S. Geological Survey to develop a treatment to boost bats' immunity to the fungus that causes white-nose syndrome.

"This research is part of an approach to find a tool for every situation," says Jonathan Reichard, our assistant national white-nose syndrome coordinator. "As research is ongoing to refine the vaccine for white-nose syndrome, this project seeks to add a complementary treatment that may increase and extend the benefits of the vaccine. It also offers a treatment that can be delivered at a different time of year, opening additional opportunities for white-nose syndrome management."

Using a $1.8 million National Science Foundation grant, the university's Dr. Bruce Klein, graduate student Marcos Isidoro Ayza, and team will investigate how the *Pseudogymnoascus destructans* fungus invades bat skin, the roles of receptor cells in this invasion, and the potential for receptor inhibitors that can prevent disease in a combination vaccine and treatment strategy.

With a $150,000 grant from the Paul G. Allen Family Foundation, we will test the treatment with help from field staff and state biologists in the second year of the study. The funding will pay for travel to field sites and supplement Service funds for field equipment, like harp traps and Radio Frequency Identification (RFID) tags, for partners to capture and track bats.

A tri-colored bat in an Alabama cave shows signs of white-nose syndrome. (PHOTO BY DR. WILLIAM E. STONE/CREATIVE COMMONS)

White-nose syndrome affects hibernating bats and is caused by an invasive, cold-loving fungus. The fungus grows on and into bats' skin, disturbing their hibernation and leading to dehydration, starvation, and often death. First documented in New York in 2006, white-nose syndrome has since spread to at least 38 states and eight Canadian provinces and has been confirmed in 12 North American bat species.

For the researchers, the grant represents a creative partnership in and of itself. "This is a really nice way to go after a big problem of consequence," Klein says of the public-private partnership represented in the joint gift from the foundations. "NSF is interested in basic research, and the Paul Allen Foundation is interested in conservation biology. What a great marriage."

Klein is a physician scientist who is head of pediatric infectious disease at the American Family Children's Hospital, so his involvement in a continent-wide effort to conserve wildlife species is perhaps at first blush a little unexpected. Klein's work studying other fungal pathogens that affect people, like blastomycosis, led him to wildlife work. In his long-term research, Klein studies how fungi interact with the immune systems of mammals. His laboratory testing, in partnership with the Survey's National Wildlife Health Center and others at the university, showed that his blastomycosis vaccine would likely stimulate cellular immunity in bats and potentially protect against the white-nose syndrome fungus.

The work of their collaborator at the Survey, Dr. Tonie Rocke, set the stage for Klein and Isidoro Ayza's research. Rocke's 40 years of wildlife disease research includes a vampire bat rabies vaccine. Working for years on a white-nose syndrome vaccine, Rocke says this method for reducing fungal loads works in concert with a vaccination that has already been tested in the field and lab.

Rocke is excited to try Klein and Isidoro Ayza's treatment in the field as part of this multipronged approach. "Not all tools work for all species or all regions," she adds. "You have to tailor the goals to every region and every species."

Klein and Isidoro Ayza's plan has demonstrated promise in Isidoro Ayza's early laboratory work. "We are making very fast progress developing these tools," says Isidoro Ayza.

Logistical barriers to vaccinating and treating wild bats are challenging, and it will likely take several more years of laboratory and field work to arrive at a realistic strategy for protecting North America's hibernating bats. Doing so will take continued dedication of partners, as well as innovation. At the very least, though, the hope of the Service, Klein, Isidoro Ayza, and our partners is that the newly funded research will help develop and refine strategies for protecting vulnerable bat populations. □

GRETCHEN NEWBERRY, Ecological Services Program, Pacific Region; MARILYN KITCHELL, Office of Communications, Headquarters; JONATHAN D. REICHARD, Ecological Services Program, Northeast Region; WILL CUSHMAN, Science Writer, University of Wisconsin-Madison Office of University Communications.

Eliminating Barriers, Improving Access, and Promoting Conservation

Recreational fishing has experienced rapid growth in recent years. (PHOTO BY USFWS)

In March, we announced a cooperative agreement with the Recreational Boating & Fishing Foundation (RBFF) in the amount of $70 million over a five-year period to implement the National Outreach and Communication Program.

The communication program is a long-term effort established in 1998 to improve communications with anglers, boaters, and the public regarding fishing and boating opportunities; reduce barriers to participation; and promote safe fishing and boating practices as well as the conservation and the responsible use of the nation's aquatic resources. The program is funded by the Sport Fish Restoration and Boating Trust Fund, which is supported by manufacturers' excise taxes on fishing equipment, motorboat fuel, and other sources.

Thanks in part to efforts funded through the program over the past two decades, recreational fishing has experienced rapid growth in recent years — with substantial increases in female anglers, urban and multicultural families, and youth. This five-year, approximately $14 million-per-year agreement will allow us and RBFF to work together with states, Tribes, industries, and nonprofits to continue to improve fishing and boating access while engaging outdoor enthusiasts in natural resource stewardship.

"We are thrilled to continue our work to grow fishing and boating and create lifelong participants who value the resource," says RBFF President and CEO Dave Chanda. "The RBFF team is energized around a clear mission and vision to spread the joys of fishing and boating to all ages, genders, and cultures. We look forward to partnering with the U.S. Fish and Wildlife Service as we continue this important work to support our state, industry, and federal partners."

Moving forward, RBFF will continue its critical work to grow fishing and boating participation among new audiences including multicultural families with kids, women, and traditionally underserved and underrepresented communities. □

Don't Let the Sun Set on Evening Grosbeaks

Evening grosbeaks have long been a delightful presence, bringing joy to the lives of birders and people who feed birds. But sightings are increasingly less common, and flocks are getting smaller. Over the last 50 years, evening grosbeak populations have decreased more than 90%. Scientists are still working to understand the reasons why.

One reason: Researchers from the U.S. Geological Survey Bird Banding Laboratory have 100 years of bird band data showing that, in some decades, evening grosbeaks were the banded birds most commonly found after they had apparently collided with windows.

On April 4, 2022, David Yeany, an avian ecologist with the Pennsylvania Natural Heritage Program, banded evening grosbeak number 228 and 17 flock mates in Aroostook County, Maine. As part of a larger project focused on conserving evening grosbeaks, Yeany also attached a radio tag to 228. Almost two months later, 228's radio tag was heard near Cap Gaspe, Quebec, which is about 240 miles northeast of where it was banded in April. Yeany believes 228 may have spent its last nesting season near Cap Gaspe. Six months later and 920 miles away in Grand Bend, Ontario, 228 was killed when it collided with a window. Evening grosbeak 228 was around a year and a half old.

How many years would 228 have lived if the window had been marked with a bird safe design? Evening grosbeaks have been known to live for over 16 years. But we can't answer other questions. How many of 228's »

Over the last 50 years, evening grosbeak populations have decreased more than 90%. (PHOTO BY COURTNEY CELLEY/USFWS)

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flock mates hit windows? How many young birds would 228 have helped raise if it hadn't died in this collision? How many more miles would 228 have traveled? How many people would have enjoyed its visit to their bird feeders?

There is an urgent need for action so that birds like 228, and all species of birds, have a better chance of survival. It is still not clear why birds collide with windows, but we do know birds don't see clear glass and seem to collide with windows when they fly toward natural reflections of habitat, like sky or plants. Collisions also happen more when they fly toward lights shining through windows or from nearby porches and yards. Although some birds may seem fine after a collision with glass, most die later from head or other injuries.

The Solution

As many as 1 billion birds collide with glass every year in the United States. Fortunately, there are simple ways to help fix this piece of the evening grosbeak puzzle — by making our windows visible to birds. As we enjoy filling our winter yards with bright colors and songs, we need to take simple steps to help these beautiful birds. Prevention is the best option.

There are many inexpensive and attractive options for making windows visible to birds. Simply hanging a few hawk silhouettes or decals is NOT enough. Window patterns should include at least a 2-inch by 2-inch grid on the outside of windows, even if the dots are small. For low-cost, temporary methods: make and hang a paracord bird curtain or create decorative patterns using tempera paint and stencils. For more long-term solutions: apply decal markers (dots), external screens, or use fritted glass.

Now is the time to find a solution that matches your budget and style to treat your windows for immediate bird protection. This simple act can go a long way in protecting birds.

Together we can help these beautiful birds that bring the colors of sunshine and sunflowers to short winter days. □

JOELLE GEHRING, Migratory Bird Program, Headquarters

Dots help birds see windows.
(PHOTO BY JOELLE GEHRING/USFWS)

Riparian Brush Rabbits Rescued From Floodwaters on San Joaquin River National Wildlife Refuge

January's record-breaking rainstorms left endangered riparian brush rabbits in a lurch when water poured over levees on San Joaquin River National Wildlife Refuge in California. Knowing the rabbits would be getting corralled into small islands of high ground by the floodwaters, refuge staff jumped into action.

"Our biologists at the refuge complex quickly began trapping and rescuing riparian brush rabbits," says Fumika Takahashi, wildlife biologist at San Luis National Wildlife Refuge Complex, which includes San Joaquin River National Wildlife Refuge. "We had to be very careful about preventing the spread of rabbit hemorrhagic disease, which is highly contagious to rabbits."

Rabbit hemorrhagic disease was detected on San Joaquin River National Wildlife Refuge in 2022 after two years of vaccination efforts by refuge staff and partners in the riparian brush rabbit working group. Vaccinating the rabbits is one of the most important actions the Service and its partners can take to support the rabbit's recovery.

For January's flood rescues, administering the life-saving vaccination immediately became a part of the plan.

"Our crew of biologists, along with the refuge manager and other staff, worked long and challenging hours," Takahashi says. "We successfully rescued, vaccinated, and tagged 103 rabbits, and moved them to higher ground on the refuge."

The endangered riparian brush rabbit is found only in California's Central Valley. Winter flooding can put the small population at risk. (PHOTO BY DON COOL)

Preparing for Future Floods

While January's rain events were particularly severe, it was not the first time San Joaquin River has flooded the refuge.

"The last time the refuge flooded was in 2017. It's definitely a growing concern with climate change because we're seeing more long periods of drought followed by high rains and flash floods," says Maggie Sepulveda, senior fish and wildlife biologist in our Sacramento Fish and Wildlife Office's San Joaquin Valley Division.

In the past, when the San Joaquin River flooded, the rabbits were able to easily retreat to upland areas. With the modern levee system around the river, those paths to the uplands have been »

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lost and the flooding is now more confined to where the rabbits live. San Joaquin River National Wildlife Refuge is working to restore the river's floodplains and provide more upland habitat for the rabbits to retreat to in times of flooding.

"Riparian brush rabbits are especially vulnerable to floods because they live at the edges of rivers," says Eric Hopson, refuge manager at San Joaquin River National Wildlife Refuge. "They only live in a small area and there aren't many of them, so events like this can have a big impact on their population and recovery."

To help the subspecies survive future floods, the riparian brush rabbit working group is working to establish a satellite population of rabbits at San Luis National Wildlife Refuge, where the habitat is more flood resilient.

"There are several strategies we're working on to help the riparian brush rabbit recover," says Sepulveda. "The Service is working alongside so many passionate partners who are determined to protect the future of this species." □

CAL ROBINSON, Office of Communications, Pacific Southwest Region

Federal Excise Taxes Paid by Hunters Help Fund Massive Public Land Purchase in New Mexico

The 54,000-acre addition to New Mexico wildlife area will open the area to hunters, birders, other nature enthusiasts. (PHOTO BY NEW MEXICO DEPARTMENT OF GAME AND FISH)

If you need a reminder that the world is held together by stone and story, then consider Marquez Wildlife Area and its recent addition, the L-Bar Ranch, with its rocks and rills and temple hills near Laguna, New Mexico.

The New Mexico Department of Game and Fish acquired the L-Bar Ranch completely in late 2022, in part through Pittman-Robertson funds, excise taxes paid by firearms, ammunition, and archery manufacturers. The property expanded the existing Marquez by 54,000 acres — 84 square miles — of public land soon to be open to hunters and birders and nature enthusiasts.

This newly expanded Marquez is a varied land, rising from open savanna to its upper reaches at 9,000 feet above sea level, with vertical yellowish Jurassic cliffs at the edges of intriguing mesas. Natural depressions pock the grasslands, catching summer monsoons where migrating waterfowl tarry in the fall. Its hillocks are studded with live oak, juniper, and manzanita and may hold Mearns, Gambels, and scaled quail. Higher up, mixed confiner — spruce and fir and ponderosa pine stands — broken only by alpine meadows harbor elk, mule deer, black bear, dusky grouse, and Merriam's turkey.

Plans are underway to release pronghorn antelope on the lower-elevation grasslands now rested from domestic sheep and cattle grazing perhaps for the first time since the 1590s. The pronghorn will be trapped, examined by a veterinarian, and transplanted from northeast New Mexico in labor-intensive work also funded via Pittman-Robertson.

Aside from its massive size, acquisition of the L-Bar Ranch brings added values: It connects large swaths of existing public lands managed by the Bureau of Land Management to the north and the U.S. Forest Service to the southwest. This is especially important in science-based wildlife management by providing migration corridors for elk and mule deer, where the herds can better fulfill their habitat needs throughout the seasons. Properly managed, the lands in their totality will provide calving and nursery areas, summer range, and wintering habitats for deer and elk. A former alfalfa field fed by pivot irrigation on the L-Bar will now push up winter wheat for wildlife. A litany of songbirds visit the area on their north-south seasonal routes as stop-overs; others stay and nest and raise their broods adding their sweet audible incense to the summer air. »

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Vistas on Marquez are long, grand, and arrested only by the curve of the Earth. The stone features possess a story all their own.

The camel-colored cliffs are layered like a tall cake, marking flooding and receding seas from deep time. The Jurassic strata are littered with seashells. Mount Taylor looming large to the west on Cibola National Forest land is a dormant volcano, snow-tipped most months of the year. It's a sacred site to Native Americans. Plugs from several smaller extinct volcanoes vault from the valley floor on Marquez, and all of them have a name and spirit to the Native and local people who live nearby.

Art from the earliest inhabitants of the area graces flat stone walls and angular boulders, revealing observations of the world experienced in the past, piercing the marrow of our current understanding: Etched in stone, a human figure draws a bow on a standing elk.

After 400 years of sheep and cattle grazing, the addition to Marquez is expected to yield more public opportunity to interact with wildlife and the land much like a Native American recorded in a petroglyph perhaps seven centuries years ago.

To learn more how Pittman-Robertson is used for conservation, visit Partner with a Payer.

CRAIG SPRINGER, Wildlife and Sport Fish Restoration, Headquarters

Racing Across Selawik National Wildlife Refuge

It is early April above the Arctic Circle, and the temperature reads a cool -28 degrees at 3 a.m. Northern lights flicker in green and purple over a small cabin and two tents. A faint shuffling noise drifts up from the frozen, quiet river, and a few minutes later light from a headlamp shines through the trees.

Next, a string of dogs streaks into view and then vanish just as quickly back into the night, pulling their sled and passenger out onto the tundra—the first racer to pass by the Paniqsgivik shelter cabin in the annual Kobuk 440 sled dog race.

More mushers follow as the night gets later and breaks into a frost-covered, sunny day. Many stop to rest at the cabin, warming up inside by the wood fire and heating up food for themselves and their dog teams. The dogs rest as well, curled up and bedded down in piles of straw. Selawik National Wildlife Refuge staff keep the fire going around the clock and greet the teams, one way of supporting this important regional race that runs across much of the refuge, as well as the Kobuk Valley National Park in northwestern Alaska.

Mushing has long been a way of life in northwestern Alaska, used by the Iñupiat for generations to travel across large expanses of sea ice, open tundra, and boreal forest during the winter months.

Today, people still cross this area on winter trails that connect communities using dog teams and sleds. The trails, though, are multi-use: shared by snow machines, mushers, and the occasional skier or someone on a fat-tire bike. Travelers on the trails must be self-supported and ready for extreme conditions. Emergency shelter cabins, like Paniqsgivik, dot the landscape and offer vital survival options for those who encounter trouble. This trail network is administered by the Northwest Arctic Borough in partnership with the refuge, park, and local community search and rescue volunteers.

The Kobuk 440 race aims to keep the tradition of mushing alive and is a mid-distance, challenging race that takes several days to complete a circuit from Kotzebue to Kobuk and back, approximately 440 miles. Mushers pass through communities on the way, where they find support and celebration.

"During the race, checkpoint communities come together to celebrate the Iñupiaq way of life, respect for nature, community wellness, and heritage," the Kobuk 440 Racing Association says.

Mushers have an opportunity to cross the refuge on nearly soundless sleds. A musher recounted a particularly memorable scene while she rested at Paniqsgivik during the 2022 race: As she crossed an open tundra plain, she saw the sun just coming up in winter pastel colors, catching the pink hues of her dogs' jackets. Later that day, she passed part of the Western Arctic caribou herd as they foraged on the refuge, the sun nearly ready to set over the quiet, snowy hills. □

Two racers in the 2022 Kobuk 440 mush across Selawik National Wildlife Refuge.
(PHOTO BY LISA HUPP/USFWS)

Partners Break Ground on Largest Salt Marsh Restoration on East Coast

Twice a day, high tide fills salt-marsh creeks with nutrient-rich ocean waters that feed Cape Cod's vital estuaries and their inhabitants, from ospreys to river herring to eastern oysters.

But for more than a century, the rising tide has hit a wall at the mouth of the largest tidal river on Cape Cod, Mass.

In 1909, in a misguided attempt to reduce breeding habitat for mosquitoes, the state funded an earthen dike at the opening of the Herring River in Wellfleet, restricting tidal flow to the nearly 900-acre estuary.

Cutting off the river from salt water launched a downward spiral for the once-mighty marsh, ushering in an era of fish kills, invasive species, bacterial contamination, marsh subsidence, and ironically, more mosquitoes.

These are all symptoms of an unhealthy marsh that could no longer provide high-quality habitat to wildlife and associated benefits to people, like storm protection.

Opening Day

Now, the wall between the Herring River and the tides is opening up.

After years of planning, conservation partners broke ground on a project to replace a portion of the dike with a bridge, outfitted with sluice gates that will be opened incrementally to restore full tidal flow to the system.

The groundbreaking is a milestone for the town, and for the broader conservation community — it's the largest salt marsh restoration in the eastern United States.

"We're thrilled to be a partner in restoring the Herring River to a naturally functioning tidal marsh that is more resilient to climate change and supports wildlife and people," Wendi Weber, Deputy Director for the Service, said at the groundbreaking. "This conservation project is a great example of the type of durable, nature-based solution that results from locally driven efforts and is needed up and down the coast."

It Takes a Village

For more than a decade, the Town of Wellfleet has been working with the National Park Service — most of the Herring River system lies within Cape Cod National Seashore — to plan the restoration project, based on years of research that demonstrated the need for it.

Numerous other partners have played key roles in the effort, including the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture's Natural Resources Conservation Service, the Massachusetts Department of Fish and Game's Division of Ecological Restoration, and the nonprofit Friends of Herring River.

For our part, we provided technical support through our Partners for Fish and Wildlife and Coastal programs, and engineering design support through our Fisheries Program. Also, our Migratory Birds Program awarded a $2 million North American Wetlands Conservation Act grant to Ducks Unlimited for the restoration.

After years of planning, conservation partners broke ground on the first phase of a project to replace a portion of the dike with a bridge. (PHOTO BY BRIDGET MACDONALD/USFWS)

The project has been hailed as a nationally significant model for using science and smart investments in infrastructure to repair environmental damage, increase community resilience, and support the local economy.

A New Era

What will it look like? Picture a homecoming.

Over time, the river herring run, once among the largest in New England, will likely return, as migratory fish like alewife can once again reach historic spawning grounds. Commercially valuable fish species that feed on herring, like cod and haddock, are set to benefit.

Returning tidal flow will carry nutrients and sediments needed for the marsh to rebuild, and eventually, the saltmarsh sparrow, a species that breeds solely in the salt marshes of the Northeast, may find the high-marsh habitat it needs to nest.

As water quality improves thanks to twice daily tidal flushing, the area should support a resurgence of eastern oysters.

And the marsh may once again be a nursery for small fish that feed on mosquito larvae.

With six miles of creeks to explore, canoers and kayakers will surely reappear, too.

Other benefits will be harder to see.

For more than a century, the degraded marsh has released carbon dioxide and methane into the atmosphere. The return of tidal flow will reverse that process, rebuilding peat soils that sequester carbon. Revived marsh vegetation will add to climate benefits.

A healthier marsh will also absorb storm surge and floodwaters from increasingly frequent intense storms, offering nearly a billion dollars' worth of protection from hurricanes to people and property.

Not to mention, the construction work required to complete the project, currently estimated at about $70 million, is expected to generate between $112 and $126 million in regional economic output and create between 1,120 and 1,680 jobs.

And the new bridge, designed to modern standards, will enhance public safety on the road and in the waterway.

The tide will once again bring life into the Herring River's creeks, and vitality to the surrounding community. □

BRIDGET MACDONALD, Office of Communications, Northeast Region

The Bipartisan Infrastructure Law provides long-term funding to plug abandoned, or orphan, oil and gas wells on national wildlife refuges and reclaim those sites to eliminate environmental and public safety hazards.

(PHOTO BY USFWS)

BIPARTISAN INFRASTRUCTURE LAW FUNDS PROVEN PROJECTS FOR WILDLIFE

A little over a year ago, *Fish & Wildlife News* featured various infrastructure projects we're involved in. The Bipartisan Infrastructure Law passed in late 2021, but we didn't have many specifics to share beyond the overall amount we would be directly appropriated: $455 million over five years. The goal of the winter 2022 magazine was to make clear that infrastructure is a key part of who we are. // Now we know where the Bipartisan Infrastructure Law is making its presence felt—pretty much everywhere. In 2022, we allocated nearly $111 million for just over 300 projects across the country. Read on for a glimpse at a few of them. ››

A fish passage project in Gustavus, Alaska reconnects the Mountain View and Flats Creek drainages to provide unimpeded access to six miles of rearing habitat for juvenile Coho salmon. The Bipartisan Infrastructure Law provided funding for the final bridge.
(PHOTO BY TRENT LIEBICH/USFWS)

INFRASTRUCTURE 'GLOW-UP'

Bipartisan Infrastructure Law funds National Fish Passage Program projects, supporting aquatic species, recreational opportunities, and flood prevention. | *By* ANNA REHKOPF

Eastern brook trout are an essential species in their ecosystem and a popular fish for anglers.
(PHOTO BY RYAN HAGERTY/USFWS)

As you learn, grow, and mature, you may find yourself in new places, trying new things. Sometimes you get stuck in a rut and feel the need to shake things up—a new haircut, new job, new town. As a person, you have the freedom to move and transform when life beckons you to make a change. It's all a part of growing up. ››

If you were say, an American eel, your life's journey would take you from an egg to larva, to a tiny clear eel, then a yellow, little bigger one, then a brownish gray one with larger fins. So many metamorphoses have brought you to adulthood and you're ready for one last transformation: parenthood. It's time to leave your freshwater home and head back to where you were born — the salty seas. It's a big move, you've got a long trip to the Sargasso Sea, but something in you knows how to get there — so long as nothing blocks your path.

Now, what if you happen to be a choke point in the path for aquatic species like eels and fish, maybe a backed up, decaying culvert or a dam? You might be imagining your own transformation, and your time of renewal could be just around the corner… an infrastructure glow-up if you will.

Across the country, people are working to transform and replenish lands and waters — creating opportunities to connect with nature and improving safety around tributaries. In some ways, we are attempting to turn back the hand of time. We want to give nature a chance to be itself again. When we remove a dam, or take out other barriers along a waterway, we give nature a chance to revert to its true form, to become vibrant and rejuvenated.

Some efforts are relatively simple (in theory) — resizing and improving a stream crossing like a culvert, adding some rocks to create riffles for better mussel habitat. Other projects require much more heavy lifting — literally — like removing a dam. But with each barrier removed or altered, nature creeps back in, and the results are phenomenal.

"As enthusiasm builds around barrier removal, the East Coast is experiencing a boom in projects aimed to connect aquatic animals to their homes." says fisheries biologist Levi Morgan of our Appalachian Fish and Wildlife Conservation Office. "Our goal is to allow a stream to be a stream again. By utilizing funding from the National Fish Passage Program and Bipartisan Infrastructure Law, we are able to start piecing together waterways like we are doing with the Potomac Headwaters Fish Passage project. As a visitor to project sites, you can see the changes for yourself. Some tributaries are functioning as they would before human infrastructure impacts — life is moving up and down unencumbered."

This work is imperative to living things that spend their entire existence in one watershed and those who must migrate back and forth between river and ocean. It's not like there's an alternate way to go. They can't hop out of one stream and walk over to another.

Imagine heading home to your apartment on the third floor, but someone put a wall up at the second set of stairs. For some, it would be an interesting but doable climb to get over. For others it would be impossible to surmount this new barrier. Your home is right there. You can see it. You know your full fridge and cozy bed are there waiting for you, but you can't get to them.

Now imagine this was the case for 50 years, 100, 300. You would move, right? You could begrudgingly find a new place if you HAD to, but the animals in these streams have nowhere else to go. They will keep heading up that first stairwell, getting thwarted by that wall, over and over again.

With each completed project, each barrier removed or improved, not only do we help species conquer the obstacles that keep them from their homes, but we also fix unsightly, sometimes unsafe, ››

Work on restoring the flow of the Sabattus River.
(PHOTO BY MAINE DEPARTMENT OF MARINE RESOURCES)

After removal of its Highland Dam, the West Fork River in West Virginia has blossomed. (PHOTO BY CALLIE MCMUNIGAL)

Restored access benefits fish and other aquatic organisms in a variety of ways. It promotes connection to places where animals can weather the seasons, it provides access to food, and opens nursery habitats and breeding grounds. In the case of the American eel, young can reach the freshwater habitat needed to grow up, and the adults gain passage to the Sargasso Sea.

With all this access restored, there will be young fish to replenish the population. We may yet beat the cycle of adult fish aging out and the population will bounce back.

While fish or mussels may go un-noticed by most people, after all neither have ››

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infrastructure and, in some cases, connect people to two sides of a stream. However, the main goals are always front and center: protect communities from flooding rivers and streams and restore aquatic connectivity for *all*.

This concept is based on opening rivers and their tributaries in a watershed to allow for effective movement throughout for aquatic organisms like fish, eels, and mussels. Working with partners, landowners, and other agencies, we take out or replace a barrier with something a fish can safely swim through or over.

"We received some exciting news from our Trout Unlimited partners, who have been spearheading the Potomac restoration project(s)", says Morgan. "[They] observed Eastern brook trout moving through the newly constructed, aquatic-friendly box culvert on a tributary to Blue Lick Run, just three short months after the project was completed."

The original fish passage structure on a tributary to Blue Lick Run was decaying and ineffective. The larger opening allows for fish passage and a bridge over the stream safe for vehicular traffic. (PHOTO BY TROUT UNLIMITED)

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the perceived charisma of something like a mountain lion, their impact on their ecosystem is just as significant. Both can serve as a river's version of the canary in the coal mine. They can be indicator species for their watershed, and even though they literally don't have a voice, they tell us a lot about the health of their environment—and we're listening.

"Aquatic species curate a waterway into a place full of microhabitats for other organisms," says Morgan. These unheralded species recharge and energize their environment by spreading nutrients through biological function—food consumption and expelling of waste—and physical movement in the water. When a habitat is severed or fragmented by barriers like a broken-down culvert, this process is thwarted, resulting in less capacity to support life instream and on land.

"Not only do fish and other aquatic species simply deserve to exist, but they ensure that other animals survive and thrive," Morgan adds.

As people help the landscape shed its old, crumbling dams, caved-in culverts, and undersized bridges, a brighter, healthier, and safer ecosystem will emerge. Yawning back to life. Fish will swim farther and farther up their rivers and streams, mussels will wedge themselves in new riffles and whitewater, and people will be able to fish, hike, and paddle in new places.

ANNA REHKOPF, Office of Communications, Northeast Region

What is the National Fish Passage Program?

The National Fish Passage Program provides funding and technical assistance to help remove or bypass barriers and reconnect aquatic habitats that support healthy fisheries. Millions of obsolete or poorly designed dams, roads, and levees in the United States keep fish and other aquatic species from moving freely to feed, migrate, and reproduce. These barriers disrupt healthy ecosystems and are a major cause for the decline in fish populations and freshwater mussel species across the globe. By removing obsolete and dangerous infrastructure we also eliminate public safety hazards, improve climate resilience, and restore river ecosystems. Improved infrastructure also benefits communities by saving money in long-term repair and replacement costs.

Migratory fish rely on free-flowing connected rivers for their survival.

Freshwater ecosystems are some of the most biodiverse places on the planet. They cover less than 1% of the planet's total surface, yet they're home to almost a quarter of all vertebrate species – including over half of all the world's fish species. Despite their global importance, freshwater ecosystems and the species that inhabit them have been heavily impacted by the proliferation of barriers like dams, undersized culverts, and watershed development that blocks fish from their natural migrations. In the United States alone, over 50 aquatic species have already been declared extinct, and many others are critically endangered or threatened. These species and many others depend on connected streams and high-quality habitat to survive.

Since 1999, the National Fish Passage Program has:

- Worked with over 2,000 local communities, Tribes, and private landowners across the country
- Removed or bypassed over 3,400 barriers to fish passage
- Reopened access to over 61,000 miles of upstream habitat for fish and other wildlife

Fish Passage Projects under the Bipartisan Infrastructure Law

The Bipartisan Infrastructure Law included an additional $200 million for restoring fish and wildlife passage by removing in-stream barriers and providing technical assistance under the National Fish Passage Program. The funding is distributed over five years, providing a once-in-a-generation opportunity to invest in our nation's rivers, streams, and communities. In the first two years of Bipartisan Infrastructure Law funding, the National Fish Passage Program has announced:

- $73 million in funding
- 79 projects across the country
- 204 barriers removed
- 6,420 stream miles reopened

SAVING HAWAI'I'S FOREST BIRDS

Service involved in Department of the Interior multiagency strategy for preventing imminent extinction of endangered species.

'Akikiki is one of several forest birds native to Hawai'i and at a high risk of extinction due to avian malaria, a disease transmitted by invasive mosquitoes. For some species a single bite by an infected mosquito can kill.
(PHOTO BY JIM DENNY)

The Service is among several Department of the Interior agencies working to prevent the extinction of Hawaiian forest birds imperiled by mosquito-borne avian malaria.

The multiagency strategy, announced in late 2022, includes more than $14 million in funding from President Biden's Bipartisan Infrastructure Law and other appropriations to address avian malaria, which causes widespread mortality of honeycreepers, found nowhere else in the world, and other forest birds.

Hawaiian forest birds are an integral ecological and cultural component to the Hawaiian Islands. They are indicative of the health of the forest and remain a cultural connection between the Native Hawaiian Community and the Hawaiian Islands. Many native species found only in Hawai'i evolved for centuries ››

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in isolation, free from threats such as avian malaria spread by invasive mosquitoes.

"Hawai'i's forest birds are facing an extinction crisis, in part because rising temperatures caused by climate change have enabled mosquitoes to reach high-elevation areas that were once sanctuaries for these birds," says Assistant Secretary for Fish and Wildlife and Parks Shannon Estenoz. "Through the Bipartisan Infrastructure Law and other investments, we can help protect and conserve these species through a coordinated strategy that considers Hawai'i's unique ecosystems and the islands' natural and cultural heritage."

In addition to the Service, the Department's U.S. Geological Survey, Office of Native Hawaiian Relations, National Park Service, and Office of Policy Analysis are coordinating on the strategy.

"The forest birds of Hawai'i are unique, not only because of their evolutionary history but their cultural significance to the Native Hawaiian people," says Earl Campbell, field supervisor of our Pacific Islands Fish and Wildlife Office. "We must continue working with our conservation partners as we strive to preserve our forest birds for future generations."

Avian malaria causes widespread mortality of Hawaiian forest birds, and a single bite by an infected mosquito is fatal for some species. Four Hawaiian honeycreepers — 'akikiki (Kaua'i honeycreeper), 'akeke'e (Hawaiian honeycreeper), 'kohekohe (crested honeycreeper) and kiwikiu (Maui parrotbill) — may go extinct within the next 10 years. Nine additional bird species are at risk of extinction in the foreseeable future if landscape-level management solutions cannot be implemented.

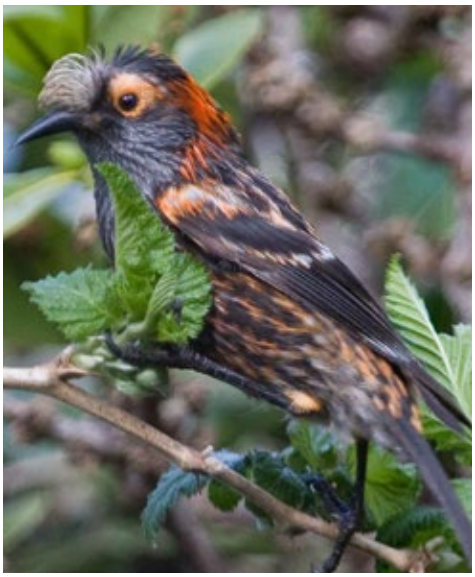
Agencies from the Department and Hawai'i have worked together for many years with partners in the Birds, Not Mosquitoes working group on a comprehensive initiative to prevent the extinction of Hawaiian forest birds. This strategy puts forward a unified vision and approach by the Department's bureaus and offices to strengthen internal coordination and effectiveness in collaborating with the state, the Native Hawaiian Community, and other partners.

Investments from the Bipartisan Infrastructure Law support the ability of federal partners to make strategic and significant ecosystem restoration investments in Hawai'i forest bird conservation, including:

- Conducting an environmental assessment led by NPS and in cooperation with the Hawai'i Department of Land and Natural Resources to evaluate the impacts of deploying a new technique to manage mosquitoes, using a naturally occurring bacteria known as Wobachia, to reduce the mosquito vector of avian malaria. This technique is essentially birth control for mosquitoes. The proposed project area includes lands on Maui within Haleakala National Park, adjacent state lands, and private conservation lands that are managed by The Nature Conservancy.
- Hiring and deployment of field staff to expand the Insect Incompatibility Technique (IIT) effort, as the Wobachia technique is known, to Kaua'i
- Increasing the Department's and Hawai'i's efforts in IIT product development, testing, and deployment
- Contracting and planning for construction of additional captive care facilities in Hawai'i for forest bird conservation
- Planning for translocation of some forest birds to higher mosquito-free habitats on Hawai'i Island
- Funding USGS research to confirm efficacy of deploying IIT and identification and development of next-generation tools that could include biotechnology for targeting mosquitoes or increasing malaria resistance in birds
- Incorporating Native Hawaiian biocultural knowledge into all planned conservation actions, including use of appropriate traditional cultural protocols and practices

Successful implementation of this plan can serve as a model approach with transferrable science applications of how to mitigate and reverse the combined impacts of invasive species and climate change at landscape scales to preserve both biodiversity and biocultural connections. □

(Top) From 2000 to 2018 the range of 'akeke'e (top) diminished 60%. (PHOTO BY JIM DENNY) (Bottom) The 'akohekohe lives in an area of about nine square miles. (PHOTO BY ROBBY KOHLE)



PROTECTING WESTERN WETLANDS

(DOUG LESTER/USFWS)

Historic investments to benefit Klamath Basin refuges for future generations. | *By* ELISE HILLMAN

Lower Klamath National Wildlife Refuge was established by President Roosevelt in 1908 as the nation's first waterfowl refuge. This 46,900-acre refuge provides feeding, resting, nesting, and rearing habitat for waterfowl, making it a key stop-over for migrating birds.

Tule Lake and Upper Klamath National Wildlife Refuges followed in 1928. Tule Lake's 39,116-acre refuge also provides essential habitat for migratory birds, including tens of thousands of waterfowl, shorebirds, and songbirds. Upper Klamath National Wildlife Refuge's more than 23,000 acres is home to over 350 bird species, and visitors can often spot bald eagles or nesting osprey nearby.

These refuges are part of a complex of six national wildlife refuges in the Klamath Basin, whose combined mission is to protect what remains of what once was the largest wetland area west of the Mississippi River.

But the Klamath Basin refuges have been facing a significant water crisis due to drought conditions and lack of water allocations, resulting in the loss of habitat for waterfowl and other species.

"The current water crisis in the Klamath Basin is greatly impacting fish and wildlife that rely on wetland ecosystems," says the complex's supervisory fish and wildlife biologist, John Vradenburg. "Many species are having a hard time finding adequate habitat and resources, which can have a long-lasting impact on their populations and overall health of the ecosystem."

However, through partnerships and funding opportunities from the Bipartisan Infrastructure Law and the Inflation Reduction Act, we're working to mitigate this crisis and ensure that the Klamath Basin's unique natural resources are protected so they may be enjoyed by future generations. In 2022, the Bipartisan Infrastructure Law invested $26 million in the Klamath Basin for 32 ecosystem restoration projects and the expansion of Klamath Falls National Fish Hatchery, which will help prevent the extinction of two federally protected species found only in the Klamath Basin.

"Funding provided by the Bipartisan Infrastructure Law will improve wetland habitat on both Lower Klamath and Tule Lake National Wildlife Refuges for waterfowl, wetland-associated birds, and other fish and wildlife by improving access to alternative water sources, including from drainage and irrigation return flows, and increasing capacity to manage and move water through different parts of the refuges," says Klamath Basin National Wildlife Refuge Complex project leader Greg Austin.

While today's Klamath Basin wetlands represent just a small fraction of what existed in prior years, historically this vast and diverse wetland complex supported over 80% of all waterfowl in the Pacific Flyway during the spring and fall, providing critical stopover habitat in which they can feed, rest, and regroup before continuing their difficult migrations north and south.

"We must work together to find solutions that balance the needs of humans as well as fish and wildlife, ensuring that these important habitats and the broader watershed benefits they support are protected and restored. The Klamath Basin wetlands are essential for the recovery of species, future water security, and communities throughout the watershed," Vradenburg says.

Adds Service fish and wildlife biologist Greg Gray, "As someone who has worked and lived in the Klamath Basin for over 20 years, I have seen firsthand the incredible diversity of wildlife that the area supports."

Despite the challenges the basin is facing, we remain committed to protecting and preserving the important habitats and the wildlife, and communities, that depend on them. □

ELISE HILLMAN, Office of Communications, Pacific Southwest Region

(Top) Cooper's Hawk at Klamath Basin National Wildlife Refuge Complex. (PHOTO BY USFWS) (Bottom) Bald eagle at Tule Lake National Wildlife Refuge. (PHOTO BY DAVE MENKE/USFWS)

RESTORATION COLLABORATION

Rufa red knots feed on the eggs of horseshoe crabs in spring in Mispillion Harbor in Delaware.
(PHOTO BY GREGORY BREESE/USFWS)

Rufa red knots need places to rest and recharge, and we're working with partners to ensure they remain available. | *By* ANNA REHKOPF

Imagine jet-setting from Tierra del Fuego up to the Arctic, stopping at sunny, beautiful beaches along the way—sounds like a dream, doesn't it? For the rufa red knot, a rusty-colored shorebird, it is a way of life. These masters of aviation may fly over 9,000 miles each way during their spring and fall migrations—sounds a little less like a vacation and a lot more like work, doesn't it?

Work is right, and an important source of the birds' energy for these massive trips across the globe: tiny, blueish, horseshoe crab eggs, millions upon millions of them. These little eggs are a "calorie powerhouse," says Service biologist Danielle McCulloch.

The biggest threat to the species is anthropogenic: Human action has resulted in warmer temps, rising sea levels, and massive storms that are threatening these shorebirds.

Understanding this impact, the Service and partners have been hard at work tracking the birds on their long migrations to see where they stop, rest, and recharge. This has been key to determining where work is focused to restore their habitat.

While we try to get a grip on climate change and how to lessen its effects, the rufa red knot is going about its business of finding beaches to land and feed on. The problem is…some of those beaches are gone.

Swept Out to Sea

Massive storm systems, like 2012's Hurricane Sandy, send high winds and waters to shores worldwide. Flooding rips into communities, destroying infrastructure and polluting waterways, while disorienting migrating birds and stripping beaches of sand.

Service partner and wildlife biologist Larry Niles recalls one rufa red knot that found itself in a tropical storm—something becoming all too common on the Eastern Seaboard.

A horseshoe crab lies flipped over on its back at Mispillion Harbor, Delaware. (PHOTO BY GREGORY BREESE/USFWS)

"We had a bird that was [tagged in] Delaware Bay and went up into the Arctic, then headed south," Niles says. "It went to Monomoy Wildlife Refuge [in eastern Massachusetts] and then left to go to South America—hit a storm and was out 1,000 miles. It got blown out into the middle of the Atlantic Ocean, and then turned around and came back, before making its way to New Jersey and on to Brazil."

Intense winds sent this bird—and presumably a flock along with it because rufa red knots don't travel solo—out to sea. It was a dangerous situation not only because our flighted friend could have been lost for good in those terrible winds but also because the extended side trip certainly cost it precious time and energy.

We will never know how many birds accompanied this one, or what number of them made it back to shore.

Given that the rufa red knot can fly such great distances, you may be thinking, "So what if you and your habitat are being swept away, find another beach, bird!" But it isn't that simple. Not only are Delaware Bay beaches important pit stops for the birds on their journeys, they're also prime locations for those little fuel packs mentioned earlier. ››

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Horseshoe crabs spawn and lay eggs in tidal sand—the wet, soft sand where waves crash and run up the beach. After Sandy, not only was most of the sand missing, but our prehistoric pals had to run a gantlet to reach what was left. A perilous path of rocks and nooks and crannies was waiting on the crabs. Given their shape is not unlike a turtle's, if a crab flips over on its back, there's not much it can do to right itself. So, aside from missing their sandy breeding grounds, the horseshoe crabs were getting stuck trying to reach someplace, anyplace, to lay their eggs—a pitiful sight, and a massive red flag for red knots.

On the Move

Luckily, the Service and partners like the American Littoral Society were on the move, and fast. Planning began immediately, and projects to restore beaches in New Jersey were underway within a few months. Sand was, and continues to be, reintroduced to the habitat.

In an effort known as a "shell-ebration," partners placed breakwaters made of shells just off the re-created beaches. These barriers have strategic gaps for the horseshoe crabs to pass through safely but keep the worst of the waves from running off with the sand.

(Above) Over 25,000 shells were bagged by locals, partners, and the Service, to make breakwaters in an effort to stabilize the sand. (PHOTO BY DANIELLE MCCULLOCH PROSSER/USFWS)

(Below) Side by side images, one of a rocky shore and one of the same place with smooth sandy beaches

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All In

Soon after "Superstorm Sandy," conservationists realized they would need not only the support of the community but also their direct help.

"We really worked hard to engage the communities—we got them involved in the work. It strengthened their own connection to the bay through a conservation lens but also helped them see the benefits that [this work] could bring to the rest of their lives," says Tim Dillingham, executive director for the American Littoral Society.

Locals depend on the bay, whether they make their incomes from the fishing industry or tourism, or simply enjoy birding and the surf washing over their feet—people need each other and the restoration of this ecosystem. And much like the horseshoe crabs that make landfall in Delaware Bay every year, "the local community is hardy," says Dillingham.

Locals drove dump trucks full of sand to deposit back on the beaches. They helped create breakwaters by packing 25,000 bags with shells. The Service taught partners to drive the swamp buggies, or "marsh masters," needed to haul the shells for the breakwaters. Captain Al Modjeski, habitat restoration director for the American Littoral Society, recounts, "Within two months of restoring the beaches, the horseshoe crabs were back." And laying eggs—giving rufa red knots a well-needed boost!

The collaborative effort between the community, partners, and the Service was immense, and the investment continues.

The American Littoral Society has been a primary partner in the effort to bring back beaches, receiving Service grants through the Delaware Watershed Conservation Fund from 2018-2021.

They will be hauling sand to make beaches later this year. Dillingham and Modjeski value and understand the importance of connecting and building a relationship with the community. After such tremendous loss and hardship, it's imperative that people know the Service and our partners are—and will continue to be—there to help.

"We haven't abandoned them; we aren't leaving; and we haven't left since Sandy," says Modjeski.

That commitment will endure.

Horseshoe crab eggs are a "calorie powerhouse" for many animals along the coast. (PHOTO BY AMERICAN LITTORAL SOCIETY)

What's Next?

The Service is receiving funding for ecosystem restoration through the Bipartisan Infrastructure Law. This places a significant chunk of money into the hands of those who are tirelessly working to save species like the rufa red knot. Funding will have lasting positive effects on local communities as well.

Community resilience, clean water, flood mitigation, and access to beautiful beaches—this work is good for body and mind. □

ANNA REHKOPF, Office of Communications, Northeast Region

WIND RIVER RESTORATION

Cooperative effort puts funding to work against cheatgrass.

By HANNAH NIKONOW, BECCA ACETO, *and* EMILY DOWNING

"What do you see?"

It's the question Mark Hogan, the recently retired Wyoming state coordinator of our Partners for Fish and Wildlife Program, liked to ask when he brought partners to experience large-scale conservation projects on the Wind River Reservation.

The answers to Hogan's question? From sagebrush to forbs to bunchgrasses to footprints from big game herds to everything else that indicates a healthy and connected shrub-steppe landscape.

But this landscape is defined just as much by what is not visible. Long fence lines, housing developments, and other human impacts on the land are few and far between. The Wind River Reservation encompasses more than 2 million acres and contains diverse habitats, from high-elevation alpine to a vast sagebrush steppe. Hogan, who worked closely with the Tribes and many other private and public partners during his long and successful career, says that lack of development makes this area especially important.

"This project area is exceptionally valuable habitat for mule deer, bighorn sheep, and elk, all of which are culturally important species," Hogan says. "It also has robust numbers of migratory birds and greater sage-grouse."

But, like so much of the West, this corner of Wyoming is not immune to the threats facing sagebrush habitat. Though Wyoming currently has less cheatgrass than many other states in the sagebrush biome, this and other aggressive invasive annual grasses are slowly gaining a foothold in the area and threatening the health and function of sagebrush habitat. However, thanks to funding from the Bipartisan Infrastructure Law, local partners now have new leverage in the fight against cheatgrass.

In early 2022, the Wind River Inter-Tribal Council approved a Bipartisan Infrastructure Law-funded project to chemically treat invasive plants in the Washakie Rim, Breaks, and Coyote Basin areas on the Wind River Reservation. The project is a cooperative effort between the Eastern Shoshone and Northern Arapaho Tribes, the Service, Bureau of Indian Affairs, and Fremont County Weed and Pest District. It's also part of a larger, landscape-scale partnership to fight cheatgrass in Wyoming's core sagebrush habitat.

Together, these partners identified a 10,000+ acre site on the Wind River Reservation near the town of Fort Washakie that is an ideal candidate for the aerial treatment of Rejuvra. This chemical can be targeted to treat annual grasses, including cheatgrass, and is highly effective — its application can result in a 98% decline in annual plants. After application, Rejuvra sits on the surface of the soil and once the seeds germinate, they can't punch through the chemical. Native plants that germinate later in the season are not impacted.

Once the partners developed the project proposal, the next step was for Hogan and Pat Hnilicka, project leader of our Lander Fish and Wildlife Conservation Office, to go to the Wind River Inter-Tribal Council with their proposal. The Lander Office has provided decades of dedicated technical assistance and other support to the Wind River Tribes' wildlife management work. The Council, made up of elected officials from the Eastern Shoshone and Northern Arapaho tribes, manages the Tribes' business affairs and approves projects such as the one proposed by the partners. Regular, ongoing communication between the Inter-Tribal Council and the Lander staff and partners helps lay the groundwork to accelerate project approval and implementation. ››

Feral horse trails cut into heavily grazed rangeland. (PHOTO BY MARK HOGAN/USFWS)

A male greater sage-grouse rests between competitive dance-fight sessions. (PHOTO BY TOM KOERNER/USFWS)

Partners tour project site in Wyoming on the Wind River Reservation. (PHOTO BY USFWS)

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Another key aspect of the project is directing the Bipartisan Infrastructure Law funding to Fremont County Weed and Pest District. Wyoming's Weed and Pest Districts are highly effective at getting work started quickly and effectively. With the ability to work across boundaries to tackle the threat of invasive grasses and noxious weeds, and with years of mapping giving them a clear roadmap, they are a key partner in any effort to treat invasive annual grasses in Wyoming. Aaron Foster, the district supervisor of Fremont County Weed and Pest, says his agency's role as a hub for invasive species management will allow relationships among local stakeholders to translate the funding to work on the ground.

"We help coordinate work between different management agencies as well as local landowners," he says. "We have the experience to continue to do that with this funding."

With this project, partners are hopeful their quick work will help them get ahead of incoming cheatgrass and the threats this plant poses. Arthur Lawson, the director of Shoshone and Arapahoe Fish and Game, says promoting native plant species will have large-scale benefits for this important area.

"This whole area is valuable winter range for mule deer, bighorn sheep, and elk," he says. "However, cheatgrass that has sprung up after fires over the last few decades is impacting the productivity of this site."

Casey Savage, the soil conservationist for the Bureau of Indian Affairs Wind River Agency, notes that a rapidly growing population of feral horses is heavily impacting the landscape, leaving sparsely vegetated hillsides where before was grassland and shrubland. Around 5,000 feral horses occupy roughly a million acres across the Wind River Reservation. The first step of the project is to round up and remove some of the population to reduce the pressure on the native plants in the project area. This feral horse management work is being funded by BIA and other partners and complements our investments of Bipartisan Infrastructure Law funds in the larger project to control cheatgrass and restore and maintain land health on the Reservation and surrounding landscape. ››

Feral horses have grazed on this aspen grove.
(PHOTO BY MARK HOGAN/USFWS)

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"Removing these horses will reduce the pressure on the native plants already struggling to compete with the invasives and give them a chance to thrive when we apply the herbicide," he says.

The outcomes from this project will also support the integrity of Fort Washakie's watershed. Sustaining healthy rangeland conditions in the uplands will maintain natural runoff patterns and allow for more effective water storage throughout the watershed throughout the water year.

"When we look at the existing plant community, it's a vertical structure. On the top is a sage-shrub layer, then an herbaceous layer of grass. When we get precipitation events, having this robust plant community allows water to absorb into the ground and minimizes runoff," Hogan says. "Cheatgrass has basically no root and robs organic matter from the soil, so in an annual grass-dominated plant community, you're going to see greater runoff events and erosional events."

Minimizing these runoff events by allowing native plant communities to establish themselves will help keep water from disappearing quickly downstream, keeping local water tables up. Furthermore, by having a native plant community that can compete with cheatgrass, the partners hope that they can hold off an irreversible invasion.

"What do you see?"

Hogan's initial question lingers. It doesn't take too hard of a look to see what is perhaps the most important element of this project: hope for the future of the West's sagebrush habitat. □

This story was written by partners at the Intermountain West Joint Venture and the original version is available on Partnering to Conserve Sagebrush Rangelands.

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HANNAH NIKONOW, BECCA ACETO, EMILY DOWNING,
Intermountain West Joint Venture

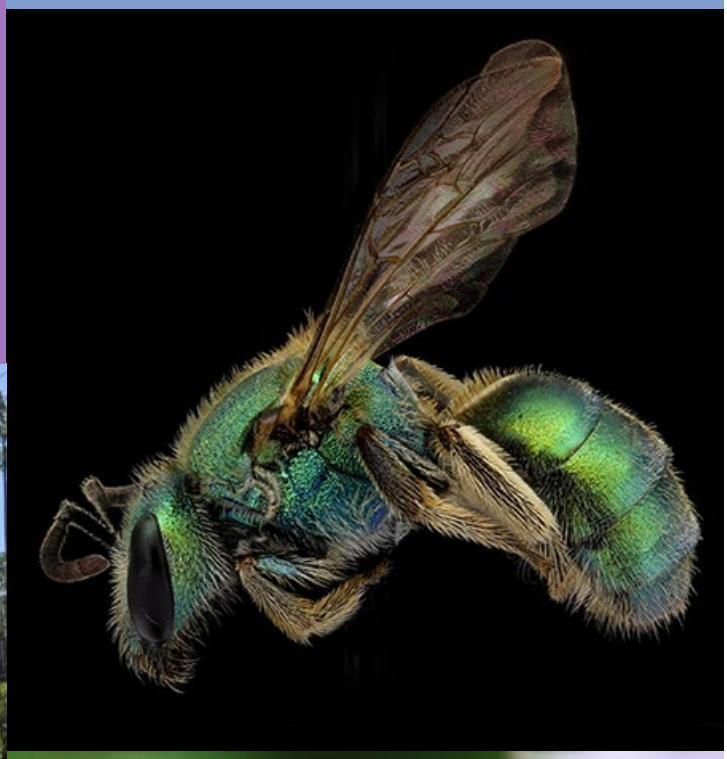
Where're All the Bees?

'The Bee Tool,' created by Service bee biologist, provides some answers.

By AL BARRUS

It's no secret that plant pollination is vital for human life. It's necessary for countless other plant and animal species as well, and bees perform the majority of it worldwide. Seventy out of the top 100 human food crops—which supply about 90% of the world's nutrition—are pollinated by bees. Not all the bee species out there actually make honey for us, but they are all important for our ecosystems and wild spaces. ››

(Clockwise, from upper right) The golden green sweat bee is very important for pollination. Sweat bees are so named because they are attracted to human sweat. (PHOTO BY USGS) The rusty patched bumblebee was once plentiful from Atlanta, Georgia, to Toronto, Canada. The Bee Tool shows it is now mainly reported in the greater Chicago to Minneapolis areas. (PHOTO BY JILL UTRUP/USFWS) Service etymologist James Weaver samples bees in the field. He created TheBeeTool.com. (PHOTO COURTESY OF JAMES WEAVER/USFWS)



"While honeybees are particularly good pollinators and important for some of our agriculture, they're not as important for our actual natural spaces," says Service conservation biologist James Weaver.

"Since they're important for our food supply, much of what we hear in the news on bees has to do with stresses relating to non-native honeybee colonies. What also stings is that a significant number of bees native to the U.S. are in also decline," says Weaver, who works for the Service's Southwest Region Science Applications Program. "In North America alone, there are around 4,400 unique bee species. And they run the gamut of different shapes, sizes, colors, life histories, and behaviors."

In current classification terms, bees are of the clade *Anthophila*, which consists of seven distinct biological families. Among those families are over 16,000 known species, with more than a quarter of all bee species occurring in North America. Most native bee species in the United States are solitary pollinators. They don't live in a hive but rather alone in underground burrows or crevices. This makes it difficult to count how many there are because surveyors can't simply track down colonies.

One major threat for native bees is habitat loss and fragmentation. Some bee species will travel only a few hundred feet from their home burrow and need certain plants to survive.

Some bees and pollinators are generalists, like European honeybees, and use pollen and nectar resources from different plants, but many species of bee rely on a small handful of plants. It's the same with plants. While some plants can be pollinated by different animals, many plants are very specific on how they can be pollinated. With these delicate, mutually beneficial relationships, it's easy to imagine how vulnerable certain species of bees and plants are to extinction or extirpation.

New and emerging risks including disease, pesticides, and invasive plants are on the rise, all while the effects of climate change stress and alter ecosystems more each year. The pressure is on conservationists to keep these species from going extinct.

To recover any imperiled species, knowing their abundance and distribution is important for assessing their risk level and if their native range has shifted or shrunk. That way conservation resources can be allocated where they're needed most. But it takes a large community of both professional and citizen scientists to gather the data needed to identify conservation needs. Once the data points are gathered, either by government, nongovernmental organizations, or academic or citizen scientist programs, it's difficult to get them all together in order to gain the widest context possible.

Luckily, there's an app for that: the Bee Tool.

For the uninitiated, if you see a bee or other species, you can photograph it if you like and download the iNaturalist app to your smartphone. That can help you identify the species, and you can also report your find on that app, creating a data point with a location and time stamp. That way, everyone else who wants to know about that species and where it occurs can benefit from your entry. A single data point isn't a giant insight, but a swarm of them gives conservation pros more knowledge on distribution of a species so they can better focus their conservation efforts.

However, not everyone reports their sightings on iNaturalist. Some folks might have just written them down. Some use databases that are for government or academic institutions. The Bee Tool combines many available datasets into a user-friendly visual map. Users can quickly see how bee sightings have evolved over time.

"Look for *Bombus affinis*, the rusty patched bumblebee. The historic range was much of the entire northeastern U.S.," says Weaver, explaining a pattern users can find with the app he built and maintains. "Now restrict the dates from 1980 onwards and see what happens." The range of data points quickly shrinks. This bee that was once plentiful from Atlanta, Georgia, to Toronto, Canada, is now mainly reported in the greater Chicago to Minneapolis areas. This visual presentation of so many data points provides insights to conservationists and bee enthusiasts, allowing them to untangle entomological mysteries.

Many conservation professionals are already using it and finding practical solutions that didn't exist before the Bee Tool.

"I had queried a couple different databases – but both systems identified only around 350 species in my region," says Elizabeth Crisfield, who helps manage a habitat improvement project for state agencies in the northeast United States. "I knew there were at least 500 species in the mid-Atlantic alone. I was so frustrated that neither of these official tools could help me understand my project's dataset in a regional context. When I ran the same query in the Bee Tool and found over 700 species observed historically it was a huge relief to finally have a decent species list for the region."

The best part of the Bee Tool is that it's free to use, for everyone. Weaver's creation is constantly being updated as more people add data points to the existing databases that feed the Bee Tool. However, he knows there plenty of yet-to-be incorporated data pockets out there.

"I'm a good example of this. I collected a lot of bee data while I was in graduate school, but I never published or shared those datasets," says Weaver. "I have now entered my research data into the Bee Tool. That's data from very rural parts of the U.S. where there aren't many people observing bees. That's the kind of data we need."

Weaver encourages anyone with research-grade bee data points to send him what they may have, that way everyone, especially bees, might benefit from that hard work.

"As long as those observations are adequately identified to species and contain GPS location data and date information, I can incorporate those observations into the Bee Tool almost immediately."

Everyone's data is valuable. Non-scientists can download the iNaturalist app to report bees and other species encountered in the wild.

Send your research-grade datasets to <james_weaver@fws.gov>. □

AL BARRUS, Office of Communications, Southwest Region

MORE INFO

Check out the Bee Tool of North America. <thebeetool.com>

Maintenance Teams Make Nature Accessible

With help from the Great American Outdoors Act, maintenance professionals breathe new life into Service-managed lands.

By MASON WHEATLEY
and CARINA VELAZQUEZ-MONDRAGON

Kris had been coming to Occoquan Bay National Wildlife Refuge in Virginia for more than two years. She loved snapping photos from her car along the Wildlife Drive, but because she uses a manual wheelchair, the refuge's unpaved trails remained mostly inaccessible to her.

That is, until one summer afternoon, when she arrived at the refuge to a wonderful surprise: a recently opened visitor center trail, built by a Service maintenance team. Kris had such a nice day at the refuge she wrote to refuge manager Amanda Daisey:

"What a beautiful facility. I loved sitting on the covered porch after I explored the loop trail that goes around Painted Turtle Pond, and I decided to write to tell you how happy I am with the recent upgrades to this refuge. The visitor's center and the accessibility of the trail (it is pretty smooth and there aren't a lot of rocks), including the observation deck at the pond, are real enhancements, and I am grateful that I now have more terrain to explore when I come to visit."

During her visit, Kris sat at the new observation deck at Painted Turtle Pond and captured photos of a bald eagle, an egret, and a green heron—all within a couple of minutes.

Kris's story is an example of what well-maintained infrastructure provides for visitors and employees alike: Service-managed lands that are safer and more accessible for everyone.

Thanks to additional funding from the Great American Outdoors Act, our dedicated maintenance professionals are coming together to tackle some big jobs that have needed attention for a long time. And their work is getting great reviews.

(Previous page) Service maintenance professionals at work on Tundra Swan fishing pier at Eastern Neck National Wildlife Refuge. (PHOTO BY USFWS) The Great American Outdoors Act National Strike Force at Eastern Neck National Wildlife Refuge. (PHOTO BY USFWS)

Tackling the Backlog

Infrastructure is always degrading. As one problem is fixed, others develop. Structures and facilities at national wildlife refuges and other Service facilities are particularly vulnerable to deterioration due to their locations, as well as the increasingly destructive effects of climate change . Although facility maintenance staff does their best to keep up, limited resources often delay or defer projects, leading to a growing backlog of work.

To tackle this list of postponed projects, we assemble Maintenance Action Teams: groups of Service maintenance professionals who come together to do short-term construction, habitat restoration, and demolition projects that would otherwise go to a private contractor.

Maintenance Action Teams have numerous benefits:

- They develop skillsets for employees through on-the-job training.
- They create and strengthen employee relationships.
- They make us more resilient and adaptable as an agency.
- They offer some nice cost-savings, too.

The Great American Outdoors Act, passed in 2020, gives the Service funding—nearly $100 million annually—to reduce the list of deferred maintenance projects. That includes repairing or replacing visitor facilities—like the one at Occoquan Bay—as well as roads, trails, and other critical infrastructure. By leveraging Great American Outdoors Act funding with that from other sources, we can make maintenance miracles happen in the places they're needed most.

Maintenance Supergroup

This winter, Eastern Neck National Wildlife Refuge in Maryland welcomed 19 talented Service maintenance professionals hailing from all over the United States—from Alaska to Oklahoma to New York to Louisiana. This was the first national Great American Outdoors Act Strike Force. Think supergroup, like the Traveling Wilburys…if the Traveling Wilburys had impact drills and chainsaws rather than guitars.

So, what brings a crew of this scope together to an island refuge in the Chesapeake Bay? Well, a boardwalk.

The Tubby Cove Boardwalk stretches approximately 500 feet across the refuge's healthy marshlands and is a fantastic spot for birding, watching wildlife, or taking the dog for a walk (on a leash, of course). Visitors and locals from the nearby town of Rock Hall have been enjoying it for decades. Sadly, its deterioration over time, in part due to severe flooding, had rendered it defunct.

It wasn't the only one either; the Tundra Swan Boardwalk, another popular access point on the refuge, closed to the public in 2021 due to failing conditions.

The maintenance couldn't happen soon enough, says refuge manager Marcia Pradines Long. Over the years, the Friends of Eastern Neck raised funds for "patch-ups" to the boardwalks, but it became obvious that eventually a major overhaul would be needed. That's where the strike forces came in.

Here's how these projects went down:

First, a local maintenance team began work on both boardwalks, a process that carried on for nearly a year. Progress was made, but it became evident to refuge staff that they were going to need significantly more resources (and people) than they anticipated. So, they called in help. ››

(Top) Painted Turtle Pond's new observation deck at Occoquan Bay National Wildlife Refuge. (PHOTO BY USFWS) (Below) Flooding at Eastern Neck National Wildlife Refuge over the years has led to repeated closures of visitor access points. (PHOTO BY USFWS)

Continued from previous page.

In came the Regional Strike Force, a larger team composed of staff from Service facilities throughout the Northeast Region. They focused their efforts on finishing Tundra Swan, replacing the beams, joists, decking, and handrails for the roughly 150-foot boardwalk. For the first time in two years, Tundra Swan was open for business—and looking better than ever.

That left Tubby Cove (a bigger project) and the National Strike Force (the biggest team). In just one day, the group demolished all 500 feet of the old boardwalk—but that was only the beginning. The next two weeks brought 12–13-hour days, bitter cold, blustery weather… and the occasional misstep into freezing-cold waters. Suffice it to say, winter isn't the easiest season for construction. More reason to get the work done quickly. ››

The Great American Outdoors National Strike Force releases banded ducks. (PHOTO BY USFWS)

Continued from previous page.

Pradines Long is amazed by how well this team of strangers came together despite the challenges. "So often in those kinds of conditions, you can really get sick of each other," she says, laughing. "But they worked so well together. It was extremely rewarding to see."

As a token of gratitude for braving the Maryland winter, refuge staff treated the team to some lunchtime duck banding. It was a great opportunity to show the team how their work directly connects to and supports conservation, Pradines Long explains.

"We wanted to bring them in and give them a sense of why we're here and what we do here at the refuge," she says.

Hard Work Paid Off

The difference is like night and day. Both boardwalks are back open and wheelchair-accessible. In addition, refuge roads and visitor parking were repaired and improved, and new interpretive kiosks were installed. Pradines Long is already getting positive feedback on the makeover.

"Smaller refuges like ours might sometimes feel that we have been overlooked," says Simon Kenyon, president of the Friends of Eastern Neck. "The amazing work of the Strike Teams showed that that is not the case. Our boardwalks and viewing areas are in great shape again, ready to welcome new seasons of bird migration and the visitors that love them."

Pradines Long is just as thrilled and excited to welcome visitors to the recreation sites once again. She notes that Eastern Neck National Wildlife Refuge has been Rock Hall's pride and joy for many years.

"Bringing in the Great American Outdoors Act Strike Force from around the country was that extra push that we needed to get it done. If it wouldn't have been for them, it still wouldn't be done."

And to top it off, hiring a third-party would've cost the government $300,000 more than using the Strike Force for these projects.

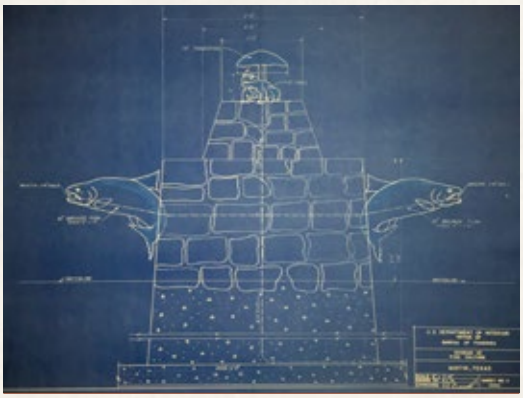
Our maintenance professionals are unsung heroes. Behind the scenes, they're doing work that supports nearly every conservation and recreation activity that occurs on Service-managed lands.

The next time you stop in at a refuge visitor center, enjoy a paved nature trail, or watch wildlife on the pond from the pier, you might take a minute to appreciate the incredible levels of creativity and collaboration that has gone into them. Those efforts ensure everyone is welcome and able to enjoy the beauty our country has to offer. □

MASON WHEATLEY, Office of Communications, Northeast Region, and CARINA VELAZQUEZ-MONDRAGON, Office of Communications and National Wildlife Refuge System, Headquarters

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.



Fountains of Fun

Austin National Fish Hatchery in Texas was built in 1940 and included a fun feature—a charismatic water fountain. The fountain featured two fish on the sides and a frog under a toadstool on the top. The hatchery raised bass, sunfish, and channel catfish for fishing delights. When the hatchery closed in 1968, the nonprofit Austin Geriatrics Corporation built a senior citizens independent living residential tower on the land. The fountain still stands today, though it is not used and is in disrepair. (APRIL GREGORY)

Stocking Far-away Waters

In 1962, over 300,000 trout eggs were sent to Japan, Costa Rica, and Hawaii from Winthrop National Fish Hatchery in Washington state. The eggs were sent by air, and this photo shows two women picking out the dead trout eggs upon arrival—most of the eggs arrived in good shape. According to a local newspaper article, "Eggs are being sent as a good will gesture to stock streams and lakes for the benefit of sports fishermen in the two countries and the new state." Shipping eggs to support recreational fishing was no new concept in 1962 and continues to this day, but it is now generally limited to providing eggs to states and Tribal conservation agencies through our National Broodstock Program. Many states and Tribes rely on the Service to stock lakes and rivers with fish for sustainable recreational fishing. (APRIL GREGORY)

The Ding Darling Collection

In 1934, President Franklin Roosevelt appointed his friend, Pulitzer Prize-winning *Des Moines Register* political cartoonist Jay Norwood "Ding" Darling, to head the U.S. Biological Survey. (The Biological Survey merged with the Bureau of Fisheries in 1940 to become the U.S. Fish and Wildlife Service). In addition to Darling's skills as an artist, he was also an accomplished painter, writer, and an avid conservationist. Though Darling led the Biological Survey for a mere 20 months, his tenue was one of the most significant in the Service's history. As Director, Darling established the Federal Duck Stamp Program (and painted the first Duck Stamp), designed the Refuge System's "Blue Goose" emblem, and supervised a major expansion of the National Wildlife Refuge System. Darling also was one of the founders of the National Wildlife Federation and served as the organization's first president. In honor of his many accomplishments in the field of American conservation, Sanibel National Wildlife Refuge in Florida was renamed J.N. "Ding" Darling National Wildlife Refuge in 1967.

The U.S. Fish & Wildlife Service Museum and Archives preserves a number of items that originally belonged to Ding Darling, including his printing press, the plate used to print the first Duck Stamp, his art table, shotgun, fishing rods, and, as seen here, his deputy game warden badge and his cartoon of Roosevelt (and a tiny Darling). (STEVE FLORAY)

A Treasure in Treasure Valley

Deer Flat National Wildlife Refuge shines in Idaho's third largest city

By LENA CHANG

I'm new to the Pacific Northwest. Where I grew up, seasons were barely detectable in the temperate Mediterranean climate, where intermittent rivers would only flow after a rare, substantial rainstorm. But here in Idaho, the seasons are distinct. There is ample water flowing in the rivers and a wonderful spectacle of wildlife and flora that flourish in the spoils of that precious water.

I live and work in the Treasure Valley of Idaho, one of the largest metro areas in the Pacific Northwest and am fortunate to call Deer Flat National Wildlife Refuge an "office." The refuge is located fewer than 30 miles from the bustle of the capital city, Boise, and within Nampa — Idaho's third largest city and one of the fastest growing cities in the country.

The drive approaching Deer Flat is interspersed with suburban development and agricultural fields, and there's a specific threshold crossed when I turn into the refuge when I feel a notable shift in perspective. Suddenly the capital city seems a thousand miles away.

As I make my way down the windy road, I always look forward to the first glimpse of Lake Lowell. No two mornings have looked the same.

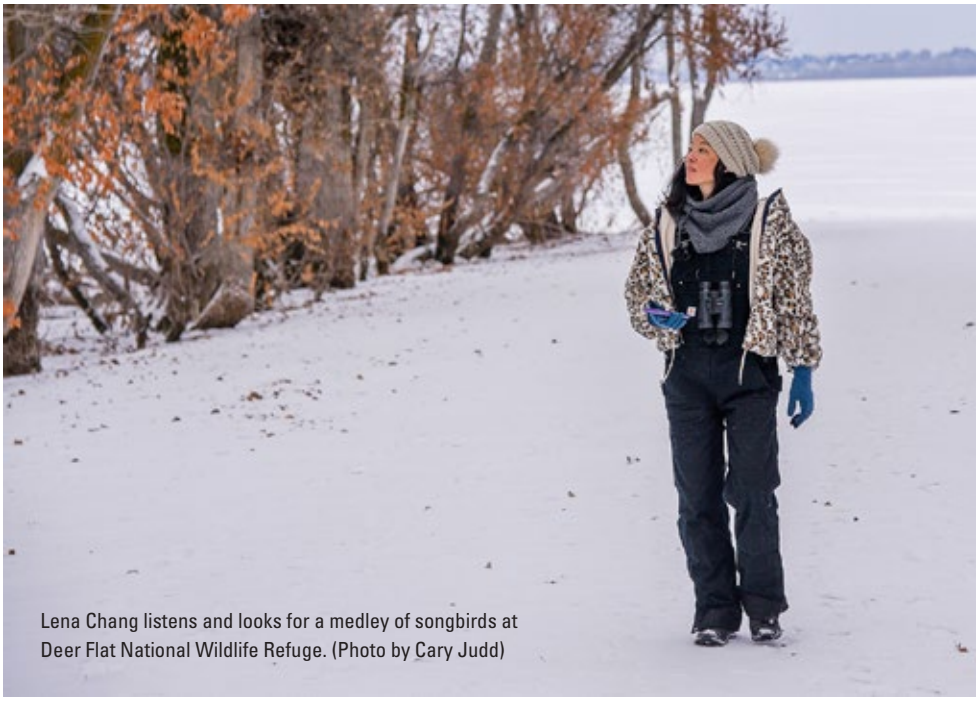
I arrived in Idaho in the fall of 2022, when hunting at Deer Flat was in full swing. I could hear the distant sounds of hunters in their pursuits of pheasant, quail, partridge, mourning doves, ducks, coots, and deer.

Last year, fall weather gave way early, as the seemingly impatient winter barged in and held tight. The trees quickly traded their turning leaves for bare limbs, where bald eagles would perch, their large silhouettes unimpeded, blocky, and conspicuous. Numerous species of waterfowl continued to provide the backdrop of consistent sounds, their quacks, honks, and cackles resonating from the lake surface to the sky.

I'd take breaks to walk down to the water's edge or visit the bird blind to open a window and be amused by the fluttering of white-crowned sparrows at the feeders and shuffling of quail below. They'd go about their business, unaware of my observing from just a few feet away.

True winter arrived, and the lake froze over — the winter solstice was a spectacular day, as icy in the air as it was under foot. And just before Christmas, a fresh, thick layer of snow covered the frozen lake. Eagles and ravens looked busy flying back and forth to their bare perches, and the new-to-my-ears sounds of songbirds known to me only from field guides spilled sweetly from the forest as I tried to spot them. Winter is magical at Deer Flat.

Spring has snuck in under the guise of a prolonged winter; however, the days are getting longer, migrating birds are moving out as breeding birds make their way in, ››



Lena Chang listens and looks for a medley of songbirds at Deer Flat National Wildlife Refuge. (Photo by Cary Judd)

Continued from previous page.

and the activity at Deer Flat will soon shift focus to Lake Lowell and its riches. Boats will paddle and buzz the lake through the hot summer months, and thousands of families and visitors from all around the Treasure Valley will flock to the refuge to enjoy the lake until the end of September when the boating season ends to make way for migrating and wintering wildlife.

Soon enough, the tilt of the Earth will create the conditions to welcome another fall, then winter, spring, and summer… I look forward to witnessing the full cycle and greeting the seasons as they emerge again, over time, like reliable and familiar friends. □

LENA CHANG, Office of Communications, Pacific Region

(Top) A crisp, fall day at Deer Flat National Wildlife Refuge. (PHOTO BY LENA CHANG/USFWS) (Above) An early spring morning at Lake Lowell on Deer Flat National Wildlife Refuge. (PHOTO BY LENA CHANG/USFWS)

Deer Flat Gets $1M Investment

Deer Flat National Wildlife Refuge works with community members, as well as traditional and nontraditional partners, to co-design programs around community priorities using the Urban Wildlife Conservation Program Standards of Excellence. The refuge welcomes diverse communities to connect with nature and each other through free educational and outdoor recreational experiences. During a visit to the refuge in April, Secretary of the Interior Deb Haaland and Service Director Martha Williams announced a $1 million investment for this work. The funding is a part of our Urban Wildlife Conservation Program.

transitions

Pacific Region

50 Years and Counting! Quinault National Fish Hatchery Employee Ed Lemieux Reaches 50 Years With the Service

To most people, a 50-year career means you're past due for retirement. (Well, 51 counting a year with the Bureau of Indian Affairs.) But **John "Ed" Lemieux**, a fish culturist at Quinault National Fish Hatchery in Washington, is showing no signs of slowing down.

"Figure I'll keep working till I can't," Lemieux says with a chuckle.

Lemieux first provided support for Quinault Hatchery as a Bureau of Indian Affairs employee in 1971, which was just three years after the hatchery opened. The hatchery would call on Lemieux for maintenance support given his extensive skills with welding and construction. When a position opened at the hatchery in 1972, Lemieux was ready. The allure of a permanent federal position and staying close to home was too good to pass up for this enrolled member of Quinault Indian Nation.

Let's put Lemieux's career into perspective. When he started with the Service at the hatchery, it was the first year that more than 50% of television households in the United States had a color TV, and *M*A*S*H* was in its first year on television.

Feeding time! Quinault National Fish Hatchery fish culturist Ed Lemieux feeds salmon in the outdoor rearing ponds, or "raceways." (PHOTO BY USFWS)

That year also marked the 100th anniversary of the Service's Fish and Aquatic Conservation Program. Today, Lemieux has been with the Fisheries program for one-third of its 150-year existence.

Lemieux's impact was significant immediately after being hired by the Service. He designed and made a mechanical fish lift system, for example, to increase efficiency and reduce physical demands on the staff during spawning season. Before his custom improvement, staff had to manually net and lift thousands of adult salmon, which included Chinook salmon exceeding 30 pounds. It's no doubt that he spared his co-workers from the usual sore backs during this busy and physically demanding time of year.

When asked about his favorite part of the job, Lemieux says it would have to be spawning season.

"It's rewarding when you see your hard work paying off and there's a lot of staff excitement and energy."

During his tenure at the hatchery, Lemieux has spawned tens of thousands of salmon and steelhead. His hard work throughout each year has also contributed to the release of well over 150 million juvenile salmon and steelhead.

Fish production wasn't the only thing to flourish during Lemieux's tenure. He moved into employee housing in 1982 and his growing family became a fixture on the hatchery grounds. His seven children were essentially raised at the hatchery, and they all eventually worked at the facility through the Quinault Indian Nation's Youth Opportunity Program as teenagers. Three eventually continued on with careers in fisheries conservation, including Jane, who is a permanent biological technician at the hatchery.

Reflecting on his experience working with his kids, Lemieux says: "Sometimes we're so busy and it's so routine that I hardly notice. But you know how special it is when you have time to reflect."

Lemieux's family continues to grow, with 23 grandchildren, and four great-grandchildren. He enjoys having them over for visits, watching their sporting events, and hunting and target shooting with them. And he continues to serve as a role model and inspiration, as some of them are also showing interest in fisheries careers. It's no doubt they have learned a great deal about hard work and dedication.

Lemieux's impact, however, goes well beyond his family.

"It is impossible to overstate Ed's contribution to the success of the hatchery," says Quinault Hatchery manager Daniel Fielding. "Whether it be infrastructure, fish, or nurtured relationships with the Quinault Indian Nation and broader community, Ed Lemieux remains at the core."

Lemieux clearly finds fulfillment in his work. When asked about the value of supporting his Tribal fishing community, he has a heartfelt response.

"It means a lot!" Lemieux says. "When I started, it meant a livelihood to people I knew. With almost no stream protection going on and quickly declining salmon returns, many Tribal fishers had to find other work. When the hatchery returns began to build, the Tribal fishers came back."

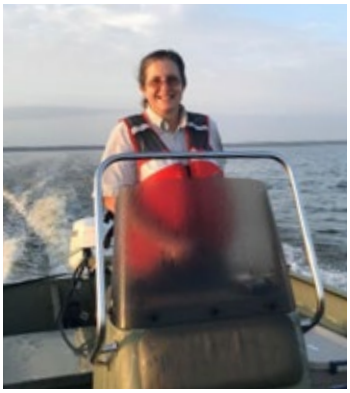
Lemieux has clearly built an impressive legacy of hard work, dedication, results and inspiration. Just like the millions of salmon he has helped raise and release, he plans to keep on coming back to the hatchery again and again. □

DAN SPENCER, Fish and Aquatic Conservation, Pacific Region

Southeast Region

Wolf Creek National Fish Hatchery in Kentucky welcomes deputy project leader **Travis Collier** to the team. Collier has spent most of his career with the Service in Washington state, beginning in 1999 working as an animal caretaker at White Salmon National Fish Hatchery Complex. From there, he moved on to the Columbia River Fisheries Program Office as a fisheries biologist working with Pacific lamprey, salmonids, and freshwater mussels. He then spent 17 years as assistant hatchery manager at Leavenworth Fisheries Complex.

Collier joins Wolf Creek most recently from Willard National Fish Hatchery in the Columbia River Gorge National Fish Hatcheries Complex where he served as project leader, raising 3 million salmon a year. He enjoys hiking and kayaking and is "looking forward to working at a facility that isn't covered in snow for half the year." □



Wendy Stanton took over in March as the refuge manager for Pocosin Lakes National Wildlife Refuge in eastern North Carolina. Pocosin Lakes Refuge is one of the nine national wildlife refuges in North Carolina Coastal National Wildlife Refuges Complex.

Wendy holds a bachelor's degree in wildlife biology at Frostburg State University and master's degree in wildlife biology from North Carolina State University. She began her federal career in 1991 as a graduate co-op student with the Bureau of Land Management in Roseburg, Oregon. She has been with the Service since 1994. She has previously served as the refuge biologist for Pea Island National Wildlife Refuge, Pocosin Lakes National Wildlife Refuge, Mattamuskeet National Wildlife Refuge Complex, and a wildlife biologist with the Refuge System's Inventory and Monitoring branch.

For almost 30 years, Wendy has been married to the "love of her life" and best friend, John Stanton, who recently retired from the Service's Migratory Bird Program. They have two grown sons and two very spoiled Irish wolfhounds. "My husband and I have been living in Columbia, N.C., since 1994. This is our home and we love it here. Both our sons were born here and attended the public schools in Tyrrell County."

"I am so excited to be a part of the amazing team at Pocosin Lakes NWR. There are many challenges and opportunities at the refuge that I am eager to work on. These include peatland restoration, waterfowl management, cooperative farming, fire program, red wolf recovery, visitor services, environmental education and many others.

"I am looking forward to collaborating with the local communities and other partners to meet the refuge mission and advance conservation for the continuing benefit of the American people." □

Big cat deadline

Individuals who own big cats such as lions, tigers, leopards, cheetahs, jaguars, cougars, or hybrids of these species must register them with the Service by end of the day June 18, 2023, to comply with requirements of the Big Cat Public Safety Act. Current private owners may keep their animals if they register them with the Service and abide by other applicable state and federal regulations. More on the Big Cat Public Safety Act.

(PHOTO BY MATHIAS APPEL)

Fish & Wildlife News
Division of Marketing
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U.S. Fish and Wildlife Service
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parting shot

Makeover. The Red Wolf Center at Pocosin Lakes National Wildlife Refuge has transformed from a once non-descript utilitarian facility to a work of art that Tyrrell County, North Carolina, can proudly showcase. The change comes thanks to the Good of the Hive's Matt Willey's mural depicting red wolves and flora and fauna native to eastern North Carolina. Raising community awareness of red wolves and the work of the Service and partners on red wolf recovery is the primary goal for the Center's transformation.

(PHOTO BY USFWS)

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