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Fish & Wildlife News

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On the cover: Alligator at J.N. "Ding" Darling National Wildlife Refuge.
(PHOTO BY USFWS)

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Martha Williams, Director

Water Is Life

The title of the spotlight in this issue of *Fish & Wildlife News* says it all: Everyone needs water. The world's wild things and wild places need it, too.

The American people have tasked the U.S. Fish and Wildlife Service with stewarding wildlife and wild places for their continuing benefit, but we also strive to ensure our work directly helps people.

You see this in our fish passage projects, many of which receive funding from the Bipartisan Infrastructure Law. Yes, these projects re-open fish migration by removing or lessening barriers fragmenting our rivers, a plus for nature. They also improve infrastructure safety and climate resilience, increase recreational opportunities, strengthen local economies, and more, huge pluses for the people who live nearby.

I was in Springville, Alabama, in April 2024, and saw firsthand an example of us stewarding natural resources for people and wildlife. The Bipartisan Infrastructure Law fish passage project in Springville helped conserve the trispot darter, which is protected as threatened. The restoration work also reduced flooding at the city's youth athletic fields. (Listen to podcasts about the Springville project and the trispot darter.)

Gigi Otten, of our Midwest Region, provides a primer on why we're removing dams on p. 16.

As with fish passage, salt marsh conservation pays dividends beyond helping wildlife, and up and down the Atlantic Coast, we are engaged with other conservationists in an effort to save the salt marshes.

Healthy salt marshes serve as a buffer against harsh storms and high tides, protecting coastal communities. They fight climate change by storing carbon in their soils. Economically, as the Southeast Region's Dan Chapman points out in his story on salt marshes in the South (p. 26), "Marshes and estuaries provide shelter, nourishment, and nurseries for three-fourths of the nation's commercial and recreational aquatic species, including white shrimp, blue crabs, redfish, and flounder."

But sea level rise is drowning marshes that have nowhere to go on crowded shorelines. The 2009–2019 Wetlands Status and Trends national report, which came out in March 2024, tells us that 2%, or 70,000 acres of salt marsh, were lost in the decade, the largest net percent reduction of any wetland category.

Dan's story details work, partly financed by the Bipartisan Infrastructure Law and the Inflation Reduction Act, to build "living shorelines" to hold off the ocean.

The Northeast Region's Lauri Munroe-Hultman tells on p. 23 how in Maine, Rachel Carson National Wildlife Refuge and partners are giving salt marshes room to migrate.

On the other side of the country, the Pacific Southwest Region's John Heil's story on Ash Meadows National Wildlife Refuge in southern Nevada (p. 18) makes clear that partners are restoring the land and its all-important springs not just for the many species that rely on them but also for the area Tribes.

"We're still working hard to recover the original function of the habitats to support unique endemic species and the important cultural connections of affiliated Tribes," refuge manager Mike Bower says.

Richard Arnold from the Pahrump Paiute Tribe tells John, "This land is our drug store, garden, church, school … " We act in partnership with area Tribes to ensure Ash Meadows continues to meet their needs.

You can find other content focused on water issues, including ones on Deepwater Horizon (p. 9, 13) and marine debris cleanup in Alaska (p. 37).

There's also a story on the Wetlands Status and Trends report (p. 10). We have our work cut out for us. It's not just salt marsh. The report details a net loss of 221,000 acres of wetlands within the contiguous United States between 2009 and 2019.

I recognize these losses are disheartening to many. But as I have traveled across the country visiting conservation projects big and small, I have learned something else: The people in the U.S. Fish and Wildlife Service, easily our greatest asset, should never be underestimated. I would bet on the conservation efforts of the U.S. Fish and Wildlife Service when it comes to restoring and protecting our wetlands — for the benefit of wildlife, wild places, and people. After all, when we give nature a chance, it has a remarkable ability to heal itself and us in the process. □

Service and Partners Announce Innovative Cloning Advancements for Black-Footed Ferret Conservation

DENVER — The Service and our genetic research partners in April 2024 announced the birth of two black-footed ferret clones — Noreen and Antonia — and provided an update on their latest efforts to breed previously cloned black-footed ferret, Elizabeth Ann.

Noreen was born at the National Black-footed Ferret Conservation Center in Colorado, while Antonia resides at the Smithsonian's National Zoo & Conservation Biology Institute in Virginia. Both were cloned from the same genetic material as Elizabeth Ann. They are healthy and continue to reach expected developmental and behavioral milestones. The Service and its research partners plan to proceed with breeding efforts for Noreen and Antonia once they reach reproductive maturity later this year.

This scientific advancement to clone the first U.S. endangered species is the result of an innovative partnership among the Service and critical species recovery partners and scientists at Revive & Restore, ViaGen Pets & Equine, Smithsonian's National Zoo & Conservation Biology Institute, San Diego Zoo Wildlife Alliance, and the Association of Zoos and Aquariums. The application of this technology to endangered species addresses specific genetic diversity and disease concerns associated with black-footed ferrets. The Service views this new potential tool as one of many strategies to aid species recovery alongside efforts to address habitat challenges and other barriers to recovery.

Elizabeth Ann remains healthy at the National Black-footed Ferret Conservation Center, exhibiting typical adult ferret behavior. Planned efforts to breed Elizabeth Ann were unsuccessful due to a condition called hydrometra, where the uterine horn fills with fluid. Her other uterine horn was not fully developed, which is not unusual in other black-footed ferrets and therefore not believed to be linked to cloning. Elizabeth Ann otherwise remains in excellent health, symbolizing the early progress in biotechnology for species conservation.

Elizabeth Ann, Noreen, and Antonia were cloned from tissue samples collected in 1988 from a black-footed ferret known as Willa and stored at San Diego Zoo Wildlife Alliance's Frozen Zoo. These samples contain three times more unique genetic variations than found on average in the current population. Introducing these currently unrepresented genes into the existing population would significantly benefit the species' genetic diversity.

All black-footed ferrets alive today, except the three clones, are descendants of the last seven wild individuals. This limited genetic diversity leads to unique challenges for their recovery. Besides genetic bottleneck issues, diseases like sylvatic plague and canine distemper further complicate recovery efforts. Cloning and related genetic research offer potential solutions, aiding concurrent work on habitat conservation and reintroducing black-footed ferrets into the wild.

Black-footed ferret clone Noreen.
(PHOTO BY USFWS)

Continuing genetic research for black-footed ferrets includes efforts to breed offspring from Noreen and Antonia, which would significantly increase the species' genetic diversity. Collaborative work among partners also aims to achieve other long-term goals, such as developing resistance to sylvatic plague and potentially other diseases.

Ongoing collaboration with innovative partners is driving scientific progress, underscoring the crucial role of conservation partnerships in safeguarding and improving American biodiversity. The Service will continue to provide updates as the research progresses. This research does not in any way supplant or diminish the Service's efforts to recover the species in the wild. Those efforts, including reintroduction and monitoring of extant populations across the Great Plains, are ongoing, and the Service continues to collaborate with many partners working to conserve habitat for the species. □

Idaho's New Wildlife Overpass Improves Public Safety and Wildlife Migration

Deer use the wildlife overpass to cross highway 21 in Idaho near Boise.
(PHOTO BY IDAHO FISH AND GAME)

Approximately 10 miles east of Boise, Idaho State Highway 21 cuts across the migration routes of thousands of mule deer and elk. In this area around Cervidae Peak, roughly 8,000-9,000 mule deer and 1,800-2,400 elk of the Boise River herds cross the increasingly busy highway during their seasonal migrations. This stretch of highway had become a concern for the Idaho Transportation Department due to dangerous and costly vehicle-wildlife collisions, but a newly completed Cervidae Peak Wildlife Overpass aims to improve safety for both drivers and animals.

Overpass construction cost roughly $6.5 million and was funded by a Federal Lands Access Program grant administered by the Federal Highways Administration along with a consortium of partners providing matching funds. A significant portion of Idaho Fish and Game's matching contribution was made with Wildlife Restoration funds administered by our Office of Conservation Investment.

"The Idaho Transportation Department recognizes the vital role of Highway 21 as a conduit between high alpine summer havens and lower river valley winter retreats for big game species," says Sophia Miraglio, public information officer for the Idaho Transportation Department. "The Cervidae Overpass is expected to reduce wildlife collisions in the area by 80%, a feat made achievable through collaboration with our wildlife and land management partners."

Only weeks after completion, trail cameras showed mule deer using the structure to avoid the highway. The deer were some of the first to use the overpass to cross above the highway, which hosts a daily average of 14,000 vehicles.

Traditionally, fences have been used to keep wildlife off roadways. However, exclusionary fencing can also impact big game migrations. Build a fence tall enough and it will keep wildlife out, but it can also keep animals from their centuries-old migration paths. "Our partners at the Idaho Transportation Department recognized that their mission to make roadways safer could combine with our mission to conserve wildlife, and this overpass allows for increased road safety while still allowing yearly deer and elk migrations," says Frank Edelmann, technical services bureau chief at Idaho Fish and Game. Herds in the area winter in the lower elevation Boise River corridor and migrate to summer ranges as far away as the Sawtooth Mountains, meaning that at least twice a year these animals cross the busy highway.

"Without access to this important migration path, deer might be forced to stay at higher elevations during the winter months," adds Edelmann. "During harsh winters, deer prevented from accessing low elevation winter range could experience large die-offs due to limited food resources and harsh conditions."

The site of the approximately 150-foot-wide wildlife overpass was selected within the mapped wildlife migration routes to capitalize on an existing roadcut and nearby terrain, reducing the overpass construction costs. The Idaho Transportation Department developed and led the overpass project bringing together numerous supporting stakeholders including federal, state, and local government agencies and nongovernmental organizations.

The funds provided by Idaho Fish and Game represent a portion of the state's Wildlife Restoration grant annual apportionments. Wildlife Restoration grants, funded through manufacturer-paid excise taxes on firearms and ammunition, support efforts to restore, conserve, manage, and enhance wild birds and mammals and their habitat. "Our state agency partners rely on Wildlife Restoration funds to support efforts from hunter education courses, habitat restoration, and in this case the creation of a wildlife overpass to aid deer and elk migration," says Kyle James, wildlife biologist with the Office of Conservation Investment. "In recent years, Idaho Fish and Game has received around $19 million annually in Wildlife Restoration grant funding. By collaborating with others on projects, they are able to share costs and increase wildlife benefits."

State officials remind the public that deer and elk will continue to familiarize themselves with the overpass and motorists should continue to exercise caution.

"We know that the overpass was working soon after completion, even before trail cameras were installed, when we saw deer tracks across the structure," says Edelmann. "But wildlife will need time to get accustomed to the »

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overpass before it becomes habit to utilize it." Idaho Fish and Game will continue to monitor wildlife use of the overpass with cameras to learn if improvements can be made to this project and inform possible future projects. □

CINDY SANDOVAL, Office of Conservation Investment, Headquarters

New Name, Same Unwavering Purpose

Our Wildlife and Sport Fish Restoration Program has changed its name to the Office of Conservation Investment. This name change is more inclusive of current responsibilities and workforce, and better articulates the work the program does to support the mission of the Service.

The program started with historic grant programs in Wildlife Restoration (WR) and Sport Fish Restoration (SFR), which helped to build partnerships with state fish and wildlife agencies and manufacturers. However, the program has evolved from one grant program for state fish and wildlife agencies in 1937 to supporting over 60 grant programs with a wide range of services to a plethora of partners. Today, staff is occupationally more diverse and covers more fields and skillsets than ever before.

Largest Dark Sky Sanctuary in the World Includes Hart Mountain National Antelope Refuge

Wild places untouched by artificial light are harder and harder to find, but Hart Mountain National Antelope Refuge in south-central Oregon is a sanctuary for high desert wildlife and habitat — and the dark sky.

Pronghorn antelope, California big horn sheep, and hundreds of other wildlife species rely on the protected habitat, including seasonal and yearlong water resources fed by snow melt and springs. Like the seasonal cycles that bring water to the 278,00-acre refuge, the daily cycles of light to dark and light again are essential to the health of the natural world. The absence of light is a key element of healthy habitat.

More than half of the wildlife on Earth are nocturnal — active at night instead of the daytime. For wildlife active during the daytime, the dark of night is essential for their life cycle needs. Sea turtle hatchlings find their way to sea following the light of the moon, migrating birds navigate by the stars, and without the night there would be no dawn to cue the greater sage-grouse's dance across their leks each morning during mating season. Even plants rely on the cycles of light and dark to cue their blooming and growing. During the day, the taproot of sagebrush reaches deep into the soil, seeking and moving moisture up through the soil so its shallower roots can access the water during the night.

We have partnered with many others in the community to establish and support the dark skies that help define this area of southern Oregon, part of the largest, contiguous, pristine dark sky zones in the lower 48 states. The Oregon Outback International Dark Sky Sanctuary comprises 2.5 million acres across Lake County, including the refuge. For several years, partners in the Oregon Outback Dark Sky Network, a group of stakeholders, including community members, Tribes, government agencies, landowners, nonprofit organizations, businesses, and destination management organizations, have been working together to establish the sanctuary.

Dark Sky International designates Dark Sky Sanctuaries for exceptional or distinguished quality of starry nights and a nocturnal environment that is protected for its scientific, natural, or educational value; its cultural heritage; and/or public enjoyment. In March 2024, it certified Oregon Outback as an International Dark Sky Sanctuary, the largest sanctuary in the world.

As the great American West is getting smaller, places for wildlife and plants that are undisturbed are increasingly rare. Protecting and restoring important habitat ensure a future for wildlife and people to enjoy this uniquely American landscape. Protected places like national wildlife refuges are key for the future of the plants, wildlife, and fish of the northern Great Basin, and elsewhere. □

MEGAN NAGEL, Office of Communications, Pacific Region

Skyglow created by artificial lights at night obstructs the view of the night sky. (PHOTO BY DEBORAH LEE SOLTESZ)

Small Wonder: Island Sloth Proposed for Endangered Species Act Protection

Smitten with sloths, an adoring international public may not realize the species has a diminutive relative living on a tiny island north of Panama's mainland, the only place the pygmy three-toed sloth is known to exist on Earth. This small sloth — a resident of red mangroves and other plants on Isla Escudo de Veraguas — shares the serene expression, unhurried movements, and many of the same threats to its existence as its larger relatives, which is why we're proposing to protect it as threatened under the Endangered Species Act with a special rule allowing exceptions for certain otherwise prohibited activities.

The pygmy three-toed sloth lives in the red mangroves of Isla Escudo de Veraguas, a tiny island north of Panama's mainland. Photo by Pixabay

Weighing in at 6-plus pounds and sporting a black and white face on a tan body, the pygmy sloth is most closely related to the brown-throated three-toed sloth, its more visible mainland relative. Although it was described as a full species in 2001, little is known about the pygmy sloth's life history and habitat requirements. Pygmy sloths are known to eat red mangroves and 14 other plant species on Escudo.

The primary threats to the pygmy sloth are increased development and tourism. Although there is minimal to no current trade of the pygmy sloth, the species is listed under Appendix II of the Convention on International Trade in Endangered Species of Fauna and Flora. Known as CITES, the Convention is an international treaty created to ensure the global trade in animals and plants doesn't threaten their survival in the wild. Appendix II consists of species that may become endangered without trade regulation. Adding an ESA violation on top of a CITES violation could act as an additional disincentive for any illegal trade of the species.

Other threats to the pygmy sloth include the small size of Escudo and of the species' population, direct and indirect impacts of tourism, habitat loss from small-scale timber harvest, and habitat loss from sea level rise and erosion. These threats make the sloth vulnerable to random environmental catastrophes, such as storms. The pygmy sloth is currently considered resilient, but tourism and development are expected to increase on and around Escudo.

The Pygmy Sloth Conservation Project uses innovative and integrative activities to support pygmy sloth and Escudo conservation. The project includes repeated population surveys, education of Indigenous communities and schoolchildren regarding Escudo ecology and the benefits of conservation, and cooperation with the Indigenous government and local fishermen's association to develop a community-based natural resources management program. But while Escudo is designated as a protected area, enforcement and regulatory capacity are inadequate due to limited resources and the remoteness of the area. □

Becoming an Outdoors Woman Builds Skills, Confidence, Community, Outdoor Participation

Hunting, fishing, and the world of outdoor recreation aren't for everyone, but with 77% of hunters identifying as male, outdoors women may feel theirs is a particularly solo journey. Learning a new activity can feel intimidating or even inaccessible, especially in male dominated activities where instructors may not understand special considerations for women related to instructional tips and safe, appropriate gear. The Becoming an Outdoors Woman (BOW) program takes aim at those challenges, helping women across the country learn to paddle, fish, hunt, shoot, forage, and engage in other outdoor activities — together. We work with state natural resource agencies to help make it happen.

"Being outdoors and having a hands-on experience with nature is empowering," says Service Director Martha Williams, who participated in a BOW event in January 2024 in New Hampshire. "It's inspiring that this program gives women the opportunity to build confidence and community while connecting with the outdoors in new and different ways."

At the New Hampshire event, Secretary of the Interior Deb Haaland and Director Williams joined other women to experience learning opportunities available through the program. Neither had tried archery before, but with the help of instructors, »

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they both enjoyed shooting a bow and arrow for the first time.

"Whether you are an established outdoor enthusiast or new to the outdoors, BOW provides many opportunities for women to connect with each other and with the natural world in new and different ways," Williams says. "The Service is honored to support programming that teaches and empowers women as they pursue or advance their outdoor endeavors."

The program's success is thanks to the network of dedicated BOW instructors and the many volunteers who devote their time to sharing their knowledge and love of the outdoors with others. In many states, BOW program courses and instructor time are further supported by funding administered by our Office of Conservation Investment (formerly Wildlife and Sport Fish Restoration Program). The funds help offset costs, making BOW courses more affordable and allowing more people to participate.

Whether participants are aspiring or avid outdoor enthusiasts, BOW instructors across the country guide the way, enabling all participants to learn while taking part in fun, skill-building outdoor experiences. States follow a national model that divides BOW program offerings into thirds: one-third of the workshops focus on hunting, target shooting, or wildlife management; another third on boating, paddling, fishing, or water activities; and the remainder on nature-based outdoor recreation such as bird watching, camping, and outdoor cooking.

The Becoming an Outdoors Woman program teaches women across the country how to fish, hunt, and engage in other outdoor activities. (PHOTO BY USFWS)

Each program has its local flair, where participants learn skills specific to their area.

In Maryland, the Department of Natural Resources creates BOW events tailored to showcase the resources and opportunities available in the area, like goose hunting on the eastern shore and fishing on the Chesapeake Bay.

Texas Parks and Wildlife Department teaches bowfishing basics. Texas waterways are often highlighted as some of the best bowfishing destinations in the United States for species such as gar, buffalo, mullet, and sheepshead.

In Maine, one of the popular workshops helps participants become more self-reliant by teaching them to properly take care of game meat and prepare it for meals.

Some women participate in BOW courses multiple times. Kaisha Morse, an administrative support assistant for the Service, enjoyed two BOW events before her employment with us.

"I was able to take part in a fishing-charter experience, which was hands down one of my favorite days. The crew was over-the-top helpful and allowed participants to be as hands-on or hands-off as we were comfortable with. The icing on the cake was that I came home with plenty of fresh haddock to feed my family!" Morse says.

During both events, Morse developed her relationship with the outdoors and built camaraderie with friends.

Women are incredibly important to the future of hunting, fishing, and outdoor recreation, and state agencies and their partners are welcoming more women to these activities with every BOW course and workshop. These women are increasing the number of people who are getting outside to enjoy outdoor activities, use public lands, appreciate conservation, and manage wildlife populations.

"BOW is an exceptional program that provides all the tools and resources needed for women to grow their relationship with the outdoors to then pass on to the next generation of adventurers," Morse says. □

TRICIA ANDRISKI, Office of Communications, Northeast Region

Two Volunteers Log More than 20,000 Hours Volunteering at National Wildlife Refuges

To say Mark Ackerman and Joyce Atkinson have wide-ranging interests and talents would be a vast understatement.

Before they met, they each had their own lanes. He owned an electronics company for about 20 years. She had a wide variety of occupations including education coordinator and manager of the Rachel Carson Component of the North Carolina National Estuarine Research Reserve, a federal-state partnership between the National Oceanic and Atmospheric Administration and the N.C. Division of Coastal Management.

When the two met more than 20 years ago, their lives took an entirely different trajectory.

"When I met Joyce, it just opened a whole world of possibilities," Ackerman says. "Since we've known each other, we've worked as U.S. Merchant Marine captains, scuba diving instructors, Motorcycle Safety Foundation instructors, and EMT/paramedics. Then when we retired from paramedicine, we decided we want to travel."

Twelve years ago, the two moved into an RV full time and did just that. But they realized soon enough that travel alone wasn't all that satisfying. "Traveling around was great, but if you go to a place for a week, maybe two weeks and stay, you don't really get to be involved with the community. You're just doing tourist things," Ackerman says.

Volunteers Mark Ackerman and Joyce Atkinson at Desert National Wildlife Refuge. (PHOTO BY MARK ACKERMAN)

They began volunteering as camp hosts at state and national parks. "It was great, but it didn't really fill all the little places in our hearts that we wanted to," Ackerman says.

Then the couple spotted a volunteer opportunity at Arapahoe National Wildlife Refuge in Walden, Colorado. The refuge manager got the volunteers involved not just in guest relations, but projects that dealt with infrastructure and conservation. They were helping us achieve our mission—ensuring that future Americans will benefit from the natural resources that define our nation—fish, wildlife, plants, and their habitat.

This was the meaningful work Ackerman and Atkinson were looking for—since then they've added Desert and Malheur National Wildlife Refuges to their volunteer portfolio. In the last seven years, they have logged more than 10,000 hours each, completing projects at 11 national wildlife refuges across the country.

Atkinson and Ackerman were selected 2023 Volunteers of the Year by the National Wildlife Refuge Association for their contributions to the refuge system.

"The award ceremony was great—totally unexpected," Ackerman says. "I won't say unnecessary because we really enjoyed the appreciation, but that's not why we do it."

Ackerman says their diverse backgrounds are uniquely suited to solve problems. "Together, Joyce and I have started making that our schtick: We solve problems. We can see problems. We either know how to fix it or find a solution for it," he says.

They've volunteered at Malheur National Wildlife Refuge in Oregon for more than a decade, doing essential work to support habitat and wildlife management goals.

Tara Wertz, a retired deputy project leader at Malheur, says the two volunteers were instrumental in completing vital projects in the last couple of years. Projects include replacing an older security camera system with one that meets federal security guidelines, which required rewiring the entire system and integrating new hardware and software. "This alone would have cost tens of thousands of dollars to have a contractor install," Wertz says.

Atkinson and Ackerman also renovated a boat ramp, installed a base mat to retain the surface of the ramp, and installed four HVAC units that had been sitting around for a year because Wertz couldn't find a vendor in Eastern Oregon willing to install them.

"We do a lot of electrical, electronic, or security," Ackerman says. "You name something that's broken, we can probably tell you we can work on it."

But their expertise extends well beyond electronics. They literally move the earth to get things done.

"I had driven a farm tractor, but all of these things we run now, I never imagined doing it," Atkinson says.

They are both certified by the Service on agricultural tractors, backhoe, front-end loaders, skid steers, motor graders, and excavators. "We have all the same certifications. The only ››

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thing we don't have is bulldozer, but nobody ever has a bulldozer," Ackerman says.

The couple spends the year in nomad mode, following a temperature gradient they find agreeable. Along the way, they meet new people and do what they can to recruit more volunteers for the Service.

Volunteers are essential for helping the Service reach conservation and management goals. Don't let Ackerman and Atkinson's skills intimidate you if you are thinking about volunteering. There are volunteer opportunities for all ages, abilities, and activity levels—there is a place for everyone and every interest! □

JAN PETERSON, for the Pacific Region

MORE INFO

Find a volunteer opportunity.

Connecting With Nature Beyond Sound

The yellow warbler is known for its cheerful "sweet, sweet, sugary sweet" song. (PHOTO BY MIKE BUDD/USFWS)

If you're an avid birder, nature lover, or even just someone who enjoys going for a stroll near your home, you'd probably be thrilled to see a yellow warbler whiz by or hear its cheerful "sweet, sweet, sugary sweet" song ring through the trees. While many of us enjoy wildlife encounters like these, the experience isn't the same for everyone.

Using Sight for Song

Retired Service biologist Ron Popowski—who is deaf—developed a life hack for birding while working in northern Arizona with his U.S. Forest Service colleague—who is hearing—in the 1990s.

When the colleague heard a bird vocalize, he tipped off Popowski with a series of hand signals and motions—a combination of American Sign Language and their own invented code. With his knowledge of ecosystems and bird behavior, Popowski was able to deduce the general habitat and locate a bird for a species-specific identification.

For example, when the colleague heard a "tap, tap, tap, tap" in the woods, he'd signal "woodpecker" to Popowski. With this clue, Popowski could then determine the general habitat, height, and possible direction to visually locate the woodpecker. From there, he'd identify the species—a yellow-bellied sapsucker, for instance.

They used this silent code to record bird species in the Coconino National Forest, as part of a broader baseline data collection. This way, Popowski could perform his work duties and enjoy the same challenge that comes with identifying birds instead of simply being told what they were. Together, they identified birds such as Clark's nutcracker, sandhill crane, northern goshawk, and Mexican spotted owl.

Birding for All

Even if you aren't a biologist who is deaf or hard of hearing, Popowski's method or similar techniques can be useful for birders of all abilities.

The last thing you want to do on an early-morning birding outing is scare away a bird by saying (maybe even shouting, eek!) to your friend who's dragging behind, "Look for the wood thrush." Gesturing and signing are a covert way to share information.

Or you might flip to a page in a field guide and point out the species you suspect you heard. This also works as a nice strategy for being inclusive among a group of people who speak different languages.

Some techniques—like using bird-song phonetic spellings—can assist hearing as well as deaf and hard-of-hearing birders alike with remembering and identifying songbirds. To some, the red-eyed vireo may sound like "look up, over here, see me, up here." Assigning words to notes can help distinguish sounds.

These are a few of our favorites, or you can make up your own!

- "Chick-a-dee-dee-dee" —black-capped chickadee
- "Peter, peter, peter" —tufted titmouse
- "Tea kettle, tea kettle, tea kettle" —Carolina wren »

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- "Drink-your-tea" — eastern towhee
- "Cheer up, cheerily, cheerily" — American robin

Good Vibrations

Programmed to pick up rustling leaves, babbling brooks, frog calls, or bird songs, vibration-alert devices are fun tools to experience nature through another sensory channel. These clever gadgets detect the sounds of nature and translate them into meaningful vibrations the user can feel, enhancing their outdoor experience.

Additional tools are available for those with high-register hearing loss. As most birds sing in higher registers, assistive devices that lower the pitch of their songs without slowing them down allow birders to detect the pattern and rhythm in an audible register. Some advanced smartphone applications, like Merlin from the Cornell Lab of Ornithology, can record bird songs and suggest matching species while visually showing the pattern of the song.

It's helpful to remember that everyone's needs and experiences are different — and often, being inclusive improves the experience for everyone! Next time you're participating in your favorite hobby, consider how you can ensure it's accessible to everyone. □

LEAH RILEY and LAURA VACHULA, Office of Communications, Northeast Region

EVERYONE NEEDS WATER

New Oyster Reef Boosts Resilience of Restored Bird Nesting Island

At Rabbit Island, the site of the only brown pelican colony in southwestern Louisiana, we worked with Louisiana resource agencies to provide additional nesting habitat to offset injuries to colonial waterbirds hard hit by the 2010 Deepwater Horizon.

In 2020, the majority of Rabbit Island was underwater or subject to frequent flooding, and the island was no longer suitable nesting habitat. Wind-generated waves, periodic high tides, and the effects of traffic in the nearby Calcasieu Ship Channel had caused the slow erosion of the island's shoreline.

The restoration project added 102 acres of nesting bird habitat including 81 acres for nesting colonial waterbirds and 21 acres for other birds, such as egrets, herons, ibis, terns, and skimmers. More than 65,000 plants were installed. These included smooth cordgrass, matrimony vine, groundsel bush, and marsh elder.

Experts expected approximately 370 nests in the first year after restoration. Much to their surprise, however, more than 11,600 colonial waterbird nests, of which 561 were brown pelican nests were counted.

Eager to maintain this trend, state and federal scientists began to consider ways to stave off future erosion. In 2023, they looked to The Nature Conservancy, which has an ongoing successful oyster reef restoration initiative in southwestern Louisiana. The nonprofit provided advice and expertise, and another partner, Chenier Energy, LLC, donated a portion of the funding needed for materials to add man-made oyster recruiting structures along vulnerable shoreline areas.

In the first year after Rabbit Island's restoration, more than 11,600 colonial waterbird nests, including 561 brown pelican nests, were counted, far exceeding expectations.

Late in 2023, engineers completed the installation of 810 large wire mesh gabions filled with limestone rock along the northeastern edge of Rabbit Island. At 3,000 pounds each, the gabions now form a stable protective barrier that is intended to limit the impacts of erosion and storm surge and creates a wall-like structure behind which silt can collect and vegetation can become established.

At the same time, the limestone rock provides a proven substrate for oyster larvae, or spat, to attach to. The installation of this very simple but substantial structure is likely to lead to the creation of marsh habitat for fish, birds, shellfish, marine mammals, and other wildlife, as well as expanded recreational fishing opportunities for the public. Once the marsh habitat behind the gabions is well established, it will, along with the filter-feeding oysters, help to improve water quality.

In this way, Louisiana, the Service, and a diverse group of partners have created a multifaceted restoration project benefitting both bird and oyster habitat in southwestern Louisiana. The recent addition of shoreline protection structures to the Rabbit Island Restoration Project has made a great project even better. □

NANCIANN REGALADO, Gulf Restoration Office, Southeast Region

EVERYONE NEEDS WATER

Report Finds Wetland Loss is Increasing, Making Conservation More Challenging

Our National Wetlands Inventory Program's Wetlands Status and Trends report, delivered to Congress in March, highlights increasing wetland loss and worrying implications for wetland-dependent species. These losses are in addition to the over half of wetlands that have already been lost in the contiguous United States since European colonization. This decadal report is the sixth in a series going back to 1954 that helps us understand how and why our nation's wetlands are changing.

According to the March report, wetland loss increased by more than 50% since the last study period (2004–2009), resulting in the net loss of 221,000 acres of wetlands within the contiguous United States between 2009 and 2019. Losses disproportionately affected vegetated wetlands, resulting in a net loss of 670,000 acres of these wetlands, more than the land area of Rhode Island. This amounts to the loss of nearly 150 football fields of important habitat each day. Conversely, there was a net gain (488,000 acres) of non-vegetated wetlands. These changes were primarily caused by people as they drained, filled, and used land for development, silviculture, and agriculture, but there were also other important factors, like sea level rise.

Our nation has been losing its wetlands for hundreds of years and many of those that remain are being transformed from vegetated wetlands, like salt marshes and swamps, to non-vegetated wetlands, like irrigation ponds, stormwater retention areas, and mudflats.

Although wetlands are currently found in less than 6% of the contiguous United States, a disproportionately high number of rare, as well as economically and culturally important, species rely on them. Situated at the intersection between dry land and deepwater habitats, like lakes and oceans, wetlands support unique species that have evolved to depend on Goldilocks-like conditions, that is—just enough but not too much water. Many of these species, from white shrimp to blue crabs and wild rice, support subsistence and the economy by providing food, fiber, and recreation. About half of all threatened and endangered species are also wetland dependent.

The loss and alteration of wetlands make conserving vulnerable species much more challenging. Loss affects species in different ways, including through reduction and fragmentation of suitable habitat. The impacts of wetland loss and alteration on vulnerable species were highlighted by the North American Bird Conservation Initiative's 2022 State of the Birds report. It documented that about one-third of waterbirds are experiencing population declines, including several rail species (e.g., black rail and king rail) that rely almost exclusively on vegetated wetlands, particularly marshes. Other "Tipping Point" species, whose cumulative population loss has exceeded 70% since 1980, include the seaside and saltmarsh sparrow, which also rely heavily on vegetated wetlands. On the other hand, most species of ducks that use both vegetated wetlands and non-vegetated wetland and deepwater habitats, such as ponds and lakes, have been generally stable or increasing.

The importance of wetlands to vulnerable species is disproportionately high and is likely to increase. North American populations of wetland-dependent species are declining much more rapidly than other types of ››

Wetland losses disproportionately affected vegetated wetlands, resulting in a net loss of 670,000 acres of these wetlands, more than the land area of Rhode Island. (PHOTO BY TOM KOERNER/USFWS)

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plants and animals. Populations of some types of species, like amphibians, crayfish, and freshwater mussels, are declining particularly fast. These patterns will be heightened by climate change, which is expected to increase at the coast and other wetland-rich areas, like the Prairie Pothole Region. Recent studies indicate that declines in populations of wetland-dependent species associated with wetland loss may be punctuated by tipping points that lead to rapid, potentially difficult to reverse, declines in the viability of these species.

The Wetlands Status and Trends report includes recommendations that support wetland conservation. These include recommendations to update foundational scientific information like National Wetlands Inventory maps, which have long guided America's approach to wetland conservation.

We're committed to working with partners to conserve wetlands today so that we can hopefully avoid having to protect species under the Endangered Species Act tomorrow. □

MORE INFO

Learn more about the wetlands report.

EVERYONE NEEDS WATER

Extinct Mississippi Snail Rediscovered: Landowner Partnerships Key to Conservation Success

JACKSON, Miss. — Scientists found a living population of a Mississippi freshwater snail last seen in 1965 and assumed extinct, the Big Black rocksnail, according to a study published in *Biodiversity and Conservation* in March 2024.

Scientists from the Mississippi Museum of Natural Science, the Army Corps of Engineers, and the Service teamed up to search for the snail after finding a shell during a mollusk study in 2021. In October 2022, they found a large group of Big Black rocksnails in a privately owned and hard-to-reach part of the Big Black River in central Mississippi.

"The only way we would have been able to access such a remote site when water levels were low enough to adequately sample snails was with a private landowner granting us access to the river via their property," says Nathan Whelan, one of our fish and wildlife biologists. "Without the access, Big Black rocksnails would likely still be considered extinct."

Biologists sent 12 snails to genetics labs at our Warm Springs Fish Technology Center in Georgia and Auburn University for more study. These results showed that there had been a large group of these snails living at the newly discovered site for thousands of years.

Previously thought to be extinct, the Big Black rocksnail is living in a hard-to-reach area of the Big Black River, Mississippi. (PHOTO BY CALVIN REZAC/ MISSISSIPPI MUSEUM OF NATURAL SCIENCE)

In 1989, scientists thought that the Big Black rocksnail disappeared due to a chemical spill after not being able to find it where they thought it lived.

The new study suggested that when scientists look for these rare types of snails, they should sample as many sites as possible when conditions are good for finding the snails. It also advocated for policies that encourage partnerships with landowners, as it helped scientists rediscover the Big Black rocksnail. □

IAN FISCHER, Office of Communications, Southeast Region

MORE INFO

Read the Big Black rocksnail study.

EVERYONE NEEDS WATER

The Port Authority of Guam Restores Harbor of Refuge with Boating Infrastructure Grants

On May 24, 2023, Typhoon Mawar struck Guam.

The storm hit the island with 140 mph winds knocking out power and flooding buildings. A rain gauge in Dededo measured 28.42 inches of rain, most of which fell within three hours. Although Typhoon Mawar was the strongest storm to hit the island in 20 years, boats tied to moorings in Guam's Harbor of Refuge were safe and sheltered from the storm.

Just one month earlier, the Port Authority of Guam completed a multiyear renovation project to repair the harbor. In partnership with the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources, and with the help of Boating Infrastructure Grant funding administered by the Service, the port fixed the moorings just in time for the typhoon.

"The whole intention of the Harbor of Refuge is for boats to be able to seek shelter during a storm," says Dora Perez, a planner with the Port Authority of Guam. "It's a multiuse facility, and the primary use of the refuge is for safety of boaters during a storm."

Guam's Harbor of Refuge has 48 moorings that are open to a variety of boat types and sizes. Partnership funds from our Boating Infrastructure Grant support tie-ups for recreational transient vessels more than 26 feet in length. (PHOTO BY DORA PEREZ/PORT AUTHORITY OF GUAM)

Perez started working for the Port Authority of Guam in 1989 as a clerk. Born and raised in Guam, she ascended the agency's ranks until she became a planner in the port's strategic planning division. Perez derives the most satisfaction from seeing how her projects benefit the community.

"Our projects are tangible," Perez says. "When you walk on the docks, you just feel so good because it's for the community."

The harbor has 48 moorings that are open to a variety of boat types and sizes. Partnership funds from the Boating Infrastructure Grant Program support tie-ups for recreational transient vessels more than 26 feet in length. While the primary use of the Harbor of Refuge is to provide a place where boats can shelter from the storms that frequently strike Guam during typhoon season, it's also available for short-term boat parking.

Having a safe and functional harbor also provides conservation benefits. Tying up to a mooring instead of dropping an anchor protects fragile corals, reduces impacts on marine plants and animals, and curtails pollution.

"By ensuring that the boats are safely anchored, it helps maintain the health and biodiversity of the marine ecosystem," Perez says. "A well-maintained moorage area reduces the impact of human activity on marine life and habitats."

The project's success was attributable to the Office of the Governor's Marine Conservation Plan and the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources.

"Our agency's partnership with the Port Authority of Guam has been invaluable with completing infrastructure projects to benefit the boating community," says Jay Gutierrez, chief of the Guam Department of Agriculture's Division of Aquatic and Wildlife Resources. "Having a safe area to moor will ensure that boats and the environment are protected, especially during storms."

The Boating Infrastructure Grant program was established in 1998 and is administrated by our Office of Conservation Investment. The program provides funding to states to improve access to the historic, cultural, recreational, scenic, and natural resources within the United States for »

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large boats. The grants have supported projects designed to strengthen local community ties to boaters and marine manufacturers, raise awareness about the economic benefits of recreational boating, promote partnerships, provide continuity of access to coastal communities, and provide areas of safe harbor. Funds from this program have expanded opportunities for boating and water-related recreation and the communities these activities support.

"The partnership between Guam's Department of Agriculture and the Port Authority of Guam is a very effective collaboration," says Ruth Utzurrum, Service wildlife biologist and grants manager. "They've done a great job with building infrastructure that provides boaters and the community with safe places to tie up, and access to recreational opportunities that also benefit conservation. The Harbor of Refuge renovation is the result of a very highly complementary, effective, and mutually beneficial partnership."

The next phase of renovation includes adding a convenience dock and gangway. For now, the harbor is open—for the community, and beyond. □

LEV LEVY, Office of Communications, Pacific Region

EVERYONE NEEDS WATER

Regional Aerial Bird Survey Produces Public Database

The Service, in partnership with the five states bordering the northern Gulf of Mexico, NOAA, the U.S. Environmental Protection Agency, and the U.S. Departments of Agriculture, has produced a database on colonial nesting birds that contains information gained from tens of thousands of aerial photographs taken during the decade following the 2010 Deepwater Horizon oil spill. All information included in the database is available to the public, including the original high-resolution photographs.

The Deepwater Horizon explosion resulted in the largest marine oil spill in United States history. It discharged more than a million gallons of oil into the Gulf of Mexico. For wildlife in the Gulf of Mexico and along its coast, the oil spill was an unprecedented ecological disaster. In the wake of the spill and subsequent legal settlements, federal and state agencies were tasked with assessing and restoring damage to natural resources such as wetlands and wildlife.

For the Service, a significant part of that work involved analyzing and quantifying injuries to bird habitats and populations along the northern Gulf of Mexico, not only on federal lands, such as national parks, national seashores, and national wildlife refuges, but also in other areas that support bird populations.

Photographing colonies from a hole in the floor of the plane. (PHOTO BY COASTAL PROTECTION AND RESTORATION AUTHORITY)

Birds that nest in colonies along the coast were hard hit by the spill. Direct oiling of nests, young, and adults was one problem. Damage to and death of the vegetation they use for nesting, such as mangroves and marsh grasses, was another.

Restoration efforts began with documenting existing colonial waterbird bird nesting habitat. Having this information is enabling biologists to better locate and design bird nesting habitat restoration projects and assess the effectiveness of newly restored habitats.

For the survey, 49,000 high resolution photographs were taken in which birds were identified and counted. Their nests were also counted. The data was entered into a database that includes a range of information from the detailed to basic descriptive summaries of the most commonly seen species.

The database has already allowed us to look at the change in the number of nests over time. It appears that the number of nests for many species, such as brown pelicans, increased significantly in 2021. This portal is an easy-to-use web-based search engine that allows researchers, restoration managers, and the public to search by year, region, state, colony, species, and watershed to provide results on total birds or total nests.

"We recognize the many benefits of making this user-friendly database available to managers, scientists, and interested members of the public," says Service biologist Dave Hewitt. "This expansive data set has the potential for creating a higher level of awareness of the challenges faced by these birds, and it can lead to better decisions by wildlife biologists, managers, and other stakeholders." □

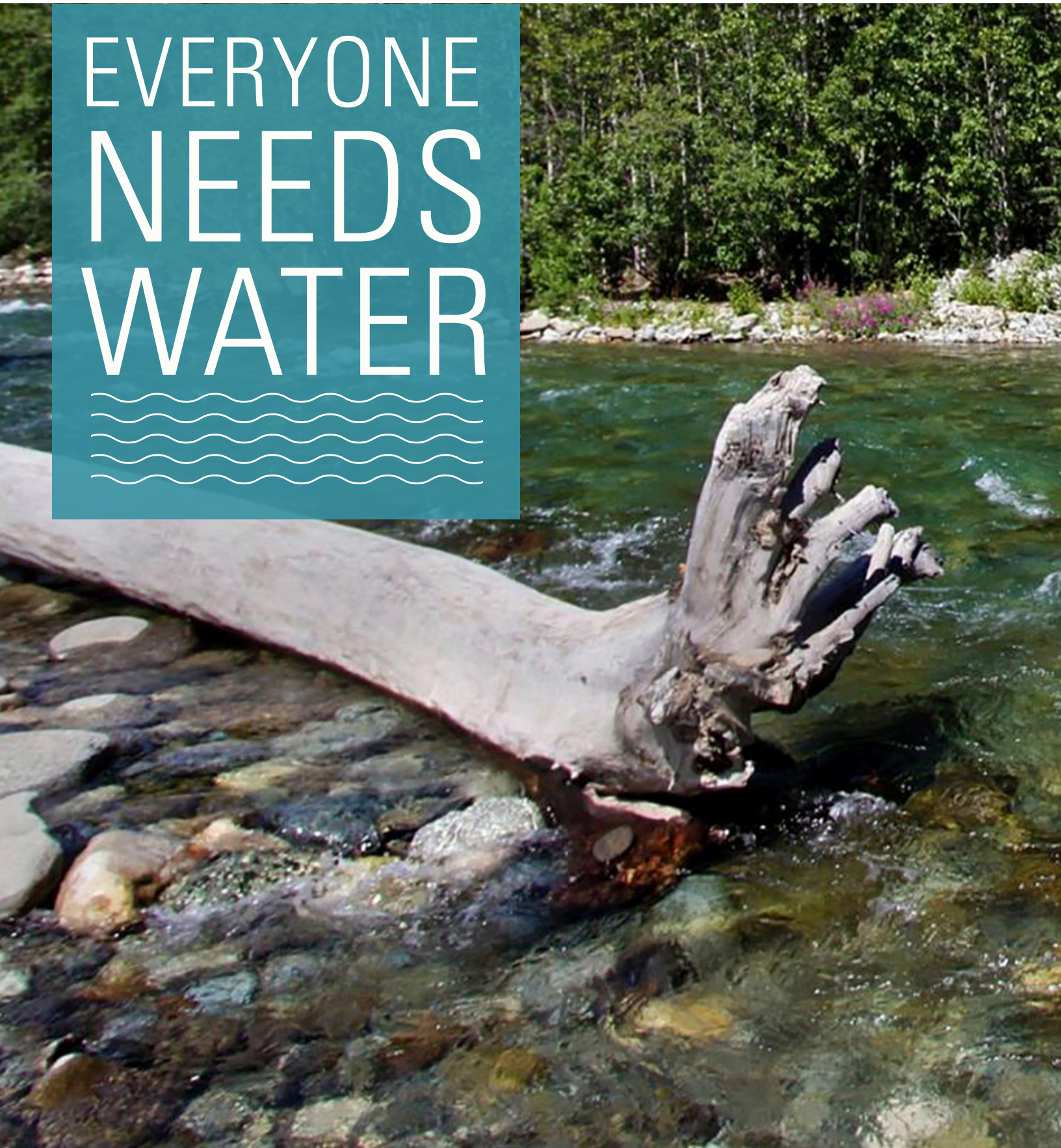
NANCIANN REGALADO, Gulf Restoration Office, Southeast Region

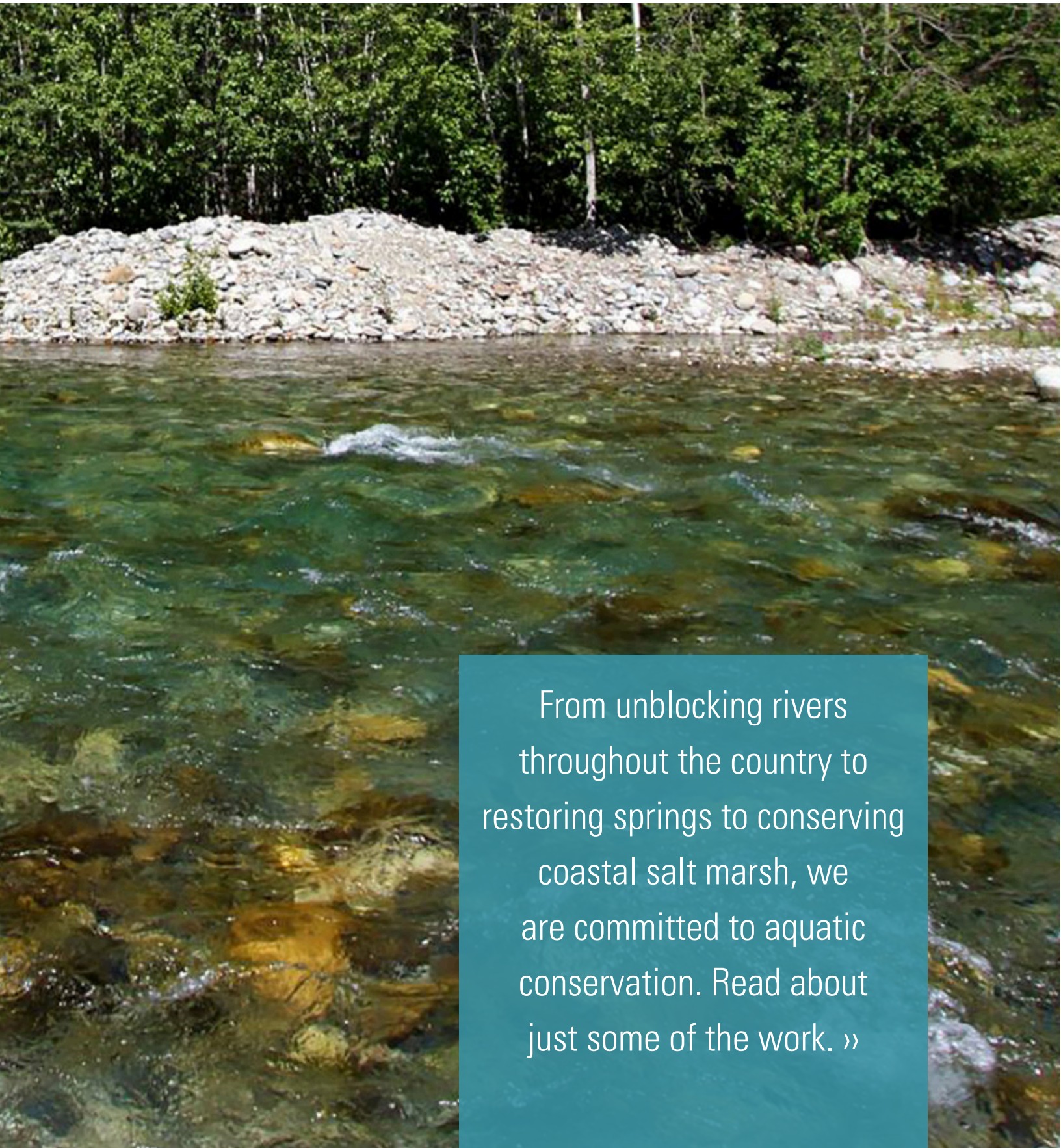
LEARN MORE

Visit the Avian Data Monitoring Portal

Learn more about how the Service and our partners are restoring the Gulf of Mexico after the Deepwater Horizon oil spill

EVERYONE NEEDS WATER





From unblocking rivers throughout the country to restoring springs to conserving coastal salt marsh, we are committed to aquatic conservation. Read about just some of the work. ››

WHY ARE WE REMOVING DAMS?

How will this work change our rivers?

By GIGI OTTEN

(Top) Removal of the Highland Dam on the West Fork River in West Virginia.
(PHOTO BY USFWS)

(Bottom) Construction crews demolishing Town Dam on the Sabattus River in Maine.
(PHOTO BY CATHERINE BIRMINGHAM/ASF)

Of the nearly 100,000 dams blocking our nation's rivers, the majority are nearly invisible. Underneath murky waters, they halt the free flow and exchange of fish, nutrients, and sediments, and they pose a deadly risk to people across the country. We're dedicated to removing those dams that are unsafe, negatively impact the environment, and serve no modern-day purpose. ››

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In fact, Bipartisan Infrastructure Law funding, announced in April 2024, will provide more than $70 million from President Biden's Investing in America agenda for 43 projects in 29 states that will improve fish passage around outdated or obsolete dams, culverts, levees and other barriers fragmenting the nation's rivers and streams.

What Is the Function of a Dam?

The dams people are most familiar with are large structures built with specific purposes in mind such as to generate power, reduce flooding, move ships, and even contain toxic waste. Massively engineered structures, like the Hoover Dam, provide drinking and irrigation water to millions of people. With climate and precipitation patterns becoming increasingly erratic, these dams save lives. But not all dams are were made with equal forethought or planning. Without continued maintenance, most dams in the nation are now failing—these are the ones we need to address.

The average dam in the United States is 63 years old and ready for retirement. The vast majority are small, locally or privately owned, and were originally built to control water flow, mill grains, transport lumber, or create a reliable fishing spot. Thousands of these dams have begun to degrade, harming aquatic, terrestrial, and human life. Though they are championed as a source of renewable energy, less than 3% of dams in the United States are still used to generate energy. Nowadays, the main purpose of most dams is to create open water for recreation activities like fishing and swimming.

A Large Impact to People

Dozens of lives are lost to dams in the United States each year, and as their purpose and stability disappear, 49 states have already implemented dam safety programs. Missouri, Texas, and North Carolina each have more than 1,000 dams considered as being likely to take human life should failure or misoperation occur.

Dams alter the flow, chemistry, silt load, and temperature of water. Furthermore, by changing the silt deposition on the bottom of the riverbed, it has even been suggested that dams may lessen the volume capacity of rivers and actually increase flooding downstream. Dams also disturb wetlands. Wetlands are the world's most powerful water-filtration system, but they have a notoriously delicate disposition. Wetlands provide New York City with its famed tap water, which is argued to be the best-tasting in country and yet never enters a filtration plant. Half the population of New York City depends on wetlands to clean their water, and the entire city saves money by avoiding construction and maintenance of large filtration facilities. Wetlands are truly one of the most underrecognized, productive and diverse habitats in the world (and they are disappearing, see p. 10).

Damming Our Rivers, Damming Our Fish

Dams, whether old or new, impact the entire ecological system. When a river is dammed, so are the nutrients and animals inside of it. This interrupts the life cycles of numerous aquatic species and subsequently, disrupts the food web. Dams slow the natural flow of water and warm it, promoting the spread of deadly algae and parasites. Effects like these have already caused the extinction of many species of mussels, fish, and even a dolphin. Dams have been harming salmon and sturgeon since their installation, and people are frustrated to see these culturally and economically important species hurt when it is within our ability to protect them.

We have an entire program dedicated to opening up rivers for fish passage. Fish passage refers to the movement of fish up and down rivers to reach spawning and feeding places. Much like birds and butterflies, fish need to move. But because people can't easily see fish, or the other organisms traveling within rivers, many don't understand how problematic dams are to an aquatic ecosystem. For example, sturgeon and salmon both remember where they were born and will return from great distances to that exact location to lay eggs once more, participating in a species-long tradition. Improving fish passage is one of the most effective ways to help conserve vulnerable species while building safer infrastructure for communities and improving climate resilience.

Communities and Invasive Species

Though dams can negatively impact the environment, they can also be cherished by their communities and aid in the control of invasive species. Many communities appreciate their local dams because of their historical and cultural significance. Dams can provide space for gathering and nature appreciation. They also create reliable ponds of water for fishing that are often uniquely accessible.

When we remove a dam, we mimic the characteristics of a healthy and self-sustaining river by installing nature-based solutions. Tearing down a dam doesn't mean losing a fishing hole. We fashion tree roots, boulder piles, and more into the riverbed and on the riverbank. These methods copy nature's way of creating pools and habitat for fish so that human communities not only maintain their favorite fishing hole but enjoy a wider diversity of species that will be healthier and live longer.

Along with the rest of aquatic life, aquatic invasive species have also been restricted by dams. Dams can protect larger watersheds by shielding them from invasive species. We value this protective quality provided by dams and prioritize maintaining those acting as the last barrier to the spread of invasive species, such as sea lamprey. □

GIGI OTTEN, Office of Communications, Midwest Region

BLENDING SCIENCE, CONSCIENCE

Ash Meadows National Wildlife Refuge is unique, full of natural resource challenges, and worth every ounce of effort.

By JOHN HEIL

With 12 threatened and endangered species and 26 species that live nowhere else on Earth, Ash Meadows National Wildlife Refuge in southern Nevada is a globally significant biodiversity hot spot. ››

(Top) Ash Meadows Amargosa pupfish swim at the refuge.
(PHOTO BY JOHN HEIL/USFWS)

(Left) A rare site: a sunray at Ash Meadows National Wildlife Refuge.
(PHOTO BY JOHN HEIL/USFWS)

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And nearly all of those endemic species live in or around its 50 springs and seeps.

The refuge, which is managed by the Service and one of four refuges within the Desert National Wildlife Refuge Complex, is home to many unique species, some readily observable, others hidden underwater. In exploring the refuge, visitors can see bighorn sheep, phainopepla, and a variety of lizards including the chuckwalla. With a careful eye, visitors can see hidden aquatic species, such as Ash Meadows speckled dace, Ash Meadows naucorid (an aquatic bug), and the Ash Meadows Amargosa pupfish, swimming within the refuge's springs.

The refuge, which falls within the ancestral homelands of Nuwuvi/Nuwu (Southern Paiute/Chemehuevi) and Newe (Western Shoshone) people, has evolved over time. According to Richard Arnold from the Pahrump Paiute Tribe, the land is alive and must be protected to stay in balance.

"Tribes work in partnership with the Fish and Wildlife Service, integrating Tribal ecological knowledge to protect this special place as we have done since the beginning of time," says Arnold. "Ash Meadows is important to all culturally affiliated Tribes. Our families lived here and continue to interact with the land. This land is our drug store, garden, church, school, and provides everything we need. It's a sentient being with feelings."

Arnold adds: "There should always be a Tribal voice into the management and protection of these resources because Tribes can contribute a lot with our traditional ecological knowledge. We have our cultural responsibility to share our knowledge to keep the land in balance. We need science with a conscience in our quest to protect our Tribal homelands.

The name "phainopepla" comes from the Greek for "shining robe," a fitting characterization of the shiny, jet-black plumage of the adult male bird.
(PHOTO BY JOHN HEIL/USFWS)

"The reason this refuge is here today is because Tribal people protected the land and managed the resources for future generations. We look at things from how they were in the past, how it is now, and how things will be in the future as our foundation for what we do as a people."

In the 1950s and '60s, before it became a refuge, extensive agricultural development converted spring and aquatic habitats into simple water conveyances to grow crops. Those activities created challenges to this day, according to refuge manager Mike Bower.

"We still have that legacy of land use and we're still working hard to recover the original function of the habitats to support unique endemic species and the important cultural connections of affiliated Tribes," he says. "There's been a great deal of progress made—many of our largest springs have been restored including the upper reaches of Crystal Spring. However, downstream, the water still enters irrigation ditches, which do not provide for all the needs of our native species."

Restoring the remaining degraded habitats is important work, Bower says, because the species that evolved at the refuge don't have anywhere else to go nor can strong cultural connections to the place be re-created elsewhere.

"It's really critical that we restore these habitats to their original function. And so that's been a long-term mission and the primary direction of management here at Ash Meadows, and there's been a great deal of progress made," says Bower. "We stand on the shoulders of giants that helped protect, restore, and steward this place. And we have ambitious restoration plans for the future, including restoration of the remainder of Crystal Spring outflow, which will involve decommissioning of reservoirs and restoration of about four or five miles of additional spring outflow habitat."

With such a unique ecosystem at Ash Meadows, there are many challenges ahead to continue to protect native species and reach the goal of ecosystem restoration.

"I would say it's challenging because this is such a unique area and there are not many real-life examples that we can use," says Leah Simantel, an ecological restoration specialist at the refuge. "As a result of the delicate nature found at Ash Meadows, we deal with a lot of trial and error or creative methods that other refuges might not face."

Bower says it is critically important that the refuge invest in science to advance understanding of the complex ecosystem and inform stewardship strategies. ››

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"The cardinal sin of conservation is failing to learn from your mistakes," he says. "What we're really trying to focus on at Ash Meadows is developing an adaptive management mindset including a commitment to scientific research and monitoring that helps us to learn and get better at what we do over time. Nature is complex and we don't always know how species or ecosystems may respond to management actions. Institutionalizing a commitment to learning over time about these important species, their environments, and how to restore them is an important act of humility."

Bower's first experience in the area was at Death Valley National Park, helping to conserve the Devil's Hole pupfish, which was his initial introduction to the ecosystem and the unique hydrogeologic environment.

"You know, I sometimes think about the story of the canary in the coal mine, where sometimes we need indicators of how our actions are affecting the environment," says Bower. "In a lot of ways, the groundwater aquifer that is expressed at Devils Hole and here at Ash Meadows could be one of those canaries in our collective regional coal mine, because it does indicate how much water we're using in relation to how much, how quickly that aquifer is being refilled.

"I invite people to understand the interconnectedness of the groundwater aquifer and how actions in one area affect areas far removed. The groundwater aquifer that comes to the surface at Ash Meadows spans a huge area encompassing many of our neighboring communities. We love to connect with our local schools from neighboring communities and host school groups to discuss issues such as water conservation. … I can't think of a higher priority than connecting the next generation who can create changes in the future, with amazing special places found in Ash Meadows." ››

Mike Bower, Ash Meadows National Wildlife Refuge Manager in front of a spring at the refuge in February 2023.
(PHOTO BY JOHN HEIL/USFWS)

Leah Simantel, ecological restoration specialist looks for bighorn sheep on a mountain at Ash Meadows National Wildlife Refuge.
(PHOTO BY JOHN HEIL/USFWS)

The chuckwalla is the second largest lizard in the United States. (PHOTO BY JOHN HEIL/USFWS)

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Adds refuge biologist Michael Reeves: "It's really easy to take pride in your job out here. That's not saying it's not fraught with challenges, but I feel like in order to grow as a biologist or concerned individual, we need to be challenged. I welcome that challenge as it definitely pushes me to stimulate change while going home with a sense of pride and accomplishment that I can share with my family and the community we serve.

"Nature to me is healing and I think it should be experienced by many. We just need to encourage visitors to come here and experience the wonders of nature," Reeves says.

"It's a really special place," says Simantel. "I think people are drawn by just the unique biodiversity and the chance to see species of fish that you don't find anywhere else on Earth. I think that it's something that people who grew up here or have experienced the wonders of nature can be proud of what we have achieved and, what lies ahead through our continued partnership to conserve this special place." □

JOHN HEIL, Office of Communications, Pacific Southwest Region

The Creator's Gift!

"When the world was new, the Creator placed our people here and told us to care for this special place. When we did, it gave us gifts and revealed powerful messages. We followed the Creator's advice and were provided with everything that makes Ash Meadows like no other. The wisdom we gained taught us to care for and respect this delicate landscape that connects our people to everything within the natural and spiritual world. Because these important lessons are still shared through the voice of the land, together we can experience this most important gift as the Creator intended. Join Nuwuvi/Nuwu (Southern Paiute), Newe (Western Shoshone) and the U.S. Fish and Wildlife Service in caring for this special place!"

—The Newe/Nuwuvi Working Group in collaboration with Jeremy Spoon and the Service, November 2011

SAVING THE SALT MARSH

Up and down the Atlantic Coast, conservationists are hard at work saving salt marshes.

Salt marsh off Harris Neck National Wildlife Refuge. (PHOTO BY DAN CHAPMAN/USFWS)

MARSHES ON THE MOVE / P. 23

CONSERVING THE COAST / P. 26

MARSHES ON THE MOVE

In Maine, today's meadow is tomorrow's marsh, and staff at Rachel Carson National Wildlife Refuge and their partners work to give salt marshes room to migrate.

By LAURI MUNROE-HULTMAN

You don't need to tell Karl Stromayer climate change is the existential threat of our time; he lives that reality every day. As manager of Rachel Carson National Wildlife Refuge in Maine, he's watching as the sea creeps up on the refuge's salt marshes. And he's taking action.

Stromayer's racing the clock to bolster the refuge—created to protect precious coastal habitat—by helping existing marsh move inland as sea level rise encroaches. But he can't do it alone.

Fortunately, he has a team of dedicated conservation groups with complementary strengths at his side. Working together with patience and persistence, these collaborators are protecting the salt marshes of the future.

Marsh on the Move

Set up in 1966 to conserve salt marsh for migratory birds, the refuge now includes more than 5,800 acres along 50 miles of southern Maine's coast. In the early years, development was the primary threat to the refuge's mission, but now sea level rise caused by climate change is jeopardizing refuge and non-refuge lands alike. By 2100, half the refuge's salt marsh will likely be underwater due to a predicted six-foot rise in sea levels.

"When the refuge was established, climate change wasn't the known challenge it is now," Stromayer says. "Our current lands aren't ideally situated for all the species we hope to protect in the long term."

Conserving existing salt marsh is no longer enough; to keep pace with rising seas, Stromayer looks for sites where salt marsh can migrate inland. That means finding marshes backed by open meadows, pastures, and even forested uplands that can morph into marsh when higher daily tides reach them in the future.

"Preparing for climate change is one of our key priorities and the importance of salt marsh migration can't be overemphasized," Stromayer says.

Opportunity Knocks

In early winter 2022, Doreen MacGillis, land protection specialist at York Land Trust, learned a prime piece of coastal property on the upper York River would soon be sold—a house with 52 acres of salt marsh, hayfield, and pasture.

Well aware of its ecological value and the potential for marsh migration, she reached out to Keith Fletcher, southern Maine project manager at Maine Coast Heritage Trust. The two met with the seller, who supported conserving the land.

The parcel was within not only the refuge's acquisition boundary but also regional, state, and local priority conservation areas. And, in 2023, the York River became the newest nationally recognized Partnership Wild and Scenic River, protected by its community.

"This property was on everybody's priority list for years," Fletcher said. ››

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Conservation Powers, Activate!

While the Service, York Land Trust, and Maine Coast Heritage Trust all wanted the parcel protected, none of them could do it independently. It would take teamwork … and trust.

All three agreed that, due to the property's abundant wildlife and plant species, it belonged in Rachel Carson Refuge. And while Stromayer was confident he could line up government funding for the purchase, it would take time — something in short supply in the real estate world.

This is where land trusts shine. With cash on hand and the generosity of a private donor, Maine Coast Heritage Trust and York Land Trust split the cost of the purchase. They sold the house, along with five acres, and held the remaining 47 acres until the title to the land could be transferred to the refuge.

"We agreed to share the risks and rewards of the project," Fletcher says. "We've partnered on a dozen projects in different ways, and we had faith we'd get some money back on the sale of the house."

Before the land was even available, Stromayer had applied for money from the federal Land and Water Conservation Fund — created by Congress in 1964 to safeguard public lands and waters using revenues from offshore oil and gas drilling — to purchase future salt marsh habitat for the refuge. In 2020, as part of the Great American Outdoors Act, Congress permanently authorized the fund and set the annual appropriation at $900 million.

In 2023, Rachel Carson Refuge received $2 million from the fund, more than enough to buy the 47-acre parcel from Maine Coast Heritage Trust. In January 2024, two years after the property came on the market, it became part of the refuge. ››

(Top) The saltmarsh sparrow relies on healthy salt marshes for its survival. (PHOTO BY USFWS) (Left) Doreen MacGillis, Karl Stromayer, Keith Fletcher and Amelia Nadilo visit the York River parcel added to Rachel Carson National Wildlife Refuge. (PHOTO BY MAINE COAST HERITAGE TRUST)

The York River salt marsh at Rachel Carson National Wildlife Refuge at high tide. (PHOTO BY MAINE COAST HERITAGE TRUST)

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"This project required all three organizations to meet its funding, resource, and timeline needs," says Amelia Nadilo, executive director of York Land Trust. "It highlights what can be achieved through collaboration."

One other partner was key to protecting the land: Friends of Rachel Carson National Wildlife Refuge has long advocated for adding acres to the refuge. The group helped secure the Land and Water Conservation Fund money for the acquisition.

A RAD-ical Idea

Supporting habitat transformation is a paradigm shift for refuge managers like Stromayer, who've long sought to undo the effects of human activities and invasive species to return lands to historical conditions. In a changing climate, historical conditions may no longer be desirable, or possible.

Instead, the Service and other federal natural resource agencies have adopted the Resist-Accept-Direct, or RAD, framework. Building upon decades of research for managing wildlife in the face of rapid change, it offers three pathways for managers to consider when approaching conservation:

- Resist by counteracting changes and restoring habitats and populations to baseline conditions (the traditional wildlife management approach).
- Accept by allowing habitats to transition without intervention.
- Direct by working alongside occurring transformations, steering change to support a variety of fish and wildlife and safeguard nature's benefits to people.

Stromayer and refuge wildlife biologist Kate O'Brien envision directing inland migration of the existing salt marsh habitat at the parcel by maintaining the open grassland behind it with habitat management tools such as mowing and prescribed fire. This spring, O'Brien is leading a team to assess the new parcel, surveying birds, plants, soil, and more, to get a better a sense of the health of system.

Depending on what they find, staff may also resist immediate changes by restoring the natural function of the current marsh.

"The York River is unique in that it's more of an inland salt marsh," O'Brien says. "We're hoping that feature gives it a buffer over sea level rise, but this is a spot where, decades from now, I fully expect salt marsh migration to occur."

Hope is the Thing With Feathers

O'Brien hopes to find at least one salt-marsh sparrow at the marsh. This gray-buff-and-brown songbird with a face striped in saffron nests only in Northeast salt marshes. Its numbers are declining at an alarming rate as rising seas flood nests, setting eggs afloat and drowning hatchlings. Without our help, the species could go extinct in the next decade.

"We can tell from older surveys, other marshes we've conserved, and features of the upper York River parcel that salt-marsh sparrows are likely nesting there," O'Brien says. "It would be very unlikely to have them not be there."

In addition to saltmarsh sparrows, the parcel may support other species considered by the Service and its partners to be at risk of steep population declines, including the fish like alewife and shorebirds like American oystercatcher.

For the Greater Good

The benefits of conserving the upper York River parcel extend beyond the needs of wildlife to those of people. Sea level rise and increasingly frequent severe storms threaten public safety on Maine's coast. Healthy salt marshes act as sponges, absorbing higher tides, storm surge, and run-off from heavy rains.

"We're experiencing more frequent flooding in York," Nadilo says. "People are seeing it in real time; the narrative is shifting to 'We're living in a climate-changed world.'" ››

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Conserving the current and future salt marsh at the parcel strengthens the coast in the face of climate change while sustaining the area's scenic, recreational, and historical resources.

Healthy marshes also store carbon, a climate pollutant, in their soils, keeping it out of the atmosphere. When they're degraded or lost, that stored carbon is released.

Think Globally, Act Locally

Recognizing the enormous value of salt marshes, the U.S. Department of the Interior launched the Salt Marsh Keystone Initiative in January 2024. With funding support from the Bipartisan Infrastructure Law, the Service is partnering with others to leverage resources and expertise to restore and sustain this valuable habitat all along the Eastern Seaboard.

The upper York River parcel is a model for this collaborative work.

"We have this big, global problem of warming oceans and sea level rise, yet we have local ways to adapt and keep our marsh and natural infrastructure," Fletcher says. "We're lucky in that respect in Maine."

And the good fortune doesn't stop there. Stromayer is grateful for the nimble, committed, conservation partners that are helping shepherd the refuge into the future. □

LAURI MUNROE-HULTMAN, Office of Communications, Northeast Region

CONSERVING THE COAST

Rising seas, nasty storms, and over-development are killing the Southeast's lovely, and ecologically important, tidal wetlands.

By DAN CHAPMAN

Sunbury, Georgia — For millennia, the salt marsh has protected the Georgia coast from bad storms while nourishing oysters, blue crabs, sea turtles, and the aptly named saltmarsh sparrows. The muddy, peat-y, cordgrass-filled wetlands provide a natural bulwark against rising seas by buffering the waves that erode shorelines.

At least they're supposed to.

Increasingly, the marshes are disappearing. Rising seas force them to move farther and farther inland. Yet seawalls, roads, and condos leave little room for the marshes to migrate. Meanwhile, with roots continuously submerged, the cordgrass drowns.

The damage is all too apparent at Martha Randolph Stevens Park, one of Georgia's few coastal enclaves where descendants of the formerly enslaved were deeded a slice of the salt marsh.

"This happened so fast," says Aminata Traore, an environmental justice advocate, while overlooking the crumbling bluff buffeted by the high-tide creek that leads to the North Newport River. "The erosion is, steadily, coming closer and closer to our building."

The park's community center sits barely 20 feet from the latest cleaved-off ››

The eroding shoreline moves, rapidly, closer to the community center at Martha Randolph Stevens Park.
(PHOTO BY DAN CHAPMAN/USFWS)

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embankment, yet it might just survive. Much money, and long overdue attention, is coming to the salt marshes that line the Atlantic Coast. Stevens Park has already received $116,000 from the National Fish and Wildlife Foundation to design a "living shoreline" to keep the rising tides at bay.

The third installment of ecosystem restoration projects financed by the Bipartisan Infrastructure Law was rolled out in early 2024, and nearby Harris Neck National Wildlife Refuge will receive a half-million dollars to help fix erosion. The Bipartisan Infrastructure Law's Salt Marsh Keystone Initiative, which aims to restore and conserve marshes from Maine to Florida, is synced nicely with a region-wide plan: the South Atlantic Salt Marsh Initiative, or SASMI.

SASMI began three years ago as a partnership between the Pew Charitable Trusts and the Southeast Regional Partnership for Planning and Sustainability. Today, dozens of local, state, federal, military, and nonprofit organizations work together to protect the coast from rising tides and rampant development. SASMI's goal is to restore, or help migrate, 1 million acres of salt marsh along the Atlantic Coast in the Carolinas, Georgia, and the northern half of the Florida peninsula. SASMI has come up with dozens of marsh restoration projects, including Stevens Park, which seeks an additional $500,000 to rebuild its shoreline.

"There's some urgency now because we're facing threats from both sides—from the sea with rising water and from the land with encroaching development," says Courtney Reich, the coastal director for the Georgia Conservancy who's charged with implementing SASMI in the Peach State. "We're squeezing out the salt marsh. It's a beautiful place. A lot of people want to move here. Thankfully, the economy is booming. But we have to be thoughtful now where we want to preserve and conserve our coast."

Aminata Traore looks over the salt marsh and eroding bluff edging closer to the community center at Martha Randolph Stevens Park. (PHOTO BY DAN CHAPMAN/USFWS)

Rising Seas, Disappearing Marshes

A tidal gauge nestled inside a wooden shack at the end of a pier next to the Fort Pulaski National Monument has measured sea levels since 1935. Its recordings are, increasingly, alarming. The seas off coastal Georgia have risen nearly a foot since 1935 and, according to the National Oceanic and Atmospheric Administration, will likely keep rising one inch every two years.

By 2110, the coast could lose 8% of its undeveloped dry land.

Meanwhile, many of Georgia's 368,000 acres of salt marsh will disappear under the waves. NOAA estimates that as much as a third of the tidal wetlands along the South Atlantic could be lost by 2060 due to sea level rise alone. Gone, too, would be the plants, algae, and decaying matter that form the food web for so many species. Marshes and estuaries provide shelter, nourishment, and nurseries for three-fourths of the nation's commercial and recreational aquatic species, including white shrimp, blue crabs, redfish, and flounder.

Resident and migratory birds feed and nest among grasses, mud flats, and pools. Ducks overwinter in the spartina alterniflora. Populations of saltmarsh sparrows, which spend their entire lives along the East Coast, have declined 70% due to rising seas and drowning marshes. And good luck finding the elusive, sparrow-sized, and federally threatened eastern black rail.

"To my knowledge," says Morgan Wolf, our primary black rail biologist, "there have been no detections on the Georgia coast, or interior for that matter, within the last decade or so despite significant survey effort." ››

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'Really Been Eaten Away'

Permanently inundated mudflats can't fight the very climatic forces — greenhouse gases — that ruin the climate in the first place. The marshy ground is composed of muddy sediment and decomposing plant matter, otherwise known as peat. Peat stores carbon at a rate up to 50 times greater than terrestrial forests — a critical weapon in the fight against global warming.

Protecting peatlands is critical to meet the goal of cutting greenhouse gas emissions in half by 2030. Georgia plays an outsized role in carbon sequestration. Its hundred-mile-long coastline acts as a "blue carbon" sink keeping the greenhouse gas in the ground.

Yet that ribbon of carbon-storing salt marsh is disappearing. The damage is perhaps most visible to the public at the dock and boat ramp at Harris Neck Refuge.

"It's really been eaten away the last couple of years," says Loyd Deverger, a commercial crabber for nearly half a century, after pulling pots from the Barbour River. "It cuts farther and farther, and deeper and deeper, on the edge."

The refuge will use $511,530 from the Bipartisan Infrastructure Law to build an 800-foot-long living shoreline of oyster shells, native plants, and all-natural logs on either side of the dock, ramp, and a nearby commercial crabbers' dock. Yet the project's significance goes well beyond shoreline protection. Both salt marsh initiatives are intended to boost recreational and commercial activities like boating, fishing, and bird watching. Historical, cultural, and archaeological attributes are also important.

Harris Neck fits the bill on all accounts. Native Americans, including the Guale Indians, lived in villages and traded along the Georgia coast for centuries. The formerly enslaved Gullah Geechee people, and other Black and White families, farmed and fished at Harris Neck from the Civil War's end to 1942 when the federal government condemned and bought their land for a military airbase.

Gould Cemetery sits precariously close to the encroaching salt marsh at Harris Neck National Wildlife Refuge. (PHOTO BY DAN CHAPMAN/USFWS)

After World War II, the properties were turned over to McIntosh County. Twenty years later the land became a wildlife refuge, a haven for wood storks, painted buntings, and migratory birds. In 2020, the African American descendants of the Harris Neck community, after years of relationship-building, signed a memorandum of understanding with the Service to collaborate on projects.

The living shoreline will also protect Gould Cemetery, an African American graveyard along the Barbour River that dates to 1882 and sits shrouded in live oaks, magnolias, palmetto bushes, and Spanish moss. The high tide rack line, though, creeps ever closer to the cemetery's edge. Large, twisted oaks, their roots exposed, hang precariously low over the encroaching tides. The project is also designed to protect the nearby "baptismal tree," a magnificent, yet threatened oak that designates the spot where baptisms were held.

'Respect for the Land'

The Bipartisan Infrastructure Phase 3 Ecosystem Restoration Projects also includes $100,000 for Cape Romain National Wildlife Refuge in South Carolina — the poster child for sea level damage — to determine whether dredged sand can be used to rebuild a barrier island.

Through the Inflation Reduction Act, $575 million will go out nationwide to boost the resilience of coastal communities to extreme weather, sea level rise, and other climate-induced dangers. The Georgia Conservancy lists nine projects, from Savannah to St. Marys, worthy of federal, state, or nonprofit funding, including Harris Neck.

Wetlands in downtown St. Marys would be bought up and turned into a community green space for migrating salt marsh. In Brunswick, living shorelines would be built to buffer two historic cemeteries. ››

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On Tybee Island, a culvert would be replaced to allow the tides to better nourish a nearby salt marsh. And, near Sunbury, a 400-foot-long living shoreline would save the community building at Martha Randolph Stevens Park.

"That's where I learned to go crabbing, fishing, shrimping, oystering, and it was my first exposure to wildlife in its natural habitat," says Krystal Hart, president of the foundation that manages the park and nearby Seabrook Village. "I just took it for granted that I always had access to the water, that it was a part of the community, something special, a safe haven."

Vandals, though, came by boat to "Stevens Landing" to break windows, steal the septic tank, and write racist graffiti on the community center's walls because, as Hart says, they thought African Americans were "not deserving of it." The foundation couldn't afford to fix up the park after each crime. It has mostly sat vacant since 2005.

Two years ago, though, interest in restoring the park and community center—and rapidly disappearing bluff—was rekindled.

"Hopefully," Hart says, "this will help younger generations to have respect for the land, the environment, and the waterways as a source for food, enjoyment, and a way of life." □

DAN CHAPMAN, Office of Communications, Southeast Region

Mealtime Twist

A trail camera at Imperial National Wildlife refuge in Arizona caught this bobcat with a rattlesnake. Rabbits and hare tend to be a favorite meal for a bobcat, but venomous snakes make the menu every now and then. They are also known to eat small deer, lizards, and birds. (PHOTO BY USFWS)

MUSIC TO OUR EARS & EYES

Songs, and now videos, promote conservation.

In 2023,in honor of the 50th anniversary of the Endangered Species Act, the Service released Songs for Species—a playlist of original music written, recorded, and donated by our employees. It features music created with an at-risk, threatened, endangered species and conservation-themed message.

Now, you can dive into three new U.S. Fish and Wildlife Service music videos—this time inspired by all things aquatic!

Catch this release of "I'm a Fish (Gonna Spawn Till I Die)," a rocking blues song by Joe McCauley and the Fish & Wildlife Band, taken from the 2003 *Songs of the System* Refuge Centennial celebration music CD. This song is about raising awareness of fish migration, the mportance of healthy fish habitat, and increasing aquatic connectivity.

Using Janis Joplin's tambourine to help rivers and streams, Greg Thompson and the Fish & Wildlife Band offer a new surfer-rock song called "Hellbender!" Intended to raise awareness of aquatic species and habitats, especially those threatened or of concern like the Appalachian home of the Eastern hellbender, North America's largest aquatic salamander. This new song is already a part of rock history (we aren't talking riverbed rocks this time), as one of the band members owns a tambourine used by Joplin and used it on this recording. The surf and the vibes are up on this one.

Finally, take a moment to pause and immerse yourself in the wonders of the ocean with "Mindfulness in the Monument," by Mason Wheatley. This meditative music video features an array of incredible deep-sea creatures found in the Northeast Canyons and Seamounts Marine National Monument. The monument is the first and only one of its kind in the Atlantic Ocean.

Our original Service music is intended as a way of connecting people to nature and our mission. We hope you find joy, inspiration, and humor in the music and discover fun ways to use it to spread the message of conservation! □

RESOURCES

For more info about FWS music, contact ,greg_thompson@fws.gov.

Listen to the full playlist.

Masked Bobwhite: A Fight for Survival

Story and photos by KEVIN CODY, Office of Communications, Southwest Region

Thought to be one of the rarest birds in Arizona at the turn of the 20th century, the masked bobwhite, a subspecies of the northern bobwhite, has faced many challenges in its fight to survive. Habitat loss due to overgrazing and habitat degradation has led to the steep reduction of native grasslands on which the bobwhite depends. In its stead, the once open landscape has become something of a forest as mesquite trees have taken over, leaving less cover for protection from predators and effective food sources.

The masked bobwhite became one of the original species listed under the Endangered Species Conservation Act and later the Endangered Species Act. Ornithologist Herbert Brown noted its rarity in 1904, a mere 20 years after the subspecies was first documented. Fast-forward to today, the species has been extirpated from the wild within the United States and, most likely, Mexico.

Masked bobwhite sourced in 1964 from Sonora, Mexico, were used to start a captive population at Patuxent Wildlife Research Center in Maryland and served as the source for the first wave of releases in southern Arizona during the early 1970s.

In 1985, we established Buenos Aires National Wildlife Refuge on the newly acquired Buenos Aires Ranch, considered the last suitable habitat for masked bobwhite in the United States. In 1995, the captive breeding population was relocated to the refuge, and in 2017, the refuge partnered with George Miksch Sutton Avian Research Center in Oklahoma to create a second captive population. Currently, approximately 600 birds live at the two facilities.

The breeding season starts in June and lasts through September. Teams at the centers collect the eggs from the breeding pairs and move them to an incubator, then a hatcher before they hatch around day 23. The chicks are then grouped into those that'll be released and those kept as breeders to maintain the genetic viability of the captive flock. Chicks being released are bonded with an adult at a ratio of up to 15 chicks to one adult. At two weeks of age, the bonded groups are transferred to outdoor flight pens, where they develop their flight muscles and become acclimated to the weather.

When it is time to release the birds, they each receive coded bands, and the surrogate parent receives a transmitter to allow for radio telemetry monitoring. Tracking the survival of the released birds, in addition to gaining a better understanding of habitat preference and other demographic information, is vital to determining the effectiveness of recovery efforts.

A Step Forward

A third captive breeding program is being developed by the Mexican Comision de Ecologia y Desarollo Sustentable del Estado de Sonoran to reintroduce masked bobwhite to Sonora, Mexico.

Habitat restoration work remains key. Areas suitable for releases are targeted for mesquite tree removal, prescribed fires, invasive species management, seeding native forbs and grasses, cattle exclusion, erosion reduction, and the restoration of water sources such as arroyos.

The path to a sustainable "wild" population of masked bobwhites has been a challenging and winding road. It is hoped that by adapting the lessons learned from previous efforts, this unique and amazing galliform will begin to gain some traction in re-establishing itself in Arizona's border region of the Buenos Aires National Wildlife Refuge.

Helen Fenske saw Great Swamp, just 26 miles from Times Square, become national wildlife refuge, wilderness.

WILDERNESS FIRSTS

By MICHELLE REILLY *and* VANESSA KAUFFMAN

In 1919, Arthur Carhart, a recreation planner with the U.S. Department of Agriculture Forest Service, was sent to Trappers Lake in the White River National Forest to survey the area for a potential summer home development. He was stuck by area's beauty and requested a meeting with Aldo Leopold, then-Forest Service assistant district forester in New Mexico. They discussed a new idea for public land that prioritized preservation of areas for their natural beauty, a designation that would combat the growing mechanization, industrialization, and expanding human developments that were occurring.

Following that meeting, Carhart drafted a memo summarizing their discussion and sent a copy to Leopold on Dec. 10, 1919. In it, he stated, "Returns from the Forests cannot be counted in total in terms of dollars and cents in the case of the aesthetic qualities within the Forests … it is almost impossible to reduce to a money basis the value returned to a Forest visitor when viewing the country from an especially scenic auto road, scenic trail, or outlook."

In 1935, the Wilderness Society was founded as an "organization of spirited people who will fight for the freedom and preservation of the wilderness." This was contrary to the popular view at the time that public lands held only extrinsic values in the form of resources from logging, mining, and other developments. By the 1950s, with the rise of the environmental movement, Americans began to understand the importance of preservation of natural areas for their ecological benefits. In 1956, Howard Zanhiser, of the Wilderness Society, wrote the first draft of legislation to protect public lands as wilderness.

Around the same time in New Jersey, a small 1.618-hectare piece of marshy land just 26 miles from Times Square was garnering a lot of attention. Great Swamp Basin was formed by the melt from the Wisconsin Glacier, which left an assemblage of lands dissimilar to the surrounding areas. The basin, made up of meadows and sandy knolls with oak, beech, rhododendron, and laurels, was a popular spot for birders and botanists. The area was in close proximity to three universities, and thus there was an extensive body of research about the ecosystem. From this research, the area was known to be home to 39 species of mammals and a nesting site for 244 species of birds.

Great Swamp has a long history of land use dating back to the 1700s when the area was divided into hundreds of woodlots and portions were drained, farmed, and logged. Locals who enjoyed Great Swamp for its unique ecology were also aware that because of its proximity to large population centers, it was of great interest to land developers. Word then got out from the press about a proposed international jetport that could occupy 10,000 acres in the Great Swamp area.

Helen Fenske, a concerned citizen, opened her home to concerned locals as a place to gather and plan to prevent Great Swamp from being filled in for this project.

The Great Swamp Committee was formed by the local citizens, and Fenske was appointed secretary. Fenske and Grace Hand, another member of the Great Swamp Committee went to Boston to meet with a U.S. Fish and Wildlife Service employee, John Gottschalk, to propose the establishment of a refuge at Great Swamp. They talked to Gottschalk and his staff about the closed ecosystem of Great Swamp, its unique plant assemblages, and the important habitats found there. They gathered a tremendous amount of biological and ecological information on the swamp. Gottschalk agreed the ››

Helen Fenske reflects on the swamp that could have become tarmac but instead became a national wildlife refuge 26 miles west of Times Square. (PHOTO COURTESY OF FENSKE FAMILY)

Continued from previous page.

area could be a showcase for wildlife education. If they would raise money to purchase 3,000 acres, he would commit money from the Migratory Bird Fund to match their acreage and open an office with a refuge manager on the total 6,000 acres.

Despite many hurdles, the Great Swamp Committee was able to raise enough money for 2,600 acres of land. On May 29, 1964, Interior Secretary Stuart Udall, Service Director Dan Jantzen, and a large group of supporters met in Basking Ridge, New Jersey, to celebrate the establishment of Great Swamp National Wildlife Refuge.

On Sept. 3, 1964, President Lyndon Johnson signed the Wilderness Act into law saying, "This is a very happy and historic occasion for all those who love the great American outdoors, and that, needless to say, includes me … No single Congress in my memory has done so much to keep America as a good and wholesome and beautiful place to live." The Wilderness Act created the National Wilderness Preservation System.

Fenske had not given up concern for Great Swamp. Reaching out to the people who helped get the refuge designated, Fenske said, "It was a groundswell that I've never seen since then on any of the projects that I've had."

The Great Swamp did not constitute untouched wild land and this was true of some of the original areas designated in the Wilderness Act itself. The Wilderness Act did not require wilderness to be undisturbed. According to his biographer, Zahniser resisted attempts to persuade him to rewrite the wilderness definition, replacing "untrammeled" with "undisturbed." This is because, unlike "undisturbed," untrammeled wilderness accepts that the area may have been modified to some extent at some point in time. And Zahniser believed this was an important distinction and warranted use of the word untrammeled. And this has rung true since the act passed.

Pool 1 in the wilderness area at Great Swamp National Wildlife Refuge. (PHOTO BY RICHARD POPE)

Thanks to all the public support, Congress passed a bill (S. 3379): "An Act to designate certain lands in the Great Swamp National Wildlife Refuge, Morris County, New Jersey as wilderness." On Sept. 28, 1968, President Johnson signed Public Law 90-532 designating 3,660 acres of the refuge as the Great Swamp Wilderness. First Lady Lady Bird Johnson invited Fenske to the White House to talk about Great Swamp after the signing. "You have no idea how incredible that occasion was to be invited to the White House to talk about Great Swamp," Fenske said in a 2000 interview with our historian, Mark Madison.

Great Swamp is monumental for many reasons. It is the first area east of the Mississippi designated as wilderness. It is not only the first area recommended to the president for designation as wilderness by the U.S. Fish and Wildlife Service (Congress then authorizes the designation). It also is the first on lands administered by the Department of the Interior (the National Park Service and the Bureau of Land Management also manage wilderness). It was also the first statutory wilderness that had not previously been under specific wilderness-type administrative protection. This was truly the first citizen-led wilderness designation.

Now, designated wilderness areas on land managed by the Service exist in 26 states, on 63 national wildlife refuges, totaling more than 20 million acres.

Today, Great Swamp provides a home to mice, moles, skunks, raccoons, otters, foxes, white-tailed deer, the endangered Indiana bat, and other mammals. ››

Celia Hunter (left) and Ginny Hill Wood at Camp Denali in Alaska in the early 1960s. (PHOTO COURTESY OF NORTHERN ALASKA ENVIRONMENTAL CENTER)

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Migratory birds see Great Swamp as a place to nest and rest. Numerous reptiles and amphibians have taken up residence, including rare bog turtles, wood turtles, and blue-spotted salamanders. There are roughly 8.5 miles of primitive trails providing access to the wilderness. Visit the Helen C. Fenske Visitor Center to learn more about the refuge and designated wilderness or visit Great Swamp National Wildlife Refuge or Great Swamp Wilderness. □

MICHELLE REILLY, Arthur Carhart National Wilderness Training Center, National Conservation Training Center, and VANESSA KAUFFMAN, Office of Communications, Headquarters

The Women of Wilderness

Mardy Murie, Helen Fenske, Celia Hunter, Ginny Hill Wood, Polly Dyer, and Sarah James are all women who contributed to the wilderness movement. The movement began decades before the Wilderness Act passed in 1964. It was a different time, and women were still filling the role of homemakers. These women stepped out of that singular role because of their passion for the protection of the wild areas they loved and their ecosystems.

Murie was an author and biologist and traveled the wilds of Alaska. Alaska didn't become a state until 1959! So, she was there at the beginning of it all fighting for protection of entire ecosystems. She is often referred to as the grandmother of the wilderness movement.

Fenske led the fight to gain protection for Great Swamp National Wildlife Refuge, which was established in 1964.

Hunter and **Hill Wood** served in World War II as Women Air Force Service Pilots (WASPs). In the mid-1950s, they created the Alaska Conservation Society, the first of its kind in the state. Hunter became the first female executive director of the Wilderness Society and Hill Wood was a founding member of the Northern Alaska Environmental Center. Both women played major roles in wilderness preservation in Alaska.

Dyer—whose full name was Pauline Dyer—was an activist in the Pacific Northwest and was very active in gaining protection for the Cascades and Olympic Peninsula. Her use of the word "untrammeled" in her campaigns led to Zanhiser using it in the definition of wilderness in the Wilderness Act.

James is a Native Alaskan and Gwich'in and has been involved with protection of the coastal plains in Alaska since the late 1980s. In 1988, James served as one of eight representatives from across Alaska and Canada seeking protection of the Coastal Plains.

There were and are a lot of women who fought for the conservation and preservation of wildlands. Others include Doris Milner who was involved with wilderness in the Bitterroot Valley in Montana, Marge Sills who was instrumental in the Nevada Wilderness Protection Act, and Althea R. Dobbins who co-authored a Forest Service roadless map (later used for wilderness area protection).

MUSEUM OBJECTS COME TO LIFE

In this series we highlight the "Treasures of the Service" from the museum collections of the U.S. Fish & Wildlife Service Museum and Archives, the Service's National Fish and Aquatic Conservation Archives, the National Wildlife Property Repository, and the collection at DeSoto National Wildlife Refuge, containing over 250,000 artifacts excavated from the 1865 wreck of the Steamboat Bertrand.

King Buck

©USFWS

The Federal Duck Stamp program began in 1934 with the first stamp designed by J.N. "Ding" Darling. (He was appointed Director of the U.S. Biological Survey, forerunner to today's U.S. Fish and Wildlife Service, the same year.) The purpose of the stamp, from the beginning, was to raise funds for wetlands conservation. In 90 years, the program has raised over $1.2 billion and protected over 6 million acres of wetland habitat. The stamp, in 1934, cost $1 ($23.24 in 2024 dollars). Today it is $25. The only animal other than wildfowl featured on a Duck Stamp is King Buck, a Labrador retriever. The 1959-60 stamp by Maynard Reece features the dog with a duck in his mouth. King Buck was named the finest field-trial retriever in 1952 and 1953. The stamp that year had a theme — "Retrievers Save Game" — and is a tribute to bird dogs. Current rules state that one of the eligible species of waterfowl must be portrayed alive and as the main focal point on the stamp. The "King Buck" Duck Stamp, along with copies of every other Duck Stamp issued, is in the collection of the U.S. Fish & Wildlife Service Museum and Archives. (ELLEN MURPHY, VOLUNTEER, U.S. FISH & WILDLIFE SERVICE MUSEUM AND ARCHIVES. PHOTO BY USFWS)

More Than a Scientist and Author

"Rachel Carson was a jock," our historian, Mark Madison, told Thoughts from Home, a conservation podcast from our National Conservation Training Center. The U.S. Fish & Wildlife Service Museum and Archives has a large Rachel Carson collection, including yearbooks that show she played field hockey in college. Can you spot her? She's in the back row, second from right? Listen to the history and archives podcast with Mark Madison.

Trout Tall Tale?

A taxidermist in Iowa donated this Ohrid trout mount to the National Fish and Aquatic Conservation Archives in 1998. The donor recalled preparing three fish mounts of "Yugoslavian Lake Trout" from Manchester National Fish Hatchery in 1962. (Ohrid trout are native to Ohrid Lake in the Republic of Macedonia, formerly Yugoslavia). Per the story, the fish were raised from eggs gifted to then-President John F. Kennedy by the president of Yugoslavia. One mount was to be presented to President Kennedy, the second was to be kept by the hatchery, and the third was a spare that the taxidermist retained and eventually donated. As exciting as this tale is, the first record of Ohrid trout eggs arriving in the United States is from 1965, two years after President Kennedy's death. Annual reports and correspondence from Manchester National Fish Hatchery record receipt of 98,000 Ohrid trout eggs from Yugoslavia in February 1965 and show that 100,000 rainbow trout eggs were flown from Iowa to Yugoslavia in exchange. A portion of the Ohrid trout eggs ended up at a state hatchery in Minnesota, but the rest were hatched and raised at Manchester Hatchery. Some of these fish were stocked out in several lakes in Minnesota in the late 1960s, as well as in locations in Colorado, Montana, Wyoming, and Tennessee. (MIRANDA ZWINGELBERG, MUSEUM TECHNICIAN, NATIONAL FISH AND AQUATIC CONSERVATION ARCHIVES)

Collaboration on the High Seas

More marine debris equals more potential negative ecological and economic impacts. And other lessons learned on marine debris clean-up.

By ASHLEY LUTTO

The 2023 Marine Debris Cleanup Crew removed 3,867 pounds of marine debris from eight beaches. (PHOTOS BY SARAH CONLIN/NPS)

"Cowboys use rope; you collected dock line." Consider it another lesson learned onboard the R/V Island C. There were many more over the six days spent on the outer coast beaches of Kenai Fjords National Park and Alaska Maritime National Wildlife Refuge.

Remote is often one of the first words that come to mind when describing Alaskan beaches. Or maybe rugged? Pristine? Wild? Certainly not littered. However, if you take a closer look, littered applies. Like other coastal areas of the world, Alaska's beaches collect marine debris, a.k.a. trash, garbage, litter, waste, refuse, junk. Whatever you call it, it's out there.

Alaska has plenty of coastline for marine debris to accumulate on—over 33,000 miles counting all the islands.

Marine debris negatively impacts our ecosystems, experiences, and economies.

Old fishing nets, packing bands, plastic bags, and other items entangle wildlife, preventing them from swimming, feeding, and flying. Derelict fishing gear catches fish and other wildlife—a process known as "ghost fishing." Smaller pieces of debris, including microplastics (less than 5 mm in length), can be ingested by wildlife. These plastics are not only bad for the wildlife, but they can bioaccumulate in species that humans consume. Plus, no one wants to see trash on the beach, further impacting recreation and tourism industries.

A less obvious threat of marine debris is transport of invasive and non-native species. Non-native species are living organisms introduced to a new environment that they don't naturally occur in. Invasive species take it a step further and are non-native species that harm the environment, economy, or human, animal, or plant health.

Plastic debris is a particular concern for invasive species transport because it is highly buoyant and slow to degrade. Marine species in nearshore environments, such as mussels and barnacles, can attach to debris. The debris can be carried out to sea and transported on ocean currents, carrying these hitchhikers along, sometimes hundreds of miles away.

The substantial reach of invasive species transport was particularly evident following the 2011 tsunami in Japan. Debris from Japan washed up all along ››

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the Pacific Coast of North America and Hawai'i. Over a five-year study, researchers documented at least 289 animal species arriving from Japan. Most of these species were macroinvertebrates (235), but also fish (2), microinvertebrates (33), and protists (19). None of these was previously reported to have transported between the continents across the ocean. Perhaps more surprising was the time lapsed before arrival — living species continued to arrive in North America on debris after nearly six years in the ocean. This is four years longer than the previous documented survival of coastal species rafting in the ocean.

Another striking example was a floating dock that washed up in Oregon. It was covered in over 400 pounds of plant and animal materials. There were 60 unique species identified, including wakame kelp, a known invasive species.

Not all marine debris is from natural disasters. Many Alaskans may recall the 2022 cargo ship spill that had people searching beaches high and low for coveted coolers. And many other spills happen each year that are not as infamous. Other debris comes in the form of derelict fishing gear and vessels. Then there's anything else you'd expect in a landfill … a plastic cup, a bike helmet, a chip bag, a flip-flop, a takeout container. Plus, things you wouldn't expect … a handmade ladder, a hardhat, a wooden fishing float.

The math is simple. More marine debris equals more potential negative ecological and economic impacts.

Recognizing the negative impacts, the National Park Service's Kenai Fjords National Park and Resurrection Bay Conservation Alliance, along with other local partners, began implementing marine debris cleanup projects in 2009.

Since then, the scale and scope of the project has grown to include beaches within Alaska Maritime National Wildlife Refuge and Port Graham Corporation.

I joined 10 others representing six organizations (National Park Service, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Resurrection Bay Conservation Alliance, Friends of Alaska National Wildlife Refuges, and the Student Conservation Association) for the 2023 Marine Debris Cleanup Crew. Plus, three members of the R/V Island C Crew. And two members of the Kenai Fjords Park M/V Couloir Crew. And four Kenai Fjords staff on the Shore Crew.

Needless to say, marine debris cleanup is a team effort.

Each beach we stopped at was unique.

Large piles of driftwood with steep and forested mountainsides (Morning Cove, Alaska Maritime National Wildlife Refuge). Smooth white-gray granite boulders the size of baseballs, basketballs, and coffee-table-sized balls (Black Bay, Kenai Fjords Park). Hidden waterfalls and inland lagoons (Thunder Bay, Kenai Fjords). Quiet dense forests crisscrossed with bear trails (Taroka Bay, Kenai Fjords).

A closer look revealed what doesn't belong there. Plastic bottles. Foam pieces. Fishing nets. Heavy boat line. Cutting boards. Foam pieces. Flip-flops. Metal water bottles. Takeout containers. Chip bags. Foam pieces. Plastic buoys. Foam mats. Fishing floats. Laundry detergent bottles. Hardhats. Foam pieces. Plastic cups. Beverage cans. Gas cans. Plastic straws. More foam pieces …

At each bay we loaded up on the landing skiff and stormed the beach, armed with gloves and trash bags. Once ashore, we scurried in different directions and began filling bags. Suitable plastics for a local recycling project went into green bags to be donated. Everything else (except "treasures") went into the yellow bags to be taken to the landfill. All the while keeping a list of what we collected … two foam shoes, 50 plastic bottles, two whole fishing nets, 10 fishing net pieces, 15 foam floats, six plastic buoys … to be added to the total collected for each beach.

Turning Trash to Treasure

"Treasures" were kept easily accessible for two reasons: avoiding the garbage pile and more importantly, bragging rights. The infamous cooler spill was still fresh in all our minds. Though only a banged-up bottom-half of one was found, everyone made it home with something to decorate a porch or use for interpretive programs: a plastic buoy (or six), Japanese plastic floats, a crab trap tag, a bike helmet.

Trash and "treasures" weren't the only thing we looked for.

Taking advantage of our mission to scour beaches, we also looked in the wrack lines for crab carapaces, the hard upper shell that is shed during molting. We searched for evidence of one species in particular — invasive green crabs (aka European green crabs). Despite the common name, they aren't always green but rather can be identified by five spines behind each eye.

Invasive green crabs were first detected in Alaska by the Metlakatla Indian Community Department of Fish and Wildlife in 2022. Their arrival to Alaska has potentially huge implications for nearshore ecosystems and subsistence, recreational, and commercial fisheries. It's no wonder they are listed on the International Union for Conservation of Nature's 100 of the World's Worst Invasive Alien Species. The original finding underscores the importance of early detection surveys for these and other invasive species across the state. (Thankfully, none was found on our survey!)

Managing the Trash

After the beach was cleaned and wrack lines were searched, the trash bags were stuffed into large white "super sacks" and hauled onto the landing skiff. The sacks were transported back to the Island C and lifted by a crane to the stern for short-term storage. Every few days as ››

Marine debris found in Kenai Fjords National Park and Alaska Maritime National Wildlife Refuge. (PHOTOS BY SARAH CONLIN/NPS, MARY KATE REPETSKI/NPS, ASHLEY LUTTO/USFWS)

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the stern got more and more full, the M/V Couloir arrived and ferried the sacks back to Seward. And the process continued.

And will continue. There are always more foam pieces, plastic bottles, and foam pieces to remove.

In total, we removed 3,867 pounds of marine debris from eight beaches.

As a marine debris cleanup crew first-timer, this was astonishing to me. To the veterans on the crew, this amounted to expected maintenance levels. For example, we removed 592 pounds of marine debris from two beaches in Thunder Bay. A similar amount (575 pounds) was removed in 2021. However, in 2009 when those same beaches were cleaned for the first time, over 6,000 pounds was removed. That's more than 10 times the marine debris! Another lesson learned: Just like a car, regular maintenance pays off.

This project, along with countless others across the state, wouldn't be possible without the collaboration between federal, state, and Tribal agencies, volunteer organizations, and local partners. While each one has a different mission, authority, and objectives, the overarching goal is the same.

The most important lesson from the R/V Island C: "Good stewardship has no jurisdiction." □

ASHLEY LUTTO, Invasive Species Outreach and Education Biologist, Alaska Region

transitions

Pacific Region

Bill Gale is the new complex manager at the Leavenworth Fisheries Complex in Leavenworth, Washington.

The Leavenworth Fisheries Complex consists of the Mid-Columbia Fish and Wildlife Conservation Office, Leavenworth National Fish Hatchery, Entiat National Fish Hatchery, and Winthrop National Fish Hatchery.

"Bill is a long-term fixture in the Pacific Region's Fish and Aquatic Conservation Program, having worked throughout the Region since 2001," says Kyle Hanson, Deputy Assistant Regional Director of the region's Fish and Aquatic Conservation Program. "We are excited that he has taken on this new role and look forward to his continued leadership in the program and the region."

Originally from the Midwest, Gale earned his bachelor's degree in biology from Illinois State University. He moved to the Pacific Northwest to attend Oregon State University where he earned his master's degree in fisheries science (physiology). His federal career began with U.S. Geological Survey at the Columbia River Research lab in Cook, Washington, where he worked on a variety of research projects focused on environmental physiology. In 2001, he moved to the Service, working first as a fish biologist at Spring Creek National Fish Hatchery and then at Abernathy Fish Technology Center, where he worked as a research physiologist. In 2008, Gale accepted a position as the deputy project leader at the Mid-Columbia Fish and Wildlife Conservation Office. He has remained at the Mid-Columbia office, working his way up to project leader in 2021.

Gale says his journey as a biologist sprang from an innate curiosity about the natural world. As a child, he spent countless hours exploring nearby woods, streams, and farm ponds where he turned over rocks and caught frogs and crayfish. "I was lucky to have parents who were patient and tolerant of a child who was curious and independent, who would generally show up home late and was almost always some degree of wet and muddy," he says.

In his free time, Gale and his wife, Jen, enjoy a busy family life that includes their three children, ages 9 to 28, and an exuberant 3-year-old chocolate lab, Rory. In those rare moments to himself, Gale enjoys heading outdoors to ski, backpack, and canoe, or heading to the shop for some woodworking time.

Gale says he looks forward to working with a tremendously talented team in his new role.

"Having worked in the complex for the past 15 years, I know it's a workplace with a strong and supportive culture. Without exception, the staff are dedicated and work with a clear set of values. Everyone at the complex works hard to address difficult environmental problems while supporting Tribal goals, meeting mitigation obligations, and advancing the conservation of aquatic species and their habitats in eastern Washington. I quite honestly can't think of a better team to work with on these difficult challenges, and I am excited to step into this new role," Gale says. □

Headquarters

In early 2024, **Gary Frazer** took over as our Deputy Director for Operations. He oversees the day-to-day operations of the Service, including providing executive direction through the Regional Directors, Native American Programs, Diversity and Inclusion, and the National Conservation Training Center.

As the Assistant Director for Ecological Services for the last 15 years, Frazer has led transformational change in the program and built a strong team that is advancing our mission and conservation work across the nation. He is a recognized national authority on the Endangered Species Act with a clear vision and constant focus on improving the effectiveness of the ESA for the species. He is also a well-respected and trusted leader who demonstrates our core values of stewardship, integrity, respect, collaboration, and innovation. He understands the importance of working with others and strives to build collaborative relationships that will advance conservation, meaningfully engage the many publics that we serve, and lead to durable conservation outcomes. And he cares deeply about the well-being of all our employees and respects and appreciates the work of the Service in every program area and in every corner of the globe.

Frazer grew up in a small farming community in southeastern Iowa. He earned a B.S. in fisheries and wildlife biology from Iowa State University in 1977 and an M.S. degree in forestry with a wildlife specialty from Purdue University in 1981. □

Southeast Region

Mike Oetker was named Regional Director of our Southeast Region in February 2024. In this role, he leads the Southeast Region across 10 states and two U.S. territories and focuses on conserving the incredible biodiversity of the South and maintaining healthy habitats for wildlife. He ››

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understands the importance of access for public recreation for all at over 130 national wildlife refuges, expanding the conservation impact of the 14 national fish hatcheries, and recovering nearly 470 ESA species, while increasing outreach and environmental education programs especially in the growing urban areas of the Southeast. He served as acting Regional Director since early 2023.

Oetker has dedicated his professional career to serving others and to conserving species throughout his 25 years with the Service. Before acting Regional Director, he served as the Southeast Deputy Regional Director for the past 11 years. Before that, he was Assistant Regional Director for Fish and Aquatic Conservation in the Southwest Region. He also served in roles with Fish and Aquatic Conservation in the Midwest Region and Headquarters.

Oetker got his start in natural resource management and policy development as a Knauss Sea Grant Fellow, where he found a passion working at the intersection of the two while with the Committee on Natural Resources in the U.S. House of Representatives. He has worked on a number of challenging issues, including Everglades Restoration, responding to and recovering from a number of significant hurricanes, red wolf and Florida panther recovery, water and ESA conflicts associated with river management, and management of international fisheries in the Great Lakes.

In addition, he is deeply committed to the employees in the Southeast Region and exemplifies our core values of stewardship, integrity, respect, collaboration, and innovation.

Oetker attended Iowa State University where he earned his Bachelor of Science degree in fisheries and wildlife biology, and Michigan State University where he earned his Master of Science degree in fisheries and wildlife. □

Midwest Region

Paul E. Haver, fish biologist at Jordan River National Fish Hatchery, began his well-deserved retirement from federal service Jan. 28, 2024. Haver's 40-plus-year natural resources career began before his graduation from Lake Superior College with a degree in natural resources technology in early 1982. He began working with us as a crew member of a Young American Conservation Corps project at Pendill's Creek National Fish Hatchery during the summer of 1981. Upon graduation Haver was picked up as a seasonal worker at the hatchery for another year until he got a more permanent position with Sea Lamprey Control in Ludington, Michigan. After several seasons chasing lamprey in streams across the Midwest, he transferred to the Hammond Bay Biological Station (1984-1985) where he served as a technician supporting sea lamprey control research.

Then, Haver began his tenure at Jordan River National Fish Hatchery as an animal caretaker. Over the following decades Haver served as a biological technician and fish biologist. He ended his career as the lead fish biologist in charge of the Coregonine Culture Program at Jordan River National Fish Hatchery. In this role, he was instrumental in transitioning station infrastructure and culture systems to accommodate these difficult-to-rear species. His skills at metal fabrication, plumbing, electrical system design, and PLC operations were instrumental in the facility becoming a national leader in coregonine culture.

Over the years, Haner led the creation of the first captive brood stocks of cisco and bloater, as well as developing large scale production systems and methodologies for these species.

Whenever a new challenge was put forth for the Midwest Region fisheries culture division, Haner was the first to volunteer. He was one of the primary fish culture representatives in the design and construction of the M.V. Spencer F. Baird fish stocking vessel, which vastly improved survival of stocked fish during annual distribution of lake trout on the Great Lakes. He worked on many wild lake trout brood stock collection projects on lakes Superior and Michigan over the decades in addition to his groundbreaking coregonine brood collections. But he will be remembered most for the countless young biologists, technicians, interns, supervisors, and managers he mentored over the years. Haner's easy-going nature, wealth of practical experience, innate kindness, patience, and communication skills leaves a legacy of dozens of Service personnel he has positively influenced and mentored during his career.

His plans for retirement include spending additional time (finally) with wife Pat, two adult sons, and his grandchildren. He hopefully will have time to pursue his other passions, which include fishing, gardening, and teaching the shooting arts.

"Good luck, Paul, we miss you already!!" says the gang at Jordan River National Fish Hatchery. □

ROGER GORDON, Jordan River National Fish Hatchery, Fish and Aquatic Conservation, Midwest Region

honors

Midwest Region

Midwest Deputy Regional Director **Chuck Traxle**r was recognized by the Department of the Interior for his service, leadership, and enduring passion for workforce safety and the well-being of Service staff.

Director Martha Williams presented Traxler with the Department's Superior Service Award at a recent Directorate Teams meeting. Departmental honor awards are the most prestigious recognition that can be granted by the Department for career accomplishments, exceptional support of the Department mission, or heroism. The Superior Service Award is for career employees of the Department who have made significant achievements, and or, performed acts or services that materially aid the mission of the Department of the Interior.

The Director's citation for Traxler states that as a "… focus on employee well-being and safety is evidenced by his ongoing work to support safety training, holding managers accountable for their responsibilities, and proactive employee recognition efforts to celebrate successes."

Traxler's regular communications with staff ensure they are prepared and share expectations, like being current in required training for the upcoming field season and offering resources to ensure employees are protected.

"No surprises" is Traxler's motto, one that he's used for years after starting his federal career in the military. Reflecting on the news, Traxler says, "I was definitely surprised by this honor. Tells me that my investment in employees to achieve good things for conservation is working."

Devoting 29 years to federal service, Traxler believes every employee should give their best to the job and stay positive while doing it. He achieves this by living our agency's values of stewardship, integrity, respect, collaboration, and innovation. He is setting the tone for our agency's culture and asks all employees to do the same. Traxler also holds accountability in high regard. There are expectations when doing a task, managing a project, or supervising employees, and Traxler takes the responsibility of being a civil servant serious. There are good lessons from taking risk, being successful, and even in experiencing failure. Traxler strives to make the agency better every day. □

MARA KOENIG, Office of Communications, Midwest Region

Pacific Region

In 2024, information and outreach specialist **Dan Spencer** received the Department of the Interior Meritorious Service Award. This award is one of the highest distinctions an employee can receive from the Department and an honor only given once in a person's career. Spencer received this award in recognition of his outstanding contributions to our Fish and Aquatic Conservation Program—specifically for his dedication to dynamic outreach, engaging education, and the creation of an innovative internship program focusing on Tribal youth, underserved communities, and urban audiences.

Spencer's enthusiasm and ability to communicate the importance of conservation—while making lessons fun and engaging for participants—has made our mission meaningful to the people that it serves.

Spencer started with the Service in Alaska as a biological field intern in 1999. He then worked as a fisheries technician and park ranger positions over several years in Alaska before joining the Western Washington Fish and Wildlife Conservation Office as a biological science technician in 2009. Although his major position responsibilities were in field support for projects, he began to share his interest and talent for bringing conservation to a wider audience.

In 2017, Spencer became the first information and education specialist for the newly formed Puget Sound/Olympic Peninsula Fisheries Complex. Building on his technical and scientific experience as a field technician and understanding of our mission and values, Spencer developed the extensive education, access, and internship program he manages today.

Spencer delivers educational aquatic conservation programs through multiple venues including Youth Fisheries Academies, summer day camps, school classrooms, field trips, citizen science projects, and activities at public events. These events engage an array of audiences who have had little exposure to natural resources. This combination of venues and audiences has resulted in a highly successful program that both educates students and increases their interest and awareness of aquatic ecosystems and conservation.

Spencer works with community partners and organizations to develop programs that break down barriers of access to fishing through his Angling for Equity programming. He developed the Library Fishing Tackle Loaner Program, which provides fishing gear for checkout at local libraries to make fishing accessible to those who may not otherwise have the opportunity. This popular program has grown from a single location to five since its launch in 2021. Spencer has also developed a successful collaboration with Big Brothers/Big Sisters, providing gear and hands-on demonstrations of how and where to fish. »

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Spencer partners with numerous organizations to provide paid internship opportunities, including the Bureau of Indian Affairs sponsored WaterCorps program, which sponsors six-month paid AmeriCorps internships for registered Tribal members. He has also partnered with American Conservation Experience since 2018 to provide career building opportunities for youth while supporting population monitoring, hatchery evaluation, and fish production efforts for the Service.

This internship program not only provides professional experience to the interns but also teaches them how to mentor others. The interns gain skills in communicating conservation through multiple mediums, experience managing data and field projects, and receive resume building counseling as part of the internship, increasing their chances to be hired for natural resources positions.

Making a Difference

Spencer's efforts thus far have made an impact on more than 40 interns through numerous avenues such as our Pathways program, Washington Service Corps, American Conservation Experience, Bureau of Indian Affairs Conservation Legacy WaterCorps program, and MANRRS — Minorities in Agriculture, Natural Resources, and Related Sciences. Some of these interns have since become permanent employees of the Service.

"It's been rare that we've had interns that have been less than stellar," says Denise Hawkins, complex manager of the Puget Sound/Olympic Peninsula Fisheries Complex. "The breadth of Dan's programming along with his sincere love of his job and infectious enthusiasm have been a tremendous benefit to the Service and conservation!"

And Spencer is grateful for this recognition. He acknowledges people such as Hawkins and former supervisors, college professors, and other mentors who have supported him along the way.

"I am deeply honored by this recognition and feel incredibly fortunate to have a career that brings such fulfillment," he says. "I have benefitted from a great deal of inspiration, support, and mentoring throughout my life, so I am highly motivated to pay it forward and thankful for these opportunities to do so." □

LENA CHANG, Office of Communications, Pacific Region

Recently retired Pacific Region supervisory fish and wildlife biologist and regional recovery program coordinator **Sarah Hall** (seen between Pacific Regional Director Hugh Morrison and Deputy Regional Director Bridget Fahey) has received the Meritorious Service Award from the Department of the Interior. Hall's outstanding leadership, dedication, and contributions to the Pacific Region Endangered Species Recovery Program for federally protected species have rightfully earned her this special distinction given only once in a person's career.

Based in Portland, Oregon, Hall's career in conservation with the Service began more than 25 years ago and is rooted in a deep love of nature and a passion for partners and colleagues working together to recover endangered species. "I've always been drawn to nature and knew at a young age that I wanted to work with and help conserve species; I spent a lot of time outdoors growing up and was inspired by the work done by pioneering individuals like Dian Fossey, Jane Goodall, and Alan Rabinowitz," says Hall.

An exemplar of a career come full circle, Hall studied wolverines in graduate school through Portland State University and later went on to play a role in the team that led to the Service's listing of wolverine as threatened under the Endangered Species Act just a month before she retired.

Shortly after Hall's tenure began, she formed and led a dynamic regional team responsible for creating recovery plans, issuing recovery permits, overseeing the grants to states program, overseeing recovery implementation, and conducting status reviews for the 621 species in the Pacific Region protected by the Endangered Species Act.

Hall considered her career a "dream job" with the most rewarding days involving "being part of a team of very talented people that got to focus on efforts to conserve and recover imperiled species and their habitats." From the people she has trained to the projects she worked on, her colleagues attest to her ability to make complicated processes engaging and efficient. Hall taught countless Service biologists the ins and outs of recovery planning and five-year status reviews.

Hall parlayed her penchant for working with others into several leadership positions. She streamlined many recovery-related processes for the Pacific Region and served as an esteemed coach for the Service's Stepping Up to Leadership program. She was also an early leader for the Service on climate science at a time when the effects were not well understood, maintaining the region's initial Climate Science Database for best available science on climate change. In addition to leading the Pacific Region's approach to climate science, Hall was the driving force behind region-wide recovery workshops that most recently culminated in a Pacific Region Recovery Training Workshop. Ever the supporter of recognition for employees who make a difference, she spearheaded the Pacific Region's Recovery Champion Awards, designed to recognize employees and partners beyond the national Recovery Champion Awards.

Hall's care and support of her colleagues was also evident in her almost continuous volunteering and participation on the region's Safety Team. Hall's focus has always been on valuing the sound scientific work of, and maintaining a safe workplace for, Pacific Region employees. "Sarah has been a remarkable conservationist, mentor, and colleague. Her legacy is »

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evident in every recovered species and in each biologist she's hired, mentored, and coached over the years. I feel lucky to have worked with her," says Kate Norman, Assistant Regional Director for the Service's Ecological Services Program in the Pacific Region.

Hall is humble when it comes to the legacy she left and thinks less of her own mark on the agency and more about the future of the Service as a force for good for future generations. "I've appreciated the efforts the Service has made to reach out to diverse communities; each of us has unique perspectives and talents such that, when brought together, we can accomplish so much more," says Hall. "It will take that diversity of knowledge, experience, and creativity to continue to adapt the work that needs to be done to conserve species in this ever-changing environment."

While she doesn't have any specific plans at this point in her retirement, she says she is "enjoying the transition to spring and taking time to get back outside and reacquainted with our garden and local wild areas." □

in memoriam

Remembering a Conservation Pioneer

James G. "Jim" King, a Service conservation hero, died in late March 2024 in Juneau at age 96. Mr. King leaves behind a legacy with the Service that includes a significant role in establishment of national wildlife refuges in Alaska.

Mr. King was born in Portland, Maine, in 1927 and came to Alaska in 1949. He learned to fly single engine airplanes on wheels, skis, and floats in the Fairbanks area and initially served as a game warden during hunting and trapping seasons. He spent his summers helping with waterfowl surveys and banding. He then accepted a job as the first manager of Clarence Rhode National Wildlife Refuge, which later became part of Yukon Delta National Wildlife Refuge.

Two years later, a job opened in the Service's Waterfowl Division, and he and Mary Lou (his wife) and kids moved to Juneau where his biggest responsibility was the annual migratory waterfowl breeding pair survey of Alaska. Mr. King flew thousands of miles at 100 feet above the ground to inventory waterfowl breeding areas, eventually training his successor Bruce Conant. Together, their work helped to define Alaska's most productive wetlands. Mr. King's early success in waterfowl banding landed him in charge of Alaska's largest duck banding project—which led to the establishment of seven national wildlife refuges.

Jim King was awarded the Distinguished Service Award in 2002 by the Department of the Interior.
(PHOTO BY USFWS)

His work also helped save Yukon Flats. Shortly after Alaska statehood, newly elected Senator Gruening hatched a plan to dam the Yukon River at Rampart to stimulate the Alaska economy. This dam would have created a reservoir the size of Lake Erie and displaced residents of the Yukon Flats whose homes and ancestral lands would be flooded.

The Service was tasked with learning about the area's waterfowl resources. Mr. King, other biologists, and local residents banded over 20,000 ducks in two years, mostly at Ohtig Lake south of Chalkyitsik, Alaska. Mr. King was very proud of this operation, in part, because he involved local residents, including Clifford Adams of Fort Yukon.

Ducks banded on the Yukon Flats went to at least 45 states, eight provinces, and even to South America. Displacement of the local residents and duck-band return information generated quite a bit of public opposition to the dam, including opposition from members of Congress. In the end, the Rampart Dam project was scrapped because of opposition from virtually every state game department in the country.

A product of his time when Indigenous people's sovereignty was ignored, Mr. King suggested to Gordon Watson (then the Service's Alaska supervisor) building on the momentum the project created and proposing the area as a national wildlife refuge. Watson thought that was a good idea, and Mr. King's work had put Yukon Flats on the map as an important waterfowl production area.

With the passage of the 1971 Alaska Native Claims Settlement Act, Congress directed the Secretary of the Interior to recommend public lands for conservation in Alaska. Armed with years of scientific information, Mr. King and another Service biologist (Calvin Lensink) were called to Washington, DC, and given the chance of a lifetime—to suggest which areas of Alaska needed permanent protection for breeding water-fowl. »

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Ultimately, Mr. King's work, combined with the shared vision of Native and conservation leaders, resulted in the creation of seven national wildlife refuges in Alaska — including Yukon Flats National Wildlife Refuge. Taking a stand for Indigenous people was nothing new for Mr. King.

In spring 1960, he learned of discussions about the Service beginning to enforce the Migratory Bird Treaty Act in Alaska. At the time he was still a game management agent in Fairbanks. He decided to write a memo to the Regional Director stating, "A rigid enforcement program does not seem justified among [Native people] who are traditionally dependent on waterfowl."

In the memo he outlined his knowledge of Alaska Native people and their customary and traditional use of migratory birds, stating, "It was brought out at the recent meeting that the BSF&W [the Service] has a moral as well as a legal obligation with regard to the use of waterfowl by [Native people] in the more remote parts of Alaska. The problem then is to work out a policy that is fair to the [Native person] without being subject to undue criticism from local White residents, outside politicians and conservationists and other federal agencies …. [Native people] do not like evasive answers from game wardens any more than game wardens like evasive answers from Washington brass … there may be a culture barrier between the [White person] and [Native person] but there is no intelligence barrier … It would seem that a 'Let's all get together and save the duck,' approach to the problem would be far more acceptable to all concerned than a 'Don't break the Law or else' approach."

Mr. King flew for 30 years with the Service, logging 6,555 hours as pilot in command and retired in 1983, but retirement was just an administrative action. He remained highly engaged in conservation activities for decades and logged 3,000 hours as co-pilot/observer/mentor with the Service (as a reemployed annuitant) and with private companies doing bird work.

Mr. King served on the Citizens Oil Spill Advisory Committee that was formed after the Exxon Valdez oil spill in Prince William Sound, served as President of the Trumpeter Swan Society, helped establish the Bald Eagle Research Institute in Juneau, and wrote successful petitions to list the Steller's eider and spectacled eider for protection under the Endangered Species Act.

He and wife Mary Lou received the Chevron Conservation Award in 1989 for their long-standing conservation work in Alaska. Mr. King was awarded the Distinguished Service Award in 2002 by the Department of the Interior.

Besides being a trailblazer in conservation, Mr. King was an exceptional person and was known for being kind, encouraging, and an inspiration to all including college students he mentored. His legacy is an important part of Alaskan history that continues to inspire today's conservation leaders and upcoming generations invested in Alaska's future. □

JIMMY FOX, MARK BERTRAM, BRYCE LAKE, NIKKI GULDAGER, DELIA VARGAS KRETSINGER, PAUL BANYAS, JULIAN FISCHER, KRISTIN REAKOFF, Alaska Region

(Top) Jim King (left) visited Canvasback Lake on Yukon Flats National Wildlife Refuge in 2008 and assisted in a scaup banding effort by directing staff on construction of a swim-in style trap, a smaller version of a trap Mr. King used for large-scale banding efforts in the early 1960s. (PHOTO BY USFWS)

(Above) Jim King flew for 30 years with the Service. (PHOTO BY USFWS)

From Here, You Can Go Anywhere: 39 Years Working for the U.S. Fish and Wildlife Service

By MEGAN NAGEL

Steve Berendzen floated above the sea floor, keeping his eye on dozens of circling sharks, as he also watched his snorkeling partner examine the coral reef. The water around Howland Island National Wildlife Refuge was so clear—the bright sun above illuminated the busy reef below. As the sunlit water around him grew dark, two ocean-going manta rays began to circle the two Service biologists. Face-to-face with one of the largest creatures he'd ever encountered (ocean-going or pelagic manta rays can have a fin-span of up to 26 feet), Berendzen's only thought was of the magnificence of the animals that danced around him—curious about their land-based visitors. Working for the Service for 39 years, he would come face-to-face with a large animal many times, but the ray experience is Berendzen's favorite and first working for the agency.

In early 2024, Berendzen retired as the project leader for the Central Washington National Wildlife Refuge Complex. Since starting his career as a biologist in Hawai'i, Berendezen worked in five regions and at nine refuges across Washington, Alaska, Colorado, Oklahoma, Arizona, and California. He also worked as a regional refuge supervisor for Montana, Wyoming, and Utah.

Nature and working outdoors and with the land have always been a part of his life. Growing up on a farm in rural Missouri, Berendzen spent his youth outdoors hunting, fishing, and running trap lines. He went to the University of Missouri for his undergraduate studies in fisheries and wildlife and the University of Massachusetts for his graduate ones. He wasn't sure where he was headed after graduation, but the opportunity arose to research endangered Hawaiian waterbirds on O'ahu, and he headed for the Pacific. As with so many folks who start their career in the federal service, Berendzen was able to take advantage of a special hiring program for students through the university's cooperative studies program. Without this program, he would not have known about the career opportunities offered in the Service.

There are several ways that folks can start their careers in the Service, and from Berendzen's perspective, internships or fellowships are a great one. As a supervisor and refuge manager, Berendzen supported opportunities for folks to grow. According to those who worked for him, Berendzen believed in empowering his team to make decisions and share their input. When asked what one of his most important lessons is from 39 years in conservation, Berendzen says it is to take the time and be willing to listen to others and understand their perspective on conservation and their values. "He has a passion for mammals and a very humble approach to refuge management, says Trina Staloch, the deputy project leader for the Central Washington National Wildlife Refuge Complex. "He's been recognized for this approach not just by those of us who've worked for him, but for anyone he's worked with throughout the years." ››

Steve Berendzen at Arctic National Wildlife Refuge. (PHOTO BY USFWS)

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This foundational principle is one of the reasons he was selected as the 2021 National Wildlife Refuge Manager of the Year by the National Wildlife Refuge Association. The award recognizes the outstanding accomplishments of refuge managers who protect and manage national wildlife refuges. At the time, Berendzen managed Arctic National Wildlife Refuge, the largest and northernmost refuge in the country. As manager, he oversaw 19 million acres, 8 million of which are designated wilderness, and balanced multiple designated purposes for the refuge, including the implementation of an oil and gas program.

According to Berendzen, Arctic National Wildlife Refuge is the crown jewel of the National Wildlife Refuge System — and of our wilderness-protected areas. Hiking those mountains, you feel small and insignificant surrounded by all that majesty and beauty, says Berendzen. But many wilderness areas are facing challenges as the changing climate brings impacts that conservationists couldn't have predicted when the Wilderness Act became law in 1964. For example, anything that leaves a human impact is typically prohibited in a wilderness area. However, as ecosystems shift or invasive species move into previously unoccupied habitats, wilderness areas may need human management actions to retain the area's wilderness character.

Using the best available science to plan for the future is one of the ways managers have adapted to long-term challenges and impacts throughout Berendzen's career. Things like comprehensive conservation plans. CCPs ensure that each national wildlife refuge unit is managed to fulfill the purpose(s) for which it was established. Completed CCPs allow refuge managers to take actions that support State Wildlife Action Plans, which improve the condition of habitats and benefit wildlife. The current generation of CCPs focuses on individual national wildlife refuge actions that contribute to larger, landscape-level goals identified through the Landscape Conservation Design process. Ultimately, the work of the National Wildlife Refuge System and refuge managers ensure that future generations will be able to benefit from the amazing natural resources that define America.

It tells you a lot about a person, the things they hold onto as important. When asked for his favorite memories throughout his career, Berendzen chooses to share ones like the manta ray experience where wildlife surprised him with their intelligence and curiosity and where the immensity of the natural places we protect made him feel small. He also recalls that getting anything done starts with valuing people and hearing what they have to say. From those who know him, his passion, dedication, and interest in wildlife have resulted in a career that made a difference for wildlife and those that worked with him.

A manta ray passes a diver.
(PHOTO BY RYAN HAGERTY/USFWS)

"One of the best things about working for this agency has been the opportunity to work in so many different places," says Berendzen. "There are so many different job opportunities or job series that [anyone] should have an opportunity to find a good fit in the way of a job series. I would recommend working for the Service to any person that has a passion for nature and an interest in the work." □

MEGAN NAGEL, Office of Communications, Pacific Region

MORE INFO

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parting shot

Respect the Raven

A white raven showed up in fall 2023 in Anchorage, Alaska. Thought to have the condition leucism, the bird has inspired art, multiple local and national news articles, social media posts, and photos. Read more about the wonder, science, and meaning of this local celebrity.

(PHOTO BY LISA HUPP/USFWS)

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