



RefugeUpdate

National Wildlife Refuge System

www.fws.gov/refuges



INSIDE: The Coastal Barrier Resources Act encourages federal fiscal responsibility and, simultaneously, provides extra protection for coastal lands, including dozens of national wildlife refuges. See the Focus section, which is titled Dollars That Make Sense and begins on page 8. (Drew Gibson)

Louisiana Black Bear Is Removed From Threatened and Endangered List

Interior Secretary Sally Jewell announced that, after 24 years of recovery efforts by an array of partners, the Louisiana black bear has been removed from the threatened and endangered species list.

Jewell made the announcement at Louisiana's Tensas River National Wildlife Refuge, which has a substantial population of Louisiana black bear and played a major role in the species' recovery. Bayou Teche Refuge, Bayou Cocodrie Refuge, Lake Ophelia Refuge and other refuges in Louisiana also were vital to the recovery.

The bear became part of American culture after a 1902 hunting trip to Mississippi during which President Theodore Roosevelt refused to shoot a bear that was trapped and tied to a tree by members of his hunting party. The episode was featured in a cartoon in *The Washington Post*, sparking the idea for a Brooklyn candy store owner to create the Teddy bear.

"President Theodore Roosevelt would have really enjoyed why we are gathered here today," Jewell said at a March announcement at Tensas River Refuge. "Working together across private and public lands with so many partners embodies the conservation ethic he stood for when he established the National Wildlife Refuge System as part of the solution to address troubling trends for the nation's wildlife. As I

\$1 Million Boost Goes to Two More Urban Refuges

The U.S. Fish and Wildlife Service announced in late March that Valle de Oro National Wildlife Refuge in Albuquerque and John Heinz at Tincicum National Wildlife Refuge in Philadelphia each will receive \$1 million above base annual funding to engage urban communities and youth in conservation and outdoor recreation.

The two are the third and fourth national wildlife refuges to receive the funding boost in perpetuity. California's San Diego Bay Refuge has received \$1 million extra since 2014 to engage residents of the San Diego and Los Angeles areas, and Oregon's Tualatin River Refuge has received the boost since last year to engage residents in the Portland-Vancouver area.

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Chief's Corner

Is ROI Measured Only in Dollars and Cents?

People are always looking for a bargain. That's just what they get from national wildlife refuges. The articles in the "Dollars That Make Sense" focus in this *Refuge Update* tell those stories.

Certainly the 2013 *Banking on Nature* report gives hard numbers: \$4.87 returned for every \$1 appropriated in fiscal year 2011, and \$2.4 billion pumped into the economy that year.

What can't be measured as easily in dollars and cents are the personal and health reasons that make wildlife refuges so valuable. We haven't been able to quantify the value of wildlife refuges' contributions to the nation's clean air and clean water. We haven't come up with a calibration on how wildlife refuges benefit kids in their personal well-being and even in their schoolwork.



Cynthia Martinez

How can we measure the importance of giving families a chance to find free and easy-to-reach recreation? How do we quantify the pleasure of a walk in the woods not only to see wildlife but also to talk to kids in a way you can do only when you're surrounded by nature? What is the dollars-and-cents equation of a chance to see the beauty of wilderness or the opportunity to be alone with your thoughts? What metrics can calculate the adrenaline rush when people living in big cities get to see a soaring eagle or an elk and its calf?


What's the return on investment for giving happiness?

We might not be able to measure every return on investment in national wildlife refuges, but visitors know a bargain

We haven't come up with a calibration on how wildlife refuges benefit kids in their personal well-being and even in their schoolwork.

when they see one. That's why we've had an 8 percent increase in visitation since fiscal year 2010, even as our budgets have gone in the opposite direction. Some of the increases in participation have been astounding: a 52 percent uptick in photography, 45 percent growth in attendance at interpretive programs and talks, and a 14 percent increase in people driving auto tour routes.

It may seem contradictory that I, a wildlife biologist, find no greater excitement than seeing youngsters light up when they hold a lizard for the first time or learn the name of a bird they never noticed before. I love wildlife biology – I love restoring habitat, conducting a wildlife survey or helping an endangered species get one step closer to recovery. But when I can pass my amazement about wildlife to a new generation of would-be biologists, I know that I am ensuring that whooping cranes, Moapa dace and thousands of other wildlife species will be around in a hundred years to inspire children.

What's the return on investment for ensuring that the natural wealth of our nation will enrich generation after generation? Maybe some economists can measure that. In the meantime, we can be assured that national wildlife refuges are enriching our nation in ways that people can appreciate, even if they can't fully appraise them. 

Refuge Update

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For nine years, Kayla Kimmel has been part of a team researching alligator gar at St. Catherine Creek Refuge in Mississippi. Page 7

Focus: Dollars That Make Sense

Conservation efforts at refuges can have profoundly positive economic and ecological effects on local communities across the nation. Pages 8-15

“Hands-on Science in an Outdoor Setting”

By Shelly Lawson and Bill O'Brian

Salmon aren't the only pink things at Kodiak National Wildlife Refuge Summer Science and Salmon Camp in Alaska. “I dye my hair hot pink every year” in anticipation of camp, says sixth-grader Audrey Lonheim.

The Kodiak camp, one of 16 refuge-related annual summer camps in Alaska, is celebrating its 20th anniversary. Audrey has been attending since kindergarten and, like her second-grade brother, Simon, plans to attend again this summer.

“I like going on hikes, and I like all of the art projects we do,” says Audrey. She also likes learning about internal organs by dissecting salmon and about bird diet by dissecting owl pellets. She likes sea otters “because they are really awesome and cute and fluffy.” She especially enjoys making stick-and-driftwood frames for photographs she takes of wildlife and wildflowers. The Alaska rose is her preferred flower because, like her hair, “it's pink, and that's my favorite color.”

Each summer, the Kodiak camp conducts seven sessions on road-accessible portions of the island. Those sessions are designed for four age groups: kindergarten and first grade; second and third grade; fourth through sixth grade; and seventh and eighth grade. Kindergartners through sixth-graders attend weeklong day camps; seventh- and eighth-graders camp on a nearby island for part of the week. In addition, staff and volunteers travel by mail plane to six rural Kodiak communities with small populations to conduct camps for all age groups.

Last summer, the theme was the water cycle. Campers learned about the properties of water through games, experiments, songs and exploration. Learning about salmon and fishing are annual camp favorites. Campers also learn about the culture of the Alaska Native Alutiiq people, and in 2015 the refuge partnered with the Baranov



Sixth-grader Audrey Lonheim has been attending Kodiak National Wildlife Refuge Summer Science and Salmon Camp since she was in kindergarten. In anticipation of camp, “I dye my hair hot pink every year,” she says. The camp, one of 16 refuge-related annual summer camps in Alaska, will celebrate its 20th anniversary this summer. (Kari Eschenbacher/USFWS)

The Kodiak camp is one of 16 refuge-related annual summer camps in Alaska.

Museum on something new: allowing campers to throw atlatls, ancient Alutiiq hunting tools.

“It's hands-on science in an outdoor setting,” says U.S. Fish and Wildlife Service seasonal employee Kari Eschenbacher, the camp's director. “They do a lot of fun stuff and learn a lot as well, but they don't necessarily realize that they're learning.” Among the ways they get a taste of science is by visiting biologists on active fish weirs to learn about methods of salmon research.

All told last summer, 187 campers spent 3,081 hours outside in nature and experienced 208 hours of Service-led environmental education at the Kodiak camp, which was supported by 15 partner agencies. Eleven teen or college interns contributed 2,120 volunteer hours.

Holly Lonheim, a lifelong Kodiak resident and mother of Audrey and Simon, says

the camp “gets their brains working in the summer.” They get to play, hike and fish with their friends outside, she says, “and you never know what they're going to come home talking about.” Simon loves to fish, especially for king salmon, and always has a good joke, Holly says. Audrey takes beautiful photographs and is showing signs of being a budding conservationist.

“When I grow up I either want to be a marine scientist, because I love marine life and tide pooling, or I want to be a baker, because I like baking and cooking,” says Audrey. She likes marine creatures because they are “different from all of the life on land because they have special adaptations that let them live in the water.”

Unlike his older sister, second-grader Simon is not yet considering conservation as a career. When he grows up, he says, “I'll either be a chemist or I'll work at McDonald's.” 🦋

Shelley Lawson is an environmental education specialist at Kodiak National Wildlife Refuge. Bill O'Brian is managing editor of Refuge Update.



Douglas M. Head II, an assistant zone biologist in Texas and Louisiana, received the Refuge Employee of the Year Award. (USFWS)



Ann Humphrey received the Volunteer of the Year Award for support of Midway Atoll National Wildlife Refuge. (USFWS)

Weaver Named Refuge Manager of the Year

The National Wildlife Refuge Association has honored an Arkansas refuge manager, a Gulf Coast biologist, a Midway Atoll volunteer and a Minnesota Friends group with 2016 National Wildlife Refuge System awards.

Keith Weaver received the Paul Kroegel Refuge Manager of the Year Award.

Weaver is manager at Central Arkansas National Wildlife Refuge Complex. He was honored for his 31-year career in conservation during which he has managed 11 refuges in five states. The award recognizes Weaver’s work in acquiring 10,327 acres of habitat in the past two years at Cache River Refuge, one of the complex’s six refuges. The award also honors his work to establish a new Friends group and form partnerships to aid in conservation beyond refuge boundaries.

Weaver’s “strong work ethic, excellence in developing partnerships and passion for the mission of the [U.S. Fish and Wildlife] Service is evident on a daily basis,” Refuge Association president David Houghton said. “He is loved by the community, respected by colleagues and highly skilled in protecting wildlife.”

Douglas M. Head II received the Refuge Employee of the Year Award.

Head is an assistant zone biologist at Texas Chenier Plain Refuges Complex, Mid-Coast Refuge Complex and Arkansas

National Wildlife Refuge in Texas and at Southwest Louisiana National Wildlife Refuge Complex.

Head was recognized as “a well-round biologist and a problem-solver who demonstrates innovation and ingenuity.” He was credited with managing more




Keith Weaver, manager at Central Arkansas National Wildlife Refuge Complex, received the Paul Kroegel Refuge Manager of the Year Award. (USFWS)

than 30,000 acres of wild and prescribed fire; providing educational outreach to urban youth; helping to establish new monitoring techniques to assess the impacts of grazing and hydrological management; and designing a permanent platform system to monitor the effect of sea-level rise on marsh ecosystems.

Ann Humphrey received the Volunteer of the Year Award. Humphrey was honored for “her unwavering support for Midway Atoll National Wildlife Refuge in the U.S. Minor Outlying Islands.” Because of Midway Atoll’s remote location, volunteering there requires a move to the island for the entire volunteer service tour. Since 2007, Humphrey has completed four service tours of various lengths.

In 2014, Humphrey identified volunteer program deficiencies and opportunities, and worked with refuge management to improve the program. She also helped develop a new system for recruiting and selecting Midway Atoll volunteers. The resulting 20-person volunteer corps has provided more than 26,500 hours of service to the refuge since March 2014.

Friends of Tamarac National Wildlife Refuge in Minnesota received the Molly Krival Friends Group of the Year Award. The Friends group was honored for its successful campaign to build the Tamarac Discovery Center. Upon completion, this \$800,000 environmental education center was donated to the refuge [see page 10]. The group also was cited for being instrumental in expanding the refuge’s ability to provide family-oriented outdoor experiences. 

Studying Mangroves and Rice Rats at “Ding” Darling Refuge

By Karen Leggett

The Sanibel rice rat and mangrove forests are critical components of wetland ecosystems in J.N. “Ding” Darling National Wildlife Refuge on Sanibel Island in Florida. The rice rat is a link in the food chain; mangroves effectively store carbon and produce habitat for a wide variety of species.

Slow, methodical research and monitoring of both rice rats and mangroves will help identify changes caused by sea-level rise and whether the small mammal or sprawling mangroves already are adapting to such changes.

The most wide-ranging and long-term research is a collaboration with the U.S. Geological Survey (USGS) to assess the vulnerability of coastal mangroves to sea-level rise and climate change, understand how mangroves store carbon, and learn how valuable mangrove forests are to humans in terms of the ecosystem services they provide.

“Ding” Darling Refuge biologist Jeremy Conrad has begun setting up six to eight surface evaluation tables (SETs) at the refuge to measure the effect of mangroves on wetland elevation. Current models predicting the impact of sea-level rise do not always consider that wetland elevation can increase or decrease. “If mangroves add two millimeters of sedimentation and there is a four-millimeter sea-level rise, you have counteracted the sea-level rise to a small degree,” explains Conrad.

SETs also will be established in mangrove forests in eight to 10 other Florida refuges to determine if the trend for these wetlands is gaining elevation or subsiding, and at what rate.

Over the next three years, USGS will conduct three other strands of research at “Ding” Darling Refuge: testing soil and peat under the mangroves to determine the carbon storage rate; identifying the economic value of mangroves based on certain ecosystem services; and using satellite images to analyze changes in the distribution and



J.N. “Ding” Darling National Wildlife Refuge and the U.S. Geological Survey are beginning long-term research on the vulnerability of coastal mangrove forests to sea-level rise and climate change. (Karen Leggett/USFWS)

abundance of mangroves over the past 30 to 40 years. Recent literature suggests that mangroves’ carbon sequestration-per-acre rate is among the highest of any habitat.

Mangroves benefit humans by providing coastal protection during storms, nurseries for bait fish for large commercial fisheries, and recreation opportunities for birdwatchers and paddlers.

Mangroves also appear to provide habitat for the Sanibel rice rat, a subspecies unique to the island.

Wesley Boone is a graduate student at the University of Florida. He tromps around “Ding” Darling Refuge setting traps for Sanibel rice rats to determine what specific refuge habitats they frequent. For the first time, says Boone, these rats have been found in saline mangrove habitat.

“Before, we thought they were restricted to freshwater habitats, and now we know they can survive in mangroves,” says Boone. “That’s a good thing. They may survive in mangroves even if we lose our freshwater habitat to sea-level rise.”


Although the rice rat and mangrove research projects were initiated independently, Conrad says “we are now discovering connections because we are finding rice rats where we didn’t think they were – in mangroves.”



A University of Florida graduate student is researching habitat use of Sanibel rice rats on the refuge. (USFWS)

Boone’s research will help determine how important mangroves are to rice rat survival.

For Boone, there are practical and philosophical reasons that compel him to regularly get wet and muddy for rice rats. The rice rats are prey for owls, which also eat invasive and highly damaging black rats. Besides, “small mammals enable us to ask big questions about ecology,” says Boone, “questions that apply not only to Sanibel but to islands halfway around the world, like how to protect different species during changes in seasonal water levels, including flooding.”

Boone hopes to begin analyzing two field seasons of data later this year. 

Karen Leggett is a writer-editor in the Refuge System Branch of Communications.

An Inspirational Moment in Conservation History

By *Diego Blanco*

One day last December, I was lucky enough to be a part of a historic event in the ongoing story of California condor conservation: the release of condor AC4 back onto Bitter Creek National Wildlife Refuge, where he was captured in the 1980s as part of an attempt to save the species.

AC4 was one of the few California condors remaining in the wild in the '80s, and he spent 30 years in captivity after being captured at Bitter Creek National Wildlife Refuge, then known as the Hudson Ranch.

Now, AC4 is no longer needed for the captive breeding program, as his DNA is already well represented in a new supplemental population of captive-bred condors.

On that December day, we arrived at the refuge around 9 a.m. and were greeted by biologists and U.S. Fish and Wildlife Service employees who outlined the day's schedule. Soon, we headed up the mountain in vans to an area where we could see the flight pen that held AC4. As we arrived at the mountaintop, we saw four California condors and one golden eagle soaring in the distance, not far from where AC4 was being held across the canyon. We set up on a ridge and watched increasing numbers of condors passing above our heads, recording the color and number of the tag on each individual's wing.

Pete Bloom, Jesse Grantham and Jan Hamber, conservationists and biologists who have been instrumental in the California condor recovery and critical to the captive breeding program, told us about AC4's life history.

When the few surviving wild condors were captured in the 1980s, wildlife biologists identified individual condors by distinctive markings on their primary feathers. AC4 came to be recognized by a hole in one of his primaries. Before capture, he was frequently seen soaring

in the Santa Barbara backcountry and eventually was trapped at the Hudson Ranch.

As the moment of AC4's release drew closer that December day, preparations were made to ensure his safety, including scaring off a coyote near the pen and maintaining radio contact between the biologists at the flight pen and those of us across the canyon.

AC4 was released through a procedure known as a "soft release," whereby the gate of his pen was opened and he was allowed to wander out and fly off on his own, as opposed to a regular release where the biologists would remove him and release him by hand.

After a period of anxious observation, from across the canyon we saw the gate of AC4's pen opened. AC4 dropped to the ground but didn't venture outside the pen, prompting the biologists to close and reopen the gate to entice the condor

toward it. Soon, AC4 jumped out of the pen and began running and flapping, ignoring a nearby carcass that had attracted several condors earlier. AC4 shortly took flight and soared to our left, away from the pen and over the canyon. He crossed a ravine, passed over several ridges and followed the canyon. We last saw AC4 as he disappeared behind the top of the hill where he was caught in the '80s.

AC4 represents a thin, but unbroken, link to the 10,000 years of condors. Witnessing his release was a truly inspirational moment, not in the least because of the amazing and phenomenally dedicated people who have worked, and continue to work, to preserve this icon of North American wilderness. 🦅

Diego Blanco is a 15-year-old member of the Pasadena Young Birders Club in California.



The California condor known as AC4 was released into the wild at Bitter Creek National Wildlife Refuge after 30 years in captivity as part of the U.S. Fish and Wildlife Service-led California Condor Recovery Program's captive-breeding program. (Beatrix Schwarz)

“They Actually Swam With the Dinosaurs”

By Bill O'Brian

For most of its 2,350 miles, the Mississippi River is channelized by levees. At St. Catherine Creek National Wildlife Refuge, the river and its floodplain are allowed to be themselves. The river's natural pulse floods thousands of acres each winter/spring and recedes each summer – creating ideal habitat for alligator gar.

For nine years, Kayla Kimmel has been part of a team researching behavior of the enormous, mostly freshwater fish at the refuge in southwest Mississippi.

“I think it's the coolest fish around,” says Kimmel, a U.S. Fish and Wildlife Service fish biologist based in Baton Rouge, LA. “No matter how many of them I've handled or pulled in the boat or wrestled around, it's impressive every time I have a fish the size of me right next to me.”

Alligator gar typically grow to six feet long, exceed 100 pounds, live 20 to 30 years and don't spawn until age 10.

“These fish have been around for over a hundred million years. I mean, they actually swam with the dinosaurs. To think we have a fish of that magnitude,” says Kimmel, “I feel like what we're doing is really important.”

Kimmel and team are supported by the Refuge System Inventory and Monitoring Program, the Gulf Coastal Plains & Ozarks Landscape Conservation Cooperative, the Service's Baton Rouge Fish and Wildlife Conservation Office, Private John Allen National Fish Hatchery and others. Since 2010, the team has tagged more than 60 gar and is using acoustic telemetry to monitor their movements and habitat use at the refuge.

Alligator gar are physostomous (can breathe in air or water). They have bony, armor-like ganoid scales. “I even have some alligator gar earrings made from the scales,” says Kimmel. Native Americans used the scales “all sorts of different ways, from jewelry to arrowheads, because they are diamond-shaped and very pointed.”



U.S. Fish and Wildlife Service fish biologist Kayla Kimmel, left, and volunteer Alonda Wright prepare to release a 100-pound alligator gar after tagging it at St. Catherine Creek National Wildlife Refuge in southwest Mississippi. For nine years, Kimmel has been part of a multi-partner team studying the ancient species at the refuge. Related video at <https://youtu.be/8PKuYCvwo4> (USFWS)

Alligator gar are recognizable by their long mouth full of sharp teeth. They are the apex predator in the lower Mississippi River ecosystem. They control other species, including non-native species like carp, and help keep the ecosystem in balance. “We know that everything has an important role,” says Kimmel. “We know they are here for a reason.”

Kimmel and colleagues have learned, or confirmed, that the alligator gar:

- choose to stay year after year at St. Catherine Creek Refuge even though they could leave via the river.
- use all habitat types once the water changes floodplain from dry land to aquatic habitat.
- differ genetically from other populations.
- are an opportunistic fish that will eat anything in abundance nearby.
- prefer spawning in 73-degree-Fahrenheit open-but-shallow water containing terrestrial or aquatic vegetation.

“Through the recent research, we have determined that the refuge has three

features that meet the alligator gar's requirements to survive and reproduce successfully: permanent water; seasonal flooding and shallow water across shrubby vegetation,” says St. Catherine Creek Refuge manager Jimmy Laurent. “As managers, we have to ensure that we provide the permanent water that alligator gar need during dry times of the year; fish passage or travel corridors through culverts, canals and pipes; and shallow grassy-scrubby fields for spawning.”

The knowledge gained from the St. Catherine Creek Refuge study can be applied to other alligator gar populations, and the refuge helps stock other waterways throughout the Mississippi River Basin. Each spring since 1999, four or five adult females and a dozen or so adult males have been temporarily relocated to Private John Allen National Fish Hatchery in Tupelo, MS, to spawn before being returned to the refuge. Hatchery manager Ricky Campbell estimates those adults spawn about 60,000 fry annually. They are used to stock bodies of water in Tennessee, Kentucky, Missouri, Illinois and elsewhere. 🐟

Refuges Boost Local Economies, Enhance Local Ecosystems

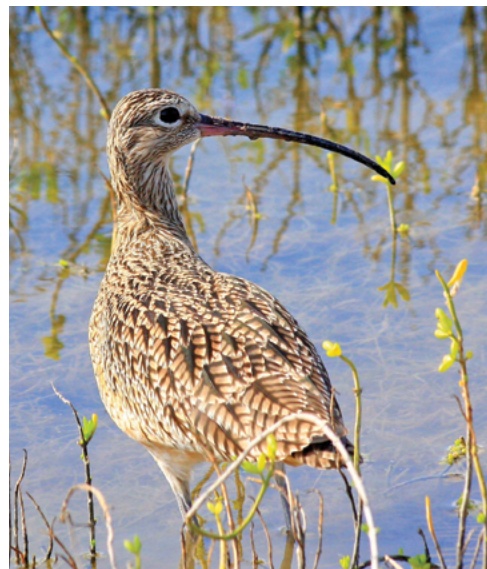
By Bill O'Brian

Conservation efforts and land management practices at national wildlife refuges can have profoundly positive economic and ecological effects on local communities across the nation.

Banking on Nature, a 2013 peer-reviewed U.S. Fish and Wildlife Service report, found that refuges are strong economic engines locally, pumping \$2.4 billion into the economy and supporting more than 35,000 jobs. Additionally, the report found that refuges contributed an average of \$4.87 in total economic output for every \$1 appropriated in fiscal year 2011.

"This study shows that national wildlife refuges repay us in dollars and cents even as they enrich our lives by protecting America's natural heritage and providing great recreation," Service Director Dan Ashe said at the time of the report. "That's inspiring and important news."

The report also found that spending by refuge visitors in fiscal 2011 generated nearly \$343 million in local, county, state and federal tax revenue, and that 77 percent of refuge spending was done by non-local visitors.



Birding is a big reason visitors to Laguna Atascosa National Wildlife Refuge in Texas produced nearly \$30 million in economic effects in 2011. (USFWS)

Among refuges the report cited as exemplary were:

- **Laguna Atascosa National Wildlife Refuge** in Texas, where visitors produced nearly \$30 million in economic effects from the refuge's \$801,000 budget.
- **Upper Mississippi River National Wildlife and Fish Refuge** in Minnesota, Wisconsin, Iowa and Illinois, whose visitors supported 1,394 jobs and produced \$226 million in economic effects on a \$4.9 million budget.
- **Kenai National Wildlife Refuge** in Alaska, whose visitors supported about 900 jobs and produced \$106 million in economic effects on a \$3.9 million budget.

Furthermore, the National Survey of Fishing, Hunting and Wildlife-Associated Recreation, which informed the *Banking on Nature* report and is published by the Service every five years, found that more than 90 million Americans, or 41 percent of the U.S. population age 16 and older, pursued wildlife-related outdoor recreation in 2011, and spent nearly \$145 billion.

The ecological benefits that wildlife conservation, land management practices and habitat restoration at and near refuges provide to local communities can be harder to quantify, but they are important.

Refuge wetlands and grasslands serve as absorbent sponges that reduce runoff and help in flood control. Their vegetation helps reduce carbon emissions. Refuge habitat restoration often improves water quality, insect control, erosion control, fishing and boating access, and storm surge protection. For instance, since Superstorm Sandy in 2012 the Service has been leading 31 projects to restore coastal marshes, wetlands and shoreline; create open connections to rivers and streams for fish passage; and reduce the risk of flooding from future storms.

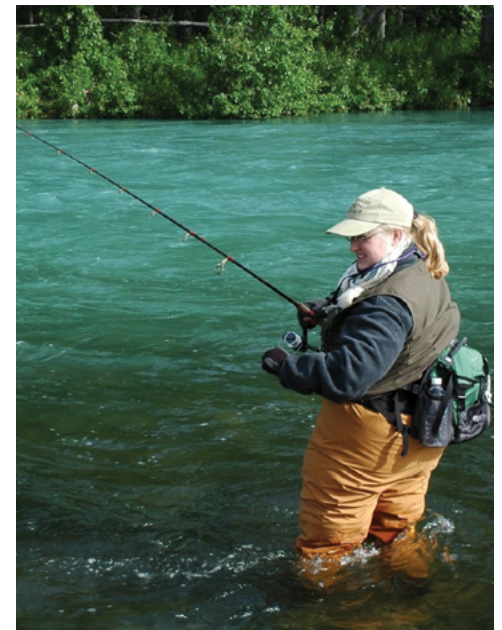
About a dozen of those projects are at or near refuges from Maine to North Carolina.

Prescribed burns at and near refuges are important to public safety because they reduce hazardous fuels (dry underbrush and other vegetation) that, if left uncontrolled, can result in catastrophic wildfires.

In the West, ranchers who cooperate with the Service, refuges and other agencies have found that managing their land in a way that is beneficial to greater sage-grouse is also beneficial to their cattle. In fact, they have a saying: "What's good for the bird is good for the herd."

Finally, a 2012 North Carolina State University study found that being within half a mile of a refuge in an urban area can increase the value of a home by up to 9 percent.

This *Refuge Update* highlights examples of where the Service, refuges and communities are getting great bang for the buck. 🦋



Fishing is popular at Alaska's Kenai National Wildlife Refuge, whose visitors supported about 900 jobs and produced \$106 million in economic effects. (Brett Billings/USFWS)



“Wichita Mountains Wildlife Refuge is a real treasure in southwest Oklahoma,” says Jacob Russell, director of the Lawton-Fort Sill Convention & Visitors Bureau. “We are very fortunate to have the refuge in our backyard.” According to the 2013 Banking on Nature report, recreational visitation to the refuge produced \$174 million in economic effects. (Michael Hampton)

Home on the Range Yields Returns

By Ben Ikenson

Before Theodore Roosevelt designated Pelican Island in Florida as the first national wildlife refuge in 1903, there was a place now known as the Wichita Mountains Wildlife Refuge in Oklahoma. A 59,000-plus-acre oasis of mixed-grass prairie converging on a series of forested and sheer-faced mountains rising from the Great Plains, the refuge was established as a forest preserve in 1901. It was designated as a national game preserve in 1905, and soon came to play a vital role in saving the American bison and conserving other wildlife species. In 1936, it became part of the National Wildlife Refuge System.

But the land is not just a reminder of an emerging national conservation ethos that has so successfully honored the region’s natural heritage. It’s also a showcase of the economic value of American public lands.

According to the U.S. Fish and Wildlife Service’s 2013 *Banking on Nature* report, recreational visitation to Wichita

Mountains Wildlife Refuge, which was operating on a budget of \$3.9 million, produced \$174 million in economic effects while supporting some 1,050 jobs. That is about \$44 generated for every \$1 in budget expenditures.

Home to more than 800 plant species, 240 bird species, 36 fish species, elk, white-tailed deer and a thriving bison herd, the refuge is a popular destination for rock-climbing, hunting, fishing, birdwatching, hiking and wildlife photography.

The refuge maintains a robust environmental education and interpretation program, a network of scenic roads and trails, more than 8,500 acres of designated wilderness, a 22,000-square-foot visitor center, two campgrounds, a backcountry camping area, four picnic areas and 13 lakes that provide fishing for largemouth bass, sunfish, crappie and channel catfish.

“Not only do we strive to provide valuable contributions to the conservation of wildlife such as bison, elk and the endangered black-capped vireo,” says

refuge manager Tony Booth, “we also work very hard to offer outstanding outdoor recreational opportunities. And we are extremely proud that the refuge is one of the most popular attractions in the region.”

Indeed, in 2015, it was named Best National Wildlife Refuge in a *USA Today* Reader’s Choice poll, and this year it was named Best Place to See Wildlife. The refuge draws 1.7 million visitors annually. And visitors bring great economic contributions.

“When the weather’s good, lots of folk come out to the refuge – and that’s good for business,” says Joe Maranto, owner of nearby Meers Store and Restaurant (“Home of the World Famous Meers Burger”). “Be here on a Saturday or Sunday night, and I’ll have a line of 100, 150 people because I’m plumb full.”

Maranto, an 85-year-old walking encyclopedia of frontier history, takes pride in his Texas longhorn cattle herd –

continued on pg 14



The Friends of Tamarac provided \$600,000 of the nearly \$800,000 cost to build the Tamarac Discovery Center at Minnesota's Tamarac National Wildlife Refuge. Left: the grand opening. Right: Children using the center. (Left photo by Lee Kensinger; right by Denise Warweg)

Discovery Center Exemplifies Support At Tamarac Refuge

By Kelly Blackledge

Staff and volunteers at Tamarac National Wildlife Refuge in Minnesota can't imagine how they operated without the Tamarac Discovery Center. The center, built and donated to the U.S. Fish and Wildlife Service by the Friends of Tamarac, is a testament to long-lasting community support.

"It's a dream we've had for years, and it's exceeded all expectations. It's created unbelievable interest in our local community to participate in our education programs," says Ron Jenson, past president of the Friends of Tamarac and the center's construction coordinator.

Since the center's grand opening last June, more than 3,000 children learning about the local ecosystem have visited the building. It serves as the hub of a growing environmental education program. Many of the children are from the White Earth Indian Reservation.

The center is also a place for the refuge or Friends to host volunteer training, citizen science workshops and partner meetings. The Friends have helped make powerful connections with surrounding communities. Now, everyone from photography clubs to the White Earth Tribal Department of Natural Resources has a beautiful place to gather to discuss conservation.

Before starting a capital campaign to raise money for the Discovery Center, the Friends did a feasibility study to see if the community was ready to support such an undertaking. The community was ready. Through careful planning, with guidance from a fundraising professional, the Friends raised more than \$500,000 in just a year.

"Raising this amount in a small community was remarkable, but we were committed and had a meaningful project," says Friends board member Don Blanding. "People don't give to the project as much as they do to people, based on relationships. We had the right relationships in place to make this happen."

The Friends of Tamarac provided \$600,000 of the almost \$800,000 cost of the building and its landscaping. The federal investment was matched three to one by private donations raised by the Friends. The facility is built to last and incorporates energy conservation features, including geothermal heating and cooling, high-efficiency windows and doors, water-conserving bathroom fixtures and high-efficiency lighting. Wi-Fi inside and outside the building, and other technology, assures the building's relevancy into the future.

The center helps Tamarac Refuge foster in all Minnesotans an appreciation for wild places and wildlife.


"Our vision for the Tamarac Discovery Center is one that will inspire the next

generation to connect with nature and offer pathways to new opportunities that were previously unattainable," says refuge manager Neil Powers.

Previously, when the refuge held interpretive programs at primitive access points with pit toilets, attendance was minimal. Now, when the refuge advertises an event at the Discovery Center, attendance can be four times what it was. When the weather cooperates, activities are still held outside to make meaningful connections with nature, but the accessible facility, amphitheater and trails allow a wider range of people to feel comfortable participating. Grandparents bring grandchildren to the "Wild Wednesday" events through the summer and fill the classroom that accommodates 50 people.

The Tamarac Discovery Center stands as a symbol of a community uniting for conservation.

"I'm continually amazed that our Friends, refuge staff, volunteers, community partners, business leaders and private citizens all came together with a goal of making this project a reality," says Powers.

"I am especially proud of the fact that we all came together as 'investors' in the future of natural resources conservation." 

Kelly Blackledge is visitor services manager and Friends liaison at Tamarac National Wildlife Refuge.

Taking MAT to a New Level at Big Muddy Refuge

By Bill O'Brian

For 21 years, staff members at Big Muddy National Fish and Wildlife Refuge in Missouri have been – in the endearing words of refuge manager Tom Bell – “trailer rats.” They’ve been housed in a cramped, hard-to-find trailer in Columbia, about 20 miles from the nearest refuge land.

Soon, thanks to the first national-level U.S. Fish and Wildlife Service maintenance action team (MAT), the trailer rats will have a new office/visitor contact station on a refuge bluff overlooking the Missouri River floodplain.

“It is almost impossible to overstate what an improvement the new office and contact station will be over the trailer we have occupied since 1995,” says Bell. “We will be conveniently available to the public for the first time.”

A MAT is a group of Service employees with maintenance skills, drawn from multiple field stations and temporarily brought together to work on a construction, demolition or habitat restoration project that traditionally would be done by a private contractor.

MATs tend to be intra-regional. The Big Muddy Refuge contact station/headquarters MAT project is the first to be national. The team has included more than 50 employees from all eight Service regions, Headquarters and even



The first national-level U.S. Fish and Wildlife Service maintenance action team (MAT) is building a new office/visitor contact station at Big Muddy National Fish and Wildlife Refuge in Missouri. The team has included more than 50 employees from all eight Service regions, Headquarters and even the National Park Service. (Marty Comstock)

the National Park Service. The MAT has been led by Midwest Region heavy equipment coordinator Dale Pittman and Alan Lagemann, a maintenance worker at Great River National Wildlife Refuge, MO/IL.

MATs also tend to save money. The Big Muddy Refuge project is expected to cost \$3.5 million. Bell and Pittman estimate that is \$1 million less than if it had been done by a private contractor.

“The MAT concept has been essential,” says Bell. “Given current budgets and fiscal expectations, I don’t believe we would be building an office and visitor contact station otherwise. The savings are significant.”

MAT projects typically last three to six weeks; this one is more than a year. It is “the largest project we have ever undertaken,” Pittman says. It broke ground last June. Despite being

continued on pg 14



This rendering shows what the office/visitor contact station will look like when it is completed this fall. (Timothy Fuller)

Tensas River Refuge Hunting Bolsters Local Economy

By Bill O'Brian

Louisiana is called “the Sportsman’s Paradise.” Tensas River National Wildlife Refuge is one reason why.

The refuge attracts about 100,000 visitors a year; three-quarters of whom come to hunt. They hunt white-tailed deer, ducks, squirrels and more.

Those hunters and other recreational visitors have a substantial positive impact on the economy of Madison Parish, the nearby city of Tallulah and other northeast Louisiana communities. Conservation and land management practices at the refuge benefit those communities ecologically, too.

A 2006 U.S. Fish and Wildlife Service report, *Banking on Nature*, estimated that 78,000 annual visitors to the refuge spent \$2.6 million locally and had a total economic impact of \$3.6 million. “I actually think that it’s probably higher now,” says Kelly Purkey, Tensas River Refuge manager from 2008 until this spring, when she moved to Balcones Canyonlands Refuge in Texas.

“I can’t even begin to tell you how many people have told me how they just love this place. That’s what we’re here for.”

“Those numbers have gone up because we’ve made a conscious effort to do management that has helped the deer herd. Also, I think it’s been marketed well [via social media] that you can come up here and on public land you can kill a trophy wall hanger,” says Purkey. There are no guarantees a hunter will take a deer, but “we have the genetics, and because of the very fertile soil from the Mississippi River, we just naturally grow really nice deer. Like right now the state record bow and crossbow kills are both from the refuge.”

Hunting is a way of life in Louisiana, and the refuge embraces it.

Refuge hunts include: guided youth and wheelchair; deer-archery; deer-youth; deer-modern firearms; deer-primitive weapon; turkey; squirrel and rabbit; raccoon; woodcock and snipe; ducks and coots; and incidental species.

“It’s just such a rich environment, biologically and ecologically speaking. There’s just such a plethora of things you can hunt. We have good numbers of them, too, and cool places to go and find them,” says Purkey. “I can’t even begin to tell you how many people have told me how they just love this place. That’s what we’re here for.”

Purkey estimates that 40 percent of hunters are local, 40 percent regional and the rest from farther afield.

“We only have two hotels here in Tallulah, and during hunting season they are usually booked,” says the Madison Parish Tourism Commission’s Tina Johnson. “Private individuals rent out camps [cottages], too.” Hunters pack an off-refuge campground.

The Lower Mississippi Alluvial Valley once had 25 million acres of bottomland hardwood forest. Now it has about 5 million. Tensas River Refuge, at almost 80,000 acres, is “this island of trees in this sea of agriculture,” says Purkey. Its habitat supports numerous species of concern, including Louisiana black bears, Swainson’s warblers and bats. The iconic and critically endangered ivory-billed woodpecker once lived there.

Ecologically, Tensas River Refuge



The bottomland hardwood forest habitat at Tensas River National Wildlife Refuge – much of it restored – is biologically and ecologically rich. It also attracts hunters by the tens of thousands, benefiting the economy of northeast Louisiana. (Bill O'Brian/USFWS)

benefits local communities in important ways.

Refuge habitat alleviates flooding in towns and on farmland. “It’s got all of this land that will hold the water – and we need it, and we like it. It’s part of the natural process,” says Purkey. Because refuge habitat slows runoff, it also reduces erosion and improves water quality (silt settles out). The refuge helps prevent catastrophic fire by disking forest fire breaks. It provides fishing, wildlife photography and other recreation for non-hunters, too.

The refuge’s most recent ecological success was its role in the Louisiana black bear’s removal from the endangered species list [see front page]. Tensas River Refuge might permit bear hunting someday, but for now managing habitat for deer, duck and squirrel hunting is keeping business coffers and waterways in northeast Louisiana healthier than they otherwise would be. 🦋

Coastal Barrier Resources Act Helps Protect Refuges

By Margaret Engesser

The late President Ronald Reagan and current Ten Thousand Islands National Wildlife Refuge project leader Kevin Godsea share an appreciation of the Coastal Barrier Resources Act (CBRA).

“It is a classic example of environmental legislation that is a triumph for natural resource conservation and federal fiscal responsibility,” President Reagan said in 1982 as he signed the CBRA.

CBRA is “not just about on the refuge. It applies to beyond our borders ... within the landscape,” Godsea said recently. More on that later, but first some context.

Americans forever have been drawn to the coasts for their natural beauty, recreational value, and fish and wildlife. In the mid-20th century, development of hurricane-prone and biologically rich coastal barriers took off. By the early 1980s, Congress and the federal government recognized that such development was unsustainable and that certain federal actions and programs were subsidizing and encouraging this risky development. This resulted in the loss of natural resources and threats to human life and property, costing taxpayers millions of dollars annually.

Congress addressed these challenges by enacting the Coastal Barrier Resources Act of 1982. The act and its amendments established the John H. Chafee Coastal Barrier Resources System (CBRS), a set of defined geographic units along the Atlantic, Gulf of Mexico, Great Lakes, Puerto Rico and U.S. Virgin Islands coasts where most new federal expenditures are prohibited.

All or portions of 73 national wildlife refuges are within the 3.3-million-acre CBRS. The CBRA adds a layer of protection that promotes long-term conservation and fiscal responsibility by prohibiting most federal funding for flood insurance and infrastructure development

in the high-energy, dynamic coastal environment of the CBRS.

The U.S. Fish and Wildlife Service’s CBRA program is responsible for modernizing and digitizing official CBRS maps so they are more accurate and useful to the public. To accomplish this, the CBRA and refuge programs often work together to determine where the CBRS boundaries should be relative to the individual refuge boundaries.

The two programs recently collaborated on such a mapping project involving Ten Thousand Islands Refuge on Florida’s southwest coast. The goal was to add part of the refuge to the CBRS. Doing so supports the Service’s goal of expanding the CBRS by adding undeveloped coastal barrier lands to protect vulnerable areas from development.

For Godsea, who has been at the refuge since 2010, having the CBRA designation on a refuge that is facing sea-level-rise challenges offers more protection to the valuable habitat within the larger landscape. “CBRA provides adaptability of those habitats to move and transition without the urbanization that encroaches upon and impedes the natural processes that are occurring as a result of sea-level rise,” he says.

For American taxpayers, the designation means that the refuge won’t build structures in places that may be underwater in a few years. It will also help prevent the encroachment of development around refuges where the landscape is threatened by sea-level rise.

Godsea says the CBRA is “a law refuge managers don’t typically deal with every day.” But he thinks it should be part of a coastal refuge’s comprehensive conservation plan. “Managers need to be thinking about it in a planning context,” he says. “Where will future visitor services and administrative facilities be? CBRA can limit you on some of that, so it needs to be identified in the planning process.”

When incorporated into planning, the CBRA helps ensure that refuges remain among the nation’s most valuable places for fish and wildlife species and habitat. Regarding vulnerable coastal barrier areas, Godsea says, the CBRA “provides some certainty to refuge managers and the general public” that these areas will have some protection from future risky development. 🦋

Margaret Engesser is a program specialist in the Ecological Services CBRA Program.



The Coastal Barrier Resources Act encourages federal fiscal responsibility and can help prevent the encroachment of development around national wildlife refuges where the landscape is threatened by sea-level rise – including at Florida’s Ten Thousand Islands National Wildlife Refuge. (Larry Richardson/USFWS)

Taking MAT to a New Level at Big Muddy Refuge

— continued from page 11

hampered by severe rain, the bulk of construction is scheduled to be done by this September. Visitor exhibits are to be installed by December. Big Muddy Refuge is 12 units along a 367.8-mile stretch of the Missouri River between St. Louis and Kansas City. The new office/visitor contact station is roughly at the midpoint just off Interstate 70 at Overton Bottoms, the refuge's largest unit.

"For the first time the public and our many partners will have an attractive place to interact with us and each other, enhancing communication, cooperation and understanding," says Bell. "Visitors will be able to orient themselves to the refuge and the Missouri River resource, ask questions, pick up maps and guides."

The 6,500-square-foot building will include staff offices, a meeting/classroom for 60 people, and a small exhibit room. The exhibits "will address large river hydrology, fish and floodplain dependent wildlife as well as human interaction and influence," Bell says. Two walking trails will begin at the building.

Bell and Pittman are effusive in their praise of all who helped make the project happen, but they single out Lagemann, Midwest Region civil engineer Todd Criswell, Big Muddy Refuge administrative officer Molly Comstock and Headquarters facilities personnel John Blitch and Greg Resch.

"The crews are remarkably hard-working, skilled, upbeat and fun to be around. They also want everything to be just right," says Bell, a Missouri native who has been refuge manager since 1999. "I think everyone is demonstrating what great potential the Service has to accomplish large and high-quality projects with our own resources."

Adds Pittman: "I cannot thank the project leaders enough for allowing their people to help on the project." 🦋



Wichita Mountains Wildlife Refuge in Oklahoma, which has a thriving herd of bison, is a popular destination for wildlife photography and other outdoor recreation. (Dale Hirschman)

Home on the Range Yields Returns — continued from page 9

and the longhorn burgers his customers enjoy – that may not have been possible without Wichita Mountains Wildlife Refuge. Since 1927, the refuge has maintained a Texas longhorn cattle herd that has preserved the characteristics of the breed. Each year, staff members must round up and cull surplus bison and longhorns to prevent overgrazing. Except for the 25 percent of the surplus bison that are donated to tribes, the refuge sells the animals through public auctions. These events attract spectators and buyers from across the nation. The local Chamber of Commerce provides meals for the auction participants.

"Wichita Mountains Wildlife Refuge is a real treasure in southwest Oklahoma," says Jacob Russell, director of the Lawton-Fort Sill Convention & Visitors Bureau. "We are very fortunate to have

the refuge in our backyard."

For his part, refuge manager Booth says, "we're very impressed and proud of the outstanding local support for this refuge. I hope we can continue to contribute to the public appreciation of our conservation mission while remaining a significant contribution to the local economy."

One Google reviewer said of the refuge: "It is a great way to get away from it all for a day. I love going down here to hike, fish and eat at Meers."

That's more than testament to the value of a place that conserves nature and feeds the human soul. That's money in the bank. 🦋

Ben Ikenson is a New Mexico-based freelance writer.

Refuges Collaborate to Restore Fire-Resilient Landscapes

By Karen Miranda

Six national wildlife refuges in seven states are involved in a \$10 million pilot program designed to better manage vegetation and wildland fire across federal, tribal, state, local and private lands within iconic American landscapes, including sagebrush-steppe and longleaf pine habitats.

The national initiative, announced by the Department of the Interior (DOI) last June, is funded by Congress to encourage a collaborative, cost-sharing approach to restoring and maintaining landscapes that are naturally resilient to wildfire. The new Resilient Landscapes Program, which incorporates the goals of the Congressionally mandated National Cohesive Wildland Fire Management Strategy, funds 10 collaborative proposals in distinct geographic areas in the West and Southeast.

The U.S. Fish and Wildlife Service is leading two of the proposals, called collaboratives, which aim to improve conditions on certain refuge lands and adjacent non-Service lands.

The Greater Sheldon Hart Mountain Collaborative received \$3.98 million in fiscal year 2015 to conduct collaborative fuels treatments to increase resistance to invasive plants in a high-desert sagebrush-steppe ecosystem and reduce the risk of damaging wildfire by removing encroaching juniper trees and non-native grasses that contribute to extreme fire behavior. The collaborative encompasses a 4-million-acre area that includes Sheldon National Wildlife Refuge in Nevada, Hart Mountain National Antelope Refuge in Oregon and adjacent lands managed by the Bureau of Land Management and the Summit Lake Paiute Tribe.

The collaborative seeks to restore and maintain the natural role of fire in this habitat, which is home to hundreds of native wildlife species, including the greater sage-grouse, mule deer, pronghorn, bighorn sheep and the largest lake-dwelling population of federally



A contractor hired under the new Resilient Landscapes Program cuts down a juniper tree encroaching on sagebrush-steppe habitat at Hart Mountain National Antelope Refuge in Oregon. The program, which is designed to better manage vegetation and wildland fire, incorporates the goals of the Congressionally mandated National Cohesive Wildland Fire Management Strategy. (USFWS)

threatened Lahontan cutthroat trout.


Through cost-sharing with partners, the project increased cutting, piling and burning of invasive juniper and monitoring of noxious weeds at the two refuges and surrounding areas by 15,704 acres. It also included related planning, training and science. The collaborative complements progress made by the Department of Agriculture on national forest and private lands near the refuges.

The Longleaf Pine/South Atlantic Collaborative, funded at \$770,000 and largely focused on the use of prescribed fire, seeks to return historic low-intensity fire intervals to a forested ecosystem encompassing parts of five southeastern coastal states. While longleaf pine forests have been reduced to just 3 percent of the 90 million acres they once covered, this collaborative stretches across much of the species' historic range – from southeastern Virginia, through North and South Carolina, to Georgia and northern Florida.

Healthy longleaf pine forests, where fire plays a natural role, are resistant to damaging wildfire, disease outbreaks and insect infestations. This ecosystem provides important benefits to wildlife,

water quality and local economies. For example, healthy longleaf pine forests – which are cleared of dead understory vegetation – use much less water; data analysis shows that restoring this ecosystem can increase water availability by up to 20 percent.

In fiscal 2015, the collaborative treated 39,871 acres at four refuges – Great Dismal Swamp Refuge in Virginia, Carolina Sandhills Refuge in South Carolina, Okefenokee Refuge in Georgia and St. Marks Refuge in Florida. An estimated 768,000 acres of non-refuge lands were treated by cooperators. The collaborative also: broadened cost-sharing agreements among DOI agencies; conducted numerous community education sessions; and is establishing protocols for collection of spatial data.

For fiscal 2016, Congress has allocated \$10 million to the Resilient Landscapes Program. The DOI Office of Wildland Fire is determining how to distribute this funding to the collaboratives. 

Karen Miranda is a public affairs specialist working for the Refuge System Branch of Fire Management at the National Interagency Fire Center in Boise, ID.

Around the Refuge System

Michigan

Researchers discovered that Detroit River International Wildlife Refuge is home to extraordinarily rare plants. A survey of flora and fauna found that the refuge's Humbug Marsh supports a grass-like plant called the hairy-fruited sedge and an orchid species called oval ladies' tresses. Records show that these plants have never been found in Wayne County. The survey also showed that habitat at Humbug Marsh – a Ramsar Convention-designated wetland of international importance – is distinctly different from nearby forests. To conduct the survey, researchers referenced records dating to 1817, before the land was settled and converted to agriculture. Researchers included refuge biologist Greg Norwood.

Florida

More than a dozen staff members from St. Marks, St. Vincent and Lower Suwannee National Wildlife Refuges and a similar number of Friends and volunteers went on a planting binge in late January and early February to help restore habitat at St. Marks Refuge. Staff, Friends of St. Marks Wildlife Refuge and volunteers planted 17,000 longleaf pine seedlings over three days. Staff, Friends, volunteers and students as young as six planted 14,500 wiregrass plugs in a separate, one-day effort. Both plantings were part of longleaf pine ecosystem restoration work that will benefit gopher tortoises, Bachman's sparrows, fox squirrels, red-cockaded woodpeckers, brown-headed nuthatches, indigo snakes, pine snakes and eastern diamondback rattlesnakes, among other species, according to North Florida Refuges biologist Joe Reinman. "Restoring the longleaf pine ecosystem, including the wildlife, is a priority of the refuge," he said. "It is considered an endangered ecosystem, and its restoration is a priority of the [U.S. Fish and Wildlife] Service and many partners."

Minnesota

Sherburne National Wildlife Refuge is restoring 968 acres of non-native pine and

degraded forest lands to pre-European settlement conditions consisting of five habitat types, with the spotlight being the 486 acres of globally imperiled oak savanna habitat. Oak savanna, a mosaic of prairie grasses and wildflowers interspersed with oak trees, was once a predominant habitat in the Midwest, but just .02 percent of oak savanna remains. Sherburne Refuge, 45 miles from downtown Minneapolis, provides an opportunity to restore land and inform the public of the importance of diverse vegetative habitat types. The project, to be completed in 2018, will provide habitat for a range of wildlife species.

Texas

As part of a partnership with the AFL-CIO and its conservation organization, the Union Sportsmen's Alliance, to restore parks and other public lands and waters, Interior Secretary Sally Jewell joined AFL-CIO President Richard Trumka and others to dedicate a boardwalk connecting the city of Liberty with Trinity River National Wildlife Refuge. The 500-foot Palmer Bayou Boardwalk was supported by the

Texas Parks and Wildlife Department, the Liberty Community Development Corporation and refuge Friends, and was built by the AFL-CIO Union Sportsmen's Alliance and other volunteers.

Hawaii

The trail between the Kilauea Point National Wildlife Refuge office and Daniel K. Inouye Kilauea Point Lighthouse was scheduled to reopen in late April after repair and stabilization work. The maintenance was done to correct the effects of erosion that had made the trail unsafe for public use. To allow the work to be completed, the refuge was closed from mid-January to late April, a time of year when visitation is heaviest. The dates were selected because they are the least busy time of year for wildlife nesting. Hawaii geese (nene) typically are done incubating their eggs by January, and wedge-tailed shearwaters (uaukani) generally arrive in March and lay their eggs in early June. The refuge, on the island of Kauai, attracts more than 400,000 visitors annually.



Interior Secretary Sally Jewell and AFL-CIO President Richard Trumka dedicate a new boardwalk that connects the city of Liberty, TX, to Trinity River National Wildlife Refuge. (Union Sportsmen's Alliance)

Whooping Cranes

The Service is ending its support of the use of ultralight aircraft to guide young whooping cranes migrating from public lands in Wisconsin to national wildlife refuges in Florida because the captive-bred cranes have proved unsuccessful in raising young. “After 15 years and 250 [captive-bred] whooping cranes released, there are only four wild-fledged cranes alive today, and only two have nested successfully,” said Service external affairs officer Georgia Parham. “If this level of reproduction continues into the future, this population will never sustain its own existence. To achieve our goal of a self-sustaining population, we have to review our efforts and pursue strategies that hold the best prospects for success.” The Service is reassessing techniques with the Whooping Crane Eastern Partnership, which was established in 1999 to help recover the endangered species. There are 93 whooping cranes within the eastern migratory flock, one of three whooping crane populations in North America. A second population – a wild population of about 325 birds – winters at Aransas National Wildlife Refuge in Texas and nests at Wood Buffalo National Park in Canada. Efforts to establish a non-migratory flock are underway in Louisiana. The latter two populations are unaffected by this decision.

Florida

After recent acquisitions, Everglades Headwaters National Wildlife Refuge and Conservation Area, which was established in 2012, has grown to more than 5,700 acres – 4,214 acres in conservation easements and 1,502 acres in fee-title land. The acreage includes working ranchland and wildlife habitats that connect landscapes and help safeguard water supply. It was acquired with Land and Water Conservation Fund money and with help from conservation partnerships formed by Florida ranchers, sportsmen, state and federal agencies and nonprofits. The land will conserve habitat for the Florida panther, Florida black bear, gopher tortoise and the endangered Florida grasshopper sparrow.

Midway Atoll

Wisdom – a Laysan albatross and the oldest known bird in the wild – became a mother again in February at Midway Atoll National Wildlife Refuge, part of Papāhāumokuākea Marine National Monument. The chick was named Kukini, the Hawaiian word for “messenger.” Wisdom was at sea foraging when the chick hatched. Wisdom’s mate oversaw the hatching at the nest. Wisdom, who is at least 65 years old, has raised at least eight chicks since 2006 and as many as 40 in her lifetime. “Wisdom is an iconic symbol of inspiration and hope,” said Midway Atoll Refuge manager Robert Peyton. “From a scientific perspective, albatrosses are a critical indicator species for the world’s oceans that sustain millions of human beings as well. In the case of Wisdom, she is breaking longevity records of previously banded birds by at least a decade. With over a million albatross on Midway Atoll alone, this shows just how much is left to learn about the natural world around us.”

A month or so before the chick hatched, refuge volunteers counted 470,000 active albatross nests across the atoll. Because each nest represents two adults, the total breeding population at Midway Atoll was about 940,000, and the overall population exceeded 1 million.

Rachel Carson Award

Gail Collins, supervisory wildlife biologist at Sheldon-Hart Mountain National Wildlife Refuge Complex in Nevada and Oregon, has received the Service’s 2015 Rachel Carson Award. The award recognizes scientific excellence through the rigorous practice of science applied to a conservation problem that achieves



Wisdom – a Laysan albatross and the oldest known bird in the wild – became a mother again at Midway Atoll National Wildlife Refuge. The chick, shown above at about six weeks old, was named Kukini, the Hawaiian word for “messenger.” (Carmen Antaky/USFWS)

extraordinary results in fish and wildlife conservation. At Sheldon Refuge in Nevada, Collins led scientific studies documenting the severe ecological impacts to wildlife habitat of feral horses and burros, which include habitat degradation, loss of watershed functions and reduced biodiversity. Collins’s investigations provided strong scientific support to justify the controversial and complex decision to remove the feral horse and burro population from the refuge. With the removal complete, priority species like pronghorn and greater sage-grouse will benefit from improved sagebrush habitat. 🦅

Louisiana Black Bear Is Removed From Threatened and Endangered List — *continued from page 1*

said last spring [2015] when the delisting proposal was announced, the Louisiana black bear is another success story for the Endangered Species Act.”

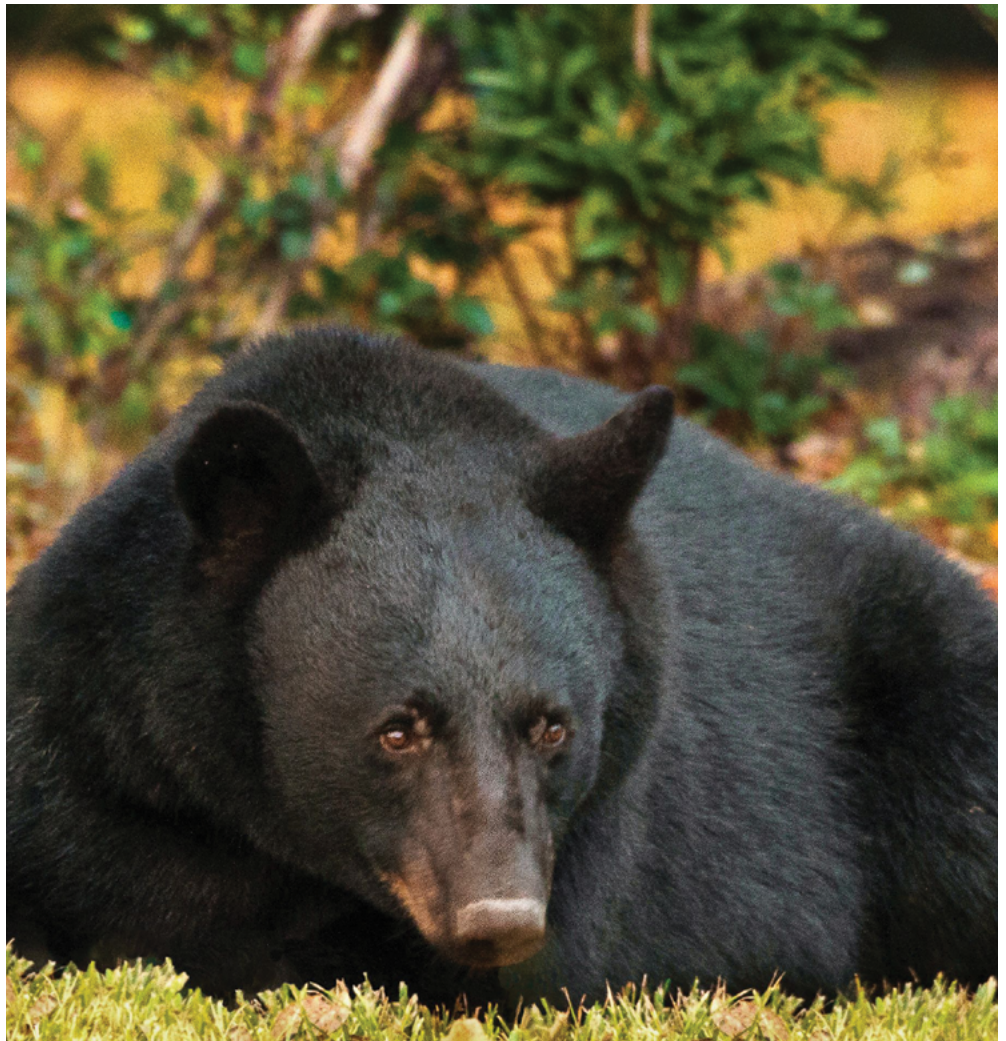
The delisting follows a comprehensive scientific review by the U.S. Fish and Wildlife Service of the bear’s status. The Service released a post-delisting monitoring plan that will help ensure the bear’s future remains secure.

The majority of Louisiana black bear habitat falls on private lands, where the Departments of Agriculture and the Interior and the Louisiana Department of Wildlife and Fisheries worked with farmers to voluntarily restore more than 485,000 acres of bottomland hardwood forests in priority areas for conservation. One key tool was the use of conservation easements in these targeted areas, through which USDA’s Natural Resources Conservation Service worked with farmers to restore habitat on difficult-to-farm lands.

“Farmers played a pivotal role in helping the Louisiana black bear recover, using easements and other Farm Bill conservation programs to sew together primary habitat corridors,” Agriculture Secretary Tom Vilsack said.

“The recovery of the Louisiana black bear is an outstanding conservation accomplishment,” said Service Director Dan Ashe. “Led by Louisiana and [Louisiana Department of Wildlife and Fisheries] former secretary Robert Barham, along with Texas and Mississippi, our state partners and private landowners have been crucial to this achievement.”

When the Louisiana black bear was listed under the Endangered Species Act in 1992 – because of habitat loss, reduced quality of habitat and human-related mortality – the three known breeding subpopulations were confined to the bottomland hardwood forests of Louisiana in the Tensas and Upper and Lower Atchafalaya River basins. Today, those subpopulations have increased in number and have stabilized. Additional




The Louisiana black bear was listed under the Endangered Species Act in 1992. In March, Interior Secretary Sally Jewell announced that the bear, which was the inspiration for the Teddy bear, was removed from the list. (PamMcIlhenny)

Tensas River National Wildlife Refuge and other refuges were vital to the bear’s recovery.

breeding subpopulations are forming in Louisiana and Mississippi, providing a healthy long-term outlook for the species.

In 1992, there were as few as 150 bears in Louisiana habitat. Today, the Service estimates that 500 to 750 bears live across the species’ current range and successful

recovery efforts are enabling breeding populations to expand. Consequently, the bear is not likely to become in danger of extinction in the foreseeable future.

The Endangered Species Act has saved more than 99 percent of the species listed from the brink of extinction and has served as the critical safety net for wildlife that Congress intended when it passed the law 40 years ago. The Obama administration has delisted more species due to recovery than any other administration; those species include Oregon chub, Delmarva fox squirrel and brown pelican. 

We're Going Online ... Please Come Along With Us!

In a move to save money and trees, the U.S. Fish and Wildlife Service is discontinuing *Refuge Update* as a printed newsletter. This issue is the final printed edition. Beginning in July, comprehensive stories or multimedia presentations will be posted on the National Wildlife Refuge System homepage (<http://www.fws.gov/refuges>). Each story will be heavily promoted on social media.

In addition, we plan to compile selected presentations into an electronic newsletter that will be distributed via e-mail.



Here's How to Sign Up

To receive the electronic newsletter, *please send your e-mail address to RefugeUpdate@fws.gov as soon as possible.* Thank you!

\$1 Million Boost Goes to Two More Urban Refuges — continued from page 1

Valle de Oro Refuge – five miles from downtown Albuquerque – has been working extensively with partners to connect with families and youth through conservation, culture and community.

The refuge, established in 2012, “has the potential to become an essential ecological, educational and recreational resource for families and kids in the Albuquerque area and across the region. Our goal is to accelerate this process by giving the refuge’s outstanding staff additional resources to build and strengthen relationships with community partners and residents,” Service Director Dan Ashe said in a March 22 announcement.


John Heinz at Tinicum Refuge – across Interstate 95 from Philadelphia

International Airport – has been coordinating with Audubon Pennsylvania and community groups to close the gap between local communities and green spaces.

Recent successes include year-round youth employment programs, environmental education in public schools and restoration of community gardens. The \$1 million boost is designed to enable the Service to continue engaging local residents at the refuge and nearby areas such as Cobbs Creek and Bartram’s Garden.

“If we want to ensure that conservation is relevant to future generations, we have to put more energy into reaching people where they live, which is becoming more and more in urban centers,” Ashe said

in a March 31 announcement. “We can pay lip service to that reality, or we can start putting our money where our mouth is. That’s exactly what we are doing in Philadelphia, where we have a unique opportunity to connect residents of one of the largest metropolitan areas on the East Coast to natural areas like John Heinz National Wildlife Refuge.”

The Service recognizes that, with increased urbanization, youth may lose their connection to the natural world. In response, the Service created the Urban Wildlife Conservation Program (<http://www.fws.gov/urban/index.php>), which helps national wildlife refuges create partnerships and reach out to urban communities. 



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A Look Back ... The Lodore School



Browns Park National Wildlife Refuge in Colorado preserves the Lodore School building. The school was built in 1910, and class sessions were held there from 1911 to 1947. Although its original purpose was to educate ranch children, the building quickly became a center of the local community in northwestern Colorado, southwestern Wyoming and eastern Utah. It has hosted dances, school plays, funerals and parties for various occasions. The Lodore School was placed on the National Register of Historic Places in 1975. (Main photo: Dawn Wilson/DawnWilsonPhotography.com. Inset: USFWS)

Follow the National Wildlife Refuge System on Facebook at www.facebook.com/usfwsrefuges and Twitter @USFWSRefuges.

Send Us Your Comments

Letters to the Editor or suggestions about *Refuge Update* can be e-mailed to RefugeUpdate@fws.gov or mailed to *Refuge Update*, U.S. Fish and Wildlife Service, Mail stop: NWRS, 5275 Leesburg Pike, Falls Church, VA 22041-3803