



# RefugeUpdate

National Wildlife Refuge System

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One goal of the America's Great Outdoors action plan announced by President Obama is to increase recreational opportunities on public lands. Here, kayakers paddle at Rachel Carson National Wildlife Refuge in Maine. (Lamar Gore/USFWS)

## President Obama Announces America's Great Outdoors Action Plan

President Obama recently announced an America's Great Outdoors action plan to achieve lasting conservation of the outdoor spaces that power the nation's economy, shape its culture and build its outdoor traditions.

"At a time when America's open spaces are controlled by a patchwork of groups, from government to land trusts to private citizens, it's clear that conservation in the 21st century is going to take more than just what we can do here in Washington," Obama said at a Feb. 16 White House ceremony. "The new test of environmental stewardship means finding the best ideas at the grassroots level. It means helping states, communities and nonprofits protect their own resources. And it means figuring out how the federal government can be a better partner in those efforts."

In making the federal government a better partner, the initiative seeks to reinvigorate the nation's approach to conservation and reconnect Americans, especially young people, with the lands and waters that are used for farming and ranching, hunting and fishing, and for families to spend quality time together.

Recognizing that many of these places and resources are disappearing and under intense pressure, the President established the America's Great Outdoors Initiative last spring to work with the American people in developing a conservation and recreation agenda for the 21st century. The action plan released in February outlines

## Draft Vision Available for Public Comment

With nearly 100 recommendations to guide the growth and management of the National Wildlife Refuge System for the next decade or so, the *Conserving the Future* draft vision covers the gamut of wildlife conservation issues. It is available at <http://americaswildlife.org/> for public comment through Earth Day, April 22.

"The American public too often discounts wildlife conservation threats as being too far away, not relevant to their everyday lives and even temporal," says the draft vision. "The finest minds, the strongest partnerships and the greatest innovation must be brought to the task of increasing society's conservation literacy to fulfill the agency's mission for the continuing benefit of the American people."

# Chief's Corner

## Tomorrow Is Yours to Change



Greg Siekaniec

Change is the only constant.

That quotation is attributed to the ancient Greek philosopher Heraclitus, who lived about 2,400 years ago. He might as well have

been talking about the National Wildlife Refuge System of today.

Since last winter, five of the eight regional chiefs of refuges—an unprecedented number—have announced their retirements or accepted other jobs.

The five—Jon Andrew, Tony Leger, Carolyn Bohan, Todd Logan and Chris Pease—have served with distinction,

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**Leadership has always been a rather intangible quality that frequently yields measurable results.**

as has Brian McManus, the chief of the Refuge System Fire Program, who has also announced his retirement. Those personnel moves may well be the tip of an iceberg about to hit. According to a workforce planning report completed in October 2009, 19 percent of the Refuge System's employees plan to retire by 2014—and that was before a federal pay freeze was announced.

Although it is unknown whether a significant exodus of Refuge System employees will occur, the question remains: Are we prepared?

The massive change in the ranks of regional refuge chiefs will set a different tone for the Refuge System. While our mission is everlasting, the way we discharge it is influenced not only by science and sound wildlife management

practices but also by the experiences that top managers bring. So, we fully expect that a cadre of new regional refuge chiefs will bring fresh ideas, new approaches and different emphases to a range of programs and issues. Innovation, after all, is the lifeblood of any enterprise—whether private or public.

Which brings me to *Conserving the Future: Wildlife Refuges and the Next Generation*, the process by which the U.S. Fish and Wildlife Service is creating a reinvigorated vision to guide the Refuge System for the next decade or so. One chapter of the draft vision, now online at <http://americaswildlife.org/>, focuses on leadership in a landscape of change. Not only must the Refuge System of today deal with environmental challenges, it also must deal with myriad societal changes. Consider just one: Some futurists have predicted that, in coming decades, the entire body of human knowledge will double every week. What would that mean for wildlife management?

As an essay by former Service Director Lynn Greenwalt in this issue and other articles about people connecting with people suggest, leadership has always been a rather intangible quality that frequently yields measurable results. That's why the *Conserving the Future* vision chapter on leadership and your comments on its recommendations are especially crucial. But that chapter is not the only one that needs your consideration and reaction.

The Refuge System confronts a host of uncertainties, as we have throughout our 108-year history. Yet, one tenet has been unwavering: We owe the American people hard work, integrity, fairness and a voice in the protection of their resources. The *Conserving the Future* process gives all of us—Refuge System employees, Friends, partners, visitors, taxpayers—a chance to make our voices heard. Don't let the chance pass you by. 

# Refuge Update

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*Looking forward, a key to success for the National Wildlife Refuge System will be leaders and employees who can connect with each other and with the American public.* Pages 10-17

# Texas Border Refuge Cooperates With DHS

By Bill O'Brian

**T**he first thing you notice about the border fence at the Monterrey Banco Unit of Lower Rio Grande Valley National Wildlife Refuge is: It's not on the border. It's a quarter-mile or so north of the river that separates the United States and Mexico. The second thing you notice is: It's not a fence. It's an 18-foot-high concrete wall built into the side of a once-traversable levee.

By any name, though, the border barrier directly or indirectly impacts 60 to 70 percent of the refuge's habitat, according to South Texas National Wildlife Refuge Complex project leader Kelly McDowell. And the refuge is adjusting. It is working with the Department of Homeland Security to safeguard the border while simultaneously "trying to protect the [natural] resources that the American people want us to protect," McDowell says.

Lower Rio Grande Valley Refuge comprises 90,000 acres on about 115 units along 275 river miles in a locale where four climates—desert, coastal, temperate and subtropical—converge. Although 95 percent of the valley's vegetation has been cleared for development or agriculture, the refuge is home to 1,200 documented plant species. Its mission is to protect, restore and connect habitat through which wildlife can travel and flourish.

The downsides of the border barrier are well-known.

"You've just stuck a fence through a corridor refuge," says McDowell. "So, the impacts to movement of species, particularly species like ocelots and jaguarundi, are the biggest concern."

In Texas—unlike New Mexico, Arizona and California—the barrier is not continuous. Rather, it is more than 20 gapped segments totaling 57 miles (of a proposed 70 miles) in length. It is from 200 feet to a mile north of the border. And, in Texas, for geographical, technical and political reasons, it is a wall in some places and a bollard fence



*In Texas, the border barrier is a wall like this in some places and a bollard fence in others. It directly or indirectly impacts 60 to 70 percent of Lower Rio Grande Valley National Wildlife Refuge's habitat. (Bill O'Brian/USFWS)*

in others. As such, the barrier disrupts habitat connectivity for transient species and blocks genetic interchange within such species. It separates wildlife from the essential water of the Rio Grande. It increases operational- and maintenance-related damage to refuge habitat. It can corner wildlife (and perhaps refuge staff) trying to escape floods, fires or other danger. It funnels human traffic to its gaps.

How the refuge is assisting DHS and adjusting to the border barrier is less well-known.

"We're working together and not getting in the way of DHS," says Nancy Brown, the refuge's public outreach specialist. "The Fish and Wildlife Service is cooperating."

## **"A Forum to Discuss Issues"**

One way the agencies are cooperating is via a Border Management Task Force that was mandated by the Department of the Interior and DHS secretaries. The task force, which meets quarterly, "has given us a forum to discuss issues, to work out issues," says McDowell—issues such as on which refuge roads Border Patrol agents can operate, and how and when Border Patrol crews trim refuge vegetation. Together, the Service and

U.S. Customs and Border Protection (CBP) produced a nine-minute video designed to cultivate in border agents and refuge staff an understanding and a respect for the other agency's mission.

A result has been greater cooperation between refuge law enforcement and CBP. Border Patrol agents now routinely report nocturnal wildlife sightings to the refuge. To prevent smugglers from driving through expanses of the refuge near the Rio Grande, the Service has helped CBP by erecting natural barriers through which wildlife can pass but cars can't.

The situation reached this point because, in 2007, then-DHS Secretary Michael Chertoff exercised his authority to waive numerous laws—including the National Environmental Policy Act (NEPA)—to construct the border barrier on DOI lands. "We stood our ground" as much as possible, but decisions on the barrier's placement were made in four days, says Lower Rio Grande Valley Refuge-based ecological services specialist Ernesto Reyes, who helped win key placement concessions for endangered wildlife. Generally, though, "this was something that we weren't able to get science out in front of to see what was here and to see what would happen," says McDowell.

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# Negotiations Ensure Solar Array Won't Sap Refuge Water

By Kendall Slee

**T**he nation's need for renewable energy and a refuge's need to maintain its mission recently converged in southwestern Nevada, and a satisfactory agreement was reached.

Ash Meadows National Wildlife Refuge is an anomaly: an oasis of spring-fed wetlands in the Mojave Desert. Even more unusual are the plants and animals that have evolved there. Scientists have found 26 species that they believe exist only on or near the refuge.

So, when the Bureau of Land Management notified the U.S. Fish and Wildlife Service in early 2009 about a right-of-way application to install a solar array on BLM land 10 miles from the refuge, Service and National Park Service staff took a careful look at how the project might affect the refuge and its resources. Most concerning was a proposed wet-cooling system that would consume 4,500 acre-feet of water per year. (The average household uses 0.5 acre-feet of water per year.)

"Ash Meadows is really about water, from the fish to the endemic plants," says refuge manager Sharon McKelvey, explaining that a drop in groundwater levels would imperil the refuge's rare and endangered species. Among Ash Meadows Refuge's endemic species are at least 10 freshwater snail species, aquatic beetles and a variety of listed native fish—all dependent on warm springs from a deep aquifer. The area's high water table sustains endemic plants that have adapted to dry, alkaline soil.

The endangered Devils Hole pupfish's sole natural habitat is Devils Hole, a water-filled abyss on Park Service land within the refuge. The fish spawn on a rock shelf near the surface and are vulnerable to water-level shifts.

In coordination with BLM and the Park Service, the Nevada Fish and Wildlife Office (ecological services) negotiated with the renewable energy company, Solar Millennium. Eventually, the company agreed to use a dry-cooling system that would consume much less



*Kings Pool at Ash Meadows National Wildlife Refuge in Nevada is a source of precious water in the desert. (Cyndi Souza/USFWS)*

water—about 400 acre-feet per year. Even then, negotiations surrounding the project's water use continued, explains Amy LaVoie, then the deputy assistant field supervisor for Service ecological services in Nevada. Ultimately, Solar Millennium agreed to increase its water rights acquisition—with a portion dedicated to conservation, to ensure a net-neutral effect on groundwater.

## Partnerships Are Key

Solar Millennium's Amargosa Farm Road Solar Project will produce 500 megawatts of solar energy—enough to power 150,000 homes. The Department of the Interior cites the project as a model of collaboration in its initiative to increase large-scale renewable energy production on public lands. Negotiators from the Service and other DOI agencies recognized their roles in supporting the initiative as they worked to find solutions for all parties, says LaVoie.

Partnerships were a key to the negotiations, McKelvey says. She was familiar with regional federal and state land managers through the Desert Managers Group. Many shared the refuge's concern over water, and the Service was able to tap the expertise of Park Service hydrologists and others, she says.

LaVoie stresses the importance of getting to the table early on a project. A project in its final hour of approval is difficult to alter, she says, but by knowing about this one early the Service was able to help negotiate substantial changes.

Biologists, hydrologists and land managers had to give themselves a crash course on solar technology so they could discuss alternatives. "The more educated we became, the better positioned we were to protect the refuge and Devils Hole," LaVoie says. "There are many different types of solar technology, and it's important to understand how they work on the ground and how they could affect wildlife." Keep in mind, she says, that companies often have niche technologies and may resist using other technologies.

Learning about solar technology clearly is time well spent. The demand for solar energy is growing with the nation's need to produce domestic energy and address climate change. Beyond the Amargosa Farm Road Solar Project, applications were filed for eight other solar projects within 20 miles of Ash Meadows Refuge in 2010. 

*Kendall Slee is a Colorado-based freelance writer.*

# One Year After Oil Spill, Task Force Focuses on Gulf Restoration

By Bill O'Brian

As the one-year anniversary of the onset of the Deepwater Horizon oil spill approaches, many eyes in the National Wildlife Refuge System are on the natural resources damage assessment and restoration (NRDAR) process. But, vital as it is to the U.S. Fish and Wildlife Service and the three dozen refuges on or near the Gulf of Mexico, NRDAR is just one part of a larger federal Gulf restoration effort.

The main driver is the Gulf Coast Ecosystem Restoration Task Force, which was established by President Obama in October 2010. Its mandate is to prepare, by October 2011, a restoration strategy to address decades of environmental degradation in the Gulf well beyond the spill damage.

NRDAR will be important to the overall restoration strategy—and the Clean Water Act will be, too, if Congress directs penalties toward the Gulf, as a September 2010 report by former Navy secretary Ray Mabus recommends.

Cindy Dohner, the Service's Southeast Region director, spoke about the Gulf restoration effort during a panel discussion on Jan. 19 at the 11th National Conference on Science, Policy and the Environment in Washington, DC.

"It is a challenge," Dohner said. "But I see it as an opportunity, too, because this unfortunate spill has brought a light to this region."

The Gulf of Mexico is the world's ninth-largest body of water. If the Gulf region were a nation, the annual \$294 billion economy its oil and gas, seafood and tourism industries generate would rank it 29th. About 41 percent of the North American watershed drains into the Gulf via the Mississippi River. The Gulf is home to millions of people, countless marine and migratory bird species, unparalleled habitat and, of course, the three dozen refuges.

Oil landed directly on at least three refuges—Breton and Delta off the Louisiana coast, and Bon Secour on the Alabama coast. How the Gulf recovers from the massive spill that began on April 20, 2010, matters to the Refuge System.

"Our Gulf coast refuges provide vital habitat for migratory birds and 40 threatened and endangered species," Dohner

said. "Our employees continue to play an extraordinary role in the response to this disaster."

## "Pre-Spill Conditions"

Dohner, who is overseeing the NRDAR process for the Department of the Interior, is on the NRDAR trustee council. Its members are the five Gulf states (Louisiana, Mississippi, Alabama, Florida and Texas), DOI, NOAA, the Department of Defense and, should they come forward, federally recognized tribes with impacted trust resources.

What the NRDAR process "does is restore the natural resources that were impacted to pre-spill conditions," Dohner said. "And it includes all types of resources as we're going forward. So, you have impacts to the lands, impacts to the fish, to the wildlife, to the deepwater habitat, but you also have impacts that look at lost use, lost recreational use" on public lands.

Because NRDAR, which is authorized under the Oil Pollution Act of 1990, is a legal process requiring the trustee council to assess the spill's impact, document the oil release, demonstrate the oil's pathway, calculate what the



With oil boom in the background, a brown pelican soars over Breton National Wildlife Refuge in the Gulf of Mexico off the Louisiana coast during the Deepwater Horizon spill. (Tom MacKenzie/USFWS)

injuries are and figure out how to restore the impacted area, "we have to use sound science, the best science," Dohner said.

In terms of working with the Gulf Coast Ecosystem Restoration Task Force on the overall effort, Dohner said, "we don't need to do a new plan. We need to figure out the best in those plans that are already developed by the states and the different entities that are out there ... and figure out how we can combine all those and use the best of the best to complement each other."

For more information about the overall effort, go to <http://www.restorethegulf.gov/>. For information about the Service effort, go to <http://www.fws.gov/home/dhoilspill/>. 

# A Gated Community for Bats

By Lindsay Smythe

**W**hat do you do when some of the best habitat on your refuge isn't actually on your refuge? You find a way to partner. What do you do when people are bothering bats in a mine? You put a gate on the entrance.

Kofa National Wildlife Refuge has done both.

The abandoned Hull Mine on a 130-acre private inholding within the southwestern Arizona refuge is home to a maternal colony of 400-plus California leaf-nosed bats. The landowner always has been generous about allowing biologists access to the mine, so refuge staff members have known for years that it is one of the largest roosts in the region.

The mine was established in the early 1900s as a gold and silver mine. During World War II, it yielded lead for ammunition. Today, it is well known on the Internet to collectors of lead-based crystals such as wulfenite and vanadinite, which are valued for their interesting shapes and rich red-orange colors. Because the abandoned mine is easily accessible from a nearby highway, human disturbance is a big concern.

“Visitors to the mine invariably disturb the bats, causing them to leave their roost and fly around, sometimes out of the mine into what may be an inhospitably hot day,” says refuge manager Susanna Henry. “This is especially concerning if the bats are using the mine as a maternity roost.”

The California leaf-nosed bat has an average weight of half an ounce and wingspan of 13 inches. It lives an average of 20 to 30 years and has such acute hearing that it can detect the footsteps of a cricket. The bat is a federal species of concern and “wildlife of special concern” (threatened) in Arizona. Human disturbance has contributed to its decline.

So, refuge staff approached the landowner about placing a bat gate at the primary mine entrance. He was willing, both to



California leaf-nosed bats are a “wildlife of special concern” (threatened) in Arizona. (Dominic Barrett/USFWS)

protect the bats and prevent trespassing. Because the entrance is big enough to accommodate a truck, a tamper-resistant bat gate would be expensive and the refuge would need help.

Biologist Jason Corbett of Bat Conservation International (BCI) visited Kofa Refuge to survey several mines in April 2008. He was impressed by the bats at Hull Mine and agreed it should be gated. He spent two years helping the refuge pursue funding sources, with little success. Refuge staff was about to despair when Dominic Barrett from the Partners for Fish and Wildlife Program offered help.

The Partners program provided financial assistance. Funding was matched with in-kind services from the landowner and BCI, which agreed to administer the funds and coordinate logistics. Tom Gilliland from Mine Gates Inc. of Tucson arrived in July 2010 to take measurements. In September, Gilliland

and his crew returned to install the customized gate, which is 15 feet wide, 10 feet high, weighs about 300 pounds and is made of super-strong Manganal steel. After days of heavy lifting, welding and retrofitting, the installation was done.

The gate even includes an opening known as an owl window so that larger birds—mostly barn owls—can continue to roost in the entrance. And its padlocks can be opened to allow researchers, students and others to enter with permission from the landowner.

A December 2010 survey found 336 bats exiting through the gate in one evening. So, the gate does not appear to hinder the bats. With the help of the landowner and BCI, Kofa Refuge will continue to monitor the mine and track progress of the bat population. 🦇

*Lindsay Smythe is a biologist at Kofa National Wildlife Refuge.*

# “Tremendous Progress” on Louisiana Black Bear Habitat

By Mary Tillotson

**D**eborah Fuller remembers the Case of the Traveling Bear. A black bear tagged in Florida ambled across Alabama, Mississippi and into Louisiana before wildlife officials caught him and sent him home. That was extraordinary. But Fuller, the U.S. Fish and Wildlife Service’s Endangered Species Program coordinator in Lafayette, LA, says even bears that are homebodies must range far and wide for food and mates—up to 80,000 acres for males and 8,000 for females.

So, black bears were hard-hit in the last century by the conversion of their hardwood habitat into agricultural fields. By 1992, the Service declared the Louisiana black bear, which once flourished from east Texas into Mississippi, as threatened with extinction. The Louisiana black bear is one of 16 subspecies of the American black bear.

Nineteen years later, “tremendous progress has been made,” says Fuller, who is optimistic the Louisiana black bear may be taken off the threatened list in five to 10 years.

Bayou Teche National Wildlife Refuge, established in 2001 in the Atchafalaya River Basin of coastal Louisiana, is the only refuge with the primary mission of preserving and managing Louisiana black bear habitat. On the refuge’s 9,028 acres of bottomland hardwood forest, bears forage for their staples—nuts and berries. Fallen and hollow trees offer them places to den during cold months when they are in a torporous state.

The recovery impact of the refuge is multiplied by corridors that give bears relatively safe passage from forest to forest. Federal and state programs encourage nearby private landowners to preserve their hardwood bottomlands, or to restore that habitat on land that was once agricultural. Since the early 1990s, says Fuller, at least 200,000 acres in Louisiana have been set aside to encourage growth of the bear population.

But, in a landscape fragmented by agricultural and residential development and bifurcated by Interstate 10 and U.S. Route 90, road kills are the primary cause of bear mortality, says Bayou Teche Refuge manager Paul Yakupzack.

There were only three known breeding populations of the Louisiana black bear when it was listed—all in Louisiana, and all considered

isolated: the area that includes Bayou Teche Refuge on the coast; an area farther north in the Atchafalaya Basin; and Tensas River Refuge and vicinity in north Louisiana. Fuller says a fourth breeding subpopulation recently has been established in central east Louisiana near Lake Ophelia National Wildlife Refuge. She estimates there are now at least 400 to 700 bears in the state. A study is underway to refine the number, Yakupzack says.

## Everybody Wants High Ground

For the Louisiana black bear to be de-listed, says Fuller, wildlife biologists would need to confirm there are at least two viable populations with existing and long-term habitat protection; corridors to support intermingling of the two populations; and sufficient numbers of bears to support the likelihood that 95 percent of the existing population will persist over 100 years.

While habitat preservation/restoration has been a success, Fuller says, “conflict resolution” with the local population “remains our number one issue. There’s not a lot of high ground here, and everybody wants it—including the bears.”



*Louisiana black bear cubs and their parents use fallen and hollow trees as dens in bottomland hardwood forest at Bayou Teche National Wildlife Refuge. (Janet Ertel/USFWS)*

Louisiana black bears are essentially opportunistic vegans. Pecans, acorns, berries and grasses are their basic diet, with the occasional carrion or small mammal thrown in. But human garbage, with its leftover food, can be enticing, and—at several hundred pounds—the bears can be intimidating. Louisiana’s Department of Wildlife and Fisheries actively tries to ameliorate bear-human conflicts, says Fuller, often providing bear-proof garbage dumpsters. And, says Yakupzack, nuisance bears are occasionally trapped and relocated to such public areas as Bayou Teche Refuge.

“You like to think you can just tell people” to dispose of their garbage more carefully so as not to attract bears, says Fuller. “But it’s not that simple ... It’s a huge investment of time and effort, convincing people that we want to protect the bears, but that we want to protect *them*, too.” 🦵

*Mary Tillotson is a regular contributor to Refuge Update.*

# Listening to the “Soundscape” of Wilderness

By Susan Morse

**W**hy does Tim Mullet plan to collect moose poop for a two-year study of noise levels on Kenai National Wildlife Refuge in Alaska? Because bagging moose pellets is safer and easier than taking blood samples from wild horned animals weighing half a ton and up.

Mullet, a biological technician at Kenai Refuge and a PhD candidate at the University of Alaska Fairbanks, will test the moose poop for levels of glucocorticoids—hormones that are indicators of animal stress. Chronic high levels of these hormones can lower wildlife densities and displace animals from preferred habitat. Mullet hopes to find out whether exposure to human-made noise causes such stress.

One source of human-made noise is snowmobiles. Snowmobile use is permitted on the refuge under the provisions of the Alaska National Interest Lands Conservation Act (ANILCA), especially for hunting and fishing, even in wilderness areas.

Noise from human activity is penetrating deeper into Kenai Refuge’s 1.3 million acres of wilderness, and growing recreational use of snowmobiles has sparked some visitor complaints, says John Morton, supervisory wildlife biologist at the refuge for the past decade. The area also absorbs noise from Sterling Highway, which passes through the refuge on the Kenai Peninsula about three hours south of Anchorage.

“At this point, I’ve got an idea that 30 to 40 percent of Kenai’s wilderness could be affected by human-made noise,” says Mullet. His study will map a “soundscape” of the refuge, based on sound-level readings and recordings and predictive modeling. Sound is measured in decibels (dB), with conversation usually measuring about 60 dB and a jet take-off about 120 dB, loud enough to cause permanent hearing loss.

Readings previously taken on Kenai Refuge include 95 dB for low-flying



*Tim Mullet, a biological technician at Kenai National Wildlife Refuge and a PhD candidate at the University of Alaska Fairbanks, is gathering data to map a soundscape of the refuge. (Tim Mullet/USFWS)*

aircraft and 120 dB on or near Sterling Highway.

The study—conducted with the Ecological Wildlife Habitat Data Analysis for the Land and Seascape, and overseen by Mullet’s academic advisor, Falk Huettmann—goes beyond simple decibels (loudness), though. It is a foray into the emergent field of soundscape ecology, which examines the interplay of anthrophony (human-induced sounds) and biophony (natural sounds).

## “It’s Definitely Cutting Edge”

Loudness is “a piece of this study,” says Morton, “but another piece is the origin of sound—whether it’s human or nature—and developing a ratio between the two. It’s definitely cutting edge.”

Understanding the relationship between anthrophony and biophony is important to the refuge and wildlife conservation in general, Morton says, because “human-generated noise can drown out natural noises—and that can be a huge deal, to the point where animals can’t actually hear themselves.”

The study will focus on “recognizing how snowmobiles specifically affect the winter soundscape and how winter soundscapes differ from summer soundscapes,” Mullet says. In summer in wilderness, airplanes, singing birds, road traffic and raging rivers can be heard, he says. Winter, he says, generally is quieter because road traffic is lighter, wildlife is hibernating and snow has insulating properties. Motorized vehicles, aside from snowmobiles, are also absent from wilderness.

Sound samplings are beginning in earnest in this year. Conclusions from the study are not expected until 2014, in part because the work involves unwieldy data sets and “a heavy-duty analytical piece at the end,” Morton says.

“As far as I know, nobody has attempted to model sound in the landscape,” says Mullet. “We could encounter some big surprises there.” 🦋

*Susan Morse is a writer-editor in the Refuge System Branch of Communications.*

# Trying to Make South Texas Safe for Endangered Ocelots

By Bill O'Brian

**W**ildlife biologist Jody Mays gingerly approached the cage in the dense, thorny brush at Laguna Atascosa National Wildlife Refuge in Texas. Peering out with gorgeous feline eyes was a healthy 14-year-old ocelot, trapped overnight as part of the refuge's monitoring program. The ocelot seemed relaxed, but when, after a brief examination, Mays released the animal, it fled in a nanosecond with lightning speed and cat-like grace.

Speed clearly is an ocelot asset. However, as a newly placed sign near the refuge visitor center says, "*speeding* kills ocelots." Automobile speeding. In the past year and a half, vehicles have killed four of the endangered cats on or near the refuge. The species can ill afford those mortalities, and the refuge is working with state and local highway officials to minimize deaths.

There are fewer than 50 ocelots in the wild in the United States. South Texas is the only place in the nation with a breeding population. There are 13 known ocelots, and up to a dozen unidentified, on or near Laguna Atascosa Refuge. There is a separate population of 20-25 ocelots on private ranch land considerably north of the refuge. The numbers are imprecise because ocelots are small (about twice the size of a house cat), nocturnal and highly elusive.

Mays—along with a temporary bio science technician, interns and volunteers—is working to recover the species. The biggest challenge is habitat connectivity, *safe* connectivity.

Ocelots require Tamaulipan thornscrub habitat—semi-arid thicket of spiny shrubs, trees, grasses and succulents. "If it's the kind of place that horrifies you to get pushed into, ocelots love it," says refuge public outreach specialist Nancy Brown.

That native habitat is sparse in south Texas because of agricultural and residential development. So, the refuge is attempting to connect itself to existing

fragmented habitat or acquire farmland and, over decades, restore it to Tamaulipan thornscrub.

Working with private landowners and Lower Rio Grande Valley Refuge, Laguna Atascosa Refuge seeks to establish corridors for ocelots between itself and the ranches to the north and Mexico to south. The main thing is "getting everything to come together resource-wise and adjacent-landowner-wise to put the pieces together," says refuge manager Sonny Perez. "It's a long-term project."

To protect ocelots, the refuge advocates road wildlife crossings that can accommodate animals as large as whitetail deer and thus make thoroughfares safer for all wildlife—and drivers. The Texas Department of Transportation and Cameron County have shown willingness to engineer such crossings into the design at the start of a road project, says Perez, "as opposed to trying to retrofit an existing project and squeeze money and having crossings as an afterthought."

## Lack of Genetic Diversity

Mays is also concerned about the refuge ocelots' lack of genetic diversity. Studies show that the population is losing four percent of its diversity per generation. For example, Mays says, "an ocelot's nose can be anywhere from solid pink to solid black and anything in between. We've lost the solid pink. If you see a photograph of an ocelot with a solid pink nose, it didn't come from here." The limited gene pool leaves the population susceptible to catastrophic disease.

To address the problem, refuge staff and partners are preliminarily



*There are fewer than 50 ocelots in the wild in the United States. This one was photographed using a remote night camera at Laguna Atascosa National Wildlife Refuge in south Texas. (USFWS)*

considering translocating a female ocelot from northern Mexico, where up to 3,000 ocelots occur, to Laguna Atascosa Refuge.

"There's little to no flow between the two populations in Texas, and then between those populations and Mexico. They used to be connected. They should be connected," says Mays. "The idea of the translocation is basically a kind of an emergency tactic to help keep the populations that we've got from disappearing until we can get these longer-term things like habitat restoration."

For now, despite ocelots' dire straits, Mays is simply proud to lead their recovery. "To me, they represent the wildness of nature," she says. "They're a unique animal. They've got beautiful markings. They have some really neat behaviors that are unusual, just really cool."

To learn more about ocelots, their behavior and efforts to save them, go to: [http://www.fws.gov/southwest/refuges/texas/STRC/laguna/Endangered%20Species\\_Laguna.html](http://www.fws.gov/southwest/refuges/texas/STRC/laguna/Endangered%20Species_Laguna.html). 

# Focus...Conserving the Future, People to

## Wildlife Refuges and the Next Generation

Scores of U.S. Fish and Wildlife Service employees have been working for months with the National Wildlife Refuge Association, Friends and partners on a vision to guide the National Wildlife Refuge System for the next decade or so. This renewed vision, titled *Conserving the Future: Wildlife Refuges and the Next Generation*, will be the successor to the *Fulfilling the Promise* vision crafted in the late 1990s.

The process of developing the vision has been transparent, with healthy discussions online at [www.americaswildlife.org](http://www.americaswildlife.org). The *Conserving the Future: Wildlife Refuges and the Next Generation* vision document will be presented

for ratification at a conference in mid-July in Madison, WI.

This is the second in a series of *Refuge Update* Focus sections leading up to that conference. The section's title—"Conserving the Future, People to People"—derives from Wisconsin conservationist Aldo Leopold's famous quotation, "There are two things that interest me: the relation of people to each other, and the relation of people to land."

The section's content focuses on the people-to-people realms of two of the five *Conserving the Future* Core Teams: "relevance to a changing America" and "leadership and organizational excellence." 🦋



Words of inspiration from President Theodore Roosevelt, the founder of the National Wildlife Refuge System. (David Cooper)

## Draft Vision Available for Public Comment — continued from page 1

Among the draft vision's recommendations are:

- To work with tribes and other federal land management agencies to develop a National Conservation Strategy that works across landscapes with private landowners to increase the representation, size and connectivity of protected areas.
- To implement a plan to guide the Refuge System's land conservation work and overhaul the Land Acquisition Prioritization System to help determine the importance of new and existing acquisition projects, including the establishment of national wildlife refuges in urban areas.
- To encourage a Friends group for every staffed refuge; there are now about 230 Friends groups.
- To review the Appropriate Use Policy, so a wider variety of nature-based experiences may be possible. The draft notes that jogging, picnicking, sunbathing, bicycling and dog-walking

often are considered outside of the wildlife-dependent recreation definition that guides strict interpretation of refuge appropriate use. "Refuge managers have become rightly cautious because they have seen what happens to wildlife resources when participation is too large and incompatible," the draft says.

- To engage youth in an array of work and volunteer programs.
- Within the next 10 years, to more than double the number of minorities and people with disabilities who work for the Refuge System, in part by reaching high school and college youth from diverse communities and exposing them to Service conservation careers.
- To develop an environmental education strategy that not only inventories existing programs but also identifies priorities for investment of staff and funds and outlines basic standards for national wildlife refuges.

- To develop standards for credibility, efficiency and consistent application of science in planning and management.
- Working with state fish and wildlife agencies, to prepare a strategy to double youth participation in hunting and fishing by 2020, paying special attention to individuals of all ages with disabilities.
- To develop a five-year plan to "green" the Refuge System.

The draft also makes recommendations regarding climate change, law enforcement, fire management, marine ecosystems, invasive species, wilderness stewardship, and conservation science and research.

The draft vision is the work of 70 U.S. Fish and Wildlife Service employees as well as the National Wildlife Refuge Association, a partner in the *Conserving the Future* process. A vision document is scheduled to be presented to the Service Director and top management in late May. 🦋

## The Evolution of Conservation Leadership

By Lynn A. Greenwalt

The refuge manager job description has evolved dramatically over the past century. Current refuge managers assume responsibilities that early leaders of the National Wildlife Refuge System could not have imagined.

In the beginning, refuge managers played a largely custodial role, all were men, and many were newcomers to natural resources management. My father, Ernest Greenwalt, was a journalist before being hired 80 years ago to manage Sheldon National Wildlife Refuge in Nevada.

Refuge managers then protected the land; kept track of events; took note of wildlife and habitat conditions; and, when possible, improved them. Their supervisors often were preoccupied and offered only passing guidance. The refuge manager was left pretty much to his own devices. When it came time to erect the boundary markers at Sheldon Refuge, for instance, my father enlisted University of Nevada football players to dig the post holes—and my mother fed them in return.

In the years before the Bureau of Fisheries and the Biological Survey merged to form the U.S. Fish and Wildlife Service in 1940, the Refuge System grew rapidly. The Great Depression and drought were gripping the nation, but land was cheap. More than 100 national wildlife refuges were established in the 1930s. Various federal programs provided jobs for millions who were out of work. Refuge managers made good use of Civilian Conservation Corps and Works Progress Administration specialists.

As the new refuges were established, managers were charged with ensuring that suitable habitat was available for migratory birds, for resident species and for vanishing species. Refuge leaders identified projects to achieve these aims. Just as today, refuge managers needed to



*The author's father enlisted University of Nevada football players to dig the post holes for the original boundary markers at Sheldon National Wildlife Refuge. (Kurt Kuznicki/Friends of Nevada Wilderness)*

demonstrate innovation, common sense, vision and the ability to work with others.

Then, World War II intervened. The manpower and financial resources were diverted to the war effort, depleting refuge staff and reverting managers' roles to custodial status. After the war, however, refuge managers found a renewed interest in outdoor recreation among a wealthier, more highly mobile public.

### External Pressures

The refuge managers, who once concentrated on matters inside the refuge, now needed to pay attention to activities outside. They learned that managing wildlife is often the easy part; dealing with external pressures often is not.

This was when I became professionally involved with the Refuge System. I started as a youth/summer employee at Wichita Mountains Wildlife Refuge in Oklahoma and worked at three other refuges before moving to the Albuquerque regional office and eventually serving as Service Director.

Refuge managers and their leaders in the 1950s and '60s focused on creating long-term plans to conserve the nation's

wildlife resources. Refuge leaders began to assess how refuges might complement one another and how to involve the public in the planning process. This led to the hiring of employees with special skills and to in-service training programs.

Women soon appeared in refuge leadership ranks. Refuge leaders were no longer crew chiefs, equipment operators, law enforcement officers and overseers of crop-sharing farmers. They became administrators, supervisors, mentors and refuge spokespeople—thorough professionals in complex jobs.

I am impressed by how refuge leaders have created and used opportunities; by the Service's outreach; and, in recent years, by the volunteer programs and the Friends groups. I am most proud of the unremitting commitment to the mission, in good times and bad, and of the enthusiasm for refining the vision that guides the Service and the Refuge System—as has been evident in the ongoing *Conserving the Future* process.



*Lynn Greenwalt was Director of the U.S. Fish and Wildlife Service from 1973 to 1981.*

# Focus...Conserving the Future, People to

## The Bear River Watershed: "Leading by Example"

*This is the first of two articles about Bear River Migratory Bird Refuge's watershed conservation plan. A second article, focusing on educational outreach, will appear in the May/June issue of Refuge Update.*

By Karen Leggett

**B**ear River Migratory Bird Refuge in Utah is a highly managed landscape—"the hand of man joining with forces of nature," in the words of former refuge manager Al Trout, who is on the sidelines cheering as his successor, Bob Barrett, manages that landscape way beyond the refuge boundaries.

The refuge was established in 1928 to preserve migratory bird habitat. Fifty miles of water control structures were built to ensure adequate water for the birds. Trout describes habitat management then as stable, predictable and inside the boundaries. "A classic waterfowl refuge to the nth degree," says the National Wildlife Refuge Association's Anne Truslow, "strategically located on the Pacific and Central Flyways, the last stop on the Bear River before the Great Salt Lake."

In the early 1980s, however, record precipitation caused the Great Salt Lake to rise, overtaking refuge dikes, contaminating freshwater habitat with saline water, destroying the refuge visitor center and forcing the birds elsewhere. Trout was hired to begin the long process of restoration. "The community was hungry to start working on the refuge," he recalls. A longstanding positive relationship grew between the refuge and its neighbors; breeding habitat was added; existing habitat was restored; and, by 2000, the refuge again supported millions of birds and was a crucial component of the Great Salt Lake ecosystem.

When Barrett became refuge manager in 2007, he began assembling the pieces

of a puzzle that includes three refuges, two U.S. Fish and Wildlife Service regions, three states and a 500-mile river. But it is still all about the water. "If we don't pay attention to our water," says Barrett, "the future could be scary. We're looking at doubling the population by 2030 in this area ... So we started talking about the watershed."

The Bear River watershed covers about five million acres. Barrett and others led the development of a Preliminary Project Proposal (PPP) affecting wildlife habitat at refuges in Utah, Idaho and Wyoming (Bear River, Bear Lake and Cokeville Meadows). The PPP calls for using various wildlife management techniques to address conservation needs collaboratively on 2.5 million of those acres.

### Thinking on a Landscape Scale

Right now, Barrett has more questions than answers. "Our climate change model tells us that between 2040 and 2060 we'll be a little warmer, and a lot of precipitation will be rain. What can we do to support wildlife resources in the future? Can we help improve grazing practices? Can we look at residential and commercial development and identify high-risk areas? Is the water allocation policy adequate?"

"Picture a stream," says Barrett. "It runs into Bear River, which carries its nutrient load to the refuge. If we work in the watershed, we can grow willows along the stream to prevent erosion and prevent animals from grazing right next to the stream, reducing the animal



*The future of Bear River Migratory Bird Refuge in Utah as prime waterfowl habitat depends on managing the entire Bear River watershed. (Karen Leggett/USFWS)*

waste that flows into the river. And we'll do it all by working with landowners interested in easements."

Barrett hopes a landscape conservation cooperative will provide crucial watershed-wide information, such as the location of critical wildlife habitat areas and the habitat requirements of various species.

One after the other, Trout and Barrett moved Bear River Migratory Bird Refuge into a wildlife conservation leadership position in the watershed. Barrett believes the Service can and should be a major facilitator on landscape-scale projects. "There's a mind-set among people who want to leave the refuge better than they found it. I'm excited to be able to take action now for the future. We are leading by example." 🦋

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

## Leadership With a Capital P (Perseverance)

By Bill O'Brian

**K**elly Purkey has been overseeing an ambitious bottomland hardwood reforestation project at Tensas River National Wildlife Refuge since mid-2007. Her experience with the project has reinforced three precepts of her profession: Conservation is complicated. It takes perseverance. And, if you keep your eye on the big picture, it's all worth it.

Purkey, a 14-year U.S. Fish and Wildlife Service veteran, is refuge manager at Tensas River Refuge, home to one of the largest contiguous stands of bottomland hardwoods in the Mississippi Alluvial Valley.

When the northeast Louisiana refuge was established in 1980, “there was a nice, big forest in the north and a nice, big forest in the south,” Purkey says. “But there was sort of a big hole in the middle.”

The reforestation project she inherited as refuge manager almost four years ago is designed to fill in that hole. That the refuge now owns 10,000 acres of an 11,000-acre tract connecting the northern and southern forest blocks is widely viewed as a National Wildlife Refuge System habitat success story. But it is indeed complicated, and it does take perseverance.

How the refuge has come to own most of what Purkey calls this “jewel of an acquisition” is complicated its own right. A decade ago, the timber company that held the tract put it up for sale. Because the refuge couldn't afford the asking price, the nonprofit Trust for Public Land (TPL) agreed to buy the 11,000-acre tract and, over time, sell it piecemeal to the refuge at a bargain price. To cover the cost difference, TPL was allowed to sell to private companies the carbon credits that would accrue once the land was reforested. Since 2004, Tensas River Refuge has acquired 10,000 acres that way.

However, to help TPL defray land-holding costs, the project's memorandum of understanding (MOU) permitted TPL to



*Tensas River National Wildlife Refuge in northeast Louisiana is home to one of the largest contiguous stands of bottomland hardwoods in the Mississippi Alluvial Valley. (Kelly Purkey/USFWS)*

rent parcels to farmers before selling the land to the refuge. A pattern developed whereby cotton, a chemically intensive crop that provided TPL the best return, was harvested from tracts just months before trees were planted. Planting trees without letting the soil lie fallow, without letting the chemicals dissipate, without eliminating tenacious grasses that competed for water, and without providing for irrigation led to a low survival rate for the seedlings, Purkey says.

### The Need for Leadership

To fulfill the project's goal of cultivating expansive contiguous habitat for Louisiana black bear, neo-tropical songbirds, migratory birds and other resident wildlife, Purkey must help her staff regroup. First, she must find a buyer for the final 1,000 acres—a task impeded by the sluggish economy and stalled federal energy legislation. Next, she says, “we have 8,000 acres of supposedly reforested field, but about 5,000 need to be replanted.”

She and her staff know *how* the replanting must be done. Herbaceous spray must be applied to suppress the grasses, and trenches must be dug to irrigate seedlings

in the crucial first year. What they don't know, because the MOU had no success criteria, is *who* should do the replanting—the refuge or the numerous companies that own the carbon credits?

It's hard, Purkey says, to tell the carbon-credit purchasers: “You thought you were finished. Well, you aren't. And it's going to cost you a whole lot more money.”

It would be equally hard, she says, for the refuge to expend the money and labor to replant the fields and allow private companies to claim carbon credits. So, because Purkey knows that Tensas River Refuge isn't the only refuge with this problem, she will be seeking Service regional guidance.

In the meantime, Purkey says, “my goal for this year is to spend a lot of time being persistent” and keeping staff morale high by thinking long term and staying positive:

“The thought that I'm contributing—to what 50, 100 years from now will be a beautiful forest that will be part of the National Wildlife Refuge System, that's the best thing about my job every day.”

# Focus...Conserving the Future, People to

## Using Bugs to Instill a Sense of Wonder

By Janet Butler

You need a special draw to entice families to activities at Ohio River Islands National Wildlife Refuge during the sticky heat of summer. With no huge flocks of birds, herds of bison or wild ponies to lure them, we rely on what experience has taught us: Bugs fascinate kids, and children will come in swarms with their parents for a guided insect safari.

Bug hunts, or insect safaris, adapt well to almost any wild landscape and offer a useful if humble tool for exploring habitats and explaining connections in nature. They cost little to implement. Start with a few nets, clear plastic jars (peanut butter jars work well) and some basic field guides. Magnifying glasses for closer looks and small artist-type paint brushes to delicately remove fragile insects or spiders from their hiding places also help.

Because it's hot on July and August afternoons, morning safaris are preferred at our refuge, which consists of 22 islands and three mainland tracts along nearly 400 miles of the Ohio River, primarily in West Virginia and Ohio. August typically offers the greatest abundance of butterflies. Spiders, which are always a draw for the "eek" factor and the intricate beauty of their webs, also peak here late in summer.

Before starting a safari, we establish ground rules. We stress that safety is a must, especially when the typical participant is younger than 10. No one wants to get stung by a bee, wasp or certain bristled caterpillars. Adults always accompany the kids during the hunt.

It's "catch and release" on our safaris, despite the occasional protest. Recently, I talked a six-year-old into releasing his self-described "army" of soldier beetles. But I didn't win with a four-year-old obsessed by caterpillars. As we neared his point of raging meltdown, I hastily relented and gave his relieved mother a

discreet "okay" and instructions for the care of a monarch caterpillar. That incident was my fault: I failed to start the hunt with a clear message about this part of the game plan.

### Encourage Observation

We keep things simple; we don't take reservations. Weather, location on the refuge, publicity and other factors affect attendance. After broadening event publicity last year, 100 people showed up, as compared to the previous 10 to 20. Even with a summer student and a volunteer, I felt overwhelmed until the crowd spread out along the trail and groups spontaneously formed around someone's captured bug.

It helps that one of our volunteers, a retired chemist named Brad Bond, has an interest in insects and a rapport with audiences. Much of what I know about insects I've learned from him, and it isn't all about merely labeling them.

While Bond can identify the majority of the bugs we find, his real skill is in encouraging observation. His knack for sharing his own sense of wonder about insects is a special quality that seems contagious.

Volunteers also help in other ways. As 80 people assembled for our most recent safari, we began with local mom Lori Hall's presentation about her monarch butterfly-raising project. We watched an adult butterfly emerge from a chrysalis. We then introduced a giant praying mantis (11-year-old volunteer Sienna



Sienna Stocky, in a praying mantis costume, illustrates basic insect body parts at an Ohio River Islands Refuge insect safari. (Jeremiah Hunter/USFWS)

Stocky in costume) to explain the basic body parts of an insect.

While these "wow" features helped entertain the large group and allowed me to assess the audience before starting out on the trail, the best part is the spontaneous discovery that comes during the walk. Crickets and grasshoppers become magical when shared with children. The kids' sense of wonder merges with my own, and all from humble bugs. 🦗

Janet Butler is visitor services manager at Ohio River Islands National Wildlife Refuge.

## Rx: Go Outside!

By Karen Leggett

A physician in the San Francisco Bay area is posting maps in his waiting room showing local parks and refuges. A pediatric cardiology practice in Las Vegas is organizing monthly field trips to wildlife refuges. A social worker in New Jersey has given 50 “Rx for Outdoor Activity” prescriptions to children at Gilda’s Club, a clubhouse for families touched by cancer.

These efforts grew out of a partnership between the U.S. Fish and Wildlife Service and the National Environmental Education Foundation (NEEF) to help families make the connection between going outdoors and staying healthy. The idea was first discussed at a 2006 Children and Nature Summit, when Service staff began talking with doctors, educators and outdoor professionals about ways to overcome “nature-deficit disorder” in children.

An initial training for staff from seven national wildlife refuges and several other federal agencies, along with health care professionals from 11 states, was held at the National Conservation Training Center (NCTC) in September 2010. These “Nature Champions” are expected to partner with additional health care providers in their communities to provide training and encourage children and families to get outside.

### Perks for Playing

Desert National Wildlife Refuge Complex, NV, brought five health care providers to the NCTC training, including a school nurse, two physicians and an exercise physiologist. These five have now trained 30 more. The nurse has written 11 “prescriptions” for outside activity, most during a family fitness night at school.

The Children’s Heart Center, a pediatric cardiology facility in Las Vegas, serves primarily inner city families without easy access to the refuge. Desert Refuge Complex visitor services manager



Children play in snow during a Nature Club outing at New Jersey’s Edwin B. Forsythe National Wildlife Refuge, which has enthusiastically embraced the Nature Champions idea. (USFWS)

Angelina Yost is helping the center organize monthly field trips of young patients and their families to one of the four refuges in the complex. Children also can win prizes provided by NCTC and the National Audubon Society, including plush birds, totes, children’s binoculars and birdhouses.

Don Edwards San Francisco Bay National Wildlife Refuge, CA, is providing similar prizes when children have a special card punched each time they visit. “Nature has its rewards,” says a brochure. “Follow your doctor’s instructions for a healthier and better you by visiting the Don Edwards San Francisco Bay National Wildlife Refuge.”

In addition to planning specific outdoor activities such as a hiking club, geocaching and even yoga, the refuge’s outdoor recreation planner, Carmen Minch, is working with several local pediatricians. Dr. Paul Espinas is writing nature prescriptions and creating maps of local nature sites, including Don Edwards Refuge, to post in waiting rooms in three local medical centers.

At Edwin B. Forsythe National Wildlife Refuge, NJ, refuge volunteer Barry

Keefe—a social worker who has started handing out prescriptions—is working with AtlantiCare Health Systems and Richard Stockton College to train 30 pediatric health care providers over the next two years.

The Forsythe Refuge Nature Champions project was launched with a Saturday morning hike last December. Children who had a prescription for exercise could request a prize after the hike. Teens were encouraged to bring along a younger child. The continuing hikes are sponsored by Forsythe Refuge’s Nature Club, which provides about an hour of group exercise outdoors once or twice a month. Eventually, the club will meet at the refuge’s outdoor nature discovery area now being created by refuge Friends, volunteers and Eagle Scouts.

For additional information about Nature Champions, contact Jennifer\_Lapis@fws.gov, Mary\_Danno@fws.gov or [www.neefusa.org/health/children\\_nature.htm](http://www.neefusa.org/health/children_nature.htm).



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

# Focus...Conserving the Future, People to

## Two Dogs, One Cat and Three Refuge Manuals

By Tom Worthington

Leadership has communicated with staff members nationwide for years through the Refuge Manual. What follows is a brief history of the manual and a glance at some quirky language and trivia surrounding it.

In 1940, the Bureau of Biological Survey merged with the Bureau of Fisheries to create the U.S. Fish and Wildlife Service. In July 1941, Director Ira Gabrielson issued the first Service Field Manual of General Administration. In a two-page preface on Washington letterhead, Gabrielson stated that there was nothing “new” in the manual, but rather it pulled together policies and guidance that already had been in practice within the two bureaus.

Perhaps sensing that the regions were too independent in their approach to running things, he cautioned that “Regional Directors should not issue general memoranda supplementing or explaining subject matter contained in this manual.” Rather, they should contact the Washington Office to make clarifications.

The next year, the first Field Manual for Wildlife Refuges was issued. Each copy of that sturdy black-bound binder with its metallic screw hinges was numbered. When Refuge System chief J. Clark Salyer signed the transmittal page, interestingly, his letterhead was not from Washington, DC, but rather from the Service’s temporary World War II headquarters in Chicago. And only five regional offices were in existence then.

In 1957, Service Director Daniel Janzen issued the second Refuge Manual. That single volume updated policies, covered a wider scope of habitat management and restoration activities, and described a master plan process each refuge should initiate. Finally, in 1982, the familiar brown two-volume Refuge Manual was issued.



*U.S. Fish and Wildlife Service Director Ira Gabrielson—shown fishing at Upper Mississippi River National Wildlife and Fish Refuge—issued the first Service Field Manual of General Administration in 1941, a year after the Bureau of Biological Survey merged with the Bureau of Fisheries to create the Service. (USFWS)*

Thus, there have been three Refuge Manual editions, growing from one volume in 1942 to two volumes over the course of 40 years. I can’t resist noting that the Administrative Manual grew from one volume in 1941 to the shelf-busting seven binders in 1981.

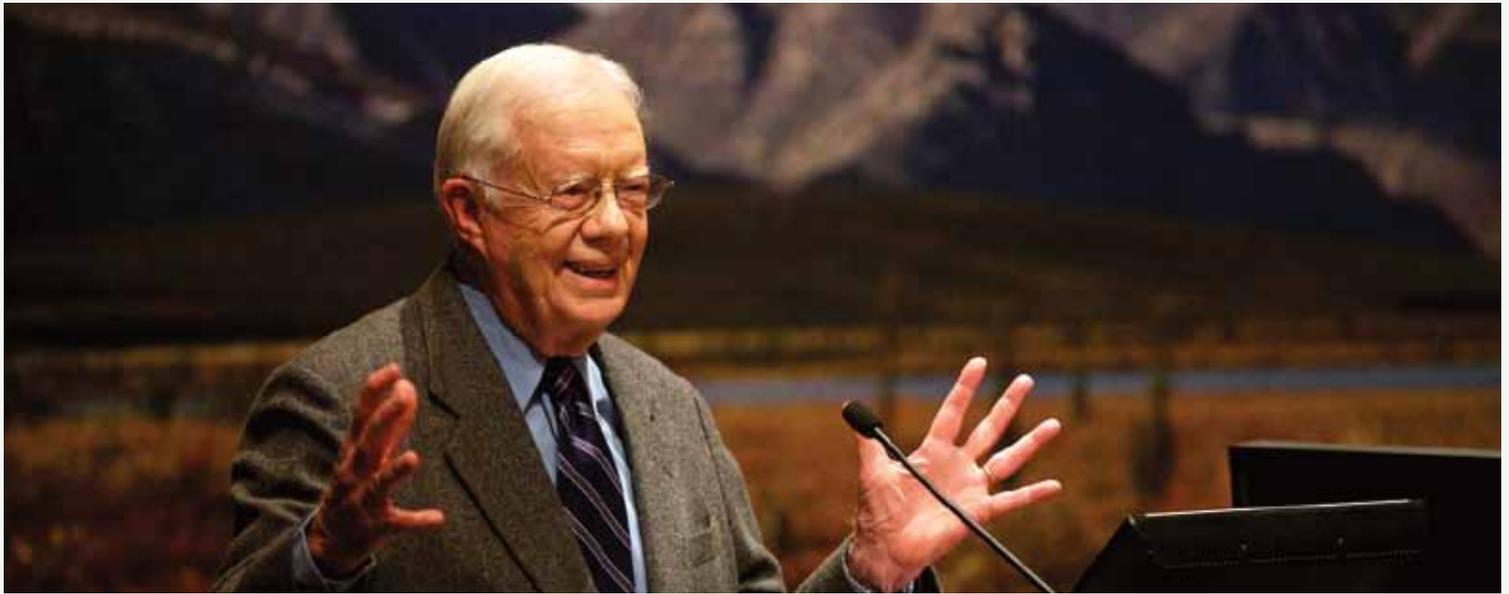
Today, the Service Manual has replaced the Refuge Manual and the Administrative Manual. Its online features at <http://www.fws.gov/policy/manuals/> make for quick searches and policy retrieval. Still, you can’t beat paging through old manuals, where you will discover that:

- In 1942, the Policy on Use of Electrically Operated Equipment When Power Supplied by Generator Units in refuge housing prohibited refrigerators,

waffle irons, percolators, hot plates, heaters, electric stoves, electric clocks, hair dryers, heating pads, infra-red lamps, cookers and sun lamps.

- The limit on how many chickens, dogs and cats are allowed in refuge housing has not changed in 70 years. Even today, one may have no more than 25 domestic fowl. And, showing uncommonly good sense, policy allows two dogs, but only one cat.
- While I can find no established uniform policy in 1942, there was personal grooming advice: “Refuge personnel are the Service’s representative in the refuge community ... Employees should always be neatly dressed and freshly shaved. A man can present a neat appearance in ‘cover-alls’ with little effort.”
- In 1942, telephone lines were still being strung to remote stations and the cost of long-distance calls was an issue. “Time permitting,” the manual stated, “air mail is a much more satisfactory way of handling urgent matters than radiograms, telegrams, or long-distance telephone calls, since by this means, it is possible for the sender to make a complete discussion of the matter.” However, even air mail was discouraged in one instance. Employees who wanted salary checks sent via airmail had to pay the extra 5 cents. Ouch. 🦋

*Tom Worthington is deputy regional refuge chief in the Great Lakes/Big Rivers Region.*



Former President Jimmy Carter, speaking at the National Conservation Training Center's symposium to honor the 50th anniversary of the Arctic National Wildlife Refuge. (Ryan Hagerty/USFWS)

## “We Just Sat There for an Hour While Thousands of Caribou Went by”

**T**he U.S. Fish and Wildlife Service's National Conservation Training Center held a three-day symposium in mid-January to honor the 50th anniversary of the Arctic National Wildlife Refuge. Former President Jimmy Carter—who signed the Alaska National Interest Lands Conservation Act (ANILCA) into law in December 1980—spoke at the symposium. Here, based on a transcript provided by NCTC, are excerpts from Carter's speech.

### On his commitment to Alaska wilderness:

ANILCA—which created the 19.6-million-acre Arctic National Wildlife Refuge and designated 8 million of those acres as wilderness—“was enormously complicated. I probably spent more time when I was President studying the map of Alaska and its most minute detail than I did any other thing or place in the world.”

### On how ANILCA was initially received in Alaska:

“This was a very unpopular thing that we did. As a matter of fact, I was burned in effigy in Fairbanks. I went up there later on the way to a funeral in Japan, and the Secret Service advised me not to go because of the large number of anti-Carter demonstrators that would be there because ANILCA had passed.”

### On how public sentiment has changed:

“Since then [1980], Alaska's population has increased 70 percent, and I checked on it 15 years after ANILCA was

passed. Park visits were up, at that time, 350 percent; I don't know how much now. Tourism had tripled, exceeding in value Alaska timber or fisheries ... Many of the communities whose chambers of commerce had condemned me, now are calling [for] some of the parks to be expanded further. So, it's changed completely, but decisions about Alaska lands are not over.”

### On visiting the Arctic National Wildlife Refuge:

“I was lucky enough to have a contract with a television network, and they wanted to take me and Rosalynn up ... We spent 10 days [at Arctic Refuge] ... I was also able to get in front, with my wife, of the Porcupine herd which is, as you know, 120,000 caribou. And we got right in front of them, and they would come toward us, and when they saw us, they would divide, and we just sat there for an hour while thousands of caribou went by.”

### On giving wilderness status to more Alaska lands:

“I think perhaps as much as 100 million acres might qualify. We need to keep roads out of [Denali] Tundra National Forest; we need to consider BLM land for wilderness status; and we need to define very narrowly the substance activities that would be permitted to Native Alaskans and Indians ... In closing, I want to quote Mardi Murie's husband, Olaus, who said the Arctic Refuge was ‘a little portion of our planet left alone.’ A little portion of our planet left alone. I hope it can stay this way.” 

# Around the Refuge System

## Midway Atoll

In January, for the first time in recorded history, a short-tailed albatross hatched outside of the islands surrounding Japan. The hatching occurred on Eastern Island at Midway Atoll National Wildlife Refuge, part of Papahānaumokuākea Marine National Monument. “We are all as excited as new parents,” said acting refuge manager Daniel Clark. “The chick hatched in the middle of a major storm, but the parent is doing an excellent job of protecting it, so we are guardedly optimistic about its chances for survival.” Establishing a new nesting colony is one of several important steps needed to continue the endangered bird’s recovery because volcanic activity regularly threatens the short-tailed albatross’ main nesting grounds on Torishima Island. The species’ recovery also depends on reducing the threats of contaminants, especially oil contamination at sea and plastic ingestion; reducing bycatch of these seabirds in commercial fisheries; and addressing invasive species conflicts at nesting colonies. Harvest of short-tailed albatrosses for their feathers caused a world population of more than five million birds to plummet to 10 individuals remaining at Torishima in 1950. Since then, conservation efforts have helped increase the population to approximately 2,400 birds, which forage widely across the temperate and subarctic North Pacific and can be seen in the Gulf of Alaska, along the Aleutian Islands and in the Bering Sea.

## Florida

Secretary of the Interior Ken Salazar announced in January that the U.S. Fish and Wildlife Service is working with private landowners, conservation groups and federal, tribal, state and local agencies to develop a new national wildlife refuge and conservation area to preserve the community’s ranching heritage and conserve the headwaters and fish and wildlife of the Everglades. “The Everglades rural working ranch landscapes are an important piece of our nation’s history and economy, and this initiative would work to ensure that they remain vital for our future,” Salazar said.



*This tract of land, Hatchineha Ranch, is part of the proposed Everglades National Wildlife Refuge and Conservation Area announced by Interior Secretary Ken Salazar. (Eric Blackmore/The Nature Conservancy)*

“The partnerships being formed would protect and improve water quality north of Lake Okeechobee, restore wetlands, and connect existing conservation lands and important wildlife corridors to support the greater Everglades restoration effort.” The Service and partners are conducting a preliminary study to establish a new refuge and conservation area of approximately 150,000 acres in the Kissimmee River Valley south of Orlando. In addition to improving water quality, the proposed area would protect habitat for 88 federal and state listed species, including the Florida panther, Florida black bear, whooping crane, Everglade snail kite and Eastern indigo snake.

## Sarbanes Transit Grants

The Refuge System has received six grants from the Paul S. Sarbanes Transit in Parks Program from proposals submitted for fiscal year 2010 funding. Rocky Mountain Arsenal National Wildlife Refuge, CO, received \$400,000 for an inside-the-fence transit feasibility and planning study. Kauai National Wildlife Refuge Complex, HI, received \$300,000 for a comprehensive transportation planning study for the complex’s three refuges. Thacher Island National Wildlife Refuge, MA, received \$79,042 to match a like amount from the

Thatcher Island Association to replace an aging vessel that supplies boat transportation for visitors, volunteers and staff. Sequoyah National Wildlife Refuge, OK, received \$57,879 for a bus/alternative transportation replacement project. Washita, Optima and Salt Plains National Wildlife Refuges, OK, received \$130,000 for a bus acquisition project. Laguna Atascosa National Wildlife Refuge, TX, received \$230,000 for two tour vehicles to replace an aging tram and van used for interpretive programs.

## Louisiana

Breton National Wildlife Refuge reopened in January after being closed to the public for eight months because of the Deepwater Horizon oil spill. The refuge encompasses a series of barrier islands, including Breton Island and the Chandeleur Islands, off the coast in the Gulf of Mexico. The refuge was closed in May 2010 when oil from the leaking BP well began washing ashore and threatened brown pelican nesting grounds. Breton Refuge, established in 1904, is the second-oldest in the Refuge System.

## Idaho

Steve Kehoe, a volunteer at Deer Flat National Wildlife Refuge, has been named 2010 second-place National Public Lands Day Volunteer of the Year by

the National Environmental Education Foundation. In advance of National Public Lands Day, Kehoe drove the refuge's 26-mile loop to map out every location, choose the best projects and determine their degree of difficulty. On the day itself (September 25 last year), he led a crew of five novice volunteers to pull invasive species. Kehoe was honored from among the 170,000 volunteers who participated in National Public Lands Day across the country. The first-place winner was Julian "Pete" Dewell of the Washington Trails Association of Seattle. At age 80, Dewell volunteered on more than 150 work parties hosted by the WTA in 2010.

### New Mexico

By the end of March, Bosque del Apache National Wildlife Refuge will bid goodbye for the season to thousands of migratory geese and sandhill cranes, the refuge's signature birds. Nearly 37,000 light geese and 11,000 cranes took up residence this winter, drawing 6,000 visitors to the refuge's Festival of the Cranes. When the big birds fly back north, they won't leave a vacuum. They will be replaced by a less well-known migration, when



*Under the watchful eye of a monitoring camera, a Kittlitz's murrelet nests at Kodiak National Wildlife Refuge in Alaska. The refuge is an important center for the study of the little-known seabird species. (James Lawonn/USFWS)*

thousands of colorful neotropical song birds—including goldfinches, yellow-rumped warblers and ruby-crowned kinglets—pass through this spring on their way north from South and Central America. To get a taste of the Festival of

Cranes, go to [http://www.fws.gov/video/flash/bosque\\_festival\\_2010.html](http://www.fws.gov/video/flash/bosque_festival_2010.html).

### Alaska

For the third consecutive year, Kodiak National Wildlife Refuge researchers uncovered a wealth of information about the Kittlitz's murrelet, a little-known seabird recently found to nest within refuge boundaries. Two volunteers—Owen Baughman and Timothy Knudson—and seasonal wildlife technician James Lawonn spent 88 consecutive days in the backcountry during the 2010 field season collecting data on the rare species.

The team discovered 16 active nests and four unoccupied nests that indicated former use. Of the 16 active nests, 10 produced chicks, four of which fledged. This season was the third year of a planned five-year cooperative study between Kodiak Refuge and the USGS Alaska Science Center. The 34 Kittlitz's murrelet nests studied over the past three years are about 30 percent of all nests ever found, making Kodiak Refuge an important center for the study of this species, which is a candidate for endangered species listing. 🦅

### Two New Regional Refuge Chiefs

David Viker and Robin West are the newest regional refuge chiefs. Viker, a 19-year veteran of the Fish and Wildlife Service, became Southeast Region refuge chief in January. He oversees 130 national wildlife refuges in 10 states, Puerto Rico and the U.S. Virgin Islands. Viker served as chief of the Southeast's Division of Migratory Birds for five years before accepting the new job. He replaces Jon Andrew, who last year became Department of the Interior interagency borderlands coordinator. Viker worked on 10 refuges in five states before moving to the Southeast regional office in Atlanta in 2002 to serve as a deputy refuge supervisor. As chief of the region's migratory bird program, Viker helped expand the system of joint ventures, establish landscape conservation cooperatives and coordinate the Service's response to the Deepwater Horizon oil spill. West, a 32-year veteran of the Service, was named refuge chief in the Pacific Region, which includes Hawaii, Idaho, Oregon, Washington and U.S.-affiliated Pacific Islands. He assumed his new duties in February. He succeeds Carolyn Bohan, who retired. West is responsible for nearly 270 million acres of land, water, coral reefs and ocean floor on 67 national wildlife refuges and five national monuments. West, who was a supervisory wildlife refuge specialist in the Pacific regional office in Portland before taking the new job, worked for 31 years in the Alaska Region. He held various refuge management positions in Alaska, including 14 years as the manager of the two million-acre Kenai National Wildlife Refuge.

# Collaboration in the Central Pacific

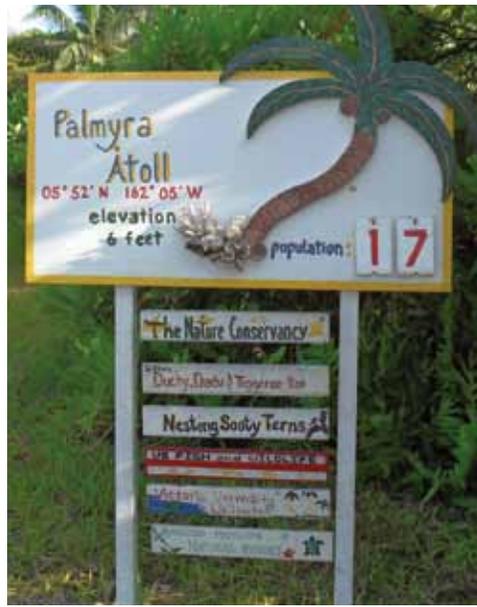
By Eleanor Sterling and Erin Vintinner

**P**almyra Atoll National Wildlife Refuge, about 1,000 miles southwest of Honolulu, is truly isolated. Its 52 islets encircle three lagoons and are surrounded by a diverse 16,000-acre coral reef ecosystem. It is a rare protected atoll in 450,000 square miles of ocean for nesting seabirds, migratory fishes and threatened sea turtles, and it has never been permanently settled.

Its location, rich biological systems and lack of persistent human pressures make it a singular setting for research. In 2004, several public and private institutions formed the Palmyra Atoll Research Consortium (PARC). Its mission is to understand the terrestrial, marine and climate systems of the atoll and the central Pacific and advance the conservation of island and coastal systems worldwide.

PARC members include the American Museum of Natural History; Scripps Institution of Oceanography; Stanford University; The Nature Conservancy; the U.S. Geological Survey; the University of California, Santa Barbara; the University of Hawaii at Manoa; and Victoria University of Wellington, New Zealand. Scientists from these institutions periodically shuttle on and off the refuge to conduct research across an array of subspecialties.

- **Biodiversity research** focuses on understanding healthy outer reef systems and restoring lagoon and terrestrial systems. For example, PARC scientists seek to understand coral settlement and growth patterns and ecological mechanisms related to reef resilience. They assess community composition and interactions within and across the food web in Palmyra's terrestrial, lagoon, reef and pelagic systems. They also study connectivity between Palmyra populations and those across the Pacific Basin.
- **Large predator research.** In most reef ecosystems, large predators have virtually disappeared, but PARC scientists have found that Palmyra
- **Lagoon research** includes studying the history of Palmyra's geo-alterations and the dynamics of the altered systems in terms of hydrology, sediment supply and transport, and biodiversity. This work allows scientists to understand how human disturbance—such as the U.S. military's modification of the atoll's environs during World War II—affects atolls and their marine resources.
- **Terrestrial conservation research** focuses on invasive species, such as rats and scale insects, and guides mitigation and restoration efforts. Palmyra's many islets and well-documented history of invasions make



*The human population at Palmyra Atoll Refuge varies as Palmyra Atoll Research Consortium scientists and refuge personnel shuttle on and off the atoll. (Erin Vintinner/Center for Biodiversity and Conservation at the American Museum of Natural History)*

Atoll is home to abundant large predator populations. This provides an unparalleled opportunity to study predators' role in shaping marine ecosystems. Scientists have placed acoustic receivers within the lagoon system and attached acoustic tags to sharks, other predators and their prey to track movements. Other scientists are unraveling the role of tiny predators—parasites—in the ecosystem.

it an ideal place to do such research. Scientists are profiling previously undocumented long-term effects of invasive plants on seabird communities, ecosystem nutrient levels, and ultimately community diversity and food web complexity. Researchers are also looking across terrestrial, lagoon, and marine ecosystems to characterize the complex interactions between the atoll's unique physical, chemical and biological processes.

- **Climate and biogeography research** at Palmyra Atoll focuses on changing climate and oceanographic patterns. Situated at the boundary between the eastern cool tongue and western warm pool of the Pacific and at the junction of the northern and southern trade winds, Palmyra experiences a broad range of natural variation in pH. It is therefore an ideal place to study the potential effects of climate change on marine systems. PARC scientists seek to better understand the impact of changing ocean temperatures and chemistry on atoll ecology and to assess short- and long-term effects for similar island systems. This research will provide improved understanding of sea-level rise and ocean acidification on tropical reef environments. By understanding the range of conditions under which different species thrive, PARC scientists can model future scenarios to help devise the best conservation plans.

Palmyra Atoll National Wildlife Refuge offers a powerful complement to existing Pacific research stations, and through coordinated research with global colleagues, PARC is poised to address some of the most pressing conservation and restoration challenges of our time.

*Eleanor Sterling is director of the Center for Biodiversity and Conservation at the American Museum of Natural History in New York. Erin Vintinner is a biodiversity specialist at the center.*

# It Takes a Region to Save a Rabbit

By Jennifer Anderson

The wrong kind of rabbit is hopping all over New England while the region's only native rabbit, the New England cottontail, seems to be disappearing. Biologists at national wildlife refuges throughout the region are working to shift the balance.

Eastern cottontails were introduced in the region in the late 1800s and are nearly impossible to tell apart from the New England cottontail. Biologists fear habitat loss, combined with the abundance of eastern cottontails, might explain the alarming decline of the New England cottontail—a candidate for the endangered species list since 2006.

A sharp population drop probably would propel the New England cottontail onto that list, says Anthony Tur, an endangered species biologist with the U.S. Fish and Wildlife Service's New England Field Office.

Instead, the decline has been observed over 50 years, with the New England cottontail's range shrinking by 86 percent since the early 1960s, based on historical rabbit-identification data. The New England cottontail has disappeared from Vermont and is endangered in Maine and New Hampshire. Its range also includes Connecticut, Rhode Island, Massachusetts and New York.

The rabbit's decline has prompted the New England Cottontail Initiative, a recovery effort launched in 2006 that includes the Service, the Department of Agriculture's Natural Resources Conservation Service, state agencies, nongovernmental organizations, tribes and nonprofit land trusts.

Refuges across New England are taking part—primarily by fostering the thick, shrub-like vegetation the rabbits require for food and shelter.

- Since 2005, Rachel Carson National Wildlife Refuge in Maine has been creating two small on-refuge habitats and working with partners on larger landscapes, says refuge biologist Kate O'Brien. Kelly Boland, an

Environmental Defense Fund contractor stationed at the refuge, works full time with landowners and other partners to create rabbit habitat. Boland is helping to manage about 350 acres of private land for the benefit of New England cottontails, O'Brien says.

- At Rhode Island National Wildlife Refuge Complex, biologists began a shrub-land restoration project in 2009 and are working with the town of Charlestown to manage habitat near the refuge, says complex biologist Dorie Stolley.
- The Eastern Massachusetts National Wildlife Refuge Complex began monitoring efforts in 2006. Working with partners, the refuge complex is trapping and tracking both eastern and New England cottontails. "We are hoping to track the rabbits to see if there is a difference in their movement patterns and habitat use during the winter and breeding season," says biologist Eileen McGourty. "If we know the New England cottontails are using a certain habitat, we can work to protect these areas and create similar habitat to support these populations."

Region-wide, much of the more than 1,000 acres identified for rabbit habitat under the New England Cottontail Initiative is private, says Tur. Several hundred acres of private lands, many of which adjoin refuges, are in various stages of restoration, he says.

As part of the effort, a multi-partner, multi-state New England cottontail captive breeding project was started last December. Four females and one male are adapting to captivity at Roger



Several national wildlife refuges are collaborating with partners to support the recovery of the imperiled New England cottontail rabbit. (Dorothy Feske)

Williams Park Zoo in Providence, says Suzanne Paton, a biologist with the Service's Southern New England Coastal Program. The plan is to breed them this spring and release the young onto national wildlife refuges and other protected areas.

Other steps being considered include:

- Relocating eastern cottontails, and thus giving New England cottontails less competition for habitat. Biologists believe the eastern is thriving because of its ability to use a wider variety of habitats and to venture into open spaces, Paton says. Biologists are not certain what impact, if any, the eastern's presence has on the New England cottontail.
- Creating a haven for the New England cottontails, free of easterns and mammalian predators—perhaps at Nomans Land Island National Wildlife Refuge, MA, near Martha's Vineyard. Literature reviews and assessments of vegetation and other island species are underway to determine suitability.



Jennifer Anderson is a regular contributor to Refuge Update.

## President Obama Announces America's Great Outdoors Action Plan — continued from page 1

ways in which the federal government will help empower local communities to accomplish their conservation and recreation priorities.

Last summer, the administration held 51 listening sessions nationwide to gather input from Americans about outdoor places and activities they value most. The sessions, which drew about 10,000 participants and 105,000 written comments, helped shape the action plan.

The plan is designed to result in: accessible parks or green spaces for children; new urban parks and community green spaces; river restorations and recreational “blueways” that power economic revitalization; stronger support for farmers, ranchers and private landowners who help protect rural landscapes and provide access for recreation; reinvestment of revenue from oil and gas extraction into the permanent protection of parks, open spaces, wildlife habitat and access for recreational activities; and a 21st century conservation ethic that builds on local ideas and solutions for environmental stewardship and connects to historic, cultural and natural heritage.

The America's Great Outdoors Initiative is “about practical, common-sense ideas from the American people on how our natural, cultural and historic resources can help us be a more competitive, stronger and healthier nation,” said Secretary of the Interior Ken Salazar. In conjunction with the initiative, in late February Salazar released the *Conserving the Future: Wildlife Refuges and the Next Generation* draft vision

document for public comment.

Recommendations and actions in the America's Great Outdoors action plan include:

- Calling for full funding of the Land and Water Conservation Fund, which directs federal revenue from oil and gas extraction for national, state and local conservation and recreation projects.
- Establishing a 21st century Conservation Service Corps to engage young Americans in public lands and water restoration.
- Extending the tax deduction for conservation easement donations on private lands beyond 2011.
- Establishing an America's Great Outdoors National Recreational Blueways Trails initiative to designate community-scale portions of rivers as recreational destinations that receive special attention for restoration and access.
- Increasing outdoor recreational opportunities and access on public lands, including establishing a Federal Interagency Council on Outdoor Recreation.



*A proud angler displays his catch at Cameron Prairie National Wildlife Refuge in Louisiana. (Steve Hillebrand)*

- Establishing an interagency America's Great Outdoors Council to ensure federal agencies collaborate efficiently on conservation and recreation strategies.
- Launching the Partnership for America's Great Outdoors, a non-governmental body that will focus on forming strategic conservation partnerships across communities, businesses and governments.
- Partnering with communities nationwide to establish and expand urban parks and green spaces and to build on large landscape conservation projects.

The full, 173-page action plan is at: [www.doi.gov/AmericasGreatOutdoors](http://www.doi.gov/AmericasGreatOutdoors).



## Texas Border Refuge Cooperates With DHS — continued from page 3

To compensate for the law waivers, a January 2009 letter of commitment between DHS and DOI states that “CBP agrees to fund up to \$50 million in reasonable mitigation measures to offset the adverse effects” of the barrier along the four-state southern border. The Service and other agencies have identified \$52 million worth of impacts to threatened and endangered species—funding that would go toward meeting

the acreage goals of Lower Rio Grande Valley Refuge.

“We’ve redesigned our land acquisition. We’ve looked at how we prioritize future growth, future management of Lower Rio Grande Valley, based on what we see now. We had to,” says McDowell. “We’ve been a little more specific about where we’d grow along the river based on where the fence is.”

Refuge staff has asked itself, “How can we, and are we going to, meet our mission as a refuge after the fence?” says McDowell. “We think we can for the species we have been entrusted”—as long as no more border barrier beyond what is now proposed is built in Texas.



# Nutria Are Growing Problem in Oregon

By Tess McBride

**P**ete Schmidt, the wildlife biologist at Tualatin River National Wildlife Refuge outside Portland, stands atop a dirt-filled levee as he looks toward the bank, now bare of the thick vegetation that once lined the water's edge.

This site, among others on the refuge, shows the damage that nutria can cause. The population of the non-native, semi-aquatic rodent, which resembles a beaver with a round, rat-like tail and large orange teeth, is growing rapidly in the Pacific Northwest.

The refuge is focusing on short- and long-term approaches to nutria management: trapping and shooting and, more important, educating refuge visitors and the general public on the dangers of the rodent, which can spread an array of diseases and parasites, and the reasons not to feed or house them.

"They drill into the levees that we're standing on here, and they build their dens underneath the levee," Schmidt says. "This area collapsed all the way back about halfway through into the levee." Short-term complications of this type of damage include loss of vegetation from erosion and damage to water control structures. It's also a safety hazard for refuge vehicles.

"It could cause a drowning if a truck rolled over into the ditch," Schmidt says. Long-term damage includes the displacement of native muskrats, which depend on the same vegetation for food. If nutria managed to burrow all the way through the levee, they could severely harm the habitat and food grown for the tens of thousands of migratory waterfowl that return to Tualatin Refuge each winter.

The refuge was established in 1992 to mimic the natural cycle of the Tualatin River Basin floodplain. Every summer, areas are selectively drained; in winter, they are flooded.

"We draw down the wetlands during the summer to promote the growth of annual plants, which feed waterfowl in



*The damage caused by nutria at Tualatin National Wildlife Refuge in Oregon has been extensive. Below, several of the rodents in captivity in Maryland. (USFWS)*

the winter time. If we had a levee breach and it flooded the wetland at the wrong time, it could kill all the plants that we're trying to grow in the summer," Schmidt explains.

The refuge hasn't experienced that catastrophe yet. But a breeding pair of nutria can multiply to 16,000 individuals in just three years.

Oregon is one of 15 states known to have stable or increasing nutria populations. In the early 2000s, Blackwater National Wildlife Refuge in Maryland embarked on a multiyear trapping program in which more than 5,000 nutria were eradicated from the refuge. The rodent, native to South America, was introduced to the United States as early as 1899 for fur farming. When the demand for their fur bottomed out, many nutria were released into the wild. In Oregon, that happened in the late 1930s.

Today, climate change could seriously increase the population of nutria, whose range is limited by cold winter temperatures. Mortality rates, which can climb to 90 percent during unusually cold winters, keep populations in check.

"If the climate begins to warm and we don't have cold winter temperatures



that stop the spread of nutria, they could extend eastward up the Columbia Basin to other areas," says Schmidt.

Schmidt says that the refuge is seeking public input into its Comprehensive Conservation Plan process for dealing with non-native species, including nutria. 

*Tess McBride is a communications intern in the Pacific Region office in Portland.*



# RefugeUpdate

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When Forrest Carpenter retired in 1973 after 36 years of federal government service, he became the founding president of the National Wildlife Refuge Association, the nonprofit organization that supports the Refuge System. “When he realized he could do something that would help refuge managers and the Refuge System that he believed in so strongly,” says his daughter Susan Evans, “he felt he had to do it. He worked harder on that than anything in his life for 13 years.”

He published the NWRA newsletter from his home basement and lobbied for dedicated funding for refuges as well as organic legislation that eventually would become the National Wildlife Refuge System Improvement Act of 1997. The act defines the mission of the Refuge System and guides many of its management practices.

Carpenter was born in 1914 in Oregon, where his father was one of the first employees of the U.S. Forest Service. He began his public service during the Great Depression in the Civilian Conservation Corps and then became



*Forrest Carpenter (1914-2000) was regional refuge supervisor in Minneapolis during the 1950s. (Courtesy of Carpenter family)*

a clerk at Malheur National Wildlife Refuge, OR, before soon transferring to Upper Mississippi River Fish and Wildlife Refuge and later becoming refuge manager at Des Lacs Refuge, ND. Two of his four children were born on that refuge.

From 1958 until his retirement, Carpenter was refuge supervisor in the Mississippi Flyway region. He played a major role in selecting and training a large corps of refuge managers. One of his goals for the NWRA was to provide a voice for these managers. He valued their opinions and wanted them heard. “Refuge managers were constantly in our home,” recalls Evans. “I have many memories of visiting refuges and sitting on the lap of J. Clark Salyer.”

Carpenter was also very aware that refuges required long-term planning. In 1975, he told a Senate subcommittee that, “by its very nature, the Refuge System cannot be managed on the basis of short-term, ever-changing priorities. Wildlife responses to habitat changes take years, even decades, to reach the desired status ... The National Wildlife Refuge System must plan and work for the needs of generations not yet born. It often takes many years to fulfill these needs once they are identified.” 

Follow the National Wildlife Refuge System on Facebook at [www.facebook.com/usfwsrefuges](http://www.facebook.com/usfwsrefuges) and [Twitter@USFWSRefuges](https://twitter.com/USFWSRefuges).

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