



RefugeUpdate

National Wildlife Refuge System

www.fws.gov/refuges



INSIDE: How sinkholes at Bitter Lake National Wildlife Refuge in New Mexico respond to current drought conditions could shed light on the hydrology, geology and biology of the world-renowned Roswell Artesian Aquifer. This sinkhole, the largest on the refuge, is called Lake St. Francis. Story on page 9. (Bill O'Brian/USFWS)

Conserving the Future Implementation: Taking the First Steps

In 24 recommendations, the *Conserving the Future* vision lays out a big picture of conservation for the National Wildlife Refuge System and for all who seek to protect America's wildlife at a time of tight budgets and growing population.

Since it began taking shape two years ago, the *Conserving the Future* vision has been a collaboration of public and private viewpoints. The Refuge System considered more than 10,000 comments and more than 240 bold ideas. More than 2,300 people joined the social network at *AmericasWildlife.org* to be part of the process. Their comments and that network are still available on the Web site, as is video from the July 2011 *Conserving the Future* conference.

The vision, which will guide the Refuge System for the next decade, has several key themes: the need for strategic, science-based landscape conservation; the need for effective public outreach and education to enhance environmental awareness; the need to assemble a U.S. Fish and Wildlife Service workforce that more closely resembles the nation's diversity; and the need to reach urban America as never before.

So, how does the Refuge System make the vision a reality? How does it ensure that most of the recommendations will be at least partly enacted in the next five years?

continued on pg 10

Kurth Named Chief; Martinez Selected as Deputy

The new year begins with a new team at the top of the National Wildlife Refuge System and all leadership eyes trained on the *Conserving the Future* implementation.

In late October, U.S. Fish and Wildlife Service Director Dan Ashe announced the selection of Jim Kurth as chief of the Refuge System. Soon thereafter, Kurth selected Cynthia Martinez as deputy chief.

Kurth assumed his new post immediately; Martinez is scheduled to begin her new duties in late January.

Kurth, a 32-year veteran of the Refuge System, had been its deputy chief since 1999. He succeeds Greg Siekaniec in the Refuge System's top management position. Siekaniec, who served as chief from 2009 until July

continued on pg 23

From the Director

Let's Make Vision a Reality

Renowned Harvard Business School professor Rosabeth Kanter once defined a vision as “not just a picture of what could be; it is an appeal to our better selves, a call to become something more.”



Dan Ashe

That's why I'm so proud of the *Conserving the Future* document, which Secretary Ken Salazar and I signed in October 2011 at Pelican Island National Wildlife Refuge. The U.S. Fish and Wildlife

Service employees, Friends and partners who worked on this document outlined a comprehensive vision for a National Wildlife Refuge System that is relevant to the American people, science-driven and working at a landscape scale to produce biological outcomes.

This vision is truly a call to action for all of us who care about the future of the Refuge System, while also setting the standard for the Service as a whole. Like the Refuge System, we must work across programs and regions to increase our relevancy to the public, our commitment to science and our efforts to deliver partnership-driven conservation at a landscape scale.

I'm incredibly pleased that Jim Kurth will be leading the effort to make the vision a reality. As the new chief of the Refuge System, Jim brings a wealth of experience, leadership and unbridled passion to this process.

The vision calls on us to prioritize future land acquisition and protection efforts, linking them to rigorous biological planning and conservation objectives developed in cooperation with state fish and wildlife agencies and implemented through effective partnerships.

continued on pg 22

Chief's Corner

Add Your Mark to Refuge History

As the new chief of the National Wildlife Refuge System, I have the best job I ever hoped for and during one of the best times in the history of the Refuge System. I have worked in the conservation profession for more than 30 years, and I can't think of a more exciting time—even though we may face some tough financial challenges.

Why my optimism?

Because, as we implement the *Conserving the Future* vision over the next few years, we have the chance to advance not only the Refuge System but also the larger conservation community. The U.S. Fish and Wildlife Service sees the vision process as the kind of strategic thinking that should be taking place across government if we are to stimulate conservation beyond our boundaries.



Jim Kurth

The next few years are the Refuge System's time to shine. We have extraordinary support from top leadership—starting with Interior Secretary Ken Salazar, who sees national wildlife

refuges as integral to his vision for landscape conservation. Service Director Dan Ashe, whose father worked in the Service for decades and proudly “saved dirt” that we now manage, has roots in the Refuge System, having led as chief from 1998-2003. The *Conserving the Future* vision articulates their passion for wild places.

continued on pg 23

Refuge Update

Ken Salazar
Secretary
Department of the
Interior

Dan Ashe
Director
U.S. Fish and Wildlife
Service

Jim Kurth
Chief
National Wildlife
Refuge System

Martha Nudel
Editor in Chief

Bill O'Brian
Managing Editor

Address editorial
inquiries to:
Refuge Update
USFWS-NWRS
4401 North Fairfax Dr.,
Room 634C
Arlington, VA
22203-1610
Phone: 703-358-1858
Fax: 703-358-2517
E-mail:
RefugeUpdate@fws.gov

This newsletter is
published on recycled
paper using soy-based
ink.



Inside

Refuge of the Future

The recently authorized urban wildlife refuge near Albuquerque, NM, “isn't your grandfather's refuge; it's your grandchildren's.” Page 5

A Drought of Epic Proportions

Refuges from Kansas to the Texas coast have not been this dry in ages. Page 6

A Herpetologist's Paradise

St. Vincent National Wildlife Refuge on the Florida panhandle's Gulf Coast is a snake-lover's dream. Page 7

FOCUS: Implementing the Vision

The Conserving the Future vision has been laid out. The implementation teams have been formed. Now, it's time to get to work. Pages 10-19

The Face and Voice of Dahomey Refuge

By Alison Howard

Heavy equipment operator Don Roby is responsible for almost every inch of infrastructure at Dahomey National Wildlife Refuge in northwestern Mississippi. Among his many duties, he keeps 16 miles of gravel road open and graded. He mows and trims back limbs along the two-mile nature trail. He maintains the 300-foot boardwalk with its observation tower, as well as the fishing pier at the lake and the levee that protects the seasonal wetlands. He makes sure the boundaries of the 9,691-acre refuge remain clearly posted.

In that way, Roby is much like the roughly 650 other wage-grade employees around the Refuge System.

Here's what else he does. He goes to Friends' meetings to hear and make suggestions. He weeds and waters the Friends' flower garden and helps with the Christmas Bird Count, dishing out chili and conversation afterward. He distributes backpacks, binoculars and pamphlets to kids who come on refuge field trips, and he prepares tidy trailers for interns who stay longer. He issues hunting licenses and makes sure everyone knows the rules.

Multi-tasking, too, is the norm among Refuge System employees, most of whom wear several hats. "Because we're so short-handed," says Stephen Gard, project leader for the North Mississippi National Wildlife Refuges Complex, which includes Dahomey Refuge, "we tend to use everybody for everything." And it's not unusual for a heavy equipment operator—often the first person a visitor sees, says national heavy equipment coordinator John Blich—to interact with visitors.

What sets Roby apart, according to his colleagues, is the grace and gusto with which he does it all—often by himself. His supervisor, Eva Kristofik, who manages Dahomey and two other refuges, is stationed miles away. Although she communicates with him daily and gets there weekly, Roby is, she and Gard agree, the face and voice of Dahomey Refuge.



Don Roby, right, mans the Dahomey National Wildlife Refuge table at a hummingbird festival in Mississippi. Officially, Roby is a wage-grade heavy equipment operator at the refuge. Unofficially, he's much more than that. (USFWS)

"He's really good with people," Kristofik says. "Visitors love him. Our Friends group—they love him. Heck, some refuges aren't staffed at all, so when you have only one person there, it's great that the public feels that way."

"One person" is *officially* correct, but Roby has a secret weapon. Often, his wife, Arlean, a volunteer, makes the 65-mile drive to the refuge with him from Holcomb, MS, where he built their house next to the one he was born in 52 years ago. Arlean Roby cleans the office, answers the phone, mows the lawn, picks up litter, sets up exhibits. When Roby has to clear a tree from the road with a chainsaw, she carries the logs away. Roby describes his wife the way everybody else describes him: "Whatever needs to be done, she does it."

Often, the Robys pick up their neighbors, Donald and Virginia Pryor, both in their 80s and members of the Friends group, who pitch in with Arlean. That kind of outreach on Roby's part "is unique and very cool," Blich says.

Roby sometimes starts work with a quick e-mail to Kristofik: "Good morning.

Today is going to be a good day." His shift begins at 8 a.m., but Roby—who also attends night school "to keep up with the kids on this computer stuff" and just retired from the National Guard after 25 years—likes to arrive an hour early "just to meet people. Visitors want to talk, and they appreciate me relating to them in a friendly way," he says. "Your attitude, your love—they go a long way up the ladder."

As he discusses his 14 years at Dahomey Refuge, he's in the office drinking coffee with an 86-year-old hunter who's "glad to see me, and I like that. If something happens, the hunters know I'm on the refuge somewhere." That part of his job—chatting, helping, just being there—is as important to him as keeping Dahomey accessible and looking spruce.

"I want this refuge to stand out," Roby says. 🦋

Alison Howard is a Virginia-based freelance writer and editor.

Making the Climate Change Connection for Teens

By Karen Leggett

It doesn't matter where you stand on climate change, "it's just that you recognize it's there and everything around you could be changing. You need to see what's there before it's gone," said then-high school senior Maggie Forslund, who joined her classmates at Tualatin River National Wildlife Refuge in Oregon to document what they saw and felt on one day last spring.

Using a \$1,000 Connecting People with Nature grant, Stephen Flinn, a new media outreach specialist in the U.S. Fish and Wildlife Service's Pacific Region, coordinated the project between the refuge and the Beaverton Arts and Communication Magnet Academy, a suburban Portland grade 6-12 public school.

"It gave students an opportunity to appreciate the pristine natural environment of the refuge that was close to where they live," said Flinn, who also engaged My Story, a local nonprofit that helps young people explore their lives through the lens of a camera.

The project began with a classroom lesson about climate change as it affects the Pacific Northwest. During that classroom visit, about a week before the field trip to the refuge, Flinn discussed nature photography with the students and conducted poetry, writing and drawing activities to bring out the students' feelings about climate change.

What We Need to Save

In a YouTube video of the project, then-10th-grader Hanna Petrillo said: "I feel like it's going to get to the point where it's going to be too late." And fellow student Tariq Mitri added: "Not only does it affect wildlife and animals, it also affects us ... I'll put together a project that just takes into account the natural beauty here and hopefully just expresses what we have and what we need to save."

Tess McBride, a Portland State University graduate student who volunteered to help the students, noticed that "they are clearly in touch with



Students at Beaverton Arts and Communication Magnet Academy in suburban Portland, OR, created diptychs by combining images from the metropolitan area with pictures taken at Tualatin River National Wildlife Refuge. (Kayla Gilmore)

their feelings regarding the reality of climate change ... This is an opportunity for them to immerse themselves in a preserved piece of land."

Students in both digital photo and book arts classes spent a day at Tualatin River Refuge, about 15 miles from downtown Portland. They were encouraged by My Story's Christine Cernal to "think about the emotional impact of being on the refuge. Tap into your heart. Experiment with that."

Photography students produced images of silhouetted trees, fungus, tree stumps, the skyline, boggy marshes. Book arts students then used the images to create two- and three-dimensional objects, such as a diptychs—different images placed side by side to form a single piece of art. Images from the refuge were often paired with images of the adjacent city to express thoughts of change, death and rebirth.

Young people "don't come at this with the same sense of impossibility as an adult," said Cernal. "They are infused with a sense of hope and they're wonderful problem-solvers, and so we can learn a lot from looking at their work that's created in response to this ... because they often

see things that we don't see and might miss." The images were published in a local magazine, drawing the attention of a large new audience.

The book arts projects were displayed at the regional office and Tualatin River Refuge. They are now on display at the National Conservation Training Center in Shepherdstown, WV. The exhibit is available for display at other Service sites by contacting David Patte, climate change coordinator in the Pacific Region.

Patte, who encourages refuges to reach out to science and art teachers, said the Beaverton teachers were especially open to having partners explore science in a way that brings students out of the classroom. Gail Heymann, a Beaverton teacher, said, "I think education is more meaningful if connections are made across subject areas. The information registers and it has its way of coming up at the least expected times with teenagers!"

To watch the YouTube video, go to <http://bit.ly/nSQ6Q1>. 

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

“This Isn’t Your Grandfather’s Refuge; It’s Your Grandchildren’s”

By Bill O'Brian

On a crisp November day, as Tom Harvey, Paul Tashjian and Andrew Hautzinger are enthusiastically explaining their vision for America’s most recently authorized national wildlife refuge, two dozen wintering sandhill cranes are foraging in a New Mexico field that once was Price’s Dairy Farm.

Harvey, the U.S. Fish and Wildlife Service Southwest Region refuge supervisor for New Mexico and Arizona, Tashjian, a regional hydrologist, and Hautzinger, the regional America’s Great Outdoors coordinator, have big plans for the 570-acre flatland that hugs a fish and wildlife habitat-rich stretch of the Rio Grande 3.5 miles outside the Albuquerque city limit in the industrial South Valley.

It is the largest remaining tract of undeveloped farmland in the metro area, and “it’s a key piece of historic flood plain land associated with the middle Rio Grande that has excellent restoration potential,” says Harvey. “We know historically what types of habitat it supported. We know we can re-create those easily on the site given the soils, the hydrology and the infrastructure.”

Once the refuge is formally established, Harvey says, the idea is to mimic the Rio Grande’s meandering past by restoring cottonwood-rich riparian bosque habitat, other native plant communities and wetlands for neotropical migratory birds, songbirds and raptors. The wetlands will be small because, in deference to the city’s airport, the goal is *not* to attract more high-flying cranes.

A goal *is* to attract people, to provide “a valuable showcase for the public as they come on the property to see those restoration activities, participate in them and witness the evolution of the property as those things are restored,” Harvey says. “There’s a saying in the region: *This isn’t your grandfather’s refuge; it’s your grandchildren’s.*”

Those grandchildren—in the immediate vicinity—are largely Hispanic, Pueblo



Sandhill cranes forage on former farmland along the Rio Grande near Albuquerque. The land was authorized last September by Interior Secretary Ken Salazar to become an urban national wildlife refuge. (Bill O'Brian/USFWS)

Indian and poor. “This wildlife refuge has become our anchor,” says Mountain View Neighborhood Association member Angela West. “As a single mother myself, when I look at this, I see mothers who can now bring their kids down here and share this with them whether they have a car that can make it 50 miles south [to Sevilleta Refuge] or not.”

“**Ribbon Along the River**”

The unit’s working name is Middle Rio Grande National Wildlife Refuge, but Tashjian says the Service might seek public help in determining a permanent name, perhaps one that honors Hispanic or Pueblo culture.

Whatever its eventual name, the urban refuge will have strong environmental education and community outreach components. “It’s up to us to meld that vision, put it out there and bring along as many different supporters and advocates for the refuge as we can while still staying true to our mission,” says Harvey.

“I think this has the potential for really being part of Albuquerque’s identity. There’s this real amazing core that the refuge will become part of,” says Tashjian, referring to a conservation-oriented “ribbon along the river” that includes Rio Grande Valley State Park, Paseo del Bosque Trail, the National Hispanic Cultural Center, the Albuquerque BioPark and the Rio Grande Nature Center.

But first the land must be acquired. Its estimated price, with significant senior water rights, is \$15 million to \$20 million, pending formal appraisal. Bernalillo County has committed \$5 million. Harvey believes that other non-Service partners—including the local flood control authority, the state of New Mexico, the Trust for Public Land, the Natural Resource Conservation Service, Ducks Unlimited and the Bureau of Reclamation—collectively could chip in as much as \$8 million toward a phased-in purchase over the next two or three years.

Once the land is in hand, Hautzinger envisions the refuge as a gateway to New Mexico’s seven other wildlife refuges and the entire Refuge System.

He points out that a nearby light-rail station is connected to Albuquerque International Sunport (airport) by shuttle bus and to tourist-rich Santa Fe by train. He notes that 60 percent of New Mexico’s population is within easy distance of the refuge—including more than 100,000 elementary and secondary students.

With numbers like those, it’s no wonder neighborhood resident Angela West says, “This is personal, and it will be measured in human terms as well as ecological in the long run.” 🦅



Big Salt Marsh at Quivira National Wildlife Refuge in Kansas in September 2010, left, and in August 2011, right. While severe drought is difficult, it does oxygenate soil and allow refuge staff members a chance to eradicate invasive plants and fish. (Left photo by Dan Severson/USFWS; right by Barry Jones/USFWS)

In Kansas and Texas, a Drought of Epic Proportions

By Jennifer Anderson

“The old-timers,” says Dan Severson, “they can’t remember a drier summer.”

Severson, the manager at Quivira National Wildlife Refuge in Kansas, calls the drought gripping the south-central United States “the worst in modern memory.”

Forget memory, says Dan Alonso, manager at Aransas National Wildlife Refuge in Texas. It’s been 223 years since the region has been this dry—and that’s from Columbia University researchers who used dendrology (the botanical study of trees) to date the most recent drought of this magnitude to 1789.

There’s no end in sight, either. Meteorologists predict the region—extending from southeastern Colorado and eastern New Mexico across southern Kansas and through Texas to the Gulf of Mexico—will remain dry through this summer.

The dryness is impacting the southern portion of the Central Flyway, the winter grounds for millions of migrating birds, ducks and cranes—including the

whooping crane, the tallest and rarest bird in North America. “All our fresh water holes are entirely dry,” Alonso says of Aransas Refuge, the December-to-March home to the continent’s only natural flock of whooping cranes.

At Quivira Refuge, Severson says, the drought started in September 2010, when the refuge received half an inch of rain in a month that typically has more than two inches. Rainfall in June 2011 was three-quarters of an inch, down from the usual four inches. July was no better, and weeks of 100-degree days set in, causing rapid evaporation. The deficit has not been made up since.

Severson estimates 100 acres of wetlands are left at Quivira Refuge, where 7,000 acres normally are underwater. The 3,500-acre Big Salt Marsh, usually thigh-deep in water, was dry in December 2011 except for a few puddles and Rattlesnake Creek barely trickling in.

While droughts are difficult, they are part of the natural cycle, Severson says. He estimates major droughts hit the region every 20 years or so and less extreme dry periods come every seven to 10 years.

The dehydration has advantages for marshes, he says. It allows for more oxygen to reach the soils, which is essential for the decomposition and regeneration of food sources for invertebrates and animals on up the food chain.

Drought also gives refuge staff members a chance to eradicate invasive plants as well as carp and other invasive fish. Those fish eat vegetation that other animals rely on and muddy the waters, preventing sunlight from reaching the plants at the marsh bottom.

That said, once a drought is over, full wetlands are a great relief—to birds, plants and refuge staff alike.

Severson is concerned about the drought’s severity, but he knows there is nothing anyone can do. He attributes it to La Niña, a phenomenon that cools the surface waters of the Pacific Ocean. When La Niña strikes, the central United States is dry. La Niña usually occurs every two to seven years and persists for about a year. But this one is predicted to continue through 2012.

continued on pg 22

St. Vincent Refuge: A Herpetologist's Paradise

By Joseph T. Collins

Since my first visit to St. Vincent National Wildlife Refuge in 1998, I have been smitten. To me, a man born in northern climes with an obsessive interest in amphibians, reptiles, turtles and crocodylians, St. Vincent Refuge on the Florida panhandle's Gulf Coast is a fantasy fulfilled. It is a place for my kind of wildlife to live in its natural environment, largely undisturbed.

For 14 of the past 15 years, I have visited the barrier island refuge to conduct herpetofaunal surveys under the auspices of the U.S. Fish and Wildlife Service. My colleagues—including my wife, photographer Suzanne L. Collins—and I have amassed data on the diversity, distribution, abundance and microhabitat preferences of amphibians, reptiles, turtles and crocodylians on St. Vincent Refuge, which is accessible only by boat.

We have found that most snake species are active in winter, despite cool temperatures. We have determined that pygmy rattlesnakes are so pervasive that we must watch our step for fear of crushing them. Our main objective, though, has been to determine if the endangered eastern indigo snake is present. The species had never been recorded on the island refuge, but the Service released a large number of them there in the 1980s as part of a patriation effort. Since 1998, we haven't found any of them, and, as long as a decade ago, we reported that the patriation had failed. But we remain ever vigilant for eastern indigos, in case we were wrong.

My most memorable moment at St. Vincent Refuge occurred in January 2002, when I was searching for eastern diamondback rattlesnakes. The eastern diamondback, a denizen of deep palmetto thickets and gopher tortoise burrows, is the refuge's largest snake. It can grow up to eight feet long and weigh up to 10 pounds. Yet, it is extremely difficult to detect unless it rattles, something it does only when you are much too close to it.




The eastern diamondback rattlesnake is the largest snake found on St. Vincent National Wildlife Refuge in Florida. (Suzanne L. Collins/Center for North American Herpetology)

On that warm January day, I spied a large, hollow log. Guessing it might contain a diamondback (or a cottonmouth), I crouched down and quietly approached it. I looked in, using the sunlight off a small mirror. Nobody was home. I stood up. Behind me, not more than three feet away, a five-foot eastern diamondback began to rattle. Apparently, my low-level approach had not alarmed it, but, when I stood up, it became agitated, apparently thinking I looked like something out of Jurassic Park. I bagged the snake and took it back to the boat ramp at Indian Pass, where I was scheduled to give a presentation to two dozen wildlife enthusiasts.

With the visitors seated on benches on an open trailer hooked up to a truck ready for a tour of the refuge, I explained the importance of herpetofauna to the island. When I took out a beautiful scarlet snake that my colleagues and I had found earlier, the visitors were awed by its orange-black-and-cream colors and pattern.

After they got back onto the trailer, I emptied the eastern diamondback rattlesnake out of the bag and let it

stretch out on the ground. First, there was silence. Then, the snake rattled. This brought a sharp intake of breath from many visitors. Soon, most were excitedly taking photographs, albeit from the elevated safety of the trailer. Afterward, the tour guide who showed them the island told me it was his fastest tour ever—because *nobody* got off the trailer.

Our work on the island has convinced my colleagues and me that St. Vincent Refuge is one of the most valuable jewels in the National Wildlife Refuge System. It provides the kind of isolation that ensures the long-term well-being of its flora and fauna. And that isolation permits the kind of long-term biological research so sorely needed to provide current information for use in wildlife management programs across the southeastern United States. 

Joseph T. Collins is director of the Center for North American Herpetology. He, with Suzanne L. Collins and Travis W. Taggart, is co-author of "A Pocket Guide to Snakes of St. Vincent National Wildlife Refuge—Florida," published in 2011 by Mennonite Press.

A Great Lakes Restoration First at Shiawassee Refuge

By Steve Griffin

Progress in central Michigan once meant wrestling farmable land from the 40,000-acre wetlands expanse known as the Shiawassee Flats. Today, progress means turning some agricultural lands back into wetlands.

That's the basis of a project dedicated last fall at Shiawassee National Wildlife Refuge, on the edge of Saginaw, MI. The wetland restoration project is the first completed under President Obama's Great Lakes Restoration Initiative, according to U.S. Fish and Wildlife Service Midwest Regional Director Tom Melius.

Eleven federal agencies are involved in the initiative, a five-year plan to return Great Lakes ecosystems to health. The initiative's objectives are: cleaning up toxins and areas of concern; combating invasive species; promoting near-shore health through protection of watersheds from polluted runoff; wetland and habitat restoration; and outreach and education.

The Shiawassee Refuge project, which began in 2010, involved breaking the underground tiles installed long ago to drain the land and make it suitable for farming.

Now, low earthen berms will help keep moisture within the area. Water control structures—floodgates and pumps—will let the refuge add or remove water, as needed.

Nature will do the rest. Ducks Unlimited biologist Russ Terry said wetland plant seeds can remain in soils for up to 100 years, awaiting only sufficient moisture and other environmental conditions to awaken them from their dormancy. Soon, he said, smartweed, wild millet, foxtail and other wild foods will be growing, and wildlife is sure to notice.

"You name it," Terry said of waterbirds, including dunlin, lesser yellowlegs and least sandpiper green-winged teal and northern shovelers, "and they'll be here."

Shiawassee Refuge manager Steve Kahl said the restored 141-acre former Flint



This 141-acre restored wetland in the Flint River floodplain at Shiawassee National Wildlife Refuge had been farmed, most recently for corn and soybeans, for at least 75 years. Wild millet, smartweed, foxtail grass and other wild foods are expected to flourish in coming years. (Steve Kahl/USFWS)

River floodplain had been farmed, most recently for corn and soybeans, for at least 75 years.


Normally, planting is not necessary in a restoration. But, Kahl said, his staff planted some wild millet, smartgrass and even leftover sunflower seeds in his first year, 2005, to anchor the soil and keep invasive alien plants from stepping into the void.

Globally Important

During peak times in late October, as many as 40,000 ducks and 25,000 Canada geese may visit the 9,620-acre Shiawassee Refuge, which is 100 miles northwest of Detroit. The refuge was established in 1953 to provide habitat for migratory waterfowl and since has been designated a Globally Important Bird Area and a Western Hemisphere Shorebird Reserve Network site. More than 280 species of birds have been documented at the refuge, including raptors, shore and wading birds, and more than 100 songbird species. It is also one of six focus areas designated by the Great Lakes/St. Lawrence Basin Joint Venture of the North American Waterfowl Management Plan.

Ducks, geese and songbirds have already flocked to the restored wetlands, Kahl said.

The field will be flooded each fall to the 6- to 18-inch depth waterfowl like best. It will remain inundated through spring migration time, when the water will be removed so that wetland plants—which sprout only in dewatered soil—will propagate again.

Ducks Unlimited, through its Ann Arbor, MI, regional office, coordinated the Shiawassee Refuge project, managing topographic surveys, engineering design, bidding, contracting and consultation. Terry said the project cost was "a little under \$100,000." In addition to Ducks Unlimited and the refuge, the Saginaw Bay Watershed Initiative Network, the Environmental Protection Agency and the Upper Mississippi River & Great Lakes Region Joint Venture were partners in the restoration. 

Steve Griffin is a freelance writer. A version of this article originally appeared in the Midland (MI) Daily News on October 22, 2011.

Bitter Lake Refuge Sinkholes Offer Glimpse Into Aquifer

By Bill O'Brian

Bitter Lake National Wildlife Refuge has one of the most unusual—and breathtakingly gorgeous—geological features in the National Wildlife Refuge System: water-filled sinkholes in a desert-like landscape.

Monitoring the sinkholes' behavior as they respond to current drought conditions could shed light on the hydrology, geology and biology of the world-renowned Roswell Artesian Aquifer. The aquifer is what makes 24,536-acre Bitter Lake Refuge a hyper-diverse oasis in southeastern New Mexico.

The sinkholes form after rainfall between the refuge and the Sacramento Mountains (60 miles west) seeps slowly into the underground aquifer. Over time, hydrostatic pressure and minerals in the aquifer's hard water combine to percolate into the gypsum/limestone-laden rock above it, basically dissolving the earth's surface from beneath until it collapses in.

The result is sinkholes punctuating the landscape. To make a climatically and geologically incorrect analogy, imagine that the earth's surface is a frozen lake, the aquifer is the water below, and the sinkholes are naturally formed ice-fishing holes.

The sinkholes at Bitter Lake Refuge are 15 to 230 feet wide. They are 50 to 70 feet deep. The salinity, pH and temperature of their cold water vary. New ones form regularly; some are believed to be 5,000 years old. There are about 70 sinkholes at the refuge.

One of the most impressive is Inkpot Sinkhole in the 9,200-acre wilderness area. Refuge manager Floyd Truetken says that, standing next to Inkpot recently, he "couldn't help but wonder, 'Did native tribes stand here as we are doing and look at this with wonder? Was there a religious or ceremonial aspect for them?' I am just in awe of their formation. It's not common to see large numbers of sinkholes with water in them out in the middle of a prairie"—a desert, really.



Inkpot Sinkhole is one of the most remote and most impressive of the dozens of sinkholes at Bitter Lake National Wildlife Refuge in southeastern New Mexico. (Bill O'Brian/USFWS)

Beauty aside, the sinkholes and hundreds of spring vents from the aquifer are the refuge's life blood. They are one reason Bitter Lake Refuge and nearby Bottomless Lakes State Park together were recognized last year as International Wetlands of Importance under the Ramsar Convention. They are a reason the refuge is host to rare invertebrate and fish species, including the endangered Roswell springsnail, Koster's springsnail, Noel's amphipod, Pecos assiminea and Pecos gambusia.

All told, 28 fish species, 360 bird species, 57 mammal species, 50 amphibian and reptile species, and more than 100 varieties of dragonflies and damselflies have been documented on or near the refuge.

Last year, extreme drought shrank habitat for migratory birds on refuge marshes, stunted vegetation growth and appears to have, indirectly, affected the sinkholes because of increased agricultural irrigation demand. "The water level in those sinkholes is an indicator of the aquifer level. It rises and falls according to the pressure," says Truetken. "During the summer

irrigation season, the farmers are pumping water and the aquifer naturally drops, and there's a corresponding drop in the sinkholes."

Because some sinkholes have dropped to abnormally low water levels, the refuge is keeping an eye on them.

"There is a direct correlation between aquifer levels and sinkhole levels," says U.S. Fish and Wildlife Service Southwest Region hydrologist Paul Tashjian. "What we don't know is how low it can go and still supply viable habitat. We're monitoring spring vents, spring runs and sinkhole levels and relating these to the aquifer levels."

What hydrologists do know is that rainfall takes, on average, 30 to 50 years to travel through the rocks and exit from refuge sinkholes or spring vents. How quickly the aquifer recovers from this drought—as evidenced by sinkhole level—may tell hydrologists a lot about the aquifer's characteristics.

What happens to micro-wildlife during and after drought recovery may


continued on pg 22

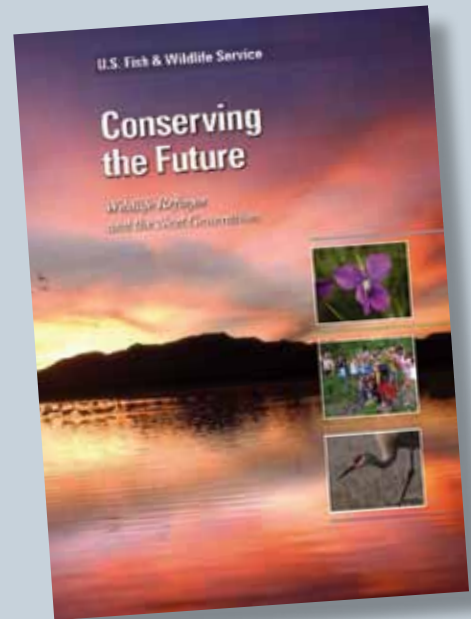
Focus... Implementing the Vision

Conserving the Future

Last year, hundreds of U.S. Fish and Wildlife Service employees and partners worked to forge the *Conserving the Future: Wildlife Refuges and the Next Generation* vision. This year, we collectively will begin to implement that vision for the National Wildlife Refuge System.

In 2012, *Refuge Update* will present a series of Focus sections devoted to the implementation. The sections will emphasize and parallel the realms of various *Conserving the Future* vision implementation teams.

This Focus section, the first in that series, includes articles by members of the first three implementation teams mandated by Service Director Dan Ashe; a listing of the members of the six other more recently formed teams; the vision's 24 recommendations; a Q&A interview with new deputy chief Cynthia Martinez; and more. 



Conserving the Future Implementation: Taking the First Steps — continued from page 1

The answer is: through more planning, consulting with stakeholders and persistence.

It starts with the Executive Implementation Council, led by Refuge System Chief Jim Kurth and supported by top Refuge System management, including the refuge chiefs from each of the Service's eight regions. The council was to complete a general implementation plan by January 20. That plan was to include a requirement for quarterly progress reports from the nine implementation teams responsible for translating broad goals into specifics.

Nine Teams' Deadlines Vary

The implementation teams will develop policies and strategies needed to achieve the recommendations. The teams are: Strategic Growth; Planning; Urban Wildlife Refuge Initiative; Leadership Development Council; Scientific Excellence; Community Partnerships; Communications; Interpretation and Environmental Education; and Hunting, Fishing and Outdoor Recreation.


While deadlines vary somewhat, most teams need to complete their draft recommendations by June and their implementation strategies by April 2013. Each team consists of about a dozen Service employees and will be reaching out to other employees, Friends organizations, partners and subject matter experts.

The Urban Wildlife Refuge Initiative implementation team, for example, must bring its specific recommendations to the Executive Implementation Council by June and must by December complete its strategies for developing an urban presence in communities that may have no refuge land base.

The Strategic Growth implementation team must complete its growth blueprint by the end of fiscal year 2012. And the Planning implementation team must complete its assessment of comprehensive conservation plans and habitat management plans by July to identify best practices gleaned from the past 15 years of refuge planning.

Refuge Update will cover the progress of implementation. The newsletter's Focus sections in 2012 will parallel the realms of various implementation teams. There will be plenty of news online, too—on the Refuge System Web site and AmericasWildlife.org.

Thousands of hard copies of the 93-page *Conserving the Future* publication have been distributed to regional offices, field stations, government officials and partners. Even as the implementation teams work, Service employees and supporters are encouraged to read the publication and ask: Which vision goals reflect *your* personal values? What actions can *you* take to make these goals a reality?

One take-home message of *Conserving the Future* already is clear: A host of individual actions toward a common goal can produce extraordinary change. 



Trumpeter swans and cygnets at Kenai National Wildlife Refuge in Alaska. (Steve Hillebrand)

Leadership Development Council

Four Recommendations and One Important Charge

By Mark Musaus and Rebekah Martin

Quoting author John Maxwell, “Everything rises and falls on leadership ... leadership makes the difference.”

Throughout the National Wildlife Refuge System’s rich history, we have hundreds of examples of how leadership at all levels—from wage-grade to refuge manager to field, regional and Washington offices—has made a huge difference in the growth and vitality of the Refuge System.

Fulfilling the Promise stated in 1999 that “doing the right things in an environment of constant change will be the hallmark of leadership for the System in the next century.” Now *Conserving the Future* is calling us all to address that change by focusing on our people and our organization through the lens of effective leadership.


The Leadership Development Council’s authorizing charter directs it to “transition the National Wildlife Refuge System into a more diverse, streamlined, efficient organization that promotes leadership in all positions” by implementing *Conserving the Future* recommendations 21 through 24.

Those four recommendations cover a broad array of topics, including considering organizational realignments and programmatic efficiencies; recruiting and retaining a workforce reflecting the diversity of contemporary America; seeking innovative ways to reinvigorate the Refuge System’s commitment to leadership development; and developing and mentoring U.S. Fish and Wildlife Service employees in the Refuge System to equip them for leadership responsibilities. That is no small charge.

Council members have a wide variety of refuge and leadership experience covering all eight regions and representing several Service programs. Many have worked for other federal and state agencies.

On our first conference call in early December 2011, we grappled with the charter, its scope and deliverables. Realizing there is a wealth of existing information from both the *Conserving the Future* process and *Fulfilling the Promise*, plus many leadership-related reports produced for the Refuge System, the team members’ first order of business was to read and mine that information. We are using that information to help better frame where we want to focus in responding to the recommendations. A

series of conference calls and a week-long workshop-type gathering in early 2012 are helping us brainstorm specific objectives and strategies for achieving each recommendation and charting a course forward.

Some of our strategies for implementing the four recommendations may include asking outside experts to review and evaluate the ways that we do business. In other cases, we will establish sub-teams of additional employees and partners to continue developing strategies, timelines and products. Either way, the council members have committed to delving into the literature, studying timeless principles of effective leadership and looking at the examples of incredible leaders working alongside us each day to build our knowledge and ability for leading conservation into the future. 

Mark Musaus, Southeast Region deputy regional director, is co-chair of the Leadership Development Council. Rebekah Martin, deputy refuge manager at Eastern Virginia Rivers National Wildlife Refuge Complex, is a member of the council. The council is one of the nine Conserving the Future implementation teams.

Focus... Implementing the Vision

Urban Wildlife Refuge Initiative Team

An Opportunity to Forge Natural Connections

By Tom Worthington and Scott Kahan

An urban refuge? No thanks! That's what the U.S. Fish and Wildlife Service told a group of citizens in the 1970s when they asked the Service to help stop impending habitat destruction on the fringe of the Twin Cities by establishing a national wildlife refuge along the Minnesota River floodplain.

It took Congressional action (and insistent activists) to get Minnesota Valley National Wildlife Refuge established in 1976. Similar narratives had played out on both coasts, where citizen efforts led to the establishment of Don Edwards San Francisco Bay Refuge (1974) and John Heinz Refuge at Tinicum in Philadelphia (1972).

We in the Refuge System know that connecting with people is vital to our efforts to "save dirt" and provide for the fish and wildlife we care deeply about. But we have struggled to understand the role urban refuges might play in forging these connections.

The first urban refuges were viewed by some in the Service as curiosities, a natural result of 1970s environmental activism. Others saw them as money sinks, diverting staff and funds from the serious work of wildlife conservation.

Over the past two years, as the Service renewed its vision for the Refuge System and studied how refuges can remain relevant to America, a close examination of the future of urban refuges has been essential. *Conserving the Future* recognizes that the nation is changing and that our conservation efforts must evolve. More than 80 percent of Americans live in urban/suburban communities, and the Service values the role urban refuges play because of their innovative education programs, their robust volunteer and Friends programs, and even their



Young visitors watch birds at John Heinz National Wildlife Refuge at Tinicum in Philadelphia. (LaVonda Walton/USFWS)


wildlife conservation achievements. There are now 17 refuges within 20 miles of America's 50 most populous urban areas.

Defining Objectives

In recognition of this issue's importance, the Urban Wildlife Refuge Initiative implementation team was established immediately after last summer's *Conserving the Future* conference. The team is charged primarily with:

- Defining the Service's objectives in managing urban refuges: What are the elements of an excellent urban refuge? Where do we fall short of success? How can we do better?
- Establishing an urban refuge initiative that relies on cooperation and coordination rather than land acquisition. By building partnerships with existing parks, zoos and natural areas, can our technical assistance help connect people, wildlife and wildlife refuges?

- Steering the establishment of new urban refuge partnerships in approximately 10 urban areas (large and midsize).

The team will be talking with partner organizations, seeking input from demographers and social scientists, and conducting virtual meetings with managers and staff at existing urban refuges to achieve these tasks. No longer are urban refuges considered unnecessary diversions from our conservation mission. Rather, we believe these refuges are important opportunities to build on the natural connections that Americans have to wildlife and to the work we do. 

Tom Worthington, Midwest Region deputy refuge chief, is a member of the Urban Wildlife Refuge Initiative implementation team. Scott Kahan, Northeast Region refuge chief, is a co-chair of the team, which will focus on recommendation 13 of the Conserving the Future vision.

Strategic Growth Team

Looking to Fill in the Gaps Smartly

By Rick Schultz

Nearly 70 years ago, Refuge System Chief J. Clark Salyer II signed the first edition of the *Field Manual for Wildlife Refuges*. This first Refuge Manual, as it became known, incorporated policies and procedures that employees of the Division of Wildlife Refuges at all levels were directed to follow.

The year was 1942, and, according to that first manual, the National Wildlife Refuge System consisted of 272 units totaling 17,643,915 acres. Of those, 170 were new refuges established over the previous eight years, largely through the efforts of Salyer. His primary tools in determining the best places for new refuges were binoculars and a government-issued Oldsmobile in which he crisscrossed the country in search of the best habitats for waterfowl and other wildlife.

Section 1421 of the Refuge Manual identified the primary purpose of the refuge program: “to preserve a minimum amount of basically natural habitat for every important species of mammal or bird requiring such facilities for its continued preservation for all time.” Subsequent subsections identified the need to establish additional refuges along the breeding, migration and wintering areas of the major flyways. In particular, Section 1422 identified “gaps” in the refuge program and directed refuge managers “to be on alert to detect important concentration points or areas [for waterfowl refuges] capable of restoration.”

Such remains our challenge today.

Guided by the *Conserving the Future: Wildlife Refuges for the Next Generation* vision, the Strategic Growth implementation team has been charged to develop new policy concerning the growth of the System. Although the




The sun sets on J. Clark Salyer National Wildlife Refuge. The Strategic Growth implementation team faces many of the same challenges that the North Dakota refuge’s namesake did three-quarters of a century ago. (Gary Eslinger/USFWS)

tools of the managers, biologists, realty specialists and conservation planners on our team are no doubt more sophisticated than Salyer’s were, we face the same question that he faced as chief: With limited financial resources, where and for what purpose do we acquire additional refuge lands that provide the greatest benefit to wildlife and to people?

Rapid Assessment

Over the next year, this team will complete a rapid assessment of existing refuge acquisition projects and use this information to formulate a strategic growth policy. Data to be collected will likely include the project’s biological objectives; percent completed; feasibility of completion; and degree of threat from off-refuge development. In formulating the new policy, the team will factor in national and regionally important wildlife species, impacts associated with

climate change, and the ongoing loss of ecologically significant native habitats.

Just as Salyer used his own powers of observation combined with those of field managers to identify important Refuge System lands during the Dust Bowl era, this current effort will tap the knowledge and skill sets of many—including wildlife managers, biologists and landscape-level planners from the Service, state agencies and private conservation organizations. Upon implementation, the work completed by this team will help determine land acquisition priorities for the National Wildlife Refuge System over the next 15 to 25 years. 

Rick Schultz, Midwest regional refuge chief, is a co-chair of the Strategic Growth implementation team. The team will focus on recommendations 3, 4 and 5 of the Conserving the Future vision.

Focus... Implementing the Vision

A Q&A Interview With Deputy Chief Cynthia Martinez

Cynthia Martinez, who was named deputy chief of the Refuge System by Chief Jim Kurth, is an 18-year veteran of the U.S. Fish and Wildlife Service. She is a former manager at the Desert National Wildlife Refuge Complex in Nevada and most recently served as chief of the Division of Visitor Services and Communications in the Washington Office. Martinez supervised the *Conserving the Future* process and conference and helped forge the vision document. Here are excerpts from a recent *Refuge Update* interview with her.

Q. When you look at the *Conserving the Future* vision document, what do you hope Service employees working in the Refuge System will take from it?

A. That it's a vision. That it's at a higher level. It's not a cookbook that's going to tell people exactly how to implement it and exactly what to do. It has to be the compass, and they have to decide how to implement it on the ground at their refuges. It's not so prescriptive that it's going to tell them exactly what to do. They need to look at it as the direction, so that we're all going to the same place.

Q. What do you hope Friends, volunteers, state agencies and other conservation partners will take from the vision document?

A. The same thing. This document was written by the Fish and Wildlife Service employees and by partners through their comments. We received over 10,000 comments via the Web. We had individual meetings with folks. They need to take the same thing from the document: This is a vision; this is where the Service is taking the National Wildlife Refuge System. Friends, partners, state folks then can figure out what their role is in helping us achieve that vision and get to that place.

Q. As you and Jim Kurth begin to lead the *Conserving the Future* implementation in earnest, what would

you like Service employees working in the Refuge System to know?

A. That this is for everybody. Everyone has a role in implementing this vision. This is where we're headed, and it's about people as much as it's about wildlife.

Q. How can Service employees who are not part of an implementation team best contribute to the implementation?

A. On multiple levels. One basic level is reading the document and then, on the ground at their refuge, asking what can they do within their duties and responsibilities to implement this vision. On another level, they can let the co-chairs of the implementation teams know that they are interested in participating in one of the work groups that implementation teams might form. Finally, they can send in their ideas to the co-chairs if they have something that they want to make sure a team is considering.

Q. How are Service employees supposed to fit in implementing the vision with everything else they're already doing?

A. We shouldn't look at this as something else to do. It ought to be more like, "How can we change how we're doing things?" We need to take a look at all of the things we're doing and maybe change *how* we're doing them versus doing something new.

Q. Why are three of the 24 recommendations—No. 2 about climate change, No. 8 about a new quadrennial report on the state of the Refuge System and No. 16 about law enforcement—being implemented outside the team format?



National Wildlife Refuge System deputy chief Cynthia Martinez was project leader at Desert National Wildlife Refuge Complex in Nevada from February 2007 until September 2010. She is shown here at Pahrnagat National Wildlife Refuge, part of that complex. (USFWS)

A. There are some things that the Washington Office just has to do. Law enforcement—that'll be a contract, and so it will be our chief of law enforcement overseeing that contract. That doesn't mean that, just because there's not a team, you can't send us e-mails, talk to the chief and say these are things that from my perspective we should include. Same thing with the quadrennial report. We needed to assign that to a Washington Office person; then if that person needs assistance, he can reach out to others. Regarding climate change, we have a [national] climate change coordinator [John Schmerfeld], and that really is his job. So, he will pull in folks

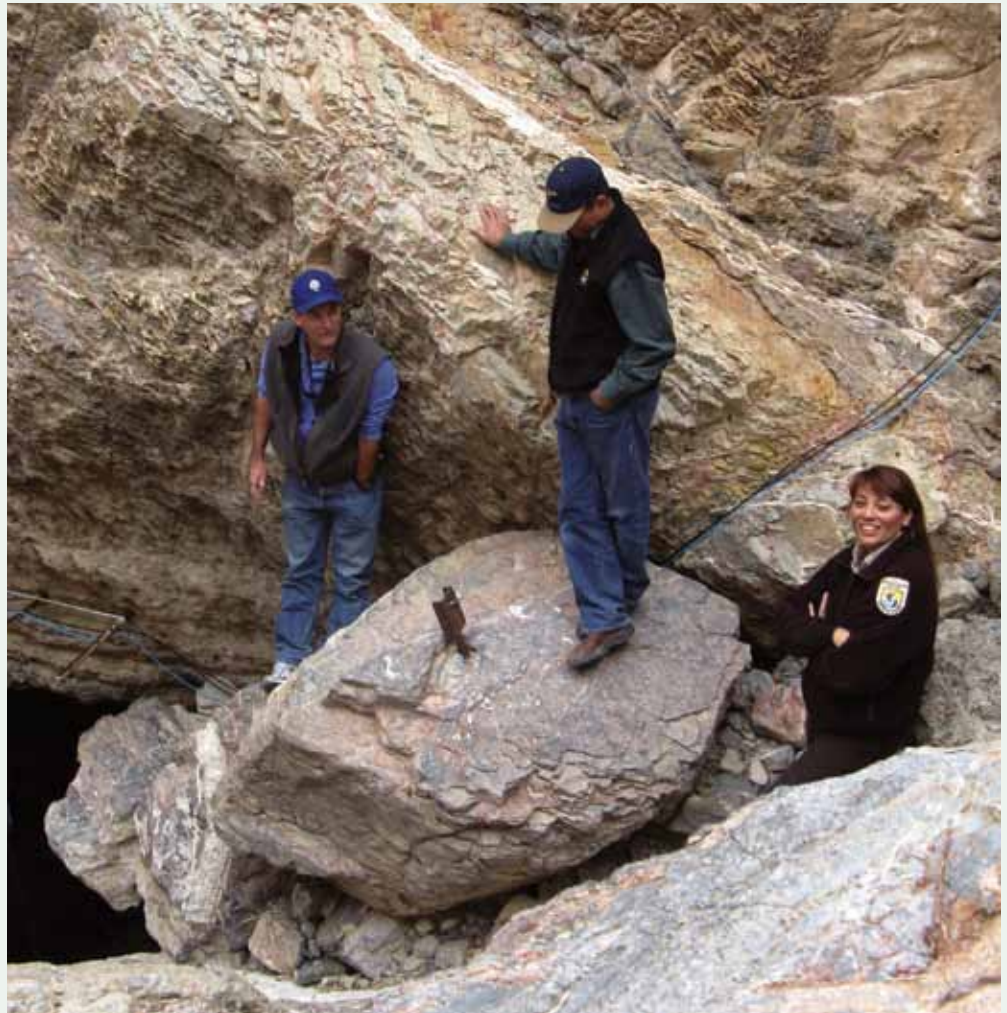
as he needs to. We thought a lot about it. Putting these teams together involved discussion at the Washington level and executive committee level. We asked: How many recommendations do we give to a team and which recommendations? At some point we just had to make a call, and that was the Refuge System chief making the call given the way the implementation charter is set up.

Q. As you look forward, when and how do you think we'll know that we've begun to gain traction on implementing the vision?

A. That's the \$64 million question. I think that maybe the short answer is when we hear people talking more about the National Wildlife Refuge System.

Q. How do you think your recent experience in the field will inform the way you help Jim Kurth lead the implementation?

A. It's critical to have people from the field involved in policy and other overarching discussions that happen in the Washington Office. We need that perspective, reminding us of what it's like to be that person on the ground dealing with all of the day-to-day activities. It's incredibly important to have that perspective, and especially recent perspective. For example, [Division of Natural Resources and Conservation Planning chief] Jeff Rupert [a former manager at Wichita Mountains Wildlife Refuge in Oklahoma] and I both have been in that seat where somebody says something here and we just look at each other like, "That's not going to fly in the field." Since I've gotten here [in September 2010], I've encouraged people to get out in the field, go see folks, go talk to people. With regard to leading implementation, when we get to a decision point, I try to look through the lens of a refuge manager. But it's not just my perspective that influences things. That's why we have people from all of the organization's levels on the implementation teams, where each of the



Then-project leader Martinez in 2008 with Pacific Regional Director Ren Lohofener and then-Devil's Hole pupfish recovery coordinator Paul Barrett at Devil's Hole at Ash Meadows National Wildlife Refuge in Nevada. (USFWS)


members has the same opportunity to influence and guide implementation.

Q. Since coming from the field, what has been the most surprising thing to you about how the Washington Office operates?

A. Organizationally, how we're set up. The most surprising thing is the differing structure of the Fish and Wildlife Service at the regional level and the Washington Office.

Q. The most impressive thing?

A. Our people. Whether you're in the Washington Office, a regional office or

the field, the level of commitment, the professionalism and expertise that people have is prevalent throughout the Service. People are very much focused on what our mission is, and they are willing to step in and do what they need to do to be a part of that mission. Regarding the *Conserving the Future* process, I'd like to say thank you to all who are taking part. And I'd like to ask everyone to read the words of the entire vision document, not just the recommendations, and answer the question in the document's Final Call to Action—"Which challenges will you accept, and which future will you make?" 

Focus... Implementing the Vision

Conserving the Future Recommendations

Here are the 24 recommendations in the Conserving the Future: Wildlife Refuges and the Next Generation vision:

Recommendation 1: Incorporate the lessons learned from our first round of CCPs [comprehensive conservation plans] and HMPs [habitat management plans] into the next generation of conservation plans, and ensure these new plans view refuges in a landscape context and describe actions to project conservation benefits beyond refuge boundaries.

Recommendation 2: Develop a climate change implementation plan for the National Wildlife Refuge System that dovetails with other conservation partners' climate change action plans and specifically provides guidance for conducting vulnerability assessments of climate change impacts to refuge habitats and species as well as direction for innovation in the reduction of emissions and improved energy efficiency on federal lands.

Recommendation 3: Undertake a rapid top-to-bottom assessment of the status of all Refuge System land protection projects and complete a report that will inform development of a plan for the strategic, future growth of the Refuge System.

Recommendation 4: Ensure future land protection efforts are based on explicit priorities, rigorous biological planning and conservation design that support achieving quantifiable conservation and population objectives that are developed in cooperation with state fish and wildlife agencies.

Recommendation 5: Use all of the [U.S. Fish and Wildlife] Service's conservation tools, especially Partners for Fish and Wildlife, to work nationwide to project conservation benefits beyond refuge boundaries, leveraging resources through partnerships with other governmental agencies, conservation groups and private landowners and achieving mutually shared and scientifically sound restoration and protection goals around refuges.

Recommendation 6: Provide each refuge with access to resources to fully implement the principles of adaptive management.

Recommendation 7: Institutionalize a purpose-driven, nationally coordinated effort to inventory and monitor

wildlife and habitats to obtain data that inform planning and management decisions; and develop a state-of-the-art data management system that can be integrated with the broader scientific community and key partners.

Recommendation 8: Create a new, quadrennial report on the state of the Refuge System starting in 2015, as part of an effort to report on the status and trends of wildlife and habitat in the System and ensure that all data gathered are easily accessible and shared widely among the Service, the scientific community and the public.

Recommendation 9: Develop and clearly articulate a research agenda for the Refuge System that is management-oriented and grounded in the testing of assumptions, with the explicit purpose of reducing uncertainty in our planning and management decisions.

Recommendation 10: Become a major contributor to the scientific community by sharing information and data; publishing scientific findings; participating in professional societies; and engaging with local, regional and national organizations and communities to solve conservation problems.

Recommendation 11: Develop and nurture active and vibrant Friends groups or community partnerships for every staffed refuge or refuge complex.

Recommendation 12: Develop a national strategy for recruiting, coordinating and supporting a more self-sustaining volunteer corps, while creating new opportunities for community involvement in implementing refuge priorities.

Recommendation 13: Create an urban refuge initiative that defines excellence in our existing urban refuges, establishes the framework for creating new urban refuge partnerships and implements a refuge presence in 10 demographically and geographically varied cities across America by 2015.

Recommendation 14: Create a strategic communications plan that educates the public about our mission and accomplishments, and creates a positive, professional "brand" for the System.

Recommendation 15: Develop integrated mechanisms for using Web-based and other emerging technologies to store and share data, communicate within the System, and inspire and educate visitors and the public.



Recommendation 19 calls for interpretation strategies to reach audiences on a variety of subjects, including historical and cultural resources such as the lighthouse at Kilauea Point National Wildlife Refuge in Hawaii. (John DeMello)



Recommendation 18 addresses the need to support recreational activities, such as this Let's Go Snowshowing! event at Des Lacs National Wildlife Refuge in North Dakota. (Jennifer Jewett/USFWS)

Recommendation 16: Conduct a new, independent analysis of refuge law enforcement to measure progress and identify needed improvements.

Recommendation 17: The Service will work closely with state fish and wildlife agencies to conduct a review of its current hunting and fishing opportunities, especially opportunities currently offered for youth and people with disabilities. Based on this review, the Service and states will work cooperatively to prepare a strategy for increasing quality hunting and fishing opportunities on national wildlife refuges.

Recommendation 18: Support and enhance appropriate recreation opportunities on national wildlife refuges by partnering with state fish and wildlife agencies, other governmental bodies, conservation organizations and businesses; and by updating relevant policies and infrastructure.


Recommendation 19: Develop an interpretation strategy that builds upon current Service standards and guidelines, takes advantage of multiple modes of delivering messages, reaches diverse audiences, and measures the effectiveness of our programs in partnership with key government agencies, the National Association for Interpretation and other professional organizations.

Recommendation 20: Develop an environmental education strategy that inventories existing efforts, identifies priorities for investment of staff and funds, and outlines basic standards for all refuges.

Recommendation 21: Assemble an evaluation team consisting of Service and Refuge System leaders to report to the Service Directorate on opportunities for organizational realignments or programmatic efficiencies.

Recommendation 22: Within the next 10 years, make our workforce match the diversity in the civilian labor workforce. Recruit and retain a workforce that reflects the ethnic, age, socioeconomic and cultural backgrounds, and language diversity of contemporary America.

Recommendation 23: Revisit *Fulfilling the Promise* and seek innovative ways to address the recommendations therein to reinvigorate our commitment to leadership development.

Recommendation 24: Develop and mentor Refuge System employees so they are fully equipped to accept the responsibilities of leadership at all levels in the Service. 



Recommendation 8 mandates the creation of a new, quadrennial report about the status of Refuge System wildlife and habitat, such as this autumnal deciduous forest at Silvio O. Conte National Wildlife Refuge in Massachusetts. (James Weliver)

Focus... Implementing the Vision

Final Six Teams Named

The charters have been signed and the individuals have been named for the final six *Conserving the Future* vision implementation teams. The teams (and which of the vision's recommendations they will address) are:

Planning (recommendation 1)—Co-chairs Jeff Rupert, Washington Office division of natural resources and conservation planning chief, and Rick Coleman, Region 6 refuge chief. Members Mike Marxen, visitor services branch chief, Region 1; Monica Kimbrough, natural resource planner, Region 2; Cathy Henry, refuge manager, Region 3; Ken Litzenberger, refuge manager, Region 4; Kathryn Owens, deputy project leader, Region 5; Mike Dixon, land protection planner, Region 6; Jenifer Kohout, fisheries and ecological services division chief, Region 7; Winnie Chan, refuge planner, Region 8; Ross Alliston, national planning coordinator, Washington Office; Noah Kahn, performance manager, Washington Office.

Scientific Excellence (6, 7, 9, 10)—Co-chairs Mark Chase, Natural Resources Program Center chief; Deborah Rocque, Washington Office division of natural resources and conservation planning deputy chief; and Aaron Archibeque, Region 2 refuge chief. Members David Drescher, supervisory geographer, Region 1; Grant Harris, biological resources chief, Region 2; Adam Zerrenner, ecological field supervisor, Region 2; Joe Robb, refuge manager, Region 3; Keenan Adams, deputy project leader, Region 4; Stephanie Koch, wildlife biologist, Region 5; Chris Swanson, wildlife biologist, Region 6; Andy Loranger, refuge manager, Region 7; Heather Abbey, wildlife biologist, Region 8; Jana Newman, inventory and monitoring manager, Washington Office.

Community Partnerships (11, 12)—Co-chairs Ken Grannemann, Washington Office division of information resources and technology management chief, and Marge Kolar, Region 8 refuge chief. Members Sue McDonald, visitor services specialist, Region 1; Juliette Gutierrez, assistant refuge manager, Region 2; Mary Stefanski, refuge manager, Region 3; Anne Morkill, refuge manager, Region 4; Beth Goettel, refuge manager, Region 5; Raul Molina, maintenance worker, Region 6; Brian Salem,



Two hunters at Izembek National Wildlife Refuge in western Alaska. The *Conserving the Future Hunting, Fishing and Outdoor Recreation* implementation team will concentrate on recommendations 17 and 18 of the vision document. (Ryan Hagerty/USFWS)


assistant refuge manager, Region 6; Kristen Gilbert, volunteer/youth coordinator, Region 7; Chris Barr, deputy refuge manager, Region 8; Joanna Webb, Friends coordinator, Washington Office.

Communications (14, 15)—Co-chairs Martha Nudel, Washington Office communications chief, and David Viker, Region 4 refuge chief. Members Lisa Langelier, refuge manager, Region 1; Cinthia Eichhorn, inventory and monitoring data manager, Region 2; Maggie O'Connell, visitor services chief, Region 3; Kevin Foerster, supervisory refuge manager, Region 3; Bruce Butler, law enforcement zone officer, Region 4; Andrew Gude, refuge manager, Region 4; Catherine Hibbard, wildlife refuge specialist, Region 5; Kyla Hastie, deputy regional director, Region 5; Theresa Waswick, administrative officer, Region 6; Ryan Mollnow, refuge manager, Region 7; Justin Epting, GIS specialist, Region 8; Susan Morse, writer-editor, Washington Office.

Hunting, Fishing and Outdoor Recreation (17, 18)—Co-chairs Jim Hall, Washington Office refuge law enforcement division chief, and Robin West, Region 1 refuge chief. Members Dianna Ellis, refuge manager, Region 1; Tony Booth, refuge manager, Region 2; Bruce Freske, refuge manager, Region 3; Keith Weaver, refuge manager, Region 4; Virginia Retig, refuge manager,

Region 5; Casey Stemler, migratory birds chief, Region 6; Noreen Walsh, deputy regional director, Region 6; Roger Kaye, wilderness specialist, Region 7; Sarah Swenty, information and education specialist, Region 8; Rob Miller, facilities branch chief, Washington Office.

Interpretation and Education (19, 20)—Co-chairs Kevin Kilcullen, Washington Office visitor services chief, and Mitch Ellis, Region 7 refuge chief. Members Laura Beauregard, refuge planner, Region 1; Jennifer Owen-White, refuge manager, Region 2; Cindy Samples, visitor services manager, Region 3; Stacy Armitage, visitor services manager, Region 4; Sarah Bevilacqua, visitor services manager, Region 5; Jennifer Jewett, education specialist, Region 6; Marianne Aplin, park ranger, Region 7; Angelina Yost, visitor services manager, Region 8; Georgia Jeppsen, education specialist, NCTC; Mike Carlo, visitor services specialist, Washington Office.

There are nine implementation teams total. The Leadership Development Council team (21-24), the Urban Wildlife Refuge Initiative team (13) and the Strategic Growth team (3, 4, 5) were announced previously. Recommendations 2 (climate change), 8 (quadrennial report) and 16 (law enforcement) will be addressed independently, for the most part. 

For Women, Challenges Remain

By Karen Leggett

When Maggie Anderson moved to Montana's Lee Metcalf National Wildlife Refuge in 1986, she was one of four female refuge managers nationwide. She says she felt pressure to make a meteoric rise because there were so few women in the field. The numbers have grown steadily since. By 1999—the earliest year official data are available—60 women were refuge managers or refuge supervisors. Today, 110 are.

Still, as Anderson retires from Minnesota's Agassiz National Wildlife Refuge after 38 years in the U.S. Fish and Wildlife Service, challenges for women remain—and recommendation 22 of the *Conserving the Future* vision directs the Service to diversify its workforce overall.

When Anderson took her first management position at Lee Metcalf Refuge, she was six months' pregnant. "I always felt physically I had to be out there hauling sacks of corn and not asking for help because a guy wouldn't," she says. "Women had to work harder to prove themselves. Men were trusted until they were proven otherwise."

In 2007, when Kelly Purkey became manager at Louisiana's Tensas River National Wildlife Refuge, she was also pregnant and still had to "prove I have value. My experience in the Southeast has been hook and bullet—that's a man's world ... Some in the public were mad as a hornet about something on the refuge and wanted to yell at someone. But when they saw me—5-foot-3 and pregnant—their demeanor would change. I spent a lot of time disarming people."

Southeast Region refuge supervisor Elizabeth Souheaver came to Florida's Merritt Island Refuge with the Youth Conservation Corps in 1978. "People paid more attention to my performance because there were not many women in the Service," she says. "I was encouraged to apply for more positions because I

was a woman. When I did apply, I got the job because of my abilities."

Bringing women into the Refuge System has long been emphasized. In 1979, then-Secretary of the Interior Cecil Andrus encouraged "the hiring of qualified women for career positions throughout the Department."

In some cases, women have been told outright they were hired because of their gender. In other cases, they suspect it.

Purkey and Anne Sittauer, manager at Sherburne National Wildlife Refuge in Minnesota, say they have received calls to apply for positions to meet recruitment targets.

"Being a woman has been an opportunity," says Sittauer. "People are interested in moving along women who are competent." But Purkey worries that such thinking can lead to people being placed in positions before they are ready.

Career-Family Issues

For a 1991 publication about the Northeast Region and the 0485 wildlife refuge management job series, Anderson interviewed current and former Service female employees. Most striking to her was that a majority of respondents had experienced harassment, usually verbal, because they were women. Sittauer believes there is less discomfort caused by such issues today, and she says: "If someone is going to be chauvinistic, I don't let it affect me."

Anderson says work-life balance has been her greatest challenge: "I would like to have had a couple more moves, but we told the kids they could be in high school in one place."



Maggie Anderson, a pioneer in the U. S. Fish and Wildlife Service, helps with a bear study in Minnesota. (Karen Noyce/Minnesota Department of Natural Resources)

Sittauer accepted collateral duty involving watercraft safety policy and training "at a time when I couldn't move every three years because I was considering the needs of my family."

The 1991 survey predicted that career-family issues would become less gender specific—and it appears to have been spot on, given that men now struggle with family-mobility issues, too.

As Anderson closes the gates at Agassiz Refuge on the last day of deer season for her final time, she recognizes that times have changed dramatically and the struggle has been rewarding.

"While I have often had to be persistent," she says, "I have always felt extremely blessed and privileged to work for the Fish and Wildlife Service." 🦋

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

Around the Refuge System

Iowa/Nebraska

The staff at Desoto and Boyer Chute National Wildlife Refuges hosted a celebration to thank more than 100 volunteers who helped build levees, pack artifacts and perform other tasks during last summer's Missouri River flood. Refuge manager Tom Cox told the volunteers their efforts saved the refuges \$27 million and preserved a national treasure. He said the cost estimate is based on discussions with engineers. The volunteers' sandbagging and levee work lowered the level of the flood on the refuges by up to two feet. At DeSoto Refuge, the volunteers helped employees relocate a museum collection of 500,000 artifacts from the 1860s steamship *Bertrand* to temporary quarters. Cox said museum specialists had estimated the *Bertrand* collection would take three weeks to six months to evacuate. With the volunteer help, the collection was packed and moved in a week. "That collection would not have survived," Cox told the volunteers. "None of this would have been even remotely possible without your help." Even though the floodwaters never entered the main floor, the museum could not have maintained the climate necessary to preserve some of the artifacts had they not been relocated.

Pennsylvania

Newly established Cherry Valley National Wildlife Refuge opened to the public on a gorgeous autumn Sunday in late October. The refuge's acquisition boundary encompasses more than 20,000 acres near the Delaware Water Gap 75 miles west of New York City. About 30 local residents and Friends of Cherry Valley spent the day hiking and cleaning two trails that had been blazed by Service workers last summer under the direction of refuge manager Mike Horne. The trails are on the pristine 185-acre parcel that is the only holding of the refuge that was established in October 2010. The hilly woodland tract includes the headwaters of Cherry Creek and Aquashicola Creek. Friends of Cherry Valley plan to build photo blinds and small walkways over Cherry Creek this spring. The refuge will



Cherry Creek is on Cherry Valley National Wildlife Refuge in Pennsylvania, which opened to the public this fall for the first time since its establishment in 2010. (Debra Schuler/Friends of Cherry Valley)

remain open to the public on Sundays, weather permitting.

2011 Federal Energy and Water Management Awards

Three refuges and U.S. Fish and Wildlife Service engineer David Guthrie received 2011 Federal Energy and Water Management Awards. The refuge projects are: the visitor center at Assabet River Refuge, MA; the hybrid solar photovoltaic and wind energy system at Benton Lake Refuge, MT; and the headquarters office renovation at San Francisco Bay Refuge Complex, CA. In addition, the office/visitor center at Morris Wetland Management District, MN, was selected by the Department of the Interior and the Department of Energy as the subject of a leadership poster for the Federal Energy Management Program's "You Have the Power" campaign. The campaign was created in 1997 to help federal agencies reach energy-saving goals by raising awareness about renewable energy, energy efficiency and water efficiency at federal facilities. "We at the Fish and Wildlife Service are in the business of conservation," said Service Director Dan Ashe. "David and all our energy-conscious

employees deserve praise and thanks for conserving water and energy, and taxpayer money."

Louisiana

Cameron Prairie National Wildlife Refuge in the southwest part of the state celebrated the grand opening of the Pintail Drive Boardwalk. The half-mile boardwalk loop allows visitors to see "everything from shore and wading birds to migratory passerines to white-tailed deer and coyotes to butterflies," says refuge visitor services manager Diane Borden-Billiot. The boardwalk, which includes three sets of viewing scopes along the way, was funded with support from the Federal Highway Administration's National Scenic Byways competitive grants program, the Creole Nature Trail All American Road and the Lake Charles/Southwest Louisiana Convention & Visitors Bureau, according to Borden-Billiot. The boardwalk loop traverses shallow wetlands interspersed with elevated ridges under normal rainfall conditions, but now the majority of the area is dry because of severe drought conditions. Cameron Prairie Refuge, created in 1988, was the first refuge established under the auspices of the North American Waterfowl Management Plan.

Maryland

As part of a community service initiative, the Washington College baseball team assisted in the annual cleanup at Eastern Neck National Wildlife Refuge in late October, collecting about 450 pounds of trash and several tires. Washington College is a small liberal arts school in Chestertown, not far from the refuge. The refuge is a 2,285-acre island at the confluence of the Chester River and Chesapeake Bay. It provides habitat for more than 240 bird species—including American bald eagles and transitory peregrine falcons—and is a major staging site for tundra swans.

Arkansas

An enormous bald cypress at White River National Wildlife Refuge has been formally recognized as the state's largest tree. The tree measures roughly 120 feet

high, 43 feet around and 14 feet wide. “Every time I see it, I’m still impressed,” Arkansas Forestry Commission ranger Shane Booth said at a dedication ceremony honoring the tree. “You can tell anybody you want, show them pictures, but until they see it ... they don’t understand.” The refuge is one of the largest remaining bottomland hardwood forests in the Mississippi River Valley.

Small Wetlands Program Exhibit

Visitors to the National Conservation Training Center in Shepherdstown, WV, now have an opportunity to learn how their

federal Duck Stamp dollars have been fueling, and continue to fuel, restoration and preservation work across America’s heartland. NCTC’s permanent exhibit, titled “Small Wetlands, Big Mission,” honors Fred Staunton’s vision for the Small Wetlands Program. Staunton, then the manager at Waubay National Wildlife Refuge in South Dakota, began documenting significant reductions in waterfowl populations in the 1940s. He and others believed the population losses were the direct result of massive wetland drainage programs across the Prairie-Pothole Region and that something needed to be done to stem the tide. More information about the Small Wetlands Program, which was created by Congress in 1958 and uses Duck Stamp funds to protect waterfowl habitat, is available at <http://www.fws.gov/refuges/smallWetlands>.

Texas



This photograph of two roseate spoonbills on High Island off the Gulf Coast won the Nature’s Best Wetland Smithsonian Rice International Award for the bird category. It was taken by Michael Rosenbaum, a longtime volunteer at Florida’s Arthur R. Marshall Loxahatchee National Wildlife Refuge. The photo is scheduled to be displayed at the Smithsonian’s National Museum of Natural History in Washington, DC, from April to September 2012. (Michael Rosenbaum)

Texas

Fishing is back at Buffalo Lake National Wildlife Refuge. Twenty five years ago, the refuge’s namesake lake dried out because of reduced rainfall and the dropping of the Ogallala Aquifer, so fishing came to an end. Last year, the refuge recognized an opportunity to use its moist soil units and decided to build a pond nearby to provide for a special Kids Fishing Derby. After completing construction of the man-made pond in October, the refuge partnered with Academy Sports + Outdoors and hosted its first “Kid Fish” event. The participating children caught anywhere from one to 20 fish provided by Oklahoma’s Tishomingo National Fish Hatchery. Dependent on water from the moist soil units, the pond will be filled during migration for special fishing events.

Mike Morrow, wildlife biologist at Attwater Prairie Chicken National Wildlife Refuge, was awarded the 2011 Hamerstrom Award, which recognizes individuals who have made significant contributions in prairie grouse research and/or management that have enhanced the welfare of one or more prairie grouse species. Morrow has been instrumental in determining the cause(s) of poor Attwater’s prairie-chicken brood survival in the wild. Through the use of “headstart” brood boxes (an idea that he developed), he was able to show that insects (or lack of insects) was the main reason young chicks were not living long. His persistence and dedication further revealed that red imported fire ants most likely have had a negative impact on the insect population, thus indirectly affecting Attwater’s prairie-chicken brood survival. 🦋

From the Director — continued from page 2

It will also accelerate development of a scientific research agenda to support and guide our management decisions.

In addition, I'm excited about a new vision for urban wildlife refuges and its potential to make our work visible to and relevant for new audiences in an increasingly urban society.

The Secretary's vision for America's Great Outdoors lines up strongly with ours. Projects such as the Dakota Grassland Conservation Area, the Flint Hills Legacy Conservation Area and the proposed Everglades Headwaters National Wildlife Refuge and Conservation Area are the centerpieces of that AGO vision, and they embody our vision for future refuge conservation efforts.

Secretary Salazar is challenging us to breathe new life into river and watershed conservation. He understands that conservation must have a big perspective (a landscape scale) but also appreciates that conservation is done at the site scale (on the ground) and by working with individual partners and landowners. The Secretary understands, as do we, that our best work often occurs where the



The Dakota Grassland Conservation Area is a centerpiece of the America's Great Outdoors initiative, and it embodies the Service's vision for refuge conservation, Director Dan Ashe writes. Here, spiderwort brightens the South Dakota prairie. (Tom Koerner/USFWS)

Service is the catalyst for conservation work on a broader scale than we could accomplish working individually.

Despite the many uncertainties and challenges we will face in implementing the vision, I'm optimistic about the future of the Refuge System.

I can't help but feel optimistic when I see the work of our dedicated employees, partners, volunteers and Friends groups—and feel the passion they demonstrate every day. I hope you'll join us as we work to make this vision a reality. 🦋

A Drought of Epic Proportions — continued from page 6

Even so, water is plentiful north of Quivira Refuge. And while migrating birds generally go where the water is, cold winter temperatures are forcing them south, ultimately to the Gulf Coast, where most remaining water is in salty bays.

Birds can handle some salinity in water, but not at the concentrations caused by the drought, says Alonso. To compensate, Aransas Refuge this winter is revitalizing old windmills to pump fresh ground water into ponds. And to help provide food for the whooping cranes, it is scheduling prescribed burns on 9,000 acres to open up foraging land.

Food is scarce at Quivira Refuge, too, where Severson says the drought has

hurt agricultural crops, an essential food source for waterfowl.

Most water left on the refuge is in Little Salt Marsh, and that's where most of the birds are concentrated. Normally the refuge holds 500,000 to a million waterfowl, Severson says. "Now we have about 100,000, and they're not staying very long—days instead of weeks."

If historical patterns prevail, Severson says, flooding will follow the drought. But before that happens, he predicts, Little Salt Marsh will dry out completely. 🦋

Jennifer Anderson is a frequent contributor to Refuge Update.

Bitter Lake — continued from page 9

tell biologists—including a Student Conservation Association intern inventorying Pecos assiminea snails—a lot about the unusual life the sinkholes and spring vents sustain at what Truetken calls "a hidden gem" of a refuge.

"You drive for many miles from all directions through vast grassland and you come to the Pecos River Valley—and here we are," he says. "The sinkholes add a tremendous diversity to that. You just don't see that in most parts of the country." 🦋

Kurth Named Chief; Martinez Selected as Deputy — continued from page 1

2011, is now the Service's deputy director for policy.

"Jim is the ideal person for this position," said Ashe. "His depth of experience with the National Wildlife Refuge System and demonstrated strong leadership are just what the Fish and Wildlife Service needs as we begin implementation of the *Conserving the Future* document."

At a gathering of employees at the Refuge System's Washington Office shortly after his appointment as chief, Kurth made clear that implementing the *Conserving the Future* vision is a high priority.

"This is a compelling document," he said, holding up the 93-page booklet. "There couldn't be a more compelling time for me personally to lead this organization."

He mentioned two challenges the Refuge System faces: how to engage the public and how to manage the Refuge System's growth.

"How we remain relevant in a changing America is a big deal," he said. "We have to groom and mentor the next generation of conservation leaders."

And, he said, "probably one of the most important issues we face is how to continue to grow the Refuge System" in a balanced and intelligent way.

From 1994 to 1999, Kurth managed the Arctic National Wildlife Refuge in

Alaska. He began his Refuge System career in 1979 and has held posts at Mississippi Sandhill Crane Refuge, MS; Arthur R. Marshall Loxahatchee Refuge, FL; Bogue Chitto Refuge, LA; Seney Refuge in Michigan's Upper Peninsula; and Ninigret Refuge, RI.

Martinez, an 18-year Service veteran and former manager at Desert National Wildlife Refuge Complex in Nevada, came to the Refuge System's Washington Office in September 2010 as chief of the Division of Visitor Services and Communications. She oversaw the team that forged the *Conserving the Future* process and orchestrated last summer's conference in Madison, WI.

Previously, Martinez worked as a fishery biologist and assistant field supervisor for the Southern Nevada Field Office. She began her Service career in the Student Conservation Education Program (SCEP), working as an assistant contaminants specialist in the Arizona Ecological Services Field Office.



Refuge System Chief Jim Kurth with refuge ecologist Andrea Pickart last fall at the newly opened Ma-le'l Dunes Unit of Humboldt Bay National Wildlife Refuge in northern California. (USFWS)

"Our experiences and backgrounds complement and balance one another," Martinez wrote in a message to Refuge System staff. "Jim is a Midwesterner with long Washington experience. I am a product of the desert Southwest, with a love of wide-open spaces and rare desert fish. On one issue, we fully agree: Implementation of the *Conserving the Future* vision will be an exciting and exhilarating adventure that will bring new partners into conservation and renewed attention to the Refuge System." 🦋

Chief's Corner — continued from page 2

We've worked hard to get to this point. With your help over the past 18 months, we have fashioned a vision that will enhance our standing in the scientific community. Its implementation will help the Refuge System and the very principles of conservation connect with urban and ethnic constituencies that rarely have been engaged in the conservation conversation.

We broke new ground on how we communicate leading up to and during the conference. We must continue to think of new ways to communicate and engage new and diverse partners.

Most of the nine *Conserving the Future* implementation teams have until this summer to formulate their recommendations for policy changes and strategic direction. That means you have many months in which you can suggest innovative ways of reaching the goals of the 24 recommendations in the *Conserving the Future* vision. The www.AmericasWildlife.org Web site is one way to communicate with the implementation teams. We are ramping up other communications avenues—including Facebook and Twitter. If you want to communicate directly, send an

e-mail to any of the implementation team members. The rosters of six teams are listed on page 18 of this issue of *Refuge Update*; members of the three previously named teams were listed in the September/October and November/December 2011 issues.

The story of the Refuge System always has been one of innovation, experimentation and optimism. Now you can leave your mark. Don't wait. 🦋



RefugeUpdate

USFWS-NWRS
4401 North Fairfax Dr.
Room 634C
Arlington, VA 22203-1610
www.fws.gov/refuges

STANDARD PRESORT
POSTAGE AND FEES
PAID
U.S. DEPARTMENT OF THE
INTERIOR
PERMIT G-77

A Look Back ... Chandler Robbins

Chandler Robbins is 93 and can still be reached at his office at Patuxent Wildlife Research Center in Maryland.

He is legendary among birders for his knowledge, dedication and friendliness. He began birding at age 12 near his home in Belmont, MA, and counts among his mentors and colleagues Roger Tory Peterson, Rachel Carson, Ira Gabrielson and Aldo Leopold. He knew Carson not as a scientist but as the best technical editor he ever had, especially for his manuscripts about the effect of DDT on birds.

Hired in 1945 as a junior biologist in the bird banding office at Patuxent Research Refuge, Robbins in 1965 initiated the North American Breeding Bird Survey, one of the world's most influential science-based surveys of bird populations. Robbins says his wife, Eleanor, was convinced the survey wouldn't work because "you can't regiment people to the point of telling them they could only count for so many



Chandler Robbins initiated the influential North American Breeding Bird Survey and has participated in 346 Christmas Bird Counts, but he is most proud of his work related to forest fragmentation. (Barbara Dowell)

minutes and then they have to stop and go do the same thing at another spot." Now, nearly 6,000 volunteers do just that, collecting data every summer along more than 3,000 routes in North America.

Robbins participated in the survey until 2008, when hearing loss forced him to stop. "I'm distorting the truth by not hearing all the high-pitched songs," he

says. He also has participated in 346 Christmas Bird Counts—far more than anyone else.

In addition to writing more than 500 professional publications, Robbins wrote *A Guide to Field Identification of the Birds of North America* with Bertel Bruun and Herbert Zim—but only after he was sure it would be different from Peterson's guides.

Robbins takes his greatest pride, though, in his work on the impact of forest fragmentation: "Maryland is the only state that is protecting wildlife habitat species for forest interior species by following my recommendations on the size of forests that are too large to be disturbed."

Officially retired in 2005 after 60 years of government service, Robbins remains intrigued by migrating birds. "Imagine birds from here going back to the tropics, to the same place where they wintered the winter before," he says. "I can get lost in the woods at Patuxent." 

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

Send Us Your Comments

Letters to the Editor or suggestions about *Refuge Update* can be e-mailed to RefugeUpdate@fws.gov or mailed to *Refuge Update*, USFWS-NWRS, 4401 North Fairfax Dr., Room 634C, Arlington, VA 22203-1610.