



RefugeUpdate

National Wildlife Refuge System

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This photograph of sandhill cranes roosting at sunset at Bosque del Apache National Wildlife Refuge in New Mexico is on the cover of the Conserving the Future: Wildlife Refuges and the Next Generation vision document. The document is a blueprint to guide the National Wildlife Refuge System over the next decade. (Gail Diane Yovanovich)

Final Vision Document Is On AmericasWildlife.org

The journey to fashion a new vision for the Refuge System took nearly 18 months. It involved the work of about 70 people on five Core Teams plus thousands more who participated online and at the *Conserving the Future: Wildlife Refuges and the Next Generation* conference in July, and the consideration of more than 10,000 public comments and 240 bold ideas.

Now, the *Conserving the Future* vision—with 24 specific recommendations—has been finalized and is available online at <http://AmericasWildlife.org>. That's just one step in an implementation process that is moving forward with deliberate speed.

The implementation process will be led by an Executive Implementation Council, chaired by the Refuge System chief and include the Refuge System Leadership Team, which encompasses the eight regional refuge chiefs as well as the Refuge System's six Washington Office division chiefs. A full-time council coordinator is to be hired in coming months.

By late January 2012—90 days after the vision document's publication—the council has been instructed to create an overall implementation plan that will identify individuals or teams and give them specific tasks and deadlines. Three

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Two New Refuges Are Established; Third Is Authorized

Two new national wildlife refuges were established and one refuge was authorized over an eight-day period in late September.

Dakota Grassland Conservation Area, which encompasses swaths of South Dakota and North Dakota, became the 554th refuge on September 22 when two conservation easements totaling almost 1,400 acres were acquired by the U.S. Fish and Wildlife Service.

Flint Hills Legacy Conservation Area in eastern Kansas became the 555th refuge on September 28 when a 4.2-acre conservation easement was received via donation from private landowners to the Service.

Middle Rio Grande National Wildlife Refuge in New Mexico was authorized

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A team of Service professionals who developed the FWS Lands Mapper received the 2011 Land Legacy Award. The Web-based application provides precise information about national wildlife refuges.

Two Individuals, One Group Honored In Three National Realty Awards

Two Californians instrumental in the transfer of Skaggs Island to San Pablo Bay National Wildlife Refuge and a group of U.S. Fish and Wildlife Service professionals are recipients of the 2011 National Realty Awards.

The winners of the three awards presented each year by the Refuge System Division of Realty are Stephen Dyer of the Service's Pacific Southwest Region; Alexandra Elias of the Naval Facilities Engineering Command in San Diego; and the Service/Refuge System Cadastral Data Working Group.

Dieffenbach Award

Pacific Southwest Region senior realty officer Stephen Dyer is the recipient of the Rudolph Dieffenbach Award. The award is presented annually to a Division of Realty employee for significant contributions to the Service's land acquisition systems, operation or mission.

"Steve has successfully concluded most of the difficult land acquisition negotiations within the FWS Pacific Southwest Region over the last 8-10 years," regional refuge chief Marge Kolar said in nominating Dyer.

Kolar credited Dyer with playing an important role in: the transfer of the Skaggs Island from the Navy to San Pablo Bay National Wildlife Refuge, CA; major land acquisitions at Upper Klamath Refuge, CA; the establishment of, and initial acquisitions at, Tulare Basin Wildlife Management Area, CA; the acquisition of the future headquarters site at San Pablo Bay Refuge; and other land-related issues.

National Land Protection Award

Alexandria Elias, a civilian employee of the Navy, received the National Land Protection Award. It is given to private citizens, groups, organizations,

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Guam Photo Essay

A kids'-eye view of Guam National Wildlife Refuge. Pages 22-23

A Flood of Intra-Service Cooperation

By Bill O'Brian

The normal flow of the White River in east-central Vermont is roughly 300 cubic feet per second. On the evening of Sunday, Aug. 28, the flow was almost 50,000 cubic feet per second.

That was at the height of the flooding caused by Tropical Storm Irene. The White River National Fish Hatchery was inundated. It was inaccessible by road for days. Much of its infrastructure was buried in up to eight feet of mud and silt.

“It was really something to behold,” says hatchery manager Ken Gillette. It took him two days to reach the facility, where water had risen to the tops of circular pools’ doorways. The flood killed 40 to 50 percent of the Atlantic salmon brood stock and 40,000 of the 500,000 lake trout the hatchery raises. Gillette knew the hatchery needed help to get back on its feet.

So, Refuge System heavy equipment operators from across the Northeast Region were called in.

Bob Springfield of Parker River National Wildlife Refuge, MA, was among the first to arrive—on Sept. 7. “It was very wet with misty rain, and the mud was soupy. It was like scooping pancake batter for a couple of days,” he says. “And the dead fish were still around, so the smell was pretty bad.”

Over the next three weeks, a Refuge System heavy equipment contingent that included Springfield; Roger Dutch of Edwin B. Forsythe Refuge, NJ; Joe Bertrand of Missisquoi Refuge, VT; Steven Zadroga of Great Meadows Refuge, MA; Steven Branstetter of Long Island Refuge Complex, NY; Mike Krug of Moosehorn Refuge, ME; and Kirk Cote of Aroostook Refuge, ME; moved millions of pounds of muck to higher ground on hatchery property.

Bill Starke, the Northeast regional heavy equipment coordinator who mobilized personnel for the intra-agency cleanup operation, reports that his maintenance crews removed 629 loads of material

in 15-yard dump trucks for a total of 9,435 cubic yards. Gillette figures that is 17 million pounds (8,500 tons) of mud. To make it happen, several Refuge System backhoes, dump trucks, skid steers, excavators, bulldozers and even a rented Bobcat (to get into tight spots) were used.

“They have been great,” Gillette says of the Refuge System equipment operators. “They just kind of asked me what I needed done. They just said, ‘Point the way.’ They did it all.”

In addition to removing sludge, the heavy equipment crews worked with at least a dozen loads of stone to repair the hatchery’s roads. And they leveled off the ground before departing in late September.

“It really shows what the maintenance people in Region 5 can accomplish when given a task,” says Starke, who notes that the experience also provided valuable training to the Refuge System crews.

“You do feel like you’re helping out almost members of the family,” Springfield says of the intra-Service cooperation. The hatchery staff was “so friendly and nice up there, you felt welcome.”

The hatchery still has a ways to go. It reopened on a limited basis in October. The Atlantic salmon brood loss will decrease the number of fry the hatchery will introduce into the Connecticut River this season. The lake trout loss will



White River National Fish Hatchery manager Ken Gillette surveys damage and dead fish stranded by Tropical Storm Irene flooding. Floodwaters rose to the top of circular pools’ doorways. Parts of the Vermont facility were left under eight feet of mud and silt. (Ann Froschauer/USFWS)

reduce the hatchery’s ability to provide stock for Lakes Erie and Ontario. Contamination tests and disinfection measures must be done for the whole facility. There is a lot of mechanical and infrastructure evaluation and repair ahead. But the hatchery is on the road toward recovery.

When asked a month after the flood how long it might have taken the hatchery to begin to rebound without Refuge System help, Gillette replies: “It depends on who we might have been able to contract with. But, to be frank with you, I think we’d still probably be in the mud.”

Protecting the Treasures of Caddo Lake

By Sen. Kay Bailey Hutchison

I have always marveled at the natural beauty of East Texas. As a child, I spent much time immersed in East Texas' treasures—from the rich forests of Big Thicket to the diverse wetlands of Big Cypress. As an elected representative of this great state, I consider it both a duty and an honor to help preserve these wonders for future Texans to enjoy.

Every year I take a road trip to highlight unique aspects of Texas geography and history. This year our East Texas bus tour included a visit to Caddo Lake and its magnificent national wildlife refuge.

Caddo Lake is an especially important part of East Texas. Not only is it Texas' only natural lake, but it also provides a shelter to many species, such as the peregrine falcon and the alligator snapping turtle. Situated on our Louisiana border, Caddo Lake is one of Texas' most diverse freshwater ecosystems, the second largest natural body of water in the South and an important point along the Central Flyway for migratory birds.

Unfortunately, Caddo Lake has come under siege by an invasive plant species. A South American plant, giant salvinia, has taken root in these pristine waters and threatens the lake's ecological balance.

Giant salvinia is a free-floating aquatic fern that is native to Brazil. It aggressively takes over any body of water where it is introduced. It is capable of doubling in size within a few days.

Since being introduced in Caddo Lake, it has threatened the ecological health of the lake by eliminating needed oxygen in the water, killing native fish and other wildlife.

Within two years of arriving in 2006, the giant salvinia had gone from covering less than two acres of the lake's surface to more than 1,000 acres. Because Caddo Lake is home to 216 bird, 47 mammal, and 90 reptile and amphibian



Caddo Lake National Wildlife Refuge is playing an important role in helping to control giant salvinia, an invasive plant threatening the lake. The wetlands and bottomland hardwood forest ecosystem of the 25,000-acre lake that straddles the Texas-Louisiana border are essential habitat for migratory and resident wildlife. (Texas Parks & Wildlife Department)


species, it is imperative that we move quickly to find ways to eradicate the giant salvinia before it damages any more of the lake's habitat.

Community leaders made me aware of this growing problem. Don Henley (known to many as a founding member of the Eagles), who was raised nearby, is also a passionate advocate for preserving Caddo Lake and its ecosystems. He founded the Caddo Lake Institute not only to help preserve the lake but also to educate generations of Texans about the importance of its ecosystem. Working cooperatively with Texas A&M University to create the Center for Invasive Species Eradication, we have made great progress in fighting this invasive species.

This summer I toured the Giant Salvinia Eradication Project facility on the refuge and witnessed first-hand the innovative methods being developed to eradicate this aggressive invader. One successful method I was shown was

the production and release of salvinia weevils—tiny insects that feed only off these plants. In addition, the project's goal is to identify the most effective control methods—whether they are biological, chemical, mechanical or others—so that they can be used to fight invasive species in bodies of water throughout the country.

Great strides in research are being made because of the cooperative efforts among Texas A&M researchers, federal, state and local governments, and community groups such as the institute.

After visiting the refuge and the lake this summer, I can understand why Caddo is called “the most beautiful lake you will ever see.” By working together, we can ensure that future generations of Texans will be able to enjoy its unique beauty. 

Kay Bailey Hutchison is the senior senator from Texas.

Helping Flora and Fauna Speak for Themselves

Last spring Refuge Update asked U.S. Fish and Wildlife Service employees around the country about the most important thing they have done to connect everyday people to the land. The result was a series of vignettes in the May/June 2011 issue. However, one response was too long to include and too good to ignore. It came from Scott Kahan, project leader at Detroit Lakes Wetland Management District in Minnesota and a 21-year veteran of the Refuge System who has since been named Northeast Region refuge chief. Here it is.

By Scott Kahan

When I consider the question of the most important thing I have done on a refuge to connect people to the land, I am reminded that my views on this subject have changed.

I spent the first half of my career not really understanding the importance of connecting people with the land. My focus was on habitat, on critters. In some sense, I knew people were an important part of the equation, but I can't say that I truly understood how important the "people side" of things is to our mission.

I began my career in the Northeast Region working often with our outdoor recreation planner. Part of my job was to give interpretive walks. I remember leading groups of birders at Ninigret National Wildlife Refuge, RI, to watch woodcocks perform their spring courtship ritual. People would ooh-and-aah as the males flew high into the sky, circling as they went, and then falling like leaves adrift in the wind and coming to rest gracefully on the ground with a "peent."

I moved to Tewaukon Refuge, ND, where I was cajoled into giving a puppet show about wetlands. I remember everyone was laughing by the end of our "performance," but I really couldn't tell you if I made an impact.

It's interesting that one of the few times I feel that I really did connect someone to the land occurred by happenstance, not anything I "did."



The beauty of a gentian on the Minnesota prairie can enthrall a visitor more than the most carefully crafted words can. (Shawn May/USFWS)

A few years ago at Detroit Lakes Wetland Management District, we were hosting Prairie Fun Day on a waterfowl production area where we had recently removed many planted trees from the prairie.


Seeing a crowd at the event, a neighbor came over to complain about our decision to take down the trees. He asked me why we had done it. I told him it was to benefit the prairie and the critters that depend on open prairie grasslands.

We were discussing the importance of prairie when he noticed a blue wildflower tucked beneath a big stem. He asked me what it was. I told him it was a bottle gentian. He said, "That's a beautiful flower. I need to go get my family and show them this."

He returned with three relatives. He showed them the gentian, and the family spent the next half-hour "discovering" this prairie. Before they left, the man told me, "You know, I've lived here all

my life, and when you guys took those trees down I was mad. I spent the last few years driving past here, and I was mad every time I looked at what you had done. I had no idea that all this [he gestured at the prairie plants] was here."

When I recall that day, I realize the prairie told the story in a more beautiful and understated way than any of my words could have.

When the land and critters tell a story, it's one that people instinctively can't resist. Whether listening to the whistling wings of blue-winged teal in the dark before the dawn or enjoying the sight of thousands of monarch butterflies during their fall migration, people hold these experiences close as precious memories. We, Service folks, provide places where it's possible to make such connections. 

The Disproportionate Cost of Private Inholdings

By Paul Steblein

Private inholdings on a national wildlife refuge may seem trivial when the remaining 99 percent of land is refuge-owned and -protected, but that 1 percent can have a costly impact.

I say this based on my 4½ years of experience as project leader at Sheldon-Hart Mountain National Wildlife Refuge Complex in southeast Oregon and northern Nevada. There, most private inholdings are 20- or 40-acre parcels whose negative impact far exceeds the potential purchase price.

All refuges are different in myriad ways, of course, but the key inholding concerns at Shelton-Hart Mountain Refuge Complex were:

Road development—Usually, we had to provide “reasonable access” to an inholding property across refuge lands. This resulted in habitat loss, habitat fragmentation, invasive species increase and the use of \$10,000 to \$20,000 in staff time to arrange for a right-of-way permit.

Water rights—In one case at Sheldon Refuge, an owner filed for water rights on a stream. In such a situation, the U.S. Fish and Wildlife Service must monitor the permit application and protest it promptly. We missed this one, the water rights were issued and now one of the refuge’s few perennial streams is dammed, affecting water flow and wildlife habitat.

Habitat impact—Inholding development resulted in loss of habitat (conversion from wildlife habitat to roads, houses or non-native vegetation), habitat fragmentation (breaking up the continuous habitat that most species need) and disturbance to species (frequent human activity scaring away wildlife). All of this contradicted the refuge mission—conservation of pronghorn antelope, sage-grouse and other sagebrush species.

Invasive species—The high-desert habitats were and are vulnerable to invasive species from disturbances to soils and native vegetation. Vehicle and



The need to provide “reasonable access” to an inholding property, such as this one at Hart Mountain National Wildlife Refuge in Oregon, can result in habitat loss, habitat fragmentation, invasive species increase and expenditure of staff time. (Google Maps)

foot traffic associated with building and using roads and houses leaves a property susceptible to invasive weeds. Such invasives are expensive to control, if controllable at all, in remote parts of a refuge.

Viewshed—The idea of a recreation property in the middle of a refuge has romantic appeal. However, creating such a utopian property for one owner often shatters the view for thousands of visitors who come to enjoy the wild landscape.

Fire risk—Fires are easily started by a hot tailpipe touching grass, a tossed cigarette or campfire embers. Occupation of remote properties increases fire risk.

Overall management—Many of the factors cited above result in increased refuge management costs, but other factors do, too. Oregon and Nevada, for instance, are fence-out states. So, if livestock are introduced by the owner, the refuge must build a fence to keep the livestock off the refuge. A 40-acre parcel would require one mile, or \$12,000 worth, of fencing. If a survey is required, it would be \$2,000 to \$5,000 for that size property. A 40-acre parcel at Hart Mountain Refuge was bought for \$9,000 not long ago. Thus, management costs can quickly outstrip a property’s value,

and it would be cheaper to buy the property outright—especially because, at Hart Mountain and Sheldon Refuges at least, operations and maintenance costs generally don’t go up when inholding properties are acquired.

The good news is that the Division of Realty, with help from refuge staff and Friends of Hart Mountain, has acquired nearly 1,000 inholding acres in the past five years.

Private property owners clearly have the right to develop their inholding properties essentially as they see fit. However, there often is a significant burden to the public when they exercise that right. So, refuges should be interested in buying inholding properties from willing sellers. But when private owners choose to keep or develop their property, refuge staff must work with them to do it in a way that does the least harm to the refuge’s habitat—and to its budget. 🦋

Paul Steblein, a critical issues analyst in the Refuge System’s Division of Natural Resources and Conservation Planning, was project leader at Sheldon-Hart Mountain National Wildlife Complex from 2006 through 2010.

After a Year's Delay, Bandon Marsh Project Is Completed

By Karen Leggett

Rogue Restoration Redd Ale was flowing and so were the tides when Bandon Marsh National Wildlife Refuge formally celebrated Oregon's largest tidal marsh restoration project on Oct. 1. The local ale's special label features an image of juvenile coho salmon, a species expected to use the marsh.

The \$9.5 million project, which started with the refuge's expansion in the late 1990s, restored 418 acres of wetlands—mostly salt marsh—from an area near the mouth of the Coquille River that had been diked, drained and converted to farmland by 19th-century settlers.

The land was acquired in four years—lightning speed in such multifaceted matters. The Archaeological Conservancy, The Nature Conservancy and willing private landowners helped with land acquisition. Twenty-seven acres, valued at \$450,000, were donated. “Anything we do to restore tides on the refuge affects so many other people within the estuary,” says Oregon Coast National Wildlife Refuge Complex project leader Roy Lowe. “We were only able to accomplish this monumental project because of the valued partnerships we have.”

The Confederated Tribes of Siletz Indians' fish biologist was involved from the beginning. The Coquille Indian Tribe helped monitor and protect cultural resources at the site. Ducks Unlimited helped design, engineer and construct the restoration.

The project was funded by the Refuge System and nongovernmental organizations, lottery revenue from the Oregon Watershed Enhancement Board and \$1.6 million in damages paid after the 1999 *New Carissa* oil spill off nearby Coos Bay. A power-line rerouting was covered by American Recovery and Reinvestment Act funds, and \$4.2 million in federal transportation enhancement funds were used to raise a county road to prevent high-tide flooding.



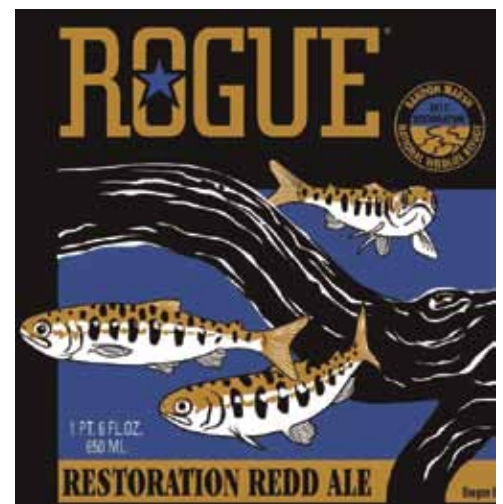
Least sandpipers, above, are among many waterbirds observed in the restored wetlands at Bandon Marsh National Wildlife Refuge in southwestern Oregon. A portion of the proceeds from the sale of locally brewed Rogue Restoration Redd Ale will be donated to the refuge's environmental education programs. A redd is the riverbed depression where a female salmon deposits her eggs. (Roy W. Lowe/USFWS)

Power-Line Problems

One big challenge involved the power-line rerouting. An above-ground line had to be buried 50 feet under the river bed to avoid wire-strike mortality of migratory birds. The drill kept coming up in the wrong location on the hillside and the bore holes collapsed more than once. The power-line construction difficulties delayed final dike removal by a year.

Finally, on Aug. 15 at 10:46 a.m., a small cofferdam was breached and the tidal flow surged into the new mouth of Redd Creek and upstream into the marsh. Over the next three days, crews repeated the process on NoName and Fahys Creeks, marking their return to their historical locations.

The restored refuge unit is named Ni-les'tun, which means “people by the small fish dam” in the language of the Coquille Tribe. Two hours after tidal flow was restored to Fahys Creek's mouth, seven tribal members entered the marsh in a ceremonial canoe—the first time Coquille Indians had paddled in the Ni-les'tun Marsh in 140 years. Later, as the canoe disappeared downriver, an osprey splashed down in the marsh and



successfully grabbed a fish, setting off cheers in an assembled crowd.

Young fish, especially coho and Chinook salmon, smolts and cutthroat trout, are expected to appear in the marsh first, eventually followed by other estuarine-dependent species such as flounder and sole, and perhaps by Dungeness crab. Lowe says anchovies already have been seen in what used to be pasture.

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Endangered Birds Flourish at Hawaiian Refuges

By Alison Howard

More than one-third of the country's endangered bird species call Hawaii home. Three of them—the Hawaiian stilt, the Hawaiian coot and the Hawaiian moorhen—are thriving at Pearl Harbor and James Campbell National Wildlife Refuges on Oahu, where careful management for more than 30 years has increased and stabilized their numbers.

In a year-round balancing act, vegetation is controlled and water levels are manipulated to serve the different foraging and breeding habits of each species, while their predators—dogs, cats, mongoose and rats (all exotic to Hawaii)—are discouraged with fences and traps. “Sometimes we’re pumping water in” to suit loafing coots or nesting moorhens, says David Ellis, project leader at Oahu National Wildlife Refuge Complex, which includes the two wetland refuges. “At other times, we have to let water out” to create the saturated mudflats where stilts like to nest.

That makes the process sound far simpler than it is. But the result is that the waterbirds' populations on the refuges “are stable at a very high level of productivity”—in some cases, still rising slightly. “They’re not declining anymore, so that’s a very big step for any endangered species,” Ellis says. “We don’t expect dramatic increases on the refuges now, because we may have reached our peak.”

In addition, some of the birds are venturing beyond refuge boundaries. Through banding, “we’ve discovered that chicks do leave,” says wildlife biologist Mike Silbernagle, for 19 years a driving force behind the recovery effort.

The coastal refuges were created in the 1970s, shortly after passage of the Endangered Species Act. James Campbell Refuge, on Oahu’s northern coast, includes two wetlands covering more than 160 acres. On the southern coast, Pearl Harbor Refuge was established on the famed naval base when airport construction threatened crucial



After three-plus decades of careful management, three endangered birds—the Hawaiian stilt (above), the Hawaiian coot and the Hawaiian moorhen—are thriving at Pearl Harbor and James Campbell National Wildlife Refuges on Oahu. (Mike Silbernagle/USFWS)

stilt habitat. It totals 98 acres. Though small by mainland standards, these wetlands “are just as crucial,” Ellis says.

The first step was to cut back invasive plants that choked the wetlands. The next was to facilitate water management by building dikes, creating ditches and installing wells and pumps. The third was finding defenses against predators. Plants, water and predators are continuously monitored and managed “to get the correct mosaic of vegetation” for each species.

Similar efforts are under way on other Hawaiian refuges, notably Hanalei Refuge on Kauai and the Kealia Pond Refuge on Maui. “There’s a bigger picture in the recovery of these species, and we’re part of that,” Ellis says.

He and Silbernagle use the birds’ Hawaiian names, and Silbernagle admits to having a favorite. It isn’t the *ae’o* (stilt), a chattering attention-grabber with its showy looks and fussy habitat demands. Nor is it the more tolerant, more visible *‘alae ke’oke’o* (coot). It’s the elusive *‘alae ‘ula*, the moorhen.

“They’re so funny,” Silbernagle says. “They’re built like a chicken. They have

a whole repertoire of vocalizations. And they’re so secretive.” He has seen a moorhen “hide” behind a few stems of sedge, like a child who covers his eyes and believes he’s invisible. Then it “will sort of melt back into the vegetation,” making it the hardest to count.

Surveys in 2004-06 estimated an average of 1,810 stilts statewide, up from 951 in 1989-91 surveys; 1,648 coots, up from 1,238; and 372 moorhens, up from 155. Of those, the two Oahu refuges contributed 225 stilts in 2004-06, up from 147; 361 coots, up from 246; and 49 moorhens, up from 25. Ellis says the recovery goal is an average of 2,500 of each species statewide over five years.

Even if the birds are eventually de-listed, the job won’t be done. The two refuges are core areas that must continue to be highly managed into the future, and unknown challenges await, Ellis says. “Sea-level rise will be a huge wild card.”

And then, Silbernagle says, there are the birds themselves: “The birds make sure you never learn all there is to know about them.”

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

Patuxent Research Refuge at 75: Still “One of a Kind”

By Bill O'Brian

Hiking trail descriptions routinely enumerate cross-slope, grade, distance, surface composition, degree of difficulty, etc. The new Jay Norwood “Ding” Darling Conservation Heritage Trail at Patuxent Research Refuge in Maryland no doubt leads the nation in a rarely cited category: the hero-to-mile ratio.

The trail is short—just one-third of a mile. But the list of conservation heroes it recognizes is long—31 in all.

Six interpretive signs along the fully accessible path display short biographies of the 27 men and four women who comprise the National Wildlife Federation’s Conservation Hall of Fame. National Wildlife Refuge System favorites Rachel Carson, Ira Gabrielson, Olaus Murie and Aldo Leopold are among those honored. So are more obscure conservationists, such as Hugh Hammond Bennett, George Perkins Marsh and Anna Botsford Comstock.

The heroes trail, which was dedicated last spring, is part of a yearlong celebration of the 75th anniversary of the federation and Patuxent Refuge.

“Most people don’t realize what an incredible legacy this place has,” says Nell Baldacchino, the refuge’s education/outreach team leader.

A Rich Conservation History

Patuxent was established in 1936 as the nation’s only research refuge. The research function was transferred to the U.S. Geological Survey in the mid-1990s. Now, USGS, Refuge System and Service Migratory Bird Program administrative buildings and research facilities are co-located on the 12,800-acre refuge. Researchers in the field work side by side with lab scientists.

Two new facets of the 75th anniversary celebration were unveiled during National Wildlife Refuge Week: a “Patuxent’s Heritage” exhibit in the visitor center lobby and a 26-minute video titled “The History of Patuxent: America’s Conservation Story.” If you



A beaver lodge at Patuxent Research Refuge, which has a storied conservation science history and has been called “the lungs of the Baltimore-Washington corridor.” (USFWS)

tour the exhibit and watch the film, you’ll understand why the refuge has been of vital importance to conservation and the Refuge System.


You will learn, or be reminded, that:

- Patuxent Refuge’s research on pesticides in 1940s and ’50s helped inspire Carson’s 1962 book, “Silent Spring.” Research at Patuxent in the ’60s about the effects of DDT and similar pesticides on earthworms showed how the pesticides became concentrated as they ascended the food chain. Other studies linked a metabolite of DDT to eggshell-thinning in birds, most notably species high in the food chain such as bald eagles. That led to the banning of DDT in this country, which led to the recovery of the bald eagle.
- In lieu of military service, conscientious objectors to World War II helped do scientific work at Patuxent and constructed many of the refuge’s 50 impoundments.
- A study at Uhler Marsh—named for Francis Uhler, a wildlife biologist at Patuxent from 1940 to 1985—determined that star-shaped man-made islands are more suitable for bird nesting than oval islands, a management principle now accepted

on refuges and state and private lands nationwide.

- In 1966, Patuxent’s Chandler Robbins launched the North American Bird Breeding Survey, which monitors avian status and population trends. Robbins is credited with banding more than 190,000 birds during his career.
- In the 1970s, Patuxent scientists helped develop captive rearing and releasing techniques for bald eagles and California condors.
- Today, the refuge rears whooping cranes, sea ducks, screech owls and kestrels for species recovery or research purposes. The first whooping crane hatched in captivity at Patuxent in 1975.

The refuge “is one of a kind. Not only does it provide habitat for wildlife in a huge urban area, it also is a research lab for here and the rest of the country,” says Baldacchino. “Former senator [Paul] Sarbanes used to call us ‘the lungs of the Baltimore-Washington corridor.’ ”

Yes, the refuge is that—with its forest, meadow and wetland habitats. But for three-quarters of a century, it also has been the conservation brains of the corridor. 

Focus... Wildlife Biology in the 21st

Sharing Rigorous Science Is the Key to Success

By Grant Harris

Novel technologies such as LiDAR (light detection and ranging) and unmanned drones will advance wildlife management on national wildlife refuges in coming years. Despite these innovations and other trends in wildlife biology, I am pulled back to the basics. If refuges truly seek targeted and lasting management impacts, scientific processes must lead. Embracing science is theme number one.

Committing to science means increasing scientific capacity and following scientific approaches. For this, the Refuge System raised the bar with its Inventory and Monitoring (I&M) initiative. I&M boosts project design, implementation, analysis and reporting. We use transparent and defensible approaches. Science guides management, building iterative and adaptive processes. We identify knowledge gaps, define research agendas, and describe why our work is important. Instead of data mothballed in closets, they are stored electronically in intuitive, accessible formats.

As a result, we make better decisions and fewer mistakes. We reinforce our reputation as the world's most effective and credible wildlife management agency.

Our commitment to science links four related themes: landscape-scale perspectives, relevancy, triage and collaboration. Let's take each in turn.

First, refuges strive to conserve species and habitats. Many refuges are small. The ecological drivers determining the status of species and habitats occur outside them. Conserving refuge resources requires landscape-scale perspectives and building an ecosystem context. This means understanding the status of species and habitats on and off refuges. Such information helps refuges identify ways to make the greatest contributions to the ecosystem's most pressing issues.

In the process, refuges gain a clearer understanding of threats to the resources they manage, and how to react. The stressors include habitat fragmentation,



Could what the Refuge System learns about deterring mountain lion predation benefit leopards and lions in Africa? (Larry Moats)


transportation corridors, energy extraction, urbanization and sprawl. Appropriate responses involve preserving large areas, minimizing fragmentation, building landscape connectivity and generating biological redundancies. These approaches inform refuge planning and realty acquisitions. They also abate the effects of climate change.

Second, the Refuge System must increase relevancy and reach. Our work should incorporate other agencies, international issues and public engagement. For instance, the National Park Service performs I&M in parks, where land is rarely altered. These data could form controls for I&M on refuges, where land is actively managed. In such an arrangement, the Park Service gains greater knowledge of which variables drive ecosystems and how they operate. Meanwhile, our I&M increases in scope and influence.

Refuge efforts can advance international conservation. For example, we're using new techniques to estimate the abundance of animals without marks. Such species lack unique patterns of spots or stripes, making them hard to identify. These techniques estimate numbers of elk, and apply to endangered Andean cats or duikers elsewhere. Similarly, we're exploring ways to deter mountain lions from unwanted predation, such as killing livestock. If successful, these methods could reduce deaths of African lions and leopards.

Our efforts will fail if they lack public support. Refuges must increase exposure and engagement. One approach is to work where people already are. Imagine McDonald's endorsing endangered species on Happy Meals. Pretend that picturesque murals of refuges adorn the walls in Wal-Mart's sporting goods section. Refuges have neat stuff. Let's show it.

Third, the U.S. Fish and Wildlife Service tries to save everything. I worry that it can't. Hence, I see many species on life support. We have to triage. This means addressing fixable issues and abandoning losing bets. Does triage admit failure? No. It addresses reality.

Lastly, collaborations are key. Building them is akin to assembling a puzzle. The Service and partners are the pieces. Be it inventory and monitoring, landscape-scale conservation, relevancy or triage, the pieces must assemble for efforts to be targeted, effective and lasting. The days of separate agencies, or units within an agency, holding small, umbrella management plans are over. I welcome the time when everyone shades under one canopy plan covering ecosystem-wide issues. Each partner has a hand holding up the awning—working together—making genuine, on-the-ground advances. 

Grant Harris is chief of biological services for the Southwest Region.

Two LCCs Help Gauge Sea-Level Rise at Five Refuges

By Bill O'Brian

Five national wildlife refuges, the Refuge System Inventory and Monitoring program, the U.S. Geological Survey, NOAA's Tijuana River National Estuarine Research Reserve, a handful of other partners and two landscape conservation cooperatives are collaborating on a project along the California coastline that illustrates how LCCs might routinely work on a practical level in the not-too-distant future.

With guidance from Pacific Southwest Region Refuge System I&M specialist Giselle Block, the California LCC and the North Pacific LCC are teaming up on a sea-level rise modeling project at points roughly 800 miles apart along the Pacific Coast—from Humboldt Bay National Wildlife Refuge on the north to Tijuana Slough Refuge on the south, with San Pablo, Seal Beach and San Diego Bay Refuges in between.

The project, which runs through September 2013 and is expected to cost roughly \$300,000, is designed to foster “a bottom-up approach to evaluating sea-level rise effects” at a local scale relevant to the landscape level. It is doing so by developing high-resolution digital elevation models (DEMs); monitoring water levels and tidal cycles to assess local-level inundation patterns; inventorying vegetation species composition and relationship to elevation and tides; and quantifying sensitive wildlife use at all five refuges.

It would have been difficult to pull off without the two LCCs, which are part of the national network of 22 public-private partnerships designed to transcend jurisdictional boundaries and provide a holistic, collaborative, adaptive approach to conservation that is grounded in science.

Without the LCCs, “it is unlikely that we would have obtained funding to conduct work at such a broad spatial



To the endangered California least tern—which nests on beaches at San Diego Bay National Wildlife Refuge—minor sea-level rise could mean major habitat disruption. (Mark Pavelka/USFWS)

scale,” says Block. “Because LCCs work at larger spatial scales, we were able to work at sites that span the Pacific Coast using a consistent set of methods and an analytical approach.”

That consistency will provide refuge managers with information that is relevant to their immediate locale and also is applicable on a landscape level. It will permit valid ecosystem comparisons up and down California.

LCCs will help create “a common base.”

“By working with the LCCs,” says Block, “we are able to examine tidal marsh ecosystems along the entire coast, allowing us to identify major similarities and differences in elevation, plant communities and vulnerability to sea-level rise and extreme flooding events.”

Mary Mahaffy—interim coordinator of the North Pacific LCC, which is funding

the Humboldt Bay Refuge portion of the project—says the LCC concept is “important because it’s a different way of doing business than we’ve done in the past.”

LCCs, she says, “allow parallel efforts among agencies to work together on environmental stressors that are too great for any one agency or organization to do alone.” LCCs will help create “a common base” and deliver science information and tools to managers so they can make more informed decisions 10 to 25 years out.

Two major benefits of this project, according to San Diego Bay Refuge manager leader Andy Yuen, are its level of detail and its permanence. Unlike SLAMM (Sea Level Affecting Marshes Model), which Yuen called “more of a broad brush” that uses existing data, this study is collecting new data and “taking it down to a new level of detail”—to an individual-parcel scale. Furthermore, he says, this project is “putting in

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Focus... Wildlife Biology in the 21st

Adaptive Management = Science + Decision-Making

By Bill O'Brian

The language of the cutting-edge decision-making process known as “adaptive resource management” is confusing. Many terms involved—“16x16 transition matrices,” “utility functions,” “iterative phase” and “Bayes Theorem”—can be downright intimidating to the uninitiated.

But adaptive resource management is increasingly popular as a framework for projects on national wildlife refuges and elsewhere, so it's probably high time to let Sara Vacek demystify the concept.

Vacek—a wildlife biologist at Morris Wetland Management District in Minnesota for her entire 10-year U.S. Fish and Wildlife Service career—echoes what an instructor once told her: Adaptive resource management is “learning through management and adjusting management action based on what you learn.”

Imagine a continuum, Vacek says. On one end is trial-and-error problem-solving. On the other end is scientific research in which the whole point is simply to learn. “Adaptive resource management is right in the middle between those two,” she says. “It’s a way to combine science and management effectively.”

Vacek, several other Service staff members and U.S. Geological Survey scientists are utilizing the technique on a massive native prairie management project. The conservation effort, which involves 20 Refuge System field stations and 120 management units in the Prairie Pothole Region, is aimed at controlling two invasive grasses—smooth brome and Kentucky bluegrass—using various forms of disturbance, including prescribed fire, grazing and haying.

Vacek and Service employees Kim Bousquet, Pauline Drobney, Vanessa Fields, Bridgette Flanders-Wanner and Todd Grant displayed a science poster

about the project at last summer's *Conserving the Future* conference. The poster's title is a mouthful—“An Adaptive Approach to Invasive Plant Management on Fish and Wildlife Service-Owned Native Prairies in the Northern Great Plains: Decision Support Under Uncertainty.”

Its content is a bit technical. However, it gets to the essence of adaptive resource management—which is to use probability models to forecast outcomes of various conservation options.

The adaptive management framework requires a conservationist to make a systematic prediction of what's likely to happen *before* acting. It also requires conservationists to periodically reexamine and revisit decisions within an established time frame.

The adaptive management pattern is: action, monitor, model ... possibly new action, re-monitor, re-model ... repeat. The result, says Vacek, is more certainty than with traditional trial and error.

“The thinking is that the less blind flaying around that you do, the more efficient you'll be,” says Vacek, who appreciates the Prairie Pothole invasive grasses project's adaptive management approach. “I hope I'm not biased, but I feel that this is the first one where we're kind of getting it right.”

USGS scientists and Service biologists in the field have been working together from the start, and communication among them has been an ongoing conversation rather than periodic



An adaptive resource management approach is helping native plants like these at Morris Wetland Management District in Minnesota thrive in the Prairie Pothole Region. (J.B. Bright/USFWS)

one-way communication. In addition, Vacek says, adaptive management is “a good way to be more transparent—transparent to my boss, to his boss and to the American public.”

Adaptive management can be challenging, she acknowledges, “but mostly because it's a new way of thinking that we're not used to.”

At the moment, there is another minus from the Service perspective: a dearth of statistics-savvy personnel capable of building probability models. The invasive grasses project model, for instance, was developed by the USGS.

Still, Vacek sees adaptive resource management as a wave of the future because it merges science and management to the benefit of both.

“I always hear a lot of talk about refuge managers making science-based decisions,” she says, “but this actually *is* incorporating science into our decisions.”

To see a depiction of the Prairie Pothole Region invasive grasses project, go to <http://AmericasWildlife.org/conference/science> and look for poster No. 16.

Using DNA Barcodes to Inventory Insects

By Matt Bowser

On four gloriously sunny days in June, a small team of entomologists convened at Kenai National Wildlife Refuge to do what entomologists do best: collect insects.

They had come to take part in a rapid ecological assessment of arthropod biodiversity in which as many species as possible are collected in a short time. The goals were twofold: to augment the list of arthropods known to live on the refuge and to build a corresponding library of DNA barcodes for those species. The project blends old-fashioned collecting in the spirit of 19th-century explorers with modern DNA work.

The whole idea is to work myself out a job.

Though the ecological importance of insects is plainly evident and their quick responsiveness to environmental change makes them ideal candidates as indicators of habitat quality, the trouble with insects is that they are hard to identify.

It took years to sort through more than 15,000 specimens collected from 2004 to 2006 as part of the refuge's Long Term Ecological Monitoring Program, and many remain unidentified today. If insect diversity is to be monitored feasibly, this identification problem must be surmounted.

Our plan at Kenai Refuge is to take bulk samples of hundreds of insects, liquefy them in a blender, extract the insects' DNA from the slurry, and—using a next-generation DNA barcoding method—obtain a list of species present in the sample.

DNA barcoding is the use of a short section of DNA for species identification, not unlike recognizing products in a store by their barcode labels. This method will make monitoring of insects much more manageable by eliminating the tedious task of sorting and identifying them

using forceps, microscope and identification keys.

However, this next-generation method requires that a library of DNA barcodes from known specimens be established first. Otherwise, barcodes obtained from a slurry of pulverized insects are nothing more than barcodes. We began building this library last winter by sequencing specimens

already in Kenai

Refuge's entomology collection, but the collection included only 208 species, just a small portion of the refuge's arthropod diversity. In June, we sought to build on the collection.

All-Star Team

With help from an all-star team of four Alaska entomologists, we scoured the refuge, visiting as many habitats as possible in four days. We surveyed the forest, muskeg and lakeshore near refuge headquarters. We toured habitats along Skilak Lake's shore. At Emerald Lake, we sampled the subalpine thickets, meadows, waters and alpine habitats.

We employed various collecting methods (sweep nets, beat sheets, aerial nets, malaise traps, pan traps, sieves, aquatic nets, streamside washing) and searched by hand under stones, logs and bark. Each of us focused on the methods and insect groups we knew best.

I have since begun cataloging the many vials, bags and containers of insects we obtained. I don't yet have a reliable estimate of the number of specimens and species we collected. I can say it was at least thousands of specimens,



Derek Sikes, curator of insects at the University of Alaska Museum, collects and records insects as part of a leading-edge project at Kenai National Wildlife Refuge. (Matt Bowser/USFWS)

representing probably hundreds of species. Incidentally, we found a northern holly fern near Emerald Lake, a plant species not previously recorded at Kenai Refuge.

The insect specimens will be sorted and mailed to specialists for identification. This winter, the specimens will be sent for DNA barcoding. Specimen data from this project is being posted on the Internet in near-real time via the Arctos database (http://arctos.database.museum/knwr_ento).

As we obtain DNA barcodes, they will be deposited in the National Center for Biotechnology Information's GenBank, where they will be useful not only to Kenai Refuge but also to any study using DNA barcodes to identify insects. Our efforts will allow national parks, national forests and other refuges to rapidly assess insect diversity on their respective pieces of Alaska. 🦋

Matt Bowser is an entomologist at Kenai National Wildlife Refuge. This article originally appeared in the Peninsula Clarion newspaper on Aug. 5, 2011.

Focus... Wildlife Biology in the 21st

Cultivating the Human Dimension

By Natalie Sexton

Comprehensive wildlife management demands the integration of science across disciplines. To achieve its mission, the National Wildlife Refuge System requires an intimate understanding of ecology and coordinated monitoring of systems. Most biologists and managers are comfortable in this biophysical realm. However, refuge management requires an equally intimate understanding of the social and economic drivers of these systems—the “human dimensions.”

Human dimension issues are not new. “Most game managers profess that wildlife management is also people management, with the human element possibly dominant,” stated a 1971 North American Wildlife and Natural Resources Conference paper. “More research is needed on human behavior aspects of wildlife.”

From isolated discussions in the 1960s and '70s about human-bear conflict to the front-and-center uproar over the northern spotted owl in the 1990s, human dimension issues have been evident. Today, the National Environmental Policy Act (NEPA) mandates that the human dimension be addressed when “economic or social and natural or physical environmental effects are interrelated.” The National Wildlife Refuge System Improvement Act requires priority public uses and coordination with landowners.

Beyond the mandated “have to” of addressing human dimension issues, there are many good reasons to “want to.”

Refuge managers should want to ask: Who are the key stakeholders using the refuge and interested in its management? What is the relationship between the refuge and the local community? How satisfied are users with current services and recreational opportunities? What are visitors' and residents' desire for future offerings or management changes? How well do visitors, residents and other



The Refuge System plays a special role in connecting future generations to America's rich natural heritage. Here, a curious girl and her mother enjoy J.N. “Ding” Darling National Wildlife Refuge in Florida. (Steve Hillebrand)

stakeholders understand the refuge and its management? What are the refuge contributions to the local economy (from refuge staff/operational activities and visitor spending)? What is the overall economic value of the refuge to visitors and the public?


Surveys, stakeholder assessments and economic modeling/analyses can be used to better understand the human dimension. So can the Department of the Interior's Economic Contributions 2011 report and secondary data sources such as the Census Bureau; the Bureau of Economic Analysis; Service Banking on Nature reports; and the National

Survey of Fishing, Hunting and Wildlife-Associated Recreation. And NCTC is planning a broadcast series about the human dimensions of natural resource conservation.

More than 40 million people per year visit refuges. Their needs, and those of community residents, can be overwhelming as refuges strive to provide quality wildlife-dependent public use.

But a public active in wildlife-based recreation represents an important pillar of the North American Model of Wildlife Conservation. Outdoor enthusiasts contribute to wildlife management through financial support, advocacy work and volunteer efforts. An involved citizenry championing for wildlife has been one of the greatest forces in our nation's conservation success story.

Additionally, the Refuge System plays a special role in connecting youth to America's rich natural heritage. A refuge visit can instill a lasting passion for wildlife and wild lands. A carefully designed set of amenities, services and recreational opportunities helps make these connections possible. To ensure continued public support, it is important to understand the characteristics, experiences and economic impacts of these contingents.

Consideration of the human dimensions of management and planning *does not* compromise the capacity to do what is best for wildlife. On the contrary, this information allows managers and planners to make more evidence-based decisions that are grounded in science so that the Refuge System mission can be accomplished *and* public support for these conservation lands can be ensured. 

Natalie Sexton of the U.S. Geological Survey Policy Analysis and Science Assistance Branch in Fort Collins, CO, has worked with Refuge System staff on 20 comprehensive conservation plans (CCPs).

Sustainability Through and Through

By Mary Tillotson

For 25 years, since Tim Bodeen was a biology major at the University of Wisconsin-River Falls and Kelly Cain was a professor of environmental sciences and management, the two men have shared a passion for conservation.

Today, that shared passion is manifesting itself in how Malheur National Wildlife Refuge is being managed in the high desert of southeastern Oregon.

Bodeen is Malheur Refuge manager. Cain is still at the university in Wisconsin, where in 2007 he established the St. Croix Institute for Sustainable Community Development. Together, they are making sustainability a guiding principle of the refuge's comprehensive conservation plan (CCP).

Bodeen concedes "sustainability" is a short-hand term that may have "15 different definitions, depending upon who is doing the defining." And, he acknowledges, sustainability is incorporated to greater or lesser degree in many refuges' CCPs. But in the Malheur Refuge CCP—which is scheduled for public comment late this fall—sustainability is *central*.

To Bodeen and Cain, sustainability means setting conservation goals for the present that enhance the conservation goals of the future, and even enhance the sustainability of public support for the National Wildlife Refuge System itself.

In 1908, when Malheur Refuge was established by President Theodore Roosevelt as a preserve and breeding ground for native birds, conservation goals were relatively simple and localized: Establish boundaries within which native species are left alone to thrive. The best available modern science, says Cain, suggests much broader questions for conservationists—regional, national, even global questions about water control and allocation, reliance on imported

fossil fuels, and climate change. Malheur Refuge's CCP attempts to address those questions insofar as one refuge can.

For example, it will be the daunting goal at Malheur Refuge to produce *more* energy than maintenance of the property requires. Malheur Refuge encompasses 120,000 acres of wetlands, six dams and 1,000

water control structures by which water level is manipulated. In a refuge that stretches 70 miles from end to end, Bodeen says, "calling a staff-meeting may mean asking people to drive 45 miles to refuge headquarters." The biggest part of his budget is for energy—for utilities, transportation and equipment.

Innovative Ideas

A few simple fixes—more fuel-efficient vehicles, better insulated buildings—can help reduce energy consumption. But more innovative ideas are under review for inclusion in the CCP.

Bodeen and Cain say the refuge could possibly produce more energy than it currently consumes by generating solar power ("We have about 300 days of sunshine a year!" says Bodeen), by harvesting invasive carp to produce methane for fuel, and by macerating the solid-liquid carp byproduct of the methane production for local use as fertilizer.

The refuge is collaborating with numerous entities (the Burns Paiute Tribe, the Harney County Chamber of Commerce, local farmers, recreational groups to name a few) to craft its long-range plan for environmental conservation.




Malheur National Wildlife Refuge is making sustainability a guiding principle of its comprehensive conservation plan (CCP) from the start. Here, a birdwatcher enjoys the view on the refuge. (George Gentry)

Too many people, says Cain, have supposed the Refuge System exists to benefit native animals and plants without equal consideration for the local communities ("stakeholders") in which the refuges exist.

"But we could send that carp fertilizer to local greenhouses, farmers," he says enthusiastically. "We could use profits to subsidize local education, training programs."

And it's not just Malheur Refuge that holds the promise of producing energy and profits for neighboring communities, he says. Refuges are rich in possibilities for wind and solar power, natural gas production. "They have phenomenal natural resource assets!"

"Unless the Fish and Wildlife Service demonstrates how it's relevant to solving the problems of the local communities in which it's embedded, it risks becoming irrelevant," says Cain.

In other words, it risks becoming unsustainable. 

Mary Tillotson is a frequent contributor to Refuge Update.

Focus... Wildlife Biology in the 21st



"Patch-burn grazing" relies on cattle, coupled with prescribed burns, to target invasive plants while stimulating vegetation native to the prairie. (USFWS)

Patch-Burn Grazing vs. Invasive Plants

By Brad Dokken

In their never-ending battle against invasive plants, personnel at Glacial Ridge National Wildlife Refuge in northwestern Minnesota have pulled out some heavy hitters:

That's heavy, as in cattle—200 cow/calf pairs, to be precise.

The refuge last spring launched a four-year study to measure the effectiveness of a grazing-and-burning technique to keep invasive plants such as thistle, sweet clover and hybrid cattails at bay, according to Glacial Ridge Refuge manager Dave Bennett.

"We've used every technique we can think of to try and remove some invasives and give the upper hand to our lands seeded there—and all for the benefit of tallgrass prairie and wildlife fauna that would naturally occur," Bennett said. "This year, being that it's very wet, I would say the invasives have had the upper hand."

That's where the cattle come into play.

Bennett said the technique, known as "patch-burn grazing," relies on cattle coupled with prescribed burns to target invasive plants while stimulating native vegetation such as prairie forbs.

Bennett said Glacial Ridge Refuge, which was established in 2004, has implemented the technique on a 2,100-acre unit.

The idea, Bennett said, is that burning promotes green vegetation, which in turn attracts the cattle. Crews then burn another site, drawing cattle to the new area once it turns green.

Other sites are left untreated, Bennett said, leaving a patchwork of varying-height grasses and forbs that provide niches for different wildlife species. Species expected to benefit from this specialized management tool include upland sandpipers, marbled godwits, Wilson's phalaropes, greater prairie chickens, Richardson ground squirrels and numerous grassland songbirds.

"It's a double-whammy—burning with grazing behind it."

"It allows us to give a second dose of treatment to invasives and to give some advantage to prairie forbs that are having a hard time surviving when vegetation gets real dense," Bennett said. "It's a double-whammy—burning with grazing behind it."


Bennett said the U.S. Fish and Wildlife Service started the process with a public meeting at which local ranchers were invited to apply for the grazing program. Six ranchers applied, he said, and the Service awarded the permit to one from nearby Fertile, MN.

Before the cattle could be introduced, refuge crews had to fence the site, Bennett said. Cattle were released on May 20 and stayed on the refuge until late September.

Cattle will be on the land for the next three summers, and the refuge plans to burn one-fourth of the 2,100-acre area every year, Bennett said. He said the area is divided into 60 study plots, which refuge biologists are monitoring to see what's growing and whether the technique is reducing invasive plants.

"Our purpose at the refuge is to manage for the benefit of plant species and wildlife that are indigenous to our area," Bennett said, "so we have to show or prove that the techniques—whether burning, mowing, grazing or a combination of those—are in fact favoring the desired species."

Bennett said patch-burn grazing has been used quite extensively on federal lands in Kansas and Oklahoma and on a smaller scale in southern Minnesota. In northwestern Minnesota, though, the technique is fairly new.

"It's kind of an exciting tool to look at," Bennett said. "I know other people are watching over our shoulders, in the Fish and Wildlife Service and other agencies, to see the results." 

Brad Dokken is a reporter for the Grand Forks (ND) Herald, in which this article originally appeared on Aug. 14, 2011.

Monte Vista Refuge's Pilot-less Project to Survey Cranes

By Floyd Truetken

A multi-agency project last spring at Monte Vista National Wildlife Refuge in southern Colorado pioneered the use of unmanned aerial drones to survey sandhill crane populations.

Sandhill cranes are large, spectacular, awe-inspiring birds. Many birders know of the cranes' migration through Nebraska each spring. A lesser-known migration occurs in the Rocky Mountains. Each spring as many as 24,000 cranes stop at Monte Vista Refuge, where they congregate in meadows to feed and replenish critical fat reserves en route to nesting grounds in Montana, Idaho, Utah and Wyoming.

To track the health of the species and establish guidelines for hunting season bag limits, the U.S. Fish and Wildlife Service measures the crane population using aerial and ground surveys.

At Monte Vista Refuge, the U.S. Geological Survey for the first time used a small, unmanned, hand-launched RQ-11A Raven aircraft to survey cranes. The Raven uses thermal, infrared or traditional daytime videography imaging to "film" low-level targets, such as flocks of birds on a refuge. USGS obtained the Raven from the Army under a memorandum of agreement. The project was overseen by a team of 20 individuals that included USGS staff, the Department of the Interior Aviation Management Directorate, current and retired Service biologists and refuge staff.

Before the experiment could begin, a major hurdle had to be cleared. The Federal Aviation Administration had never authorized drone flights for wildlife surveys. To enable the low-level, 400-foot-above-ground-level (AGL) flights to go forward, the FAA would need to waive its advisory requiring flights over refuges to be at least 2,000 feet in altitude. After months of planning by the team, the FAA approved "proof of concept" daytime-only flights.

Monte Vista Refuge then issued a special use permit authorizing the USGS to conduct flights to determine the Raven's suitability for use in crane population surveys. The team selected the peak period for cranes at the refuge, March 19-27, as the optimal time for flight operations. But two concerns remained.

The first was visitor safety. To minimize risk, Raven flights were conducted only in areas closed to the public; refuge law enforcement closely controlled access.

The second concern was for the birds. Because cranes react immediately to low-flying raptors and eagles, which are common in spring, biologists speculated that daytime low-level Raven flights would cause the cranes to flush. If such flights had consistently frightened birds from feeding and roosting areas, the project would have been a "no-deal." Fortunately, several mid-day test flights at altitudes from 100 to 400 feet AGL showed no consistent adverse crane reaction. The biologists were satisfied that potential benefits of the survey technique far outweighed minimal disturbance to the cranes.


After two days of more testing/operator training, early morning flights were conducted over crane roosting sites. Using the thermal-imaging camera, the Raven easily picked up heat signatures from roosting groups, and, in the dawn hours, the cranes showed absolutely no reaction to the drone. After software stitched imagery together, Raven crane



Mark Bauer of the U.S. Geological Survey prepares an unmanned RQ-11A Raven aircraft for launch as part of a project to survey sandhill crane populations at Monte Vista National Wildlife Refuge in Colorado. (Floyd Truetken/USFWS)

estimates were compared to a ground count performed by Service biologists. At one roost, biologists counted 2,692 cranes, while the Raven imagery showed 2,567—a difference of just 4.6 percent.

The flights were successful on many levels. They were the first unmanned drones approved by the FAA for the Interior Department. They demonstrated the technology's potential to support highly accurate biological surveys in a safe, cost-effective manner. They laid the groundwork for refining survey techniques and securing future FAA approval to conduct flights at night, when cranes roost in tighter groups.

The Raven and similar unmanned aerial vehicles hold great promise not only for wildlife censuses but also for wetland delineation and easement enforcement, drug interdiction and detection, and monitoring of remote areas. 

Floyd Truetken was refuge manager at Monte Vista National Wildlife Refuge until this summer. He is now refuge manager at Bitter Lake Refuge in New Mexico.

Two LCCs Help Gauge Sea-Level Rise at Five Refuges — continued from page 11

permanent benchmarks, so we'll be able to precisely measure sea-level rise" for years to come.

Beyond that, says Block, the Refuge System I&M program will use the project's data and findings "to support the needs of refuges relative to sea-level rise, specifically subjects such as adaptation planning and climate monitoring. They will also be used to identify how best to approach modeling in the future and at other estuarine refuge holdings along the Pacific Coast."

All of this is crucial because, says Yuen, many of his refuge's species—including the endangered California least tern, the endangered light-footed clapper rail and the threatened western snowy plover—live and nest on "on beaches that are inches to feet above sea level." 🦋



Humboldt Bay National Wildlife Refuge in northern California is taking part in a landscape conservation cooperative-facilitated study of sea-level rise. (Tupper Ansel Blake)

Two Individuals, One Group Honored in Three National Realty Awards — continued from page 2

corporations, public agencies and their employees or volunteers outside the Service, for contributions to land protection for fish and wildlife resources in partnership with the Service.

Elias helped pave the way for legislation that led to a memorandum of agreement between the Secretaries of the Navy and the Interior regarding the transfer of Skaggs Island to the Service. The legislation also allowed the Navy to utilize available state funding for removal of infrastructure to facilitate the transfer.

"Ms. Elias worked diligently with the Service, California Department of Toxic Substances Control, Bay Conservation and Development Commission, California Department of Transportation, nonprofit organizations and private landowners to ensure the cleanup was complete and that repairs to pumps and other infrastructure were accomplished prior to transfer," San Francisco Bay National Wildlife Refuge Complex project leader Mendel Stewart said. "Without her efforts, we do not believe this transfer would have been successful."

Land Legacy Award

The Service/Refuge System Cadastral Data Working Group received the Land Legacy Award.

The group, led by former Service chief cartographer Doug Vandegraft and current chief cartographer Sean Killen, is composed of a fluid roster of geographers, biologists, cartographers, surveyors and IT professionals. The names of the individuals who will be honored had not been finalized as *Refuge Update* went to print, but the group en masse was cited for developing and deploying the FWS Lands Mapper.

The Web-based Lands Mapper is designed for use by non-geographic information system (GIS) specialists. It provides detailed topographical, street and aerial views of refuge boundaries, trails and roads nationwide, complete with latitudinal/longitudinal coordinates. It also can display comprehensive acquisition information about individual refuge tracts.

The Lands Mapper is available to Department of the Interior employees

using work computers at http://gis.fws.doi.net/FWSLands_Mapper. 🦋

After a Year's Delay, Marsh Project Is Completed

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Potential recreational uses for the marsh will be outlined in the Bandon Marsh Refuge's draft comprehensive conservation plan (CCP), due out next spring, but a new 600-foot nature trail already gives pedestrians access to two small tidal channels leading into the marsh.

And for Lowe, the restoration is the crowning jewel of his 34-year Service career because, he says, "when you restore a tidal marsh, it's forever." 🦋

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

Using Nature to Heal Young Lives at Sherburne Refuge

By Heather Dewar

Single mom Mandy Belille knows her oldest, 8-year-old Evan, missed some important early lessons on responsibility and respect—for other children, for nature, for himself. “He didn’t get the respect from me that he should have,” says Belille. “I pawned him off on my mother while I was off doing my dirty deeds.”

Belille, 30, is a recovering methamphetamine addict who has endured a year in jail and a winter of homelessness. She was pregnant with her second son, Gunnar, now 3, when she got clean and sober four years ago. Now the family lives at Belle Haven Town Homes, a 16-unit complex in Princeton, MN, for parents with a history of substance abuse, a track record for staying clean and children school-aged or younger.

Belille’s youngest, 22-month-old Gracie, has never seen her mother use drugs or alcohol. But Gracie and her brothers had never seen a nature trail or a wildflower meadow, either.

That changed in June, when Sherburne National Wildlife Refuge, its Friends group, the local United Way chapter and the nonprofit Rum River Health Services joined forces to host the first Sherburne Refuge Explorers Camp. Thirteen kids ages 3 to 13—plus two parents and Gracie, the baby of the group—signed up for the four-day camp. All came from families scarred by substance abuse.

The children saw an eagle’s nest, a field of blooming lupines, some minnows, a snake, and a snapping turtle. They picked up a toad (“Oh! He peed on me!”), met a firefighter and hunted for bugs.

Guided by environmental educator Dave Ellis of the Prairie Wetlands Learning Center, the kids wrote in their first nature journals, took their first nature photographs and planted their first wildflower seeds. And, if the program works as planned, they planted the seeds of a healing relationship with nature.

“The children we deal with spend the majority of their life in survival mode,” says Mica Zimmer, Rum River Health Services’ family advocate. “We wanted to show them that they can enjoy life.”

“The Kids Loved It”

The camp began with a conversation between Sue Hix, president of the Friends of Sherburne, and Joy Nadeau, executive director of the Sherburne County Area United Way. Nadeau wanted to try a summer camp teaching life skills to help steer children away from substance abuse. Hix was enthusiastic and suggested working with the Rum River Health Services clients. With guidance from U.S. Fish and Wildlife Service environmental education professionals, Hix, Nadeau and Zimmer devised a curriculum.

Camp began each morning in Zimmer’s office with exercises on sharing, responsibility, respect and teamwork, and then moved to the refuge.

“We all contributed different things,” Hix says. Sherburne Refuge visitor services manager Betsy Beneke and other employees provided support, made copies and lent field tools. The Midwest Region contributed Ellis’s time and that of intern Lionel Grant. Hix and Nadeau volunteered as camp counselors. The Friends sponsored a pre-camp workshop. The United Way provided T-shirts, snacks, water bottles, compasses and toy turtles. The camp’s total cost was less than \$500, Hix says.

“We’re developing a model that other refuges and Friends groups could use,” she says. “The kids loved it.”



Cameras in hand, three Sherburne Refuge Explorers hit the trail on the Minnesota refuge. (Sue Hix/Friends of Sherburne)

Belille said her children “were excited to get up every morning and go to camp,” and she thinks they learned important lessons, including how to respect nature. Along with other Rum River campers, they return to the refuge regularly to help pick up trash along trails and ponds. Hix and Zimmer say they would love to repeat the camp next year. And Beneke says the group is welcome to return.

“We were so happy to host these families as they learned about the natural world together, creating new, healthy experiences and bonds with each other,” Beneke says.

To refuges and Friends groups considering a similar program, Zimmer says: “Go for it. It takes a lot of work and a lot of patience, but it’s so, so worth it.”



Heather Dewar is a writer-editor in the Refuge System Branch of Communications.

Around the Refuge System

Hawaii

In an effort to save critically endangered Nihoa millerbirds from extinction, researchers released 24 birds on Laysan Island in Papahānaumokuākea Marine National Monument on September 10 after the birds were captured on and transported from Nihoa Island. The release was the result of years of research and planning by biologists and resource managers, led by a partnership between the U.S. Fish and Wildlife Service and American Bird Conservancy. Millerbirds have been absent from Laysan Island for nearly 100 years after a related subspecies went extinct in the early 20th century. As part of a decades-long restoration effort, the translocation restores this insect-eating songbird to Laysan Island's ecosystem. The project "will reduce the chances that catastrophic events such as hurricanes or the introduction of invasive predators will extirpate the species, since there will be independent populations of millerbirds on two islands, 650 miles apart," said Loyal Mehrhoff, field supervisor for the Pacific Islands Fish and Wildlife Office. Each bird carries a unique combination of colored leg bands to allow identification in the field. Biologists plan to remain on Laysan Island for a year to monitor the birds' movements, behaviors and possible nesting attempts.

Nevada

A Friends of Nevada Wilderness full-time seasonal crew of four people—with periodic help from roughly 100 volunteers—removed approximately 75 miles of unneeded barbed-wire fence from Sheldon National Wildlife Refuge last summer. Funded by a grant of about \$17,000 from the Wildlife Conservation Society and using equipment provided by the Service, the fence removers worked at a rate of about $\frac{3}{4}$ of a mile per day on the high desert refuge's sagebrush-steppe landscape. According to Service maps, there originally were about 175



Two dozen endangered Nihoa millerbirds were released on Laysan Island in Papahānaumokuākea Marine National Monument as part of a project led by the Service and American Bird Conservancy. (R. Kohley)

miles of fence on Sheldon Refuge. About 41 miles of it had been removed before last summer by volunteers from various conservation organizations. Shaaron Netherton, the executive director of Friends of Nevada Wilderness, hopes that her group will be able to oversee the removal of the remaining 58 miles of fence next summer. The removal of fence that dates from the land's cattle grazing days is important for movement of pronghorn, bighorn sheep and other wildlife. It also reduces fence collisions that often are fatal to sage-grouse and eliminates perches for avian predators of the grouse.

Alaska

The Arctic National Wildlife Refuge this fall has been collecting public comments on its draft comprehensive conservation plan (CCP) and environmental impact statement (EIS). The draft plan, which was publicly released in mid-August, contains six alternatives for long-term management of the iconic refuge. The alternatives range from continuation of current practices to the designation of three geographical areas—including the Arctic Refuge coastal plain—for potential

inclusion in the National Wilderness Preservation System, and the potential designation of four additional Wild and Scenic Rivers on the refuge. Numerous public hearings in Alaska and at least one Congressional hearing in Washington, DC, have been conducted about the draft plan, which is available at <http://arctic.fws.gov/ccp.htm>. Public comments were being accepted through Nov. 15.

QDMA Honors the Service

The Quality Deer Management Association (QDMA), a nonprofit organization dedicated to ensuring a high-quality and sustainable future for white-tailed deer and deer hunting, named the U.S. Fish and Wildlife Service as its Agency of the Year. It is the first time the award has gone to a federal agency. The QDMA cited the Service for three achievements: establishment of a wildlife management cooperative on public and private lands surrounding Noxubee National Wildlife Refuge, MS; participation in a private-public study involving Sherburne Refuge, MN, about how urbanization affects management and hunting of white-tailed deer; and support for a first national symposium

on white-tailed deer, scheduled for early 2013. Larry Williams, then-Refuge System budget chief who recently became field supervisor at the Ecological Services Field Office in Vero Beach, FL, accepted the award for the Service at the QDMA annual conference in Nashville, TN, in August.

Maine

Half a dozen conservation entities, more than 600 individuals and the Service have collaborated to raise \$5.125 million to purchase a parcel of undeveloped coastal land for Rachel Carson National Wildlife Refuge. The Trust for Public Land (TPL) announced in early October that it, the Kennebunkport Conservation Trust, Maine Coast Heritage Trust, the Friends of the Rachel Carson National Wildlife Refuge and the Service have secured \$3 million from the federal Land and Water Conservation Fund and \$200,000 from the National Fish and Wildlife Foundation toward the purchase of 97 acres on Timber Point, where the Little River meets the Atlantic Ocean. The remaining \$1.9 million came from individual contributors, according to the TPL. Rachel Carson Refuge includes 11 divisions that total roughly 5,300 acres along 50 miles of the Maine coast. The Timber Point deal is expected to close this fall. Once it does, the land will become part of the refuge's Little River Division. It includes 20 acres of fields with nesting bobolink, 15 acres of wetlands that support nesting common eider, adjacent forest and two miles of shore land with feeding dowitchers, dunlin, least sandpipers, plovers and yellowlegs, according to refuge manager Ward Feurt.

Wyoming

National Elk Refuge took ownership of the Jackson Hole & Greater Yellowstone Visitor Center on Aug. 13 at an event that honored the Grand Teton Association, which purchased the visitor center building in 1998 and paid off the mortgage in July. The building

Virginia



During Hurricane Irene late this summer, a modern-era training mine washed up on the beach at Chincoteague National Wildlife Refuge. Refuge law enforcement and Department of Defense personnel secured the area and determined the mine did not pose a safety hazard. It has since been removed from the site. (USFWS)

was formerly owned by the Wyoming Department of Transportation, which offered to sell it to the refuge in 1995. Unable to afford the purchase and facing the prospect of the building's removal, the Service approached the GTA about buying the building in partnership with the refuge. The GTA bought the building for \$800,000 in 1997 with a written intent to donate it to the refuge when the mortgage was paid. Through proceeds from the sale of informational materials to visitors at the center, the GTA was able to pay off the building at an accelerated rate. Refuge manager Steve Kallin and GTA board chair Clay James put a symbolic close to the donation ceremony by tearing up the mortgage.

Southeast Region

Three portable interpretive exhibits about sea-level rise and climate change made their debuts at J.N. "Ding" Darling Refuge in Florida, the Southeast Louisiana Refuge Complex and Waccamaw Refuge in South Carolina this fall. More than 67 of the Southeast Region's 130-plus refuges are considered at risk from sea-level rise. The identical

exhibits display those 67 on a map. There is a child-friendly interactive component to the exhibits, too—a video screen that introduces four animated characters: a loggerhead turtle, an oystercatcher, a grain of sand and a lighthouse. When selected, each character talks about how climate change will affect it. "The kids really get it when they watch the videos," says Ding Darling Refuge visitor services supervisory ranger Toni Westland. "They like the characters, and they understand the consequences." The exhibits also include a display that advises visitors to recycle, save electricity, plant trees, volunteer at a refuge and learn more about climate. "We're trying to leave people with a sense that there is something they could do in some small way to make a difference," says regional visitor services chief Garry Tucker. "We want to give them hope." The tentative idea for the three modular exhibits, Tuckers says, is that Ding Darling, Southeast Louisiana Complex and Waccamaw will host them and they will be lent out to other refuges upon request. 🦋

Guam National Wildlife Refuge



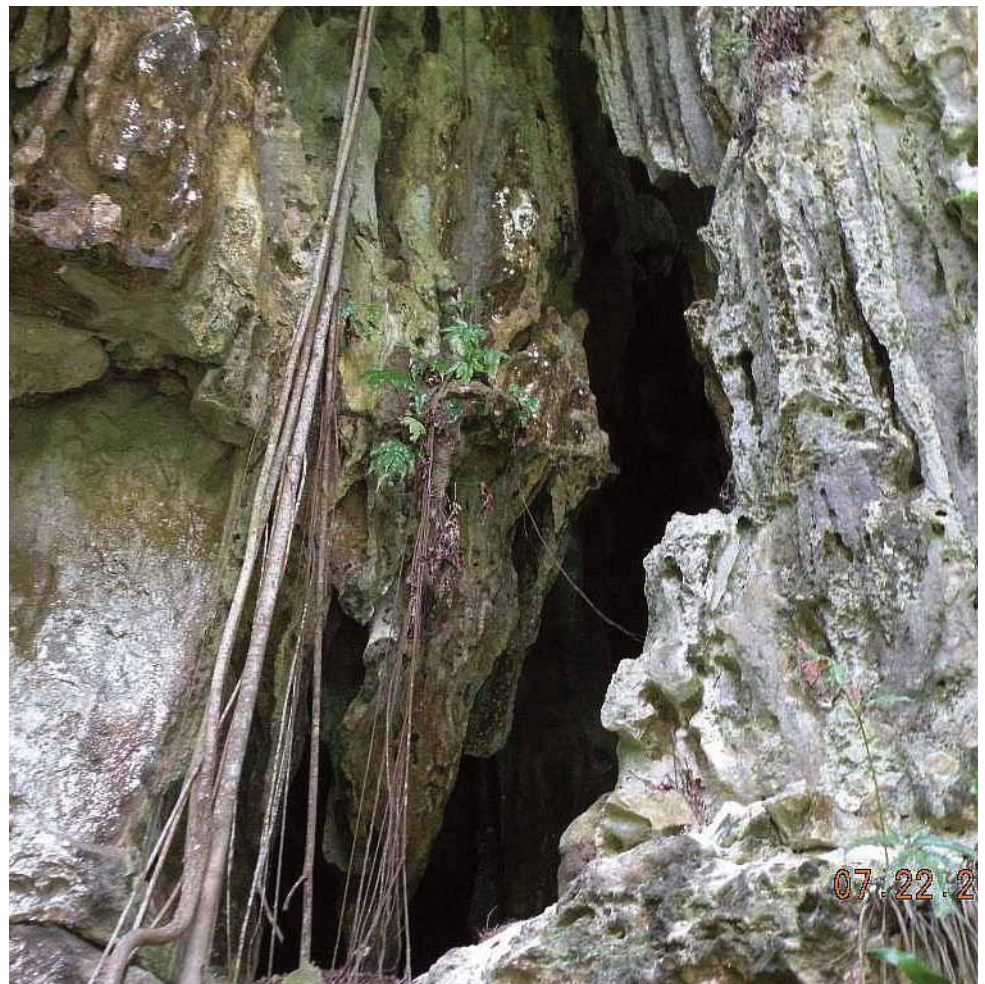
A Kids' Eye View

The images on these pages were taken by kids last summer at Guam National Wildlife Refuge's photography workshop known as Camp Shutterbug. **Clockwise from above on this page:** the red fruit of a langiti, or lipstick, tree; a volcanic outcropping at Ritidian Beach; a coconut shell with a "face" that is culturally significant to the indigenous Chamorro people; a well-camouflaged ghost crab on the beach.





Above: a hermit crab, which on Guam is called a dukduk because one can coax a crab out of its shell by holding it close and softly saying “duk duk, duk” until it emerges. **Right:** Grotto Cave, where archaeologists recently discovered a 3,000-year-old fishing camp site.



PAGE 22-23 PHOTO CREDITS:

Page 22: langiti fruit, Katherine Campbell, age 14; Ritidian Beach, Beatrice Estrella, age 11; coconut shell, Mikaela Frias, age 12; ghost crab, Tupene Baba Jr., age 10.
Page 23: hermit crab, Faith Hutapea, age 11; Grotto Cave, Carmelo Nauta, age 8.

Conservation Provocateur Brings His Message to NCTC

By Susan Morse

Randy Olson has advice for Refuge System scientists and others trying to sway public thinking on conservation, climate science or evolution: Lighten up. To engage broad audiences, he says, appeal to the heart or gut, and add a few yuks. That's heresy, coming from a fellow scientist—Olson holds a Harvard PhD in marine biology and was a tenured professor at the University of New Hampshire. But he means to provoke. And he's succeeding.

Sure, sea-level rise and shrinking habitat threaten wildlife. That's no joke. But as a Hollywood-based filmmaker, Olson, 56, sees general audiences tune out when scientists deliver the message. The problem, he says, is that scientists' love of complexity and preference for data over storytelling turns many off.

"Without humor and emotion, you won't reach the public," says Olson, whose 2009 book, *Don't Be Such a Scientist: Talking Substance in an Age of Style*, expands on this theme. According to the book, mass communicators have two goals: "arouse and fulfill." Ignore the first, and you'll fail in the second. To prevent such failure, Olson re-imagines the human body as having four main organs: the head (scientists' favorite), the heart (seat of emotions), the gut (region of instinct and humor) and the groin (sex appeal). The lower you can move a message, he says, the more you arouse an audience.

Olson took his message to the National Conservation Training Center last summer, where he spoke to 26 Service employees and others in the "Resource Management Implications for Global Climate Change" course. He showed "Sizzle: A Global Warming Comedy," a film that skewers scientists as clueless nerds. And he debated science communication strategies with George Mason University environmental policy doctoral student Karen Akerlof, leaving her to defend traditional science messaging.

In a 60-minute video interview with Service historian Mark Madison, Olson endorsed comic exaggeration to make



In a tongue-in-cheek, Randy Olson-produced public service announcement supporting marine protected areas on the California coast, actors portraying a fisherman and a game warden discuss the "record" catch of the day in 2050 when, hypothetically, overfishing has depleted the world's oceans of large fish. (Emmett Schmotkin)

serious points. He cited, as an example, his 2005 public service announcement in support of wider California fishing restrictions. In it, a fisherman brags about his catch, then holds up a string of minnows. Without controls on overfishing, the spot concludes, the scene could become reality.

The same tactic worked for the U.S. Centers for Disease Control and Prevention in Atlanta, Olson told Madison. The agency's standard disaster preparedness message drew little notice, he said, until folks recast it last spring as a wiggly "zombie preparedness campaign." Public response was so great it crashed CDC servers. Olson called the campaign "a massive success."

At NCTC, students tried the approach in drafting PSA pitches. Refuge System climate change coordinator John Schmerfeld and his team envisioned an invasive species explosion. "We had a housewife working in the yard," he says. "She's got kudzu and nutria bouncing through her flowerbed. She runs in the house, turns on the water, and zebra mussels come out of the faucet." The tag line: Invasive species are thriving

because of climate changes. Learn more (from the Service).

Olson's film "Sizzle" produced mixed reactions at NCTC. Southeast Region hydrologist John Faustini called it "contrived." But he endorsed Olson's broader message, saying, "we need to work on reaching out to audiences we don't traditionally reach."

Eva Kristofik, refuge manager at the North Mississippi Refuges Complex, liked the film. Humor helps her connect with refuge visitors, too, she said. "If they laugh, good," she said, "as long as they're getting the message. If you just preach at people, you alienate them."

Schmerfeld took Olson's point: "[His] message is that scientists need to talk more from the heart and the gut than the head. That's a difficult message for scientists to swallow, especially government scientists. But that's how our society works." 🦋

Susan Morse is a writer-editor in the Refuge System Branch of Communications. To learn more about Randy Olson's science communication philosophy, go to <http://thebenshi.com>.

Six Refuges, 21 Years, More Than 10,000 Volunteer Hours

By Jennifer Anderson

National Wildlife Refuge System volunteer Sharon Glock is the daughter of a San Antonio preacher. Helping others has been a way of life for as long as she can remember.

“We would go into poor neighborhoods and put on parades and puppet shows. We’d have the kids come to church for Bible study, singing and praying,” she says. “I can remember I would be so hoarse I couldn’t even talk.”

As an adult, Glock has turned to nature, putting in more than 10,000 volunteer hours in 21 years at six refuges.

For her dedication, she received the 2011 Take Pride in America National Volunteer Award. Take Pride in America is a Department of the Interior partnership program authorized by Congress to promote stewardship of public lands nationwide.

Glock was among 14 people or groups to receive Take Pride awards this year and be recognized at a White House ceremony.

The U.S. Fish and Wildlife Service depends on people like Glock and tens of thousands of other volunteers at refuges. From staffing visitor centers to pulling invasive weeds, “we would not be able to accomplish half of what we do if it were not for these amazing volunteers,” says Deborah Moore, national volunteer coordinator for the Service.

Since last year, Glock and her husband, Charles, have been at Buenos Aires National Wildlife Refuge in Arizona, where volunteer coordinator Bonnie Swarbrick says she nominated Sharon because of her years of service—and her personality.

“She’s bubbly, energetic, enthusiastic and always cheerful,” says Swarbrick, who describes Sharon as “quite physical,” removing sheetrock one day and digging trenches the next.

Sharon’s concern for others is impressive.

“When other volunteers leave, she throws going-away events for them,



Take Pride in America National Volunteer Award recipient Sharon Glock lives on Buenos Aires National Wildlife Refuge in Arizona with her husband, Charles, a Service maintenance worker. (Charles Glock/USFWS)

cooking up a variety of tasty goodies,” Swarbrick says. “She does this all of her own initiative.”

“I want them to feel like they were really appreciated,” Sharon explains.

The Refuge Life

Sharon’s two-decade affiliation with the Refuge System has exposed her and her family to rare experiences.

In 1991, when Charles started as a maintenance worker with Blackbeard Island Refuge, the couple moved with their three young children to the uninhabited island off the Georgia coast that is accessible only by boat.

Sharon homeschooled the children, and the family maintained the beaches and trails, gave tours and assisted boaters driven ashore by storms. Sunday nights the family stayed in a camper on the mainland so Sharon could work a 24-hour shift as a paramedic.

In 1996, Charles transferred to Mississippi Sandhill Crane Refuge, where Sharon created a filing system for photos and slides. She also helped Charles and his maintenance crews demolish old barns and houses.

From 2000 to 2008, Sharon helped out first at Wallkill River Refuge in New

Jersey and then at Montezuma Refuge in upstate New York. During this time they lost their daughter, Racheal, to a double major stroke. Their sons, Micheal and Joshua, are grown and on their own.

Sharon trained to operate heavy machinery during a two-year stay at Blackwater Refuge in Maryland. “There are not a lot of girls out there running heavy equipment,” Sharon says. But no matter—“I love it.”

In 2010, the couple made their latest move, to an old ranch house at Buenos Aires Refuge in a landscape known as Brown Canyon. They work shoulder to shoulder renovating buildings, resealing roofs, re-fencing pens for endangered species and greeting visitors.

In the isolation, they have found contentment.

“There’s no cell phone service, our closest neighbor is five miles by foot, our power is totally solar, and we get our water from a windmill,” Sharon says. “The other day we heard mountain lions fussing at each other off our front porch.”

Jennifer Anderson is a frequent contributor to Refuge Update.

Two New Refuges Are Established; Third Is Authorized — *continued from page 1*

by Secretary of the Interior Ken Salazar on September 29.

A refuge is “authorized” once its acquisition boundary has been drawn, approved and announced. A previously authorized refuge is formally “established” once the first parcel of land has been acquired or permanently protected.

The Dakota Grassland Conservation Area, which includes 1.7 million acres of grassland and 240,000 acres of wetland within its boundaries, is designed to be a model for conserving working agricultural landscapes while benefiting wildlife. The expansive conservation area is vital, Service planners say, because, at current conversion rates, half of the remaining native prairie in the Prairie Pothole Region will be converted to other uses in 34 years—and existing programs can’t keep pace.

The Dakota Grassland Conservation Area is designed to augment the Service’s half-century-old Small Wetlands Acquisition Program, which is funded primarily by Duck Stamps. The conservation area will use the Land and Water Conservation Fund and North American Wetlands Conservation Act grants to purchase perpetual conservation easements from willing sellers.

Flint Hills Legacy Conservation Area is designed to help maintain the integrity of tallgrass prairie wildlife habitat, stream water quality and the agricultural heritage of the Flint Hills. More than 1 million acres are expected to be protected through voluntary, perpetual conservation easements, resulting in a “conservation footprint” of nearly 3 million acres.

The easements will protect habitat for more than 100 species of grassland birds and 500 plant species, and ensure the region’s sustainable ranching culture—which supports conservation of the tallgrass prairie—will continue. Today, less than four percent of the once-vast tallgrass prairie in the United States remains. Nearly 80 percent of that lies in the Flint Hills of eastern Kansas and northeastern Oklahoma.



Middle Rio Grande National Wildlife Refuge, authorized by Secretary Ken Salazar in September, is on the site of a former dairy farm in metro Albuquerque. (Don J. Usner)

The Flint Hills Legacy Conservation Area evolved from the Service’s work with the Kansas Department of Wildlife and Parks, private landowners, other agencies and partners. The conservation area “will serve as a living example of how wildlife conservation and ranching can successfully go hand in hand,” Salazar has said.

Jim Kurth, chief of the National Wildlife Refuge System, said the two new conservation areas “ensure the continued survival of a vital ecosystem that might otherwise vanish.” He said their addition also demonstrates how regional and national interests can work together to protect land while preserving landowners’ way of life.

Urban Refuge in New Mexico

The proposed Middle Rio Grande Refuge on the former Price’s Dairy Farm five miles south of downtown Albuquerque is designed to serve as an urban oasis for both wildlife and people.

“With the support of Bernalillo County, the Trust for Public Land, New Mexico’s Congressional delegation, and many partners, New Mexico will gain its first urban national wildlife refuge,” Salazar said. “Once complete, this refuge, which is within a half-hour drive of nearly

half of New Mexico’s population, will be a place for people to connect with and learn about the natural world and will provide valuable habitat for wildlife, including the endangered the southwestern willow flycatcher.”

Salazar said the refuge would fulfill the goals of President Obama’s America’s Great Outdoors initiative to work with community partners to establish a 21st-century conservation ethic and reconnect people, especially young people, to the natural world.

The Service intends to work with its partners to establish environmental education programs at the refuge and provide demonstration areas for sustainable agriculture. Once the refuge is fully restored, visitors will likely be able to see waterfowl, small mammals and neotropical migrant birds, including flycatchers.

Before the Flint Hills and Dakota Grassland conservation areas, the two most recently established refuges were Cherry Valley Refuge in northeastern Pennsylvania in October 2010 and Tulare Basin Wildlife Management Area in central California in March 2010. ➤

Third *Conserving the Future* Implementation Team Named


The charter was signed and individuals were named to the third of three *Conserving the Future* implementation teams that U.S. Fish and Wildlife Service Director Dan Ashe mandated to be completed by the end of August.

Southeast Region deputy regional director Mark Musaus and Refuge System chief Jim Kurth will co-chair the team—called the Leadership Development Council—which will implement recommendations 21-24 of the vision. The council's chartered purpose "is to transition the Refuge System into a more diverse,

streamlined, efficient organization that promotes leadership in all positions."

Other members are: Miel Corbett, assistant project leader, Oregon State Office, Pacific Region; Jana Grote, fisheries program supervisor, Pacific Region; Tom Harvey, refuge supervisor, Southwest Region; Jason Wilson, project leader, Midwest Region; Holly Gaboriault, deputy area manager, Southeast Region; Rebekah Martin, deputy refuge manager, Northeast Region; Kathleen Burchett, project leader, Mountain-Prairie Region; Tracey McDonnell, refuge supervisor, Alaska

Region; Shaun Sanchez, project leader, Pacific Southwest Region; and Gloria Bell, deputy assistant director training, National Conservation Training Center.

The composition of the two implementation teams formed earlier in August—strategic growth and urban wildlife refuge initiative—was announced in *Refuge Update's* September/October issue. The remaining six teams are scheduled to be announced in the January/February 2012 issue. 

Final Vision Document Is on AmericasWildlife.org — continued from page 1

implementation teams already have been formed: strategic growth, urban wildlife refuge initiative and the Leadership Development Council.

Six other implementation teams were being assembled in October. Members were being selected from among approximately 280 Service employees who volunteered to serve. Each implementation team will be composed of about a dozen people. The six teams will focus on planning; science; community partnerships; communications; hunting and fishing; and interpretation and education.


The Focus section of the January/February 2012 issue of *Refuge Update* is scheduled to be devoted to the vision implementation and announce the final six teams.

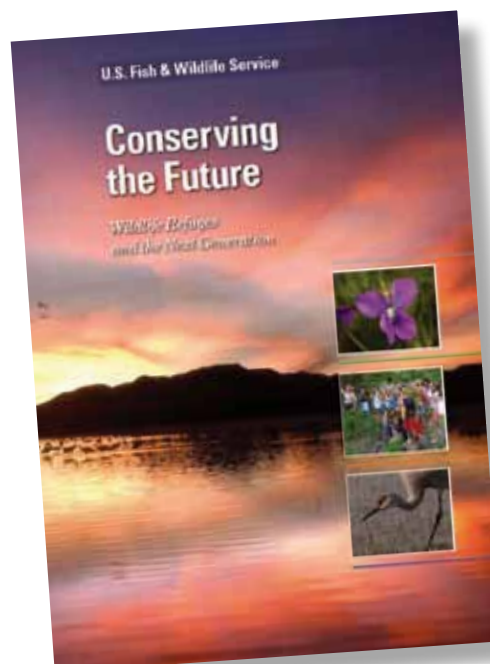
Implementation actions or partial actions on all 24 recommendations are to be undertaken within the next five years, according to the charter signed by U.S. Fish and Wildlife Service Director Dan Ashe in July.

"In every page of this document, you will see yourself," states the *Conserving the Future* vision in its preface. "Whether

you are from another federal agency, a tribe, a state, a conservation organization or a concerned citizen, we need you to help us conserve America's wild things and wild places."

The vision document seeks to engage all of America in the quest for conservation stewardship. "The conservation landscape has changed, the playing field has changed, and the stakes have

changed. Human demands on the environment combined with environmental stressors are creating an urgent need for conservation choices. The scale of issues and challenges we face is unprecedented and impacts us all; no single entity has the resources necessary to address these challenges on its own." 



The 93-page *Conserving the Future: Wildlife Refuges and the Next Generation* vision document contains 24 specific recommendations for managing national wildlife refuges.



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A Look Back ... Bob "Sea Otter" Jones

The following is adapted from a reflection written by Vernon Byrd in 2001 to celebrate the removal of the Aleutian Canada goose from the endangered species list.

Robert D. Jones Jr. was an uncommon man. As a young army officer during World War II, Jones was among the first troops to go ashore at Adak in the central Aleutian Islands, that arc of submarine volcano peaks that extends from Alaska toward Siberia. He loved the treeless tundra, found the fierce winds invigorating and saw the snow-covered volcanic peaks as needing to be climbed.

Before the war, Jones had graduated from South Dakota State University with a degree in biology, and, in spite of the war, it was obvious to him how rich the area was in wildlife. He was hired as the first resident refuge manager of the Aleutian Islands National Wildlife Refuge in 1947 (now Alaska Maritime National Wildlife Refuge).

One of his priorities was to try to remove introduced foxes from Amchitka Island—selected because of its extensive



Bob "Sea Otter" Jones was the first manager of what is now Alaska Maritime National Wildlife Refuge. (USFWS)

wetlands and grassy meadows—on the off chance that a few Aleutian Canada geese remained somewhere and could be saved from extinction. With little more than his dory and his amazing energy and persistence, he spent the best part of 10 summers removing every last fox from Amchitka.

In 1962, Jones got the Coast Guard cutter *Winona* to drop him off near Buldir Island. He captured Aleutian Canada goslings at Buldir Island to form a captive flock, ultimately at Patuxent Wildlife Research Center in Maryland, for future reintroductions to the wild. His work provided the basis for the formal recovery program that was to come.

I met Bob Jones in 1968 when I reported to Adak as an ensign in the Navy. One of my duties was to coordinate wildlife issues on the base with the refuge staff. Bob was famous by then for his work on geese, caribou and sea otters, and he was known throughout the region as "Sea Otter" Jones. I was in awe.

Bob passed away in 1998. Although he never saw the notice of the removal of the Aleutian Canada goose from the endangered species list, he knew his work had been a success. 🦋

Vernon Byrd recently retired after almost 40 years with the Service, all of them in Alaska.

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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.