U.S. Fish & Wildlife Service

January/February 2014 | Vol 11, No 1

RefugeUpdate

National Wildlife Refuge System

www.fws.gov/refuges

This statue in Sebastian, FL, honors Paul Kroegel, first volunteer, first game warden and first refuge manager in what is now the National Wildlife Refuge System. (Kevin J. Lowry)

Frog Study Reveals Low Rate Of Abnormalities, Some Hotspots

An unprecedented 10-year study by the U.S. Fish and Wildlife Service shows encouraging results for frogs and toads on national wildlife refuges.

The study, published Nov. 18 in the peer-reviewed online journal PLOS ONE, finds that on average less than 2 percent of frogs and toads sampled on 152 refuges had physical abnormalities involving the skeleton and eyes. The rate is lower than many experts feared based on earlier reports. This indicates that the severe malformations such as missing or extra limbs repeatedly reported in the media during the mid-1990s were actually very rare on refuges.

"Frogs and toads are strong indicators of wetland and environmental quality. What affects them affects a broad range of other species," said Service Director Dan Ashe. "This research significantly advances our understanding of amphibian abnormalities while amassing one of the world's largest datasets on the issue."

The study also highlights areas of the country with more abnormal frogs than expected. These areas, termed "hotspot clusters," warrant further research to determine their causes.

Concern about amphibian abnormalities became widespread in 1995 when middle school students discovered frogs with misshapen, extra or missing limbs at a Minnesota wetland. Since then, scientists have continued to report frogs and

continued on pg 19

Focus: Law Enforcement, pages 8-15

Pelican Island Refuge Celebrates Paul Kroegel's 150th

By Kevin J. Lowry

Florida is steeped in history. Paleo-Indians were among the Americas' first human inhabitants. Juan Ponce de Leon was the earliest known European explorer. St. Augustine is the United States' oldest city. Yet one of the greatest stories in Florida and American conservation history is largely unknown – to residents and tourists alike.

Pelican Island National Wildlife Refuge is doing something about that.

On Jan. 9, refuge staff and volunteers are spearheading the inaugural Pioneer Festival in Sebastian, FL, to celebrate the 150th anniversary of the birth of Paul Kroegel, the nation's

continued on pg 15

Chief's Corner

Law Enforcement Work Is Central to Our Mission

I have often wondered what it was like back in the early 1900s for Paul Kroegel to grab his 10 gauge shotgun, jump in his boat and try to chase market hunters away from the nesting colonies at Pelican Island. It was a dangerous thing to do. His love for the birds and his anger at their destruction must have made for some tense encounters with the bad guys.

Jim Kurth

Our Focus in this issue of *Refuge Update* is on law enforcement. We sure have come a long way since Paul Kroegel's time. We have come a long way in professionalizing our law enforcement program during my career.

I was one of the last refuge officers who received a badge and a gun before I went to any training.

When I reported for duty at Mississippi Sandhill Crane National Wildlife Refuge in 1979, the people in charge gave me a government ID card, turned it over and stamped it with "the authority to enforce laws administered by the Fish and Wildlife Service." They gave me a Smith & Wesson Model 66 stainless steel .357 magnum revolver, handcuffs and leather gear.

I did law enforcement patrols with no training for months before a slot in a nine-week police training course opened at the Federal Law Enforcement Training Center. During that training, I realized just how clueless I had been and how dangerous it was to have untrained people conducting law enforcement efforts.

I enjoyed law enforcement work, especially the game warden part of it. I served as an officer working on refuges in Mississippi, Florida, Louisiana, Michigan and Rhode Island. I saw all kinds of cases. I witnessed appalling disregard for wildlife laws. I caught some bad guys. I had my life threatened. Perhaps most important, I learned how central our law enforcement work is to our conservation mission. I saw how critical it is to provide safe places for our employees and visitors.

Today's federal wildlife officers working on refuges bring forward a tradition of service that is more than 100 years old. They are an elite force with the best training in the business (it now takes almost a year to fully train an officer). They have increased professionalism, safety and conservation far beyond anything I could have dreamed of during my years in the field. The work is still dangerous, and these men and women serve with great courage and distinction. I couldn't be prouder of them.

I hope you enjoy reading about our officers and the work they do. Remember when you see them to thank them for their service.

The federal wildlife officer vehicle standards and design were recently revised. The color scheme was changed from white with reflective stripes to gray with a badge on the door, in part to give the vehicles a distinctive game warden look. (USFWS)

Refuge Update

Sally Jewell
Secretary
Department of the Interior

Dan Ashe
Director
U.S. Fish and Wildlife Service

Jim Kurth
Chief
National Wildlife Refuge System

Martha Nudel
Editor in Chief

Bill O'Brian
Managing Editor

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

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

PRINTED WITH SOY INK

Inside

JIM MINNERATH/USFWS

GREG KRAMOS/USFWS

The tallgrass prairie of eastern Kansas is resplendent green in springtime, above left, and tinted with red in fall, right. The mission of the Flint Hills Legacy Conservation Area is to preserve that prairie and its ranching heritage.

Slowly but Surely Preserving Prairie in Kansas

By Bill O'Brian

For Bill Sproul, fall is the most beautiful season on the tallgrass prairie of Kansas. He relishes how grasses change "back to brown with a red tint getting ready for winter," sumac turns yellow and the sun's low angle lights the landscape.

For Jack Bohannan, spring is the prairie's best time "because everything is vibrant green with new growth – bright and fresh with the blue sky."

While Bohannan and Sproul are seasonally out of sync, they agree that the tallgrass prairie and ranching culture of eastern Kansas should be preserved.

Together, they are helping do that through the 2½-year-old Flint Hills Legacy Conservation Area, which is gaining momentum after a slow start. Because of cultivation, tree encroachment and development, only about 4 percent of North America's tallgrass prairie remains – most of it in the Flint Hills of eastern Kansas and northeastern Oklahoma. The mission of the conservation area, which is administered for the U.S. Fish and Wildlife Service by the National Wildlife Refuge System, is to preserve up to 1.1 million acres of prairie within a 3.3-million-acre project boundary.

"There is no place like the Flint Hills, standing high on top of the rolling hills with nothing but a sea of grasslands as far as you can see in every direction, the wind in your face, feeling a calming peace," says Bohannan, project leader for the conservation area. "Even though I know I won't see a herd of wild buffalo coming over the horizon, I still expect to every time."

Rancher Bill Sproul cherishes "that open vista. The absence of people … The absence of everything."

Bohannan is committed to conserving habitat for grassland-dependent birds, such as grasshopper sparrow, upland sandpiper, Eastern meadowlark, dickcissel and greater prairie chicken, and for the endangered Topeka shiner minnow. "Another important goal," he says, "is to help ensure that the ranching heritage continues. It is important to the protection of the Flint Hills."

That's where Bill Sproul comes in. He is a private rancher. Sproul, his wife and son run cattle seasonally on about 11,000 acres near Sedan, KS. Sproul cherishes "that open vista. The absence of people, absence of human presence, absence of roads; no powerlines, no cellphones, no houses. The absence of everything" on unbroken tallgrass prairie. "It's hard to hold onto that," he says. "It's important that we preserve at least a little bit of it."

Sproul admires Aldo Leopold's idea that "we abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

To Sproul, "commodity" means money; "community" means restraining the commodity impulse for the greater good. "I practice community conservation," he says. "But I have to remind myself of that because I'm a capitalist."

The Sprouls donated the first perpetual easement – on 4.25 acres – to the Flint Hills Legacy Conservation Area in September 2011. Then, two years later, in October 2013, the conservation area's first purchased easement – 2,450 acres – closed. Two more are pending. "As word

continued on pg 19

PATRICK CARROLL/USFWS

PATRICK CARROLL/USFWS

John Saxhaug, left, received the Dieffenbach Award for his work as Midwest Region supervisory realty specialist. The staff at Kulm Wetland Management District received the Land Legacy Award for work to conserve wetland habitat in North Dakota, right.

Saxhaug, Kulm WMD, Friends Group Earn Realty Awards

A savvy supervisor in Minnesota, a persistent wetland management district staff in North Dakota, and a highly cooperative Friends organization in New England are recipients of the 2013 National Realty Awards.

Midwest Region supervisory realty specialist John Saxhaug received the **Rudolph Dieffenbach Award**. The award is given annually to a realty employee for significant contributions to the U.S. Fish and Wildlife Service's land acquisition systems, operation or mission.

During Saxhaug's decade-long tenure in the Midwest, the region has acquired and conserved more than 100,000 acres. In particular, his work with The Nature Conservancy and the state of Minnesota has helped the Service acquire more than 18,000 acres at Glacial Ridge National Wildlife Refuge for a bargain price.

He was cited for developing partnerships that "have helped to maximize land acquisitions while minimizing the amount of time required to complete purchases."

The staff at North Dakota's Kulm Wetland Management District – including project leader Mick Erickson, biological technician Ryan Shively and private lands biologist Wes Weisenberger – received the **Land Legacy Award** for significant contributions to the Service's mission. The award is given annually to Service employees or volunteers who do not work in the realty function.

The staff members were recognized for their targeted, persistent and systematic approach to identifying willing landowners interested in receiving wetland easement offers on their properties. The approach involved sending letters that included estimated easement payments to landowners whose properties were of particularly high conservation value and following up with phone calls if needed. The approach also included field-checking hundreds of properties to identify wetland basins to protect and making GIS (geographic information system) shape files for each property.

As a result, 7,331 wetland acres were conserved on or near Kulm WMD in fiscal year 2012.

"Hundreds of phone calls were made, and most of the calls had to occur after hours when landowners weren't working in the field," the Bismarck Wetlands Acquisition Office said. "Kulm WMD showed great teamwork when they developed this system of initiating landowner contacts, field-checking properties and making spatial information. By calling the landowners who did not respond to the mailings, more interest was generated. This approach identified which landowners have no interest in an easement offer, and the WMD will not waste time re-contacting that same landowner."

The Friends of the Silvio O. Conte Refuge received the **National Land Protection Award**. It is given annually to private citizens, groups, organizations, 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.

The Friends group – an association of about 50 organizations from the conservation, education, recreation and economic sectors – was honored for creating a framework that accents "the true relevancy and value land conservation actions have on recreation, education and economic opportunities" and for "integrating the grassroots agenda into the national agenda."

The acquisition boundary of Silvio O. Conte National Fish and Wildlife Refuge in Vermont, New Hampshire, Massachusetts and Connecticut encompasses the Connecticut River watershed.

Friends of Heinz Refuge joined a neighborhood coalition that is fighting to conserve green space adjoining the Philadelphia refuge. (Ron Holmes/USFWS)

Community Backs Heinz Refuge and Conservation

By Karen Leggett

Friends and neighbors of John Heinz National Wildlife Refuge at Tinicum have spoken up forcefully in defense of conservation and green space in their Philadelphia community – and they're making a big difference.

It started in June 2012 when a resident of the Eastwick neighborhood noticed a surveyor. The curious resident called refuge manager Gary Stolz and Ross Pilling, who works for the Keystone Conservation Trust, a nonprofit environmental organization. Together, they learned that Korman Development Co. wanted to re-zone 35 acres next to Heinz Refuge for 722 apartments and 1,034 parking spaces. Not only that, a City Council hearing on the re-zoning proposal was scheduled within days.

"We worked around the clock and showed up with an army of partners put together in a couple of days," recalls Stolz. "We had almost 100 people representing refuge Friends, the Sierra Club, Audubon, universities and planning groups, the Delaware Riverkeeper Network and civic associations." Two dozen people testified against the re-zoning. Eventually, the re-zoning bill was withdrawn.

"A small but significant victory for the coalition!" wrote Debbie Beer, a member of the Friends of Heinz Refuge who spearheaded the 2012 creation of the Eastwick Friends & Neighbors Coalition. Pilling and the Public Interest Law Center of Philadelphia helped the coalition become an officially recognized community organization. The Keystone Conservation Trust obtained a grant to fund experts in engineering, economics and environmental impact.

The land in question is part of a 128-acre parcel adjacent to the refuge that is subject to development.

Developing a Strategy

The coalition is using the time offered by the withdrawn re-zoning proposal to develop a strategy for the future of the land that goes beyond its opposition to one apartment complex. Nearby challenges that affect the community and the refuge include frequent flooding, two Superfund sites with landfills, toxic emissions from oil refineries and jet fuel dumping from Philadelphia International Airport. In 1972, intense lobbying by a different Eastwick community group led to establishment of Heinz Refuge rather than providing more land for the airport.

"The community wants to protect this green space," says Stolz. "The group is coalescing around sea-level rise, contaminants from the landfill and flooding issues." Stolz would like to see the land become a wooded buffer for the 300 species of migratory birds and other wildlife on the refuge, with an accessible trail from an existing regional rail station to the refuge visitor center. "That would create potential for every schoolchild to come by mass transit to visit and directly engage with nature," he says. He has been meeting with city officials and senses a "groundswell coming up in favor of conservation."

Beer says the coalition has generated strong, unprecedented relationships between the refuge and the community.

"Many of the local residents here just never walked into the refuge even if they only lived a half-mile away. This particular issue brought us an instant connection," she says. "The Friends got to know the teachers and the principal of the neighborhood school, and we had programs for the fifth grade throughout the entire academic year."

The coalition also held meetings at the local library, prompting library staff to invite Friends to present a program about the refuge. Several Eastwick residents have become Friends.

"It's all about connections. One person meets one person and then the next person," says Beer. "Eastwick Friends & Neighbors Coalition is committed to planning and advocating for an environmentally, economically and socially sustainable future for the community."

Or, as Stolz says, "people in the community have now taken ownership."

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

Using LiDAR to Identify Songbird Habitat in Texas

By Steven Sesnie

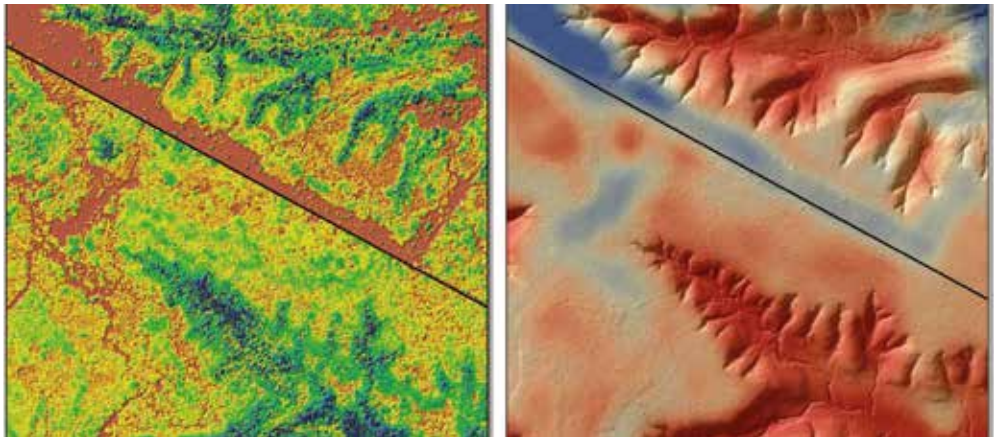
The National Wildlife Refuge System's Southwest Region Inventory and Monitoring (I&M) initiative and Balcones Canyonlands National Wildlife Refuge are using airborne technology with a new level of sophistication for the benefit of endangered songbirds.

Aerial photos and satellite images long have helped the U.S. Fish and Wildlife Service determine what habitat to protect for endangered species. And limited use of light detection and ranging (LiDAR) is quite common on national wildlife refuges. But since 2012 Balcones Canyonlands Refuge and the regional I&M initiative have been using LiDAR altimetry extensively to identify patches of habitat that can best support thriving populations of endangered golden-cheeked warblers and black-capped vireos. The resulting three-dimensional "picture" is helping biologists, fire managers and other specialists see how to best protect and restore habitat for the birds.

The 25,000-acre refuge in the Hill Country of central Texas was established in 1992 to conserve habitat for warblers and vireos. Both are neotropical migrants that winter in Mexico and Central America and occupy a narrow breeding range in the southwestern United States in spring and summer. The warbler prefers older oak and Ashe juniper woodlands; the vireo prefers semi-open shrublands.

LiDAR works much like a laser rangefinder, estimating distance to an object. But a LiDAR sensor is mounted on aircraft, sends out a pulse of laser light and receives back thousands of individual measurements from objects below in the blink of an eye. Each measurement, or "return," is mapped to create a detailed 3D sketch that can include trees, shrubs, buildings, bridges, wind turbines, telephone lines and other land features.

Highly accurate vegetation height, density and canopy cover data layers from LiDAR can augment on-the-ground field surveys to identify the songbirds' preferred habitat. The 3D images are being used to characterize warbler habitat in particular. They depict land features with striking clarity not widely available less than a decade ago.



Left: A LiDAR (light detection and ranging) image shows vegetation height, ranging from low (orange) to high (blue), inside (below black line) and outside Balcones Canyonlands National Wildlife Refuge in Texas. Right: A corresponding image – modeled from bird on-the-ground field surveys and LiDAR-derived height and canopy cover layers – shows areas likely to have a high density (red) of endangered golden-cheeked warblers. (USFWS)

Helps Set Goals

"We needed a way to identify the best habitat for warblers and other endangered species, like the black-capped vireo, using scientifically credible techniques that can be repeated to monitor changes, both on and off refuge lands," Balcones Canyonlands Refuge manager Deborah Holle says. "LiDAR is now playing a big part in that."

I&M wildlife biologist and biometrician Sarah Lehnen agrees: "We are able to learn so much more about what type of habitat conditions really matter to breeding warblers. This information can then be used to set management goals and identify high-priority habitats."

Older, taller trees and dense juniper and oak tree cover preferred by golden-cheeked warblers can be mapped from LiDAR data and imported into a geographic information system (GIS) or other software to model relationships between on-the-ground bird surveys and habitat conditions.

"It's astounding how strong the relationships are when we compare our bird surveys and vegetation data to tree height and canopy cover GIS layers developed from LiDAR," says I&M biologist Jim Mueller, who has designed a bird monitoring protocol for the refuge. "LiDAR is not necessarily replacing surveys on the ground. It's adding value to field data by allowing us to model habitat relationships and map them to better target management activities."

Making LiDAR work in a conservation management context at Balcones Canyonlands Refuge and elsewhere requires collaboration.

"These data don't just roll out of the computer" says Mueller. "We've had to coordinate our field-sampling efforts with biometricians, remote-sensing scientists, landscape ecologists, fire managers and other I&M staff from the very beginning, working as an interdisciplinary team with different strengths and skills."

Wildland fire is an important factor in maintaining warbler habitat. LiDAR's ability to characterize woodland understory, overstory and hazardous fuel conditions is being explored.

Steven Sesnie is a spatial ecologist with the Refuge System's Southwest Region Inventory and Monitoring initiative in Albuquerque.

Budget Cuts Pinch Invasive Species Work

By Bill O'Brian

Federal budget cuts and the sequester have constrained the work of the National Wildlife Refuge System across the board, but invasive species control has been particularly hard-hit.

Over the years, the Refuge System has made great strides in eradicating or controlling invasive plant and animal species on land it conserves.

It has eradicated rats from Palmyra Atoll National Wildlife Refuge and from Hawadax Island in Alaska Maritime Refuge [related story on page 17]. It has eradicated *Spartina densiflora* (a cordgrass) from California's Humboldt Bay Refuge and is on track to eradicate *Verbesina encelioides* (a flowering plant) from Midway Atoll Refuge. Hundreds of smaller projects have controlled invasives for the benefit of fish, wildlife and native habitat.

However, as Refuge System funding has been reduced by $50 million since fiscal 2010, the fight against invasive species has suffered. Refuge Annual Performance Plan (RAPP) data from 2010 to 2013 show:

- The number of acres of non-native, invasive plants controlled declined by 60 percent.
- The number of acres treated for non-native, invasive plants declined by 37 percent.
- The number of invasive animal populations controlled declined by 46 percent.

Furthermore, a $1 million Refuge System initiative that has supported one or two large invasive species projects annually since 2009 – including projects cited above – may not be funded for fiscal 2014.

Back Bay Refuge in Virginia and the U.S. Fish and Wildlife Service Northeast Region in general exemplify how budget pressure affects the field.

"Given the cuts over the past two years, including FY14, we will likely not be able to do any aerial spraying for phragmites, which is a widespread problem throughout Back Bay," says refuge manager Doug Brewer. "Without aerial spraying, it is very difficult to control 'phrag' since it spreads quickly."

Back Bay National Wildlife Refuge in Virginia – a critical feeding and resting spot for migratory birds along the Atlantic Flyway – has felt the pressure of invasive species budget cutbacks on multiple levels. (Joe Milmoe/USFWS)

Controlling phragmites is important to the 9,250-acre refuge that provides critical feeding and resting habitat for migratory birds along the Atlantic Flyway. Uncontrolled, the non-native reed grass aggressively crowds out seed-producing native vegetation that benefits birds.

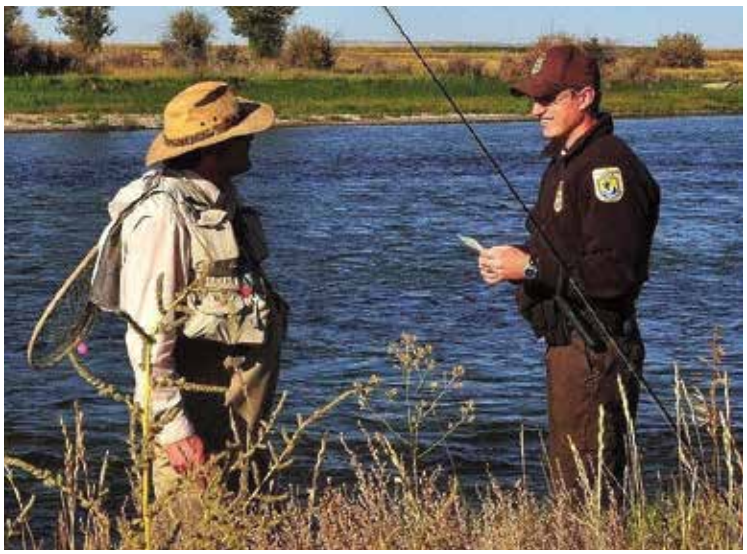
Additionally, Northeast Region invasive species biologist David Bishop, who was stationed at Back Bay Refuge until recently, has not been replaced. Bishop "gave us almost unlimited access to expertise on invasive species control," says Brewer. Bishop, who now works at The Nature Conservancy in South Carolina, also provided guidance regarding phragmites, feral pigs, nutria and other invasives to federal and state land managers all along the East Coast.

Budget constraints have forced the Northeast Region to leave dozens of Refuge System positions vacant, according to acting regional invasive species coordinator Laura Eaton. "So as people leave, there is no filling behind them. Only critical positions are refilled – such as refuge managers," she says. "There was no intention or desire to cut the regional invasive species specialist, but there is no way to fill the position without losing another important position."

Back Bay Refuge felt a double whammy, but across the Northeast, as in other regions, invasive species projects are being squeezed. At New England's Silvio O. Conte Refuge, control of pale swallowwort and water chestnut has been jeopardized. In Maine, a summer seasonal invasive plants biotech position went unfilled. In upstate New York, Iroquois Refuge had to drop plans for an ambitious invasive control effort, and Montezuma Refuge had to forgo vital reed canary grass control in 2013.

The concern for refuges everywhere is that hard-won native habitat gains will be lost if budget pressure doesn't ease soon.

"It is critical that prevention, early detection and rapid response, control or eradication are carried out as planned," says Refuge System invasive species coordinator John Klavitter. "Otherwise, time and effort are wasted, and the number of invasive species increases and/or expands their range."



Federal wildlife officer Jon Beyer talks to an angler at Seedskadee National Wildlife Refuge in Wyoming. Beyer, now at Audubon Refuge and Wetland Management District in North Dakota, is one of the National Wildlife Refuge System's 111 dual-function officers. (Keith Penner)

Federal wildlife zone officer Bruce Butler assists visitors at Vieques National Wildlife Refuge in Puerto Rico. Butler holds one of the National Wildlife Refuge System's 281 full-time officer positions. (Raul Sanchez/ USFWS)

Not Perfect, but "the Coolest Job You Can Have"

By Bill O'Brian

Since the days more than a century ago when first refuge manager/ game warden Paul Kroegel was patrolling the waters surrounding what is now Pelican Island National Wildlife Refuge in Florida, law enforcement has been fundamental to conservation in the United States.

Over the decades, refuge law enforcement officers have had different titles, have moved away from dual-function roles, have endured staffing shortages and have reported to different agencies within what is now the U.S. Fish and Wildlife Service. But their mission has remained essentially the same: to keep national wildlife refuges safe for wildlife that inhabit them and the people who visit them.

The current title, since a 2012 overhaul, is federal wildlife officer. And it's "the coolest job you can have," says Jim Hall, chief of the Division of Refuge Law Enforcement since 2010. "From tagging grizzly bears on the Alaska tundra to checking deer hunters in Mississippi to checking duck hunters in Louisiana; up in the early morning with the beautiful sunrises and marvelous sunsets that you see by being out there every day. It is absolutely the coolest job anyone can ever hold."

In recent years, the division can point to many accomplishments. It has spearheaded the establishment of the Service Honor Guard, updated the Refuge System law enforcement badge, reclassified the federal wildlife officer title and position description; clarified numerous policies, including one on taser use; and revised federal wildlife officer vehicle standards and design.

That vehicle redesign, being phased in over five years, changes the color scheme from white with reflective stripes to gray with a badge image on the door – in part to give the vehicles a distinctive game warden look. "We don't want the public to mistake that one of our biologists is a law enforcement officer," says Hall. "We don't want the drug-trafficking organizations to mistake that, either."

Still, inadequate staffing remains a prime concern.

"We need to add full-time officers," Hall says. "We're at the lowest staffing level for law enforcement that we've been at in decades. We've lost a considerable amount of our dual-function officers to retirement and relinquishment of their credentials, and we critically need to add full-time positions to replace those."

In the mid-1990s, Hall says, the Refuge System had 685 dual-function officers – officers who served simultaneously as a refuge manager or biologist. In 2002, a Department of the Interior secretarial directive mandated reduced dependency on dual-function officers. So today there are 111 dual-function officers and 281 full-time officer positions (34 of which are vacant or have an officer in rigorous training, which takes almost a year). That's a total of 392 federal wildlife officers.

By way of comparison, Hall says, the state of Florida alone has about 600 conservation officers. Wisconsin has the lowest conservation officer-to-hunter/ angler ratio among the 50 states: 1

continued on pg 15

Saving Lives Is All in a Day's Work

By Karen Miranda Gleason

Enforcing fish and wildlife regulations is central to a federal wildlife officer's job. For Russell Haskett at the Southeastern Idaho National Wildlife Refuge Complex, rescuing stranded hunters just happens to come with the territory.

Normally, Haskett's job involves patrolling by truck, all-terrain vehicle (ATV), boat or aircraft. Depending upon the time of year, he may encounter hunting and fishing violations, Migratory Bird Treaty Act infractions or looting of archeological sites. He patrols lands on and off the complex's four refuges (Minidoka, Camas, Grays Lake, Bear Lake) and one waterfowl production area (Oxford Slough).

One day while on duty in December 2012, Haskett responded to a Power County sheriff's radio report and found two waterfowl hunters clinging to their capsized canoe in the frigid Snake River near Minidoka National Wildlife Refuge. As the first law enforcement responder on the scene, he weighed the risk of trying to save the men versus staying alive himself.

While federal wildlife officers perform a range of duties and are certified in cardiopulmonary resuscitation (CPR) and first aid, search and rescue is not part of their training.

The men had been in the freezing water for half an hour despite their attempts to get to shore. One was unconscious. The other couldn't speak. Haskett waded into the river and, for the third time in his career, saved lives.

"It was a calculated risk," he says now. "It was either [go in] or watch those two guys drown." One man was treated and released after the rescue; the other went into cardiac arrest, underwent surgery and survived after 10 days in the hospital.

Federal wildlife officer Russell Haskett patrols the Snake River. Haskett's territory includes Southeastern Idaho National Wildlife Refuge Complex's four refuges and one waterfowl production area. (Lance Roberts/USFWS)

Haskett returned to the rescue site to find one of the victim's eyeglasses. After he visited the victim in the hospital twice, his own focus quickly returned to the reason he comes to work every day – to protect wildlife.

"Without law enforcement, all of the efforts done by biologists are just good recommendations."

"Without law enforcement, all of the efforts done by biologists are just good recommendations," he says. "You need law enforcement to give what the [U.S. Fish and Wildlife] Service does teeth." But as first responders, wildlife officers inevitably end up helping people, too.

Years ago, Haskett rescued another man and his 12-year-old son who had grounded their boat, also while hunting waterfowl on the Snake River. He once even responded to a traffic accident and pulled a man who had suffered a seizure from a burning vehicle. Those incidents occurred during his 13 years as a fish and game officer for the Shoshone-Bannock Tribe, of which he is a member. He joined the Service in 2004.

Today, Haskett's work involves ongoing joint cooperation with officers from the Tribe, as well as Idaho Fish and Game, the county sheriff and Service special agents.

He is also part of a special team involving Washington, Oregon, and Idaho that eradicates illegal marijuana growth, an increasing problem on public lands in the Northwest. He is one of only five Service law enforcement staff members trained in short-haul helicopter operations.

But regardless of the risk or danger involved with his daily tasks, he wants to go home at the end of the day.

"My No. 1 rule is to assess the situation so you don't become a victim yourself," he says.

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

Paws on the Ground

By Karen Leggett

Dogs that work with federal wildlife officers need the capabilities of a top-notch police service dog – and more.

They must be able to "work all day around gunfire and still make a compliance check with a waterfowl hunter, or work a beach with 300 people and still be ready to assist with an emergency arrest," says Darryn Witt, national coordinator of the National Wildlife Refuge System canine program and an officer in Illinois at Upper Mississippi National Wildlife and Fish Refuge.

The Refuge System has eight canine officers, each assigned a dog because they expressed interest. The Refuge System is aiming to add one to two canine teams each year. "We need continuity among our individual canine teams," says Witt, "as well as consistency in dog selection, training and the way the dogs are deployed." New canine teams will be established based on officer and field station interest, funding and local need.

Canines are taught to protect officers and locate contraband – from narcotics to antlers, ginseng and waterfowl or game over the limit or out of season.

"If we have to search for something, I can do it in a fraction of the time with a dog compared to four or five officers," says federal wildlife zone officer Eddie Brannon in Florida, the first refuge law enforcement officer to request a dog in the 1990s. Brannon says he and German shepherd A.J. have helped locate lost hunters, children and people with Alzheimer's disease.

Witt's canine, Rudi, can smell marijuana in a tackle box; he can also sniff out heroin, cocaine and methamphetamine. Division of Refuge Law Enforcement deputy chief Rich Johnston says groups of narcotics smugglers have abandoned

Canines like Rudi, whose handler is federal wildlife officer Darryn Witt at Upper Mississippi National Wildlife and Fish Refuge, are skilled at protecting officers and sniffing out contraband. (Eric Tomasovic/USFWS)

their drugs and run in the presence of a dog. Dogs also have detected illegal, hidden lead shot.

Protecting Officers

Federal wildlife officers usually work alone and often in remote areas. Dogs can be a force multiplier. "If I show up alone," says Witt, "I have my own presence. When I bring Rudi with me, it's a different level of officer presence. People have a lot of respect for the canines."

Most law enforcement dogs used in the United States are bred in Europe. German and Dutch shepherds and Belgian malinois are considered the best all-around breeds. Refuge System dogs are purchased from American vendors that provide training with handlers after the dogs' initial law enforcement training. Dog and handler attend 40 hours of refresher training each year. The dogs are certified annually by national accrediting organizations. They must be high-energy but also playful enough to perceive the search for evidence as a game with a possible reward. They are trained to work in extreme heat and cold, in boats and on rugged terrain.

Law enforcement dogs develop a relationship with their handlers. "It's 24/7 care of a very expensive piece of government equipment," says Witt. He refutes the presumption that these are "edgy dogs waiting for a fight. They can be friendly, but on command, they can apprehend someone." In fact, Witt says, Rudi can be extremely social, so he insists that all those friendly people on the beach *not* pet Rudi so the dog knows he is working.

Johnston calls the canine program "a field initiative that needs to be supported by Headquarters. It directly helps protect the officers and the natural resources of the Refuge System." And he quotes Refuge System Chief Jim Kurth: "If we can't put more boots on the ground, we can put more paws on the ground."

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

One Full-Time Officer for All of New Mexico

By Bill O'Brian

When you think of Southwestern federal wildlife officers, drug interdiction probably comes to mind. And, while Ben Lanford does do anti-drug-smuggling work, his job entails much more than that.

For starters, as the U.S. Fish and Wildlife Service's only full-time federal wildlife officer for New Mexico's eight national wildlife refuges, Lanford covers a lot of ground.

He is the primary officer for Bosque del Apache, Sevilleta, Las Vegas, Maxwell, Rio Mora, San Andres and Valle de Oro Refuges. That's roughly 400,000 acres of refuge land in a 160,000-square-mile territory. At Bitter Lake Refuge in southeastern New Mexico, refuge manager Floyd Truetken and outdoor recreation planner Steve Alvarez serve as dual-function officers.

Because the territory is huge, federal land management agencies cross-designate officers in New Mexico.

"I work almost day to day with other land management officers for the Bureau of Land Management and Forest Service to help provide law enforcement coverage on their lands. They, in return, provide some coverage for refuges," says Lanford, who is based at Bosque del Apache Refuge in central New Mexico. "There are no typical days, only typical seasons."

In the hot summer months, when refuge visitation slows, Lanford helps Service firefighters in various capacities. He also keeps an eye out for underage outdoor parties and trespassing violations on refuges and other federal lands.

In fall and winter, he focuses on refuge visitors – "everything from first-time family visitors to professional wildlife photographers" – as well as migratory bird hunters and poachers.

"A typical migratory bird season involves thousands of miles of patrol and hundreds of checks," he says. "Because the Service has such a small LE presence in this zone with the limited amount of officers, I spend a lot of time educating hunters and answering questions."

Most of federal wildlife officer Ben Lanford's work involves game warden duties, but he regularly does narcotics enforcement, too. Above left, he helps with duck banding at Bosque del Apache National Wildlife Refuge in New Mexico. Above right, he takes part in a multi-agency drug raid in Arizona. (USFWS)

Year-round, he is on the lookout for Archaeological Resources Protection Act violations related to New Mexico's abundant prehistoric, Native American, Spanish and even Civil War cultural resources.

"As all of our officers know, we come across all walks of life during our patrols," he says. "Any day can go from a simple fishing compliance check with a family to a felony arrest on your next stop."

Lanford, a 27-year-old New Mexico native, grew up hunting, fishing and enjoying the outdoors. "The idea of being a game warden was always appealing to me," he says. "When I discovered the Fish and Wildlife Service, I knew I found what I wanted to do."

Before joining the Service, he served four years in the Marine Corps, including Iraq and Afghanistan combat tours. "The leadership, training, discipline and experiences I had in the Corps helped prepare me as an officer in ways no other job can," he says. "The Service, especially in LE, has strong ties to hiring vets."

While he is mostly a game warden, Lanford does drug enforcement, too. He regularly serves on details along the Arizona-Mexico border, particularly at Cabeza Prieta Refuge – where in excess of 1,000 pounds of narcotics are seized weekly, on average, he says. At New Mexico refuges, marijuana growth is an increasing problem, he says, as is heroin and methamphetamine trafficking statewide.

At border security training, he learned that millions of dollars in narcotics travel annually from Mexico to Denver on Interstate 25, which runs through Bosque del Apache and Sevilleta Refuges.

Still, he finds his game warden duties most satisfying.

"The most rewarding part of my job is walking up to a group of hunters and, before I finish identifying myself, they shout out a 'Good morning, Ben,' " he says. "Seeing wildlife in places most people only see in pictures makes coming to work easy."

On the LE Beat, "No Day Is Like Any Other Day"

By Bill O'Brian

"Normally that would be a suspicious vehicle to me," says Samantha Fleming as she patrols a Patuxent Research Refuge road that is closed to motorized traffic. "But it's okay. That's Bill Harms, a volunteer who's collecting vegetation samples" for Patuxent's herbarium.

Fleming, a federal wildlife officer at the Maryland refuge, knows its 12,841 acres and the people who frequent them like the back of her hand.

"It's important to have relationships with visitors. Lots of times they're your eyes and ears. They let you know what's going on," says Fleming. "The better you know them, the better they feel about the refuge, the safer they feel on the refuge" and the more likely they are to report something untoward happening on the refuge.

It was 9:30 on a Saturday morning when Fleming recognized Harms – basically lunch time for her on this day. She had been at the refuge since 4:30 a.m. She checked in participants at a youth wild turkey hunt before dawn. Then, as first light and refuge wildlife arose simultaneously, she began to patrol in her U.S. Fish and Wildlife Service law enforcement Chevrolet Tahoe.

"Patuxent is challenging because it is an urban refuge," Fleming says. "We are 20 minutes from D.C. and 20 minutes from Baltimore, so we get an influx of different types of people. We get a lot of backcountry folks, and we also get a lot of city folks coming in not really knowing how to be in a refuge."

Patuxent Refuge is challenging also because it has three separate tracts in two counties.

On this day, Fleming started on the North Tract, "where the majority of hunting goes on and fishing," she says. "That's our biggest challenge, trying to cover the 8,000 acres, which is small in comparison to most places, but there is such a diverse use up here and it's so accessible to the public that we stay very, very busy."

Federal wildlife officer Samantha Fleming embarks on a pre-dawn patrol of Patuxent Research Refuge in Maryland. (Bill O'Brian/USFWS)

Samantha Fleming has been interested in the law and protecting animals since she was growing up near Boston.

She had been away for a few days, so before the refuge opened to visitors at 8 a.m., she checked roads, trails and "potential hotspots" for damage, dumping or mischief. She also checked that signage was intact and gates were locked. That's important on former military base land holding unexploded ordnance and rifle ranges still used by the National Security Agency, the Secret Service and others.

Next, she drove 20 minutes to the 2,540-acre South Tract, "where our beautiful visitor center is. … We had a rash of vehicle break-ins. We've had to update our camera system." Today all was quiet, so she checked out Service land along Maryland Route 197, which bisects the refuge and is the scene of frequent auto accidents that result in refuge fence damage.

The Central Tract is why it's called Patuxent *Research* Refuge. The tract houses the U.S. Geological Survey Patuxent Wildlife Research Center and endangered species/migratory bird facilities. The tract is generally closed to the public, but errant bicyclists, lost drivers and speeding delivery vehicles cause problems. With about 200 people from various agencies working on the refuge, issues regarding research permits and personnel matters arise, too. Everything in order on this Saturday, Fleming gassed up and headed back to the North Tract.

Hers can be a solitary job. So, in addition to chatting up, checking on or nodding to visitors, she relies on the U.S. Park Police, county police and other law enforcement agencies for help. "I need all the support I can get," she says.

Not that she's complaining. Fleming has been interested in the law and protecting animals since she was growing up near Boston. She enjoys being outside. She especially likes that – even though she's

Fleming checks the hunting license of Patuxent Refuge visitor Christian Wilder. (Bill O'Brian/USFWS)

on call pretty much 24/7 – "no day is like any other day."

She employs a low-key style, when possible. In approaching individuals who might be violating the law, she is conversational, not confrontational. "I don't start off as close-minded or rough," she says. She builds rapport. That way "they tell me what I need to know" uneventfully. "If I come off as being confrontational, they're more likely to come off as confrontational."

And she loves seeing kids catch their first fish. "Sometimes they have to have their dad or mom help them pull the fish in because it's so big, and they've got a smile that's ear-to-ear. And you can tell right then and there they're hooked," she says. "Same thing with hunting."

Back on the North Tract, she helped two young hunters measure wild turkeys they took and reminded them to report the kills to the Maryland Department of Natural Resources.

She also touched based with 10-year-old Sebastian Wilder. On this day, Sebastian did not bag a turkey. But his father, Christian, was grateful for the opportunity.

"It's hard for me to sum up what the refuge means to me," Christian Wilder said, "because I've been coming here since I was younger than my son is. I look forward to him growing up here, my daughter growing up here and hopefully their children growing up here."

He said he and Sebastian will be back next year for the youth turkey hunt.

Samantha Fleming likely will be there, too, checking them in, checking out their harvest and, as always, checking on the refuge.

One Service, Three Types of Officers

There are two distinct law enforcement programs and three types of officers in the U.S. Fish and Wildlife Service.

The Division of Refuge Law Enforcement has federal wildlife officers.

The Service's Office of Law Enforcement has special agents and wildlife inspectors.

Federal wildlife officers and special agents have similar authority to carry firearms, make arrests and enforce conservation laws, but officers work primarily on refuges and agents work primarily off refuges.

Wildlife inspectors are import-export control officers who ensure that wildlife shipments comply with U.S. and international wildlife protection laws. They refer violations to special agents.

Video

A video related to this article, "A Day in the Life of a Federal Wildlife Officer," is on the U.S. Fish and Wildlife Service You Tube page: *http://youtu.be/IXvpnWb9LtU.*

Connecting With Villagers "in a Neighborly Fashion"

By Bill O'Brian

It's only a slight stretch to say that Yukon River king salmon have spawned a novel approach to National Wildlife Refuge System law enforcement in Alaska.

King salmon is an important cultural and culinary part of Alaska Natives' subsistence lifestyle. Its numbers in the Yukon River have been dropping for years. For the species' long-term health, the U.S. Fish and Wildlife Service imposes regulations on king salmon fishing. The regulations aggravate Alaska Natives whose remote villages are within refuges. Federal wildlife officers must enforce the regulations and issue citations for violations such as fishing during closed periods.

"Ninety-nine percent of the time when a federal wildlife officer arrives in a village," says Alaska Region Refuge System law enforcement chief Jim Hjelmgren, "something not cool is happening."

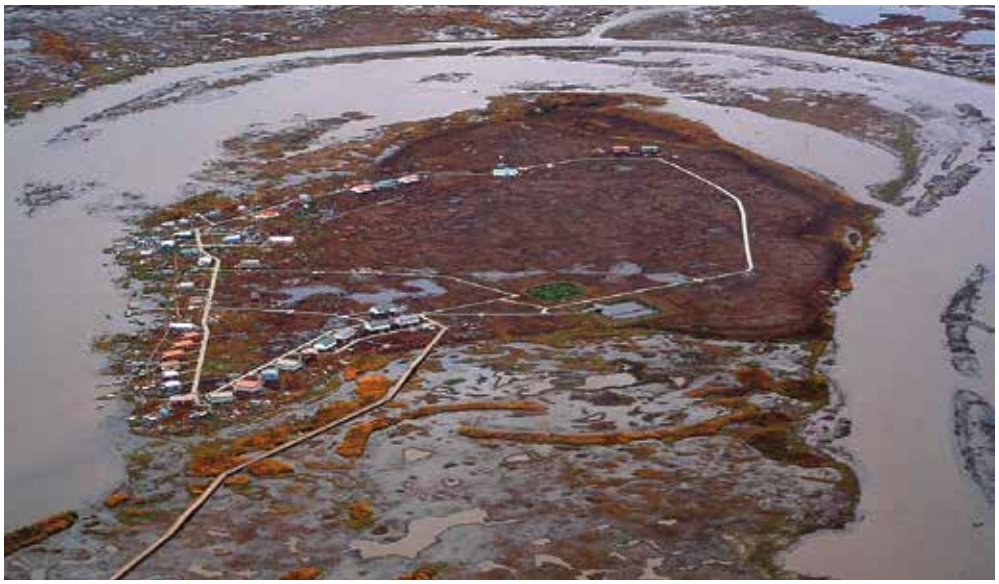
So, Hjelmgren and his officers have been making informal, unannounced, meet-and-greet visits to villages. They show up in uniform, say hello, listen, answer questions. They connect with villagers "in a neighborly fashion."

Federal wildlife officers from a dozen of Alaska's 16 refuges have made about 80 such visits, most in recent years.

"The idea came from my core belief that, for the most part, federal law enforcement agencies are missing great opportunities to further their agency's mission," says Hjelmgren. "No matter how well we do our jobs, if folks utilizing refuge lands choose not to follow the law, our mission and goals for resource conservation will be unobtainable."

Officer Isaac Bedingfield agrees.

"When the villagers hear on the radio that the Service is restricting their fishing or hunting, it is natural for them to feel their way of life is being threatened," says Bedingfield, who estimates he has made 45 drop-in visits in the past two years. "It is absolutely crucial these relationships be developed, or we can be seen as nothing more than hard-handed, impersonal disciplinarians. But if we can tie strings to hearts of individuals and find mutual respect as co-laborers in stewardship, then we will see native people wanting to work alongside us to conserve and protect resources."



In an effort to better communicate with Alaska Natives, federal wildlife officers have been making informal, unannounced, meet-and-greet visits to remote villages such as Nunapitchuk, which is surrounded by Yukon Delta National Wildlife Refuge. (Ake Lindstrom)

Bringing "Positivity" to Town

These stroll-around-the-village visits contrast with formal visits scheduled for a certain time in a certain place with certain people. The drop-in visits are "speaking to a neighbor over the fence rather than in a sterile meeting room environment," says Hjelmgren.

"It is not enough to have an official government-to-government meeting once every five years," says Bedingfield. "That is good, but it still keeps the Service seeming aloof, impersonal and distant."

The villagers generally react well when officers bring "positivity" to town, Hjelmgren says.

Sometimes an elder will invite the officer(s) in for coffee or black fish dipped in seal oil. Occasionally, villagers will halt a council meeting to welcome the officer(s). Virtually always, "the young kids want to talk. They always ask our names, what we are doing, where we live," Hjelmgren says. "At times, the kids following us resemble a parade."

Even though the visits are expensive, time-consuming and logistically difficult, Hjelmgren, Bedingfield and others believe in them because they work.

"Sitting on a couch talking makes a difference. Shaking a hand at the boat landing makes a difference. Providing an elder the ability to vent while I buy a can of sardines at the village store makes a difference," Hjelmgren says. "With 77 million acres of refuge lands in Alaska, we need rural villages to believe in the Service's mission. If they don't, and refuse to comply with the rules and regulations in place, the resources of Alaska will lose on a grand scale."

Pelican Island Refuge Celebrates Paul Kroegel's 150th — *from page 1*

first refuge manager. Thereafter, the refuge plans to use Kroegel's life story to reenergize its visitor services and outreach programs.

Kroegel came to Sebastian in 1881. It was an era when Florida was undeveloped and wild, a jungle-like landscape with no air conditioning, no mosquito control, no modern conveniences. It was also an era that tolerated the slaughter of brown pelicans, egrets and herons.

Kroegel was 17. His mother had died in his native Chemnitz, Germany. Now, he, his father and brother were immigrating to Florida, homesteading on a shell midden along the west bank of the Indian River Lagoon overlooking tiny Pelican Island. Two decades later, he would become the first volunteer, first game warden and first refuge manager in what is now the National Wildlife Refuge System.

"Kroegel had a hard childhood and was resolved to work for things he considered important, such as wildlife conservation," a U.S. Fish and Wildlife Service biography says. "Although initially he had no authority to protect the brown pelicans on the small island opposite his home, he did his unofficial best as a citizen warden of sorts. He tried to position his sailboat and 5'6" frame between the faster boats of gunners. He wore a big hat and carried a double-barreled 10 gauge shotgun to make his point."

A statue of Paul Kroegel overlooks the Indian Lagoon ecosystem that he conserved with such fervor in the early 1900s. A five-minute video about Krogel's life is at http://bit.ly/18yEYQh. *(Kevin J. Lowry)*

Eventually, Kroegel was named warden of Pelican Island. He was paid $1 a month by the federal government and $7 a month by Audubon societies to protect the birds. Even after President Theodore Roosevelt declared the five-acre island a federal preserve in 1903, Kroegel was forced to supplement his salary with boatbuilding and farming.

The Pioneer Festival, which will commemorate the life and times of Kroegel, is designed to reconnect the city of Sebastian and its business community with the nation's first refuge. It is also designed to inform Germans about their native son's legacy in America. Barbara Ludwig, the mayor of Chemnitz, is traveling to the festival to hear in person Sebastian Mayor Bob McPartlan proclaim Jan. 9 as "Paul Kroegel Day."

The festival will include live music authentic to the pioneer era and tastings of pioneer food such as swamp cabbage, heart of palm salad, oysters, smoked fish, clams and honey. There will be demonstrations of duck decoy carving, wool spinning, beekeeping, cast netting, quilt stitching and boatbuilding, all pioneer-era activities. Also scheduled: storytelling by Kroegel's granddaughter; fishing in the biologically diverse estuary; and bird walks.

Ironically, the story of Pelican Island Refuge – home of the centennial boardwalk and iconic Refuge System habitat – is largely unknown locally. So, in coming months and years, the refuge will emphasize its rich past in visitor presentations and will encourage nearby schools to weave refuge history into their curricula.

That way, local students from kindergarten to 12th grade, snowbird retirees, college spring breakers, European tourists and residents of Florida's central east coast alike will know what the Service has known for decades: Paul Kroegel's work to protect the dynamic ecosystem of the Indian River Lagoon is worthy of global respect.

Kevin Lowry is the visitor services manager at Pelican Island National Wildlife Refuge.

Not Perfect, but "the Coolest Job You Can Have" — *from page 8*

to about 12,000. The Refuge System responsibility is double that: 1 officer for about 24,000 hunters/anglers.

"That depicts the fact that our folks are working as hard as or harder than any other conservation law enforcement officer in the country," Hall says.

In 2004, the International Association of Chiefs of Police (IACP) figured the Refuge System should have 845 full-time officers based on visitation, miles of road and trails, known crime on refuges, endangered species enforcement, and more. The IACP is using updated statistics to develop a new risk-based deployment model for every unit of the Refuge System. It is expected to be completed soon.

Around the Refuge System

Iowa

After more than two years in storage, artifacts from the sunken 19th-century steamboat *Bertrand* are now back on display at DeSoto National Wildlife Refuge. In June 2011 as Missouri River floodwaters rose to record levels, more than 100 volunteers and workers rushed the museum collection of 250,000 artifacts out of the visitor center to safe temporary quarters. Now, after re-inventorying, re-cataloging and re-labeling the artifacts, the refuge has moved the collection back into the visitor center, where the exhibit has been streamlined and reorganized. A primary goal of the reorganization, according to collection curator Dean Knudsen, was to ensure quick flood evacuation in the future. To that end, display and storage cabinets are on casters and the exhibit is being selectively rotated. Only 35 or 40 percent of the artifacts are on open display at any given time; the rest are in storage. As result, repeat visitors might see different objects on different visits. The *Bertrand*, which sank in the river in 1865, was discovered on the refuge in 1968 with much of its cargo intact. The collection includes tools, bottled alcohol and foodstuffs, clothing, cannonballs and thousands of other Civil War-era artifacts.

Texas

For the 22nd year, volunteer supporters of Lower Rio Grande Valley National Wildlife Refuge spent half a day planting native tree and shrub seedlings on refuge land. Rio Reforestation XXII was held in November after being postponed because of the federal government shutdown in October. About 900 people – mostly secondary school students and young adults – participated in the annual event sponsored by the Valley Proud Environmental Council, Friends of the Wildlife Corridor and the refuge. They planted about 14,000 trees on 20 acres on the Resaca Del Rancho Viejo tract near Brownsville. Restoring and connecting native habitat is vital to ocelots and other wildlife in the Lower Rio Grande Valley, where 95 percent of habitat has been cleared for development or agriculture. Over the years, Rio Reforestation participants have planted about 200,000 native seedlings on more than 620 acres of land in the corridor refuge. Lower Rio Grande Valley Refuge comprises 90,000 acres on about 115 units along 275 river miles. The refuge is home to 1,200 documented plant species. Via the Rio Reforestation event, says refuge manager Bryan Winton, "we are able to spread the word of the value of the native plant species in attracting the full range of native wildlife like birds and butterflies into people's back yards."

U.S. Fish and Wildlife Service forestry technician Florentino "Tino" Caldera oversees native tree and shrub planting at Rio Reforestation XXII at Lower Rio Grande Valley National Wildlife Refuge in south Texas. About 900 people planted about 14,000 trees on 20 acres. (Georgiana Matz)

Michigan

The Refuge System's determination to serve urban populations took a big step in November with the groundbreaking of an 11,800-square-foot visitor center at Detroit River International Wildlife Refuge. Service Director Dan Ashe, Rep. John Dingell and more than 300 U.S. and Canadian partners attended the groundbreaking, which culminated a decade of restoration work. The visitor center – on property known as the Refuge Gateway – is adjacent to the refuge's Humbug Marsh Unit, the only Ramsar Convention Wetland of International Importance in Michigan. "As a young boy growing up in southeast Michigan, I have many fond memories of hunting and fishing along the shores of the Detroit River and Lake Erie with my dear old dad," said the 87-year-old Dingell. "The banks of the river looked a lot different than they do now. There was less concrete and more trees, less brick and mortar and more wetlands. This groundbreaking is yet another step in preserving and protecting land so important to our region and so dear to my heart." The visitor center grand opening is scheduled for fall 2015. An article about the progress at Detroit River Refuge appeared in November/December 2012 *Refuge Update.*

Washington-Idaho

Facing reduced budgets and seeking to cut maintenance and operations costs, the Inland Northwest National Wildlife Refuge Complex last fall sold off three fire engines. The complex includes Turnbull, Little Pend Oreille and Kootenai Refuges. "Ordinarily, we would keep vehicles in good working order for as long as possible," said long-time assistant zone fire management officer Doug Frederick, who coordinated the sale through the General Services Administration. A specially outfitted 1999 Ford F-550 pickup was purchased by Stevens County, WA, for $17,400. The county often helps the refuges manage wildfires and prescribed burns. A private individual bought a 1998 Ford diesel F-250 pickup, originally fitted with a small tank for drip torch fuel, for $14,825. Another individual bought an older Model 80 U.S. Forest Service engine for about $3,000. Proceeds were added to the U.S. Fish and Wildlife Service's Pacific Region Working Capital Fund, which banks money to buy replacement vehicles for fire management.

Alaska

For the first time, breeding tufted puffins have been documented on Hawadax Island in Alaska Maritime National Wildlife Refuge. The news comes just five years after the removal of invasive Norway rats from the place formerly known as Rat Island. Leach's storm-petrels, thought to have been extirpated because of the rats, have also been heard. Song sparrows and snow buntings are rebounding as well. Norway rats were spilled onto the island's rocky shores in a 1780s shipwreck. Since then, the rats had decimated native bird species by eating eggs, chicks and adult birds, and by ravaging habitat. In 2008, after years of planning, the U.S. Fish and Wildlife Service, Island Conservation and The Nature Conservancy successfully removed the rats using rodenticide bait. The early increases in native bird populations are expected to lead to more ecosystem recovery. Seabirds drive vegetation communities on islands free of invasive predators by delivering marine-based nutrients to the soil. As seabirds increase on Hawadax, scientists expect plant communities to return to this natural state.

For the first time, breeding tufted puffins have been documented on Hawadax Island in Alaska Maritime National Wildlife Refuge. The news comes after the removal of invasive Norway rats from what was formerly known as Rat Island. (Ilana Nimz)

Colorado

The U.S. Fish and Wildlife Service destroyed six tons of confiscated elephant ivory at Rocky Mountain Arsenal National Wildlife Refuge in mid-November. Service Director Dan Ashe was joined by leading conservationists and officials from the Departments of Justice and State in a call for global action to combat the illegal wildlife trade. In recent years, the number of elephants slaughtered by poachers in Africa and Asia has risen to more than 30,000. Among the items crushed were raw and carved ivory tusks, sculptures and trinkets. The United States is one of the world's largest ivory consumers, making this event especially significant for Americans.

Oregon

Community partners, including Portland General Electric, Halstead's Arboriculture Consultants and the Oregon Eagle Foundation, helped Tualatin River National Wildlife Refuge save a bald eagle nest. In the 2013 spring and summer nesting season, a pair of eagles successfully raised one eaglet to fledgling in an area visible to refuge visitors. But the nest was established on top of a dying oak tree in danger of falling over, so the U.S. Fish and Wildlife Service reached out to the community for help. Portland General Electric provided the equipment, manpower and expertise to stabilize the tree. Oregon Eagle Foundation provided guidance on the design for supporting the eagle nest, and Halstead's Arboriculture provided technical guidance on the best way to stabilize the tree. Images of the eagles' nest are at: *http://bit.ly/1iebExo*

Hurricane Sandy Restoration Projects

Last fall, at the one-year anniversary of Hurricane Sandy, Interior Secretary Sally Jewel announced that $162 million will be invested in 45 restoration and research projects designed to buttress Atlantic Coast communities and habitats against powerful storms. Many of the projects are scheduled to be completed on national wildlife refuges, including: Edwin B. Forsythe Refuge, NJ; Martin and Eastern Neck Refuges, MD; Prime Hook Refuge, DE; Great Dismal Swamp and Chincoteague Refuges, VA; Seatuck and Wertheim Refuges and Lido Wildlife Management Area, NY; Parker River Refuge, MA; and other coastal refuge lands.

Assessing Alligator Snapping Turtles at Sequoyah Refuge

By Nicole Haskett-Osborn

Sequoyah National Wildlife Refuge in eastern Oklahoma has begun a health assessment to pinpoint why the number of alligator snapping turtles has declined substantially over the past decade.

Historically, the refuge has supported a rich turtle community, including alligator snapping turtles, which have been in decline for years elsewhere in Oklahoma. Sequoyah Refuge was one of the few places in the state with a robust alligator snapping turtle population that had been used as brood stock for reintroduction efforts.

However, over the past decade that alligator snapping turtle population has collapsed. Research indicates that entire age classes from this 10-year period are missing. Biologists are baffled about the cause. In addition, carcasses of box turtles are appearing, suggesting that there may be a disease outbreak.

"In short, not only did the alligator snapping turtle populations decline, so did the entire turtle community," says Sequoyah Refuge wildlife biologist Dustin Taylor. "The decline in alligator snapping turtles is especially alarming if you consider that Sequoyah Refuge contained one of the two populations thought to be stable in eastern Oklahoma."

In response, the refuge, the National Wildlife Refuge System Inventory and Monitoring program, Missouri State University and the Tulsa Zoo are taking action. Led by Missouri State assistant biology professor Day Ligon and graduate student Jay Krystyniak, they are collaborating on a turtle health assessment. They are monitoring alligator snapping turtles, three-toed box turtles, red-eared sliders, Mississippi muds and common snapping turtles.

Sequoyah National Wildlife Refuge biologist Dustin Taylor weighs an alligator snapping turtle. The Oklahoma refuge, the Refuge System Inventory and Monitoring program, Missouri State University and the Tulsa Zoo are studying why the turtles' population is in decline at the refuge. (Eric Stewart)

Sequoyah Refuge offers excellent habitat alligator snapping turtles, which are endemic to waterways that ultimately flow into the Gulf of Mexico. The 20,800-acre refuge is on Kerr Reservoir, where the Canadian and Arkansas Rivers meet. It includes riverfront and floodplain forest, floodplain sloughs and oxbows, managed wetlands, cropland and about 7,500 acres of open water in the reservoir.

Largest Freshwater Turtle

The alligator snapping turtle is North America's largest freshwater turtle. It is known for its large, "snapping" jaw, which it uses to warn off predators and catch prey. It is almost entirely carnivorous. The species, which can live to 100 years in the wild, is secretive and mostly aquatic, with the exception of rarely observed basking.

The health assessment is capturing turtles in baited commercial hoop traps. It targets creeks that historically had the highest turtle populations as well as several managed wetlands on the refuge.

Two such creeks exemplify the decline.

Data from a baseline survey conducted in 1997-2000 show there were an estimated 127.5 to 152 alligator snapping turtles in Big Vian Creek. In 2010, the estimate was 22. In 2011, it was 50. In 2012, it rose to between 111 and 171.4, but that numerical range appears to have been artificially high, possibly because of favorable trapping conditions and movement among creeks.

A similar survey shows there were 68.4 to 86.6 alligator snapping turtles in Little Vian Creek in 1997-2000. By 2010, the estimate was 38 to 54. In 2011, it was 12 to 14.7.

All the while, capture rates for all turtle species have declined, most noticeably for red-eared sliders and alligator snapping turtles.

To determine if disease is a factor, the scientists are taking white blood cell counts and looking for the presence of specific viral antibodies as well as endo- and ecto-parasites.

"If one or more pathogens are at work," says Taylor, "it is possible that turtles, amphibians or fishes could be serving as reservoirs for these pathogens."

Nicole Haskett-Osborn is a public affairs specialist in the Southwest Region office in Albuquerque.

Frog Study Reveals Low Rate of Abnormalities, Some Hotspots — *continued from page 1*

toads with severe abnormalities and documented global amphibian population declines, disease outbreaks and an increased rate of species extinctions.

In 2000, Congress asked agencies within the Department of the Interior, including the Service and U.S. Geological Survey, to address growing concerns about the health of amphibians in the United States. In response, the Service launched a 10-year study, the largest ever of its kind, to determine the distribution and severity of amphibian abnormalities within the Refuge System.

The research effort – called the National Abnormal Amphibian Program – sampled more than 68,000 frogs on 152 refuges and, in the process, compiled one of the world's largest databases on amphibian abnormalities.

On average, only 2 percent of the frogs and toads were classified as having skeletal or eye abnormalities, the types of abnormalities most commonly studied. The expected background range of zero to 2 percent skeletal/eye abnormalities was found at many refuges. Extra limbs were exceedingly rare: just 0.025 percent of all frogs sampled.

However, consistent with other, prior studies, the Service's study detected areas where sites with higher rates of abnormalities tend to cluster together geographically. Within these regional hotspot clusters, which were found in the Mississippi River Valley (northeast Missouri, Arkansas and northern Louisiana), in the Central Valley of California, and in south-central and eastern Alaska, abnormality frequency often exceeded the national average of 2 percent, affecting up to 40 percent of emerging amphibians in some individual samples.

A U.S. Fish and Wildlife Service study published in the journal PLOS ONE finds that on average less than 2 percent of frogs and toads sampled on 152 refuges had physical abnormalities involving the skeleton and eyes. (Rick Hansen/USFWS)

The research effort – called the National Abnormal Amphibian Program – sampled more than 68,000 frogs on 152 refuges.

Analysis of the data showed that the location where the amphibians were collected was a better predictor of whether they would be abnormal than was their species or the year they were sampled. There was virtually no evidence that some species were more likely to be abnormal than others or that more abnormal frogs were found in some years than in others.

Although this study was not designed to investigate the reasons behind amphibian abnormalities, the results strongly implicate localized causes. This is consistent with other research, some of which has identified contamination, predators, parasites or the interaction of these as potential factors.

Detailed information about the study, including a link to the PLOS ONE article, is available at: *http://www.fws.gov/contaminants/Issues/Amphibians.cfm*

Slowly but Surely Preserving Prairie in Kansas — *from page 3*

of the easement program is spreading, so is the interest from landowners," says Bohannan.

A key to future success is the federal Land and Water Conservation Fund, which pays for easements and is up for reauthorization in 2015.

A key to getting this far, Bohannan says, has been partners – including the state of Kansas, National Park Service, The Nature Conservancy, Kansas Land Trust, Ranchland Trust of Kansas, the Tallgrass Legacy Alliance and private landowners like the Sprouls.

"Everybody has a little bit different agenda, but in the end the goal is to save the Flint Hills and their culture," Bill Sproul says. "No one outfit can do it all. We have to neighbor-up and help each other."

RefugeUpdate

USFWS-NWRS
4401 North Fairfax Dr.
Room 634C
Arlington, VA 22203-1610

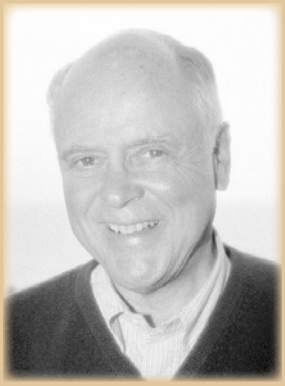
STANDARD PRESORT
POSTAGE AND FEES
PAID
U.S. DEPARTMENT OF THE INTERIOR
PERMIT G-77

Meet us at *www.fws.gov/refuges*

A Look Back . . . Kip Koss

Kip Koss was "our living connection to 'Ding' Darling," says Toni Westland, supervisory refuge ranger at J. N. "Ding" Darling National Wildlife Refuge on Sanibel Island along Florida's Gulf Coast. Christopher "Kip" Koss was the son of Darling's daughter Mary. He served in the Air Force and flew commercial planes for Pan Am for 27 years before devoting his retirement to furthering the legacy of his famous grandfather.

Koss was born in Iowa and studied economics at Stanford University. Five generations of the Darling family have vacationed on Sanibel and Captiva islands, and Koss continued to return every summer from his retirement home in Key Biscayne. He admitted being "pretty grossly ignorant of Darling's work" when he became president of the J.N. "Ding" Darling Foundation in 1983, but he was a quick study. The foundation was instrumental in consolidating land acquisitions to complete Sanibel National Wildlife Refuge, later renamed for Darling. Koss himself compiled and catalogued nearly 7,000 of his grandfather's Pulitzer Prize-winning editorial cartoons onto a searchable CD, donated numerous Darling artifacts to the National Conservation Training Center, and spearheaded production of the recent documentary film about his grandfather's life, "America's Darling."



Kip Koss (1935-2013) was a champion of conservation and of the national wildlife refuge in Florida named for his grandfather J.N. "Ding" Darling.

Refuge manager Paul Tritaik says Koss was "a warm, engaging gentleman with a good sense of humor" who was "passionate about conservation and not shy about showing his support for the work we were doing." As a member of the advisory committee for the refuge's new visitor/education center, Koss was an active fundraiser who designed the exhibit areas about his grandfather. He transferred funds from the Darling Foundation to the "Ding" Darling Wildlife Society, the refuge Friends group, to create a permanent endowment that provides $5,000 in annual grants to local teachers for environmental projects.

After Koss's death late last year, U.S. Fish and Wildlife Service Director Dan Ashe wrote that "Kip and the foundation were great partners with the Service in promoting the Refuge System, the Duck Stamp program and ongoing conservation education, all arenas in which his grandfather was an American pioneer." When the Service instituted a national Heritage Award in 2002 for extraordinary contributions to preserving the agency's history, Ashe noted that Koss was the unanimous choice for the first award winner.

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

Send Us Your Comments

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