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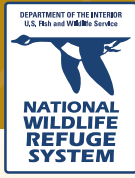
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Refuge managers may want to consider this new event for Refuge Week.



Okefenokee Swamp

The cool serenity of the Okefenokee Swamp as seen in this new international postage stamp is in sharp contrast to the fire that raged at Okefenokee National Wildlife Refuge in Georgia this year. The refuge protects 402,000 acres of the 438,000-acre swamp. Read more about the fire on page 17.

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Preventing Lange's Metalmark Butterfly from Floating Away



The U.S. Fish and Wildlife Service has launched an aggressive new effort to restore habitat for Lange's metalmark butterfly at Antioch Dunes National Wildlife Refuge in California. (Jerry Powell)

by Jim Nickles

The Lange's metalmark butterfly, whose only home is a few stunted sand mounds in the town of Antioch, California, is fluttering dangerously close to extinction. The U.S. Fish and Wildlife Service has launched an aggressive new effort to restore habitat at Antioch Dunes National Wildlife Refuge and breed the species in captivity until its wild population can be stabilized and eventually recovered to full health.

The refuge and the Service's Ecological Services program in Sacramento are working with the San Diego Zoo to establish the captive-breeding program and with Pacific Gas & Electric Co. to improve habitat on PG&E-owned land within the refuge. The two-pronged approach – habitat improvements and

captive-breeding – has worked to stabilize the population of the Palos Verdes blue butterfly, once thought to be extinct.

Metalmark butterflies – fragile and brightly colored – are named for their grey, or metallic-colored, wing tips. While many types of metalmark butterflies are found throughout California, the Lange's metalmark is named for William H. Lange Jr., the young entomology student who first described it in the 1930s.

Unlike many other butterflies that can produce several generations in a year, the Lange's metalmark breeds only one group of offspring per year. So each fall's count of adult butterflies is considered a critical indicator of the species' health. Last fall, biologists recorded a peak count of only 45 adult Lange's metalmark

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H. Dale Hall

From the Director Connections to Nature

When I was a kid growing up in Harlan County, Kentucky, I spent summer afternoons fishing or looking for all manner of salamanders, caterpillars and other creatures. My friends and I took pride in seeing how dirty we could get, and we knew the creatures and greenery around us were important.

That's what we need to give America's children once again – the chance to come home with scraped knees, dirt on their hands, and a personal understanding that nature is a central part of their lives and their heritage. In an earlier issue of *Refuge Update*, I noted that Rachel Carson's commitment to the environment may well have come from growing up on the family farm. How will tomorrow's conservation heroes emerge when today's children are more likely to recognize an iPod than a milkweed pod?

That disconnection from the natural world – and what it means for America's future – has rightly prompted a lot of national discussion.

The Service is doing more than talking; we're taking action. First, we have formed a working group, headed by NCTC Director Rick Lemon, to strengthen existing efforts to bring nature into the lives of children. Second, we're looking into ways to communicate with our wired generation through technologies that appeal to them.

Most important, we have the finest gateways to nature: our national wildlife refuges. Read any issue of *Refuge Update* and you start to see how much is already happening on refuges, from Rachel Carson Refuge in Maine helping Girl Scouts to earn merit badges by assisting wildlife in their own

communities, to Tualatin River Refuge in Oregon collaborating with the Oregon Forestry Education Program on a project for middle and high school students whose first language isn't English.

Is all that enough? Not quite, but we've only begun. Every year, national wildlife refuges offer organized environmental instruction to more than 750,000 students and teachers and welcome approximately 40 million visitors. I commend the Refuge System on your efforts to share these treasured places with the American public and teach them about our mission and conservation values. And I encourage refuges to continue coming up with innovative ways to help people – especially children – have enjoyable and meaningful outdoor experiences and develop strong life-long connections with the natural world. ♦



Geoff Haskett

Chief's Corner Refuges' New Birding Initiative

National wildlife refuges get about 30 million visits each year from people who

appreciate that the National Wildlife Refuge System has the best places in the country to see wildlife and to learn about the inextricable tie between the health of habitat and wildlife. Millions come with binoculars dangling from their necks, eager to see a dazzling variety of birds. They've come to the right place.

The Refuge System is bird heaven: Refuges provide habitat for more than

700 species of migratory birds. A third of the Important Bird Areas in the United States are on national wildlife refuges.

The Refuge System, the movement for bird conservation and popular bird watching all began at the turn of the 19th century. The Refuge System was launched just three years after the Lacey Act of 1900 banned the transport of wild bird parts across state lines – including the feathers so popular in women's hats. At the same time, more people began to watch birds for recreation. Little wonder then that establishment of the first national

RefugeUpdate

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Selawik National Wildlife Refuge Joins GLORIA



Selawik National Wildlife Refuge in Alaska is the first site in the North American Arctic to be part of the GLORIA (Global Observation Research Initiative in Alpine Environments) network, which will measure long-term changes in temperature and vegetation like this alpine boreal carnation. (Stephen Talbot/USFWS)

Selawik National Wildlife Refuge in Alaska has been named the first site in the North American Arctic to be part of the GLORIA network. GLORIA – the Global Observation Research Initiative in Alpine Environments – is identifying and maintaining long-term observation sites in alpine environments. Vegetation and temperature data collected at the GLORIA sites will be used to spot trends in species diversity and temperature.

The Arctic is extremely sensitive to climate changes, explains Service botanist Stephen Talbot, noting that the average Arctic temperature has increased at twice the rate of temperatures in the rest of the world. “Climate change is a particular threat to the unique biodiversity of Arctic regions because these plants have no place to go. Vegetation below Alpine levels can move up as it gets warmer. It’s almost like a conveyor belt and alpine vegetation is just gone.”

Four specific sites in the Hockley Hills area of Selawik Refuge have been identified. This summer, Talbot, Canadian Bryologist W.B. Scholfield and GLORIA Scientist Laslo Nagy will visit each site, inserting a total of 16 temperature probes in the ground that will continuously record the temperatures. Establishing each site is very labor intensive, as every species – vascular plants, lichens, mosses, liverworts – in a five meter by five meter sample area must be identified and recorded.

After three years, data from the temperature problems will be sent electronically to GLORIA headquarters at the University of Vienna, Austria, and new probes will be inserted. At that time, Talbot will note any changes in vegetation, submitting these findings to the database as well. The process will continue every three years indefinitely.

Patterns of Change

Over time, the data should provide information on new patterns of biodiversity and vegetation and some indication of whether these changes are caused by climate change. Eventually, Talbot hopes to identify measures that can be taken to mitigate climate-induced biodiversity losses.

The scientists who created the GLORIA network in Vienna in 2001 believe that an important feature of high mountain ecosystems is their naturalness, since the landscape is less fragmented and developed. Alpine ecosystems occur on all continents and can be compared on a worldwide scale. Currently, there are 47 observation sites, mostly in Europe, though there are sites in Africa, South America, Colorado and California.

Selawik Refuge Manager Lee Anne Ayres is especially intrigued with what she calls the exquisite quality of the database – strict protocols and a depository for the data that will be accessible to anyone. “We are a small piece of the puzzle but this data will be available to a much larger scientific public than we are usually able to reach.”

Putting Selawik on the Map

Both Ayres and Talbot believe participation in the GLORIA network helps put Selawik Refuge on the map. Talbot is getting to know scientists in other Arctic countries and he encourages other refuges with high mountain environments to consider becoming GLORIA sites. “It’s infinitely useful because across the sites you have different weather patterns, different flora and with this huge database you can begin to see patterns.”

Ayres expects sharing information with other scientists worldwide will help the refuge know what else it ought to be measuring or doing.

The refuge budgeted \$25,000 to cover travel and logistical support for the first year of GLORIA, including the use of

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The Arts Tell Nature's Story

Green Café Runs at Capacity

Who would have imagined that as many as 130 people would travel to a relatively remote refuge on a Friday night to see films about the environment or hear artists whose work addresses the natural world? Ana Flores not only imagined it but made it happen so successfully that her Green Café at the Kettle Pond Visitor Center in Rhode Island is fully booked for a second season.

Flores is the artist-in-residence with the Rhode Island National Wildlife Refuge Complex. "Kettle Pond is my back yard and I've always used the arts as a way of communicating about environmental issues," explains Flores. She found support from Refuge Manager Charles Vandemoer to seek a grant from the Rhode Island Foundation, which encourages artists to work in different venues with different materials. The \$22,000 grant, including \$7,000 from the U.S. Fish and Wildlife Service, has been funding Flores' work on the Rhode Island refuge since January 2006.

The monthly public lecture and film series entitled "The Green Café" is held one Friday evening each month. The programs are held in the Kettle Pond Visitor Center, an environmentally sensitive and sustainable facility nestled among tall oaks, pines, kettle holes and stands of highbush blueberry and mountain laurel. The series features filmmakers, sculptors, storytellers, architects, poets, writers and musicians. Some events include a dialogue after the presentation.

From Narragansett Medicine to Birdsong and Coffee

The first round of programs in spring 2006 focused on water. One evening, the audience watched a provocative documentary about global water conflicts (*Thirst*) and discussed local water issues with a Brown University professor. A Narragansett medicine woman talked about her culture's appreciation for

craft using natural resources. The film *Birdsong and Coffee* was featured along with a Service biologist who discussed bird migration. "People changed their coffee buying practices after that event," said Flores. "We are getting a response and a sensitivity that is building on other information people get."



These colonial-era female figures in stone and wood were installed by artist-in-residence Ana Flores on the site of an 18th century cellar at Rhode Island National Wildlife Refuge Complex. (Ana Flores/USFWS)

"We had no idea what the audience response would be," said Flores. "The hunger for this has been a surprise. We have been filled to capacity." Now Flores is seeking new funding to kick off a youth version of the Green Café, in which young people would develop leadership skills by planning programming for their own generation.

This spring, Flores unveiled a series of her own sculptures along a refuge trail. Each group of sculptures is made of materials that represent one of three periods in local history – a mixture of

cement and peat moss to reflect the life of the Narragansett people; wood and stone for the colonial era; steel and wood for a large slave population that lived in southern Rhode Island. Interpretive boxes and pamphlets accompany the sculptures, which will be displayed on the refuge for about six months.

The sculptures were unveiled in May during an Art Culture Nature conference that brought together artists, teachers and environmentalists at Kettle Pond Visitor Center. This year's conference focused on the connections between ecology and land-use history. Central to the theme are Kettle Pond's award-winning facility and Flores' art installations and programs.

Art on Your Refuge

Flores was especially appreciative of the open-minded support from Vandemoer and visitor services manager Janis Nepshinsky. For other refuges contemplating a program in the arts, Flores recommends finding at least one artist or committee of artists with local history and connections.

"Think about artists working in different media: film, dance, visual arts, storytellers, writers, and think about all sorts of links with scientists in the field," suggested Flores. "All of our presenters have been extremely passionate and that rubs off. Art gets to a deep part of people, especially in our time of information overload." Flores is willing to coordinate workshops to plant the seeds for Green Café programs at other refuges. For more information visit <http://www.art-farm.net> or email Flores at ana@art-farm.net. ♦

Women in the Outdoors

Scrapbooking to Hunting

Mary Ellen Steward won a shotgun at her first National Wild Turkey Federation awards banquet. Until then, she had carried only a camera on hunts with her husband and sons. Now, she is a hunter herself and coordinates a Women in the Outdoors (WITO) event at Muscatatuck National Wildlife Refuge in Indiana.

Wanda Messer is the volunteer coordinator for Women in the Outdoors events in Tennessee – when she’s not hunting turkeys with her new shotgun or selling Mary Kay cosmetics.

Several national wildlife refuges have hosted WITO events in partnership with one of the 2,000 local chapters of the National Wild Turkey Federation and other local sponsors. The Federation seeks to teach the importance of responsible wildlife management, increase participation in outdoor-related opportunities and preserve the hunting tradition. “We tap into a powerful source of energy and commitment to help manage wild resources,” says Cindy Spillman, women’s regional coordinator for the Federation.

Spillman has worked on events attended by four generations of a single family. There is frequently a special rate for mother-daughter teams. “This is a comfortable, relaxed, non-competitive environment,” continued Spillman, “where women can find out about equipment without purchasing it and then talk intelligently in a store.”

Spillman says attendance at Indiana’s WITO event skyrocketed when it was first held at Muscatatuck Refuge two years ago. The most popular classes were lake kayaking and wingbone call making. In an orienteering class, women were blindfolded and taught how to survive if they become lost.



Women in the Outdoors programs, like this one at Squaw Creek National Wildlife Refuge in Missouri, teach women outdoor skills ranging from gardening and journaling to archery, fly-fishing and shooting. (Ellen Benitz/National Wild Turkey Federation)

More Than Hunting

WITO events are about much more than hunting. With Rachel Carson’s 100th birthday anniversary this year, Andrea Stewart, visitor services manager at Montezuma National Wildlife Refuge in New York, sought a way to focus on women in conservation. The refuge hosted its first WITO event in July as a way for women to explore all the ways they can be outside. Workshops were planned in archery and shotgun skills but also gardening, journaling and self-defense.

At Noxubee National Wildlife Refuge in Mississippi, park ranger Andrea Dunstan’s WITO event in April brought 26 women from their mid-20s to retirement age. They could choose workshops ranging from orienteering and Dutch oven cooking to skeet shooting, snake identification, canoeing and game calling. There was also a silent

auction to raise money for the event itself and for the refuge Friends group. “We’re building awareness and educating people about the refuge,” says Dunstan.

The 2006 WITO event at Squaw Creek National Wildlife Refuge in Missouri drew participants from five states and won the award for best new event at the National Wild Turkey Federation Missouri Awards Banquet. The brochure for the 2007 event announced that “this is not a no-holds-barred, klutzes-need-not-apply event. This is simply your opportunity to stretch your wings and try something new.”

“The goal is to get them to come back with their families,” says Squaw Creek wildlife refuge specialist Corey Kudrna. The Squaw Creek Refuge event offered classes in wetlands ecology and alternative crop cultivation as well as turkey and waterfowl hunting. Kudrna

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More Training = Better Programs + More Enthusiasm



Minnesota Valley National Wildlife Refuge has used the National Association for Interpretation's Certified Interpretive Guide workshop to train additional volunteers. As a result, nine new programs were added to the refuge's activity calendar for 2007. (USFWS)

Ttrained volunteers can make all the difference in providing programs when staff hours are at a premium.

Just ask Minnesota Valley National Wildlife Refuge, which added nine programs to its spring 2007 calendar thanks to the National Association for Interpretation's Certified Interpretive Guide workshop.

Serving three million people in the Twin Cities area, Minnesota Refuge needed extra hands to deliver interpretive programs to an ethnically and culturally diverse population. The refuge certified nine new volunteers with the NAI program.

The Certified Interpretive Guide (CIG) workshop teaches participants how to sharpen their communication skills, capture the essential ingredients of first-rate interpretive programs and enhance visitor experiences. The course is designed for people who want to understand the history of the interpretive profession. Ultimately, the 32-hour workshop, usually taught either during four consecutive days or over two weekends, helps to boost volunteers' confidence. To become

certified, workshop participants must also complete an open book exam, write a program outline and give a 10-minute interpretive presentation.

The refuge used a Challenge Cost Share grant for the training and reference materials for each participant; CIG costs \$150 per participant. "We had hoped for 15 volunteers. Ten people signed up, and then two had

to drop out for personal reasons," said Mara Koenig, refuge park ranger and a trained CIG instructor. "Some funding purchased reference materials that staff and volunteers can use in the refuge library."

The new programs run the gamut: nature snowshoe hike, orienteering and land navigation, using one's senses to discover nature, spring flora, phenology hike, nocturnal wildlife, digital wildlife photography and history of the bass ponds. With the new offerings, the refuge nearly doubled its average number of monthly visitors last winter. Even more important, the refuge got the chance to offer programs that haven't been part of its smorgasbord before.

"We are working to partner with a state park on a fishing program for our Hmong residents," says Koenig. "The new volunteers are publicizing the program where they live and work, including inside Minneapolis and St. Paul and in the outlying suburbs. These are places where we don't always direct our information."

The NAI program is being implemented nationally, notes Koenig. That means that a volunteer who wants to leave the snows of the Midwest in January and lead interpretive programs in the sunny South will have training that is certified for both locales. To attract training participants, Koenig advertised on both NAI and the refuge Web sites as well as the Web sites of the Minnesota Office of Environmental Assistance and Minnesota Naturalist Association.

Volunteers and partners have long conducted a range of interpretive programs at Minnesota Valley Refuge, including many about birds and cultural resources. But with little or no training in interpretive techniques, the volunteers often felt limited. Not now.

"Now, refuge volunteers are leading family groups to explore with all their senses," says Koenig. "We have orientation and land navigation programs so hunters can fine tune their skills in topography map reading and compass and GPS navigation."

In another program, visitors will learn how to use digital cameras in the outdoors and then practice these skills on the refuge when attending the digital nature photography interpretive program.

Volunteers in training learn how to sharpen their observational skills to read an audience. They also learn how to incorporate tangible, intangible and universal concepts into interpretive program. "With this training, volunteers will be able to help us create a higher quality experience for visitors," said Koenig. "By letting volunteers know that they are respected members of the staff and their work is valuable, they become super enthusiastic." ♦

Reflections on a Day in March

Hosting the First Lady at Midway Atoll National Wildlife Refuge

by Barry Christenson

On March 1, I led a tour of Midway Atoll National Wildlife Refuge along with Deputy Manager Mike Johnson, Biologist John Klavitter and our volunteers. We pointed out the numerous nesting seabird species, the migrant shorebirds, rare waterfowl, endangered marine mammals and the historic structures that make this refuge unique. Just another day on the refuge? Not at all.

The visitors were First Lady Laura Bush and her guests, the Secretary of the Interior, the Deputy Secretary of Commerce, the chairman of the Council on Environmental Quality, CNN news and a host of others.

After many phone calls and e-mails that set this visit in motion, the real planning began when the advance team arrived at Midway Atoll Refuge a week before the First Lady's visit – eight highly qualified members of the White House, Interior, Air Force and Secret Service. Each “movement” of the group was planned, rehearsed, timed, evaluated and modified for the big day. We also planned for bad weather.

At 1:15 a.m. on March 1, we watched the large blue and white Boeing 757 taxi to the hangar. Weeks of discussion and days of planning were past and the visit had started. With the crisp discipline of trained Secret Service agents, we lined up the motorcade (well, a string of golf carts). I led a parade of dignitaries through fields of Laysan albatross glowing white in our headlights.

Most guests stayed at Charlie Barracks, our motel. But Mrs. Bush, her personal friend and one staff member stayed at Midway House, which my wife Elise and I call home. We quickly learned that Mrs. Bush is a wonderful, undemanding guest whom we had to convince that making oatmeal was not too much trouble!

Our refuge tour began with a boat trip to Eastern Island. There John Klavitter led the tour of what had been a highly developed island and is now dominated only by abandoned World War II runways and wildlife. Mrs. Bush delighted in seeing Laysan ducks, a short-tailed albatross, a variety of other seabirds, and even planted native bunchgrass as part of our habitat

Mrs. Bush and the others had a chance to visit with three of our refuge volunteers. They talked about the natural history of Laysan albatross, the threats albatross face at sea and the reasons for banding. After getting instructions from the volunteers, Mrs. Bush, the Secretary and others banded chicks from one of our reproductive plots. Then we traveled to the beach where she learned about



During a visit to Midway Atoll National Wildlife Refuge, First Lady Laura Bush spoke with Refuge Biologist John Klavitter, among others. Joining her for the visit were (from left), Interior Secretary Dirk Kempthorne, Council on Environmental Quality Chairman James Connaughton and Commerce Secretary David Simpson. (Shealah Craighead/White House)

restoration efforts. Following lunch at the Clipper House, our dining facility on the beach, she talked with many of the Clipper House workers who are from Thailand, posing for a group photo and asking them about their jobs and families.

Turning Focus to Wildlife

Deputy manager Mike Johnson led an afternoon tour of Sand Island. His history tours are the stuff of local legend and he captivated our guests with story after story about the colorful history of Midway. Then we turned our focus to wildlife.

the endangered Hawaiian monk seal at the National Marine Fisheries Service (NMFS) Captive Care project. Located on our cargo pier beach, the NMFS crew cared for six female seals during their first winter in an attempt to increase their long term survival prospects. Mrs. Bush and the other guests threw the seals their afternoon meal, a pail of herring. The NMFS crew in turn had a chance to explain their project and its importance for the long term survival of the species.

After a reception for everyone on the island – and right on time with our ever-present agenda – the now extremely

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FOCUS... *On Law Enforcement*

Protecting Refuge Resources:

Law Enforcement in the National Wildlife Refuge System

by Mark Chase

Change has become a central theme of all U.S. Fish and Wildlife Service activities: change due to the world around us, the budget climate, national demographics and change for the sake of continuous improvement in being stewards of our nation's resources. The National Wildlife Refuge System law enforcement program, perhaps as much or more than any program in the Service, has undergone dramatic change over the past five to six years. The Refuge System used to field a handful of full time officers and more than 600 collateral-duty officers – managers, biologists, maintenance workers, outdoor recreation

planners and others who devoted an unspecified amount of time to law enforcement activities. Now we employ more than 200 full time officers and another 200 dual-function officers who must devote at least 25 percent of their time to law enforcement.

Demands for law enforcement coverage by each officer have increased along with the diversity of crimes these officers confront. Where we used to be primarily game wardens enforcing strict conservation laws, the demands of society now require that Refuge System officers be trained and equipped to deal with the full range of crimes that are occurring on public lands.

“Demands for law enforcement coverage by each officer have increased along with the diversity of crimes these officers confront.”

Protecting the “Quilt of Conservation”

by Scott Kahan

Abird's eye view of the prairie pothole region of the upper Midwest reveals wetlands shining like diamonds among the prairie grasses, agricultural fields being harvested and drainage activities that remove wetland habitat. Look down at the landscape from a plane and you will see that conservation efforts are stitched together like a quilt.

The habitat patches are often units of the National Wildlife Refuge System, where wetlands and prairies have been protected. But who protects this quilt from unraveling? A dedicated team of law enforcement officers is entrusted with protecting the Refuge System interests.

Waterfowl Production Areas (WPAs) are fee-title lands purchased by the U.S. Fish and Wildlife Service to provide long-term protection of wetland and grassland habitats. The Service also purchases conservation easements on private lands surrounding the WPAs. Protecting prairie wetlands and grasslands was an innovative landscape level conservation strategy initiated 50 years ago with the Small Wetland Acquisition Program (SWAP), which allowed the Service to use revenue from the sale of federal Duck Stamps to purchase WPAs as well as easements on private lands in the prairie pothole region.

Enforcing conservation easements is mission critical law enforcement work. Without annual enforcement, easement wetlands are lost to the ditching machines, grasslands to agriculture or development. Once destroyed, habitats can be difficult to restore. Some



Zone Officer Brent Taylor inspects an easement managed by the Detroit Lakes Wetlands Management District in Minnesota. (USFWS)

Before 2000, law enforcement was managed by one regional coordinator, one coordinator in the Refuge System Headquarters and two staff members at the Federal Law Enforcement Training Center. Today, each region has a full-time law enforcement chief and a complement of zone officers. There is a staff of seven in Headquarters, including a security manager for the Service. The Federal Law Enforcement Training Center (FLETC) fields a staff of four, along with three other officers on long-term detail to the Department of Homeland Security.

From One Week of Training to 30

In the Service today, we have officers who were commissioned after one week of on-the-job-training with a special agent. By the mid-1970s, officers were receiving three weeks of training at FLETC. By 1984, nine weeks of training were required. Today, an officer will

habitats, like native prairie, can never be fully restored.

Inspecting Each Easement

Easement enforcement requires a sustained effort. Each year, refuge officers fly over and photograph the landscape, inspecting each easement, each square in the quilt. Drainage, filling and burning are noted. Grassland easements are inspected to make sure they are not hayed off, plowed or developed.

Annual aerial inspections are followed by confirmation on the ground, documenting any violations for possible use in court. At this point, the refuge officer may meet directly with the landowner. Although most landowners work with the Service voluntarily to repair damage and abide by their agreement, a few choose a different course. These are the violations that will be referred to the Department of Justice as a violation of the Refuge Administration Act.



U.S. Fish and Wildlife Service game warden Bruce Butler is on patrol in the southeast region. (USFWS)

spend more than 30 weeks in training to meet the demands of the job.

All law enforcement officers in the Department of Interior receive 18 weeks of basic training; refuge officers

spend another two weeks learning about laws specific to the National Wildlife Refuge System as well as ten weeks in field training on a refuge. Continuing education, especially in dealing with such social problems as drug and alcohol use,
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Many seasoned refuge officers will tell you that easement enforcement is some of the most difficult work they have done. Visiting with an angry landowner at his home in an attempt to resolve an easement violation is an experience folks don't quickly forget. Landowners vent over the loss of cropland when wetlands fill with water, over the cost of the ditches/tiles they installed and the cost associated with restoring the wetlands. Landowners can perceive enforcement of easements as a threat to their livelihood, and emotions sometimes run high.

Enforcing conservation easements also comes with costs: completing aerial surveys, ground checking violations, reviewing files, mapping wetlands, conducting interviews and ensuring compliance. These are necessary annual expenses to save habitat.

This spring, a fellow law enforcement officer and I were visiting the site of a drainage violation that had been restored last fall. We slogged through

the muddy field until our boots resembled oversized clown feet. We made our way up to the top of a hill where we could see the wetlands that had been restored and spent the time recounting how much effort it took to get this violation resolved.

As we crossed the crest of the hill, hundreds of ducks flew from the restored wetlands below us. We stood in silence, listening to the willowing of the snipe and the calls of the sandhill cranes that had also found this patch of habitat. This is the tangible reward of easement enforcement – offered by the critters and deeply valued by all who have a passion for the resource. ♦

Scott Kahan is project leader at Detroit Lakes Wetland Management District.

FOCUS...*On Law Enforcement*

A Day in the Life of a Refuge Officer

by Kevin Gormley

Marijuana on Refuges in the Midwest



Four people were charged with felonies after refuge law enforcement officers discovered illegal marijuana being grown at Sherburne National Wildlife Refuge in Minnesota.

Since 2005, refuge law enforcement officers have detected more marijuana growing operations on national wildlife refuge lands in the Midwest Region. Marijuana has been found on rural and urban refuges as well as Waterfowl Production Areas and islands. In addition to being illegal, these marijuana operations bring other invasive plants onto refuges and create potential hazards for visitors.

At two of the recent illegal grows at Minnestoa Valley and Sherburne National Wildlife Refuges in Minnesota, almost 500 marijuana plants were confiscated and four people were charged with felonies. Midwest refuge law enforcement chief Chris Jussila said the violators knew how to grow the plants effectively to get the best product. The plants had an estimated street value of almost \$1.5 million.

Officers from the Office of Law Enforcement and the Division of Refuge Law Enforcement deployed video surveillance cameras to catch the violators fertilizing and pruning their marijuana plants. Jussila noted that this is labor and time intensive since it requires setting up surveillance equipment, looking through all the videotapes and issuing search warrants. The video was valuable in identifying the marijuana growers and providing evidence in court.

The job of refuge officers has evolved over the decades from tour guide to park ranger to game warden, search and rescue expert, first responder EMT and street police officer. Today's refuge officer is all of the above. We will always maintain our roots assisting and welcoming our refuge visitors, but we are now confronting

Finding Chemicals Instead of Crystals

Digging for the unique selenite crystals of Oklahoma's Salt Plains draws 30,000 visitors every year to Salt Plains National Wildlife Refuge. But the salt flats have been closed since April 21, when a 15-year-old Boy Scout unearthed one vial of chemical. The vial has been identified as World War II-era gas used for training purposes. The site of the discovery was the former Great Salt Plains Bombing Range near Cherokee.

The Army's 22nd Chemical Battalion, wearing white protective suits, has since removed 133 more CAIS (Chemical Agent Identification Set) vials from the same area, each containing one of four chemicals. The vials were not designed to be lethal, but as Refuge Manager Jon Brock says, they were designed to train adults at a distance, not to be found by kids at close distance.

Brock has stayed in contact with the Scout's parents. The boy suffered only minor eye irritation when one vial broke.

Modern techniques to search for old chemicals

Brock says it will be necessary for the Army experts to search the entire 300 acres of salt flats normally open to selenite crystal digging. Brock expects technicians to use ground-penetrating radar and metal detectors to search most of this area. The crystal digging sites will remain closed until officials deem them safe to reopen. A six-foot chain link fence has been erected around the immediate area where the first vials were found. These vials were generally found about a foot below the surface.

Normally, the salt flats are open for digging from April to mid-October. Selenite is a crystallized form of gypsum.

criminal behavior that requires us to have more expertise and training than in the past.

A few years ago, while attending the Law Enforcement for Supervisors Training, the discussion topics were DUIs (Driving under the Influence) and other alcohol-related activities that occur on national wildlife refuges. One new refuge manager stood up and stated that, "DUIs are a societal problem and not the responsibility of national wildlife refuges." I disagreed. As stewards of national wildlife refuges, we are responsible for the safety of our visitors. Specific training to deal with DUI problems is indeed provided by some regions.

In recent years, refuge officers have also found an increase in marijuana gardens on refuge land. Methadone labs and their toxic and dangerous remains have been found, and we have seen trafficking of oxycontin on refuges as well. Societal problems are becoming refuge problems.

On the Salt Plains, crystals form just below the salt encrusted surface. Particles of sand and clay often form a unique "hourglass" shape inside the crystals, a phenomenon found only in selenite crystals from the Salt Plains of northwest Oklahoma.

Brock says closing this popular attraction has already affected both visitation at the refuge as well as small area businesses that depend on tourism. The annual Birding and Crystal Festival was moved away from the affected area and the digging events were cancelled.

The salt flats actually extend for 10,000 acres on the refuge. Researchers sometimes work in areas closed to the general public, but Brock says permits to use these other parts of the Salt Plains will be modified to forbid any digging. Researchers and refuge staff will also be

Routine Patrol Is Never Routine

Recently, refuge officers were involved in a multi-agency search for a fugitive from justice. Why would refuge officers be involved? Because one morning, the suspect attempted twice to kill his ex-girlfriend and then ran onto Patuxent Research Refuge in Maryland during the subsequent chase. County and federal police officers, K-9 units and a local police helicopter were deployed to search the refuge for the fugitive. The search was halted after the individual had not been seen for two hours.

After another two hours had passed. I was conducting one last patrol and checking on the security of the access gates when I was able to apprehend the fugitive. After a few tense moments, the suspect surrendered.

On another beautiful morning in the middle of May, a female refuge visitor was stabbed while walking on a boardwalk at Patuxent Refuge. The suspect fled when Refuge Officer Jay Perez arrived. Officer Perez stayed with the victim, providing first

aid for stab wounds to her chest, throat and back and comforting her until the emergency medical technicians arrived. The prognosis looked very bleak when she was airlifted to a local medical trauma hospital, but the quick actions of the officer saved the woman's life. The suspect was later arrested and is awaiting trial for multiple counts of attempted murder.

Refuge officers face a variety of issues on a daily basis, from assisting a refuge visitor who needs directions to confronting a visitor who drew a pistol on the officer for no apparent reason. The routine patrol for today's refuge officer is never routine. We all have to be prepared physically and mentally to perform our job – including expecting the unexpected. ♦

Kevin Gormley is refuge zone law enforcement officer in the Northeast Region.

trained to identify the vials should they be found closer to the surface.

The Army distributed the training sets between 1928 and 1969 to train soldiers in the safe identification, handling and decontamination of chemical agents. Most of the vials were simply buried, an acceptable practice until the 1970s.

Brock says there is no record of training sets ever having been delivered to the Salt Plains site and disposal records were either missing or never maintained. "No one had any idea they were here," he said. "It's a new experience for a refuge manager."

Recognize, Retreat, Report

The Service is encouraging people who may have collected CAIS vials as souvenirs from the salt plains or other sites to notify local law enforcement agencies so they can be recovered and

destroyed. The three Rs in this case are recognize that you may have a CAIS or munition, retreat – do not touch, disturb or move it, and report – call 911. Brock reiterated that "public safety remains our first and foremost concern and turning in these items with a complete and open amnesty can avert a potential incident."

The Department of Defense provides fact sheets on various chemical materials at www.cma.army.mil.

For photos and further information on CAIS visit the Department of Defense UXO Safety site at: <http://www.denix.osd.mil/denix/Public/Library/Explosives/UXOSafety/cais.html>.

Information about Formerly Used Defense Sites can be found at: https://eko.usace.army.mil/usacecop/pub/ecop/what_we_do/fuds/. ♦

FOCUS...*On Law Enforcement*

Community Policing on National Wildlife Refuges

“Refuge employees and volunteers play a key role by acting as law enforcement’s eyes and ears...”

The International Association of Chiefs of Police recommended in 2000 that the National Wildlife Refuge System adopt community policing practices as a way to leverage available resources in addressing the law enforcement requirements of the 21st century. The U.S. Fish and Wildlife Service formalized its community policing program in 2003.

Community policing extends beyond traditional law enforcement to include prevention, problem-solving, community engagement and partnerships. Refuge employees and volunteers play a key role by acting as law enforcement’s eyes and ears as they work in the field and interact with visitors. Many refuges also conduct outreach and education programs for civic groups and students to increase the level of awareness of crime in a community and its impacts on wildlife habitat and recreational activities.

Participating Fully, in Uniform

Refuge law enforcement officers at Sacramento Refuge Complex, for example, participate fully in such refuge outreach events as the Snow Goose and Salmon Festivals, International Migratory Bird Day and National Wildlife Refuge Week. Law enforcement officers attend these events in full uniform, including badges and weapons.

During the 28th Annual Endangered Species Faire in Chico, California, Sacramento Refuge Law Enforcement Officer Gregg Burgess facilitated an interactive game that taught children the essentials of a productive habitat, but officers also use these public opportunities to convey a specific law enforcement message, says Mark Chase, chief of Refuge Law Enforcement.

“It’s a law enforcement message grounded in biology,” says Chase. “If refuges are going to produce habitat for



Remains of a baby Triceratops were found at Charles M. Russell National Wildlife Refuge in Montana. The refuge is developing a new plan to manage paleo research requests. (Jack Horner/Montana State University)

Dinosaurs Under the Charles M. Russell National Wildlife Refuge

by Bill Berg

Interest in dinosaurs and paleontology spawned at the time of the movie *Jurassic Park* has raised the stakes of managing paleo resources

on a national wildlife refuge. Monetary values established when the South Dakota *Tyrannosaurus rex* specimen named “Sue” was sold for over \$1 million contributed to a rise in illegal paleo

activities. Legislation pending in the House and Senate would put more teeth in laws governing paleo resources on federal lands. Refuge law enforcement officers are responsible for safeguarding these resources and issuing paleo research permits.

Several violations have been successfully prosecuted in the past five years, but fines are minimal. For example, individuals have been cited under the Refuge Administration Act for theft of government property for removing a *Triceratops* horn, sharks teeth, an *Albertosaurus* tooth, a large *T. Rex*

migratory birds, that habitat has to be maintained. Law enforcement is one of the tools to maintain the integrity of habitat and protect the public investment in infrastructure, wetlands and other habitat.”

Chase adds that if the public becomes accustomed to seeing law enforcement officers in non-law enforcement settings, an attitude of self-policing becomes ingrained in people – another important aspect of community policing.

Why the Gun?

Refuge law enforcement officers also take their messages to schools, primarily to teach youngsters to respect and conserve the habitat that remains. Refuge officer Chuck Melvin visited elementary and high schools when he was stationed at Fort Niobrara National Wildlife Refuge in Nebraska. The number one question from the youngest students? “Why do you wear a gun?”

Melvin answers the question by explaining the changing role of refuges.

“As more and more people come to the refuges, they bring their troubles with them, including drugs and alcohol. People don’t always come to the refuge to do what it was established for. People do illegal things with weapons and animals.”

During a high school career day, Melvin discussed illegal transportation of animals in Cherry County, Nebraska, where the refuge is located. The county and the refuge are home to the Cherry County milk snake. Valuable because of its unique pale color, the snakes are sold illegally on the Internet to people who want them as pets. Melvin says students were dumbfounded that such illegal trafficking in animals would be taking place in their tiny community of 2,300 people.

Refuge law enforcement officers frequently participate in community events intended to build awareness about illegal drug activity as well. “This isn’t going on just in urban areas,” says Chase. “On these rural public lands, we find hypodermic needles in the parking lots.”

Melvin takes his anti-drug message to students and teachers at middle schools by bringing a display of drugs and paraphernalia that he has collected on the refuge. He wants to prevent drug use among adolescents and show teachers what to look for, including the various pipes used for smoking marijuana or other drugs – even a crushed soda can. As the first full-time law enforcement officer at Fort Niobrara Refuge, Melvin says he saw a dramatic improvement during his seven-year tenure, from about 30 drug violations a year during the first two years, to about five a year at the end. ♦

Gregg Burgess, law enforcement officer at Sacramento National Wildlife Refuge Complex in California, and Bruce Marto, chief of the Refuge System Branch of Law Enforcement Operations, contributed to this article.

femur and numerous small specimens of turtle scoots and claws. In addition to a \$450 fine, one violator was also banned from the refuge for five years.

Where the Dinosaurs Roamed

One hundred and sixty-five million years ago the Charles M. Russell National Wildlife Refuge in Montana was home to Tyrannosaurus Rex and Triceratops. Since the early 1900s, paleontologists have been attracted to this area because of the exposure of the Hell Creek Formation that surfaces throughout the eastern half of the 1.1 million-acre refuge and is the geological stratum that contains many fossils. The earliest known fossil was removed in 1903 by P.T. Barnum and is currently on display at the Carnegie Museum in Pittsburgh.

Current research focuses on documenting the evolutionary and paleobiological aspects of the last

dinosaur-dominated ecosystem in North America. Research is being conducted on the refuge under a Special Use Permit issued to Jack Horner of the Museum of the Rockies (MOR) at Montana State University. Flora, fauna and geological specimens removed from the refuge remain the property of the government and are kept in a repository at the MOR. Many of the significant specimens are on display at the Museum. The public displays are world class and attract thousands of visitors.

The fame of the paleo resources on the refuge also attracts attention from numerous private, educational and commercial paleontologists seeking to conduct investigations on the refuge. Requests are evaluated from a compatibility standpoint and to avoid conflicts with the wildlife purposes of the refuge. Conditions of the Special Use

Permits only allow paleo activities during the summer to avoid conflicts with critical wildlife periods and high public use during hunting seasons.

Currently, the refuge is developing a paleo management plan that will help managers better evaluate research requests. This plan will call for systematic evaluation of potential disturbance to wildlife, size and location of field camps, time of year, conflicts with other public uses and purpose of the research. This effort coupled with the potential for stricter laws against theft of paleo resources will help protect and manage an ancient natural resource on the Charles M. Russell National Wildlife Refuge. ♦

Bill Berg is the deputy project leader at Charles M. Russell National Wildlife Refuge in Montana.

Protecting Unique Wildlife and Irreplaceable Habitats

The Cooperative Alliance for Refuge Enhancement (CARE), a coalition of 21 wildlife, sporting, conservation and scientific organizations, has concluded that the National Wildlife Refuge System needs \$765 million in annual operations and maintenance funding by 2013 to achieve its wildlife conservation mission.

In a new report – *Restoring America's Wildlife Legacy 2007* – CARE documents that refuges are operating at half the funding levels needed to maintain America's unique wildlife and irreplaceable habitats. While Congress approved modest funding increases from 1998 to 2003, funding shortfalls since then have required a 20 percent cut in national staffing levels with more than 57 percent of national wildlife refuges expected to operate at a fiscal loss by FY 2013.

“About a third of all wildlife refuges have no staff at all,” said Congressman Ron Kind of Wisconsin. “Not only does this hurt the hunters and anglers who can no longer gain access to these areas, but lack of staffing can also cause biological operations to cease and invasive species to expand unchecked.”

Providing a Community Resource

The report outlines the importance of the National Wildlife Refuge System to both wildlife and people:

- 80 percent of the birds on the Pacific flyway migrate through the Klamath Basin refuges in Oregon and California.
- Environmental education programs reached nearly 780,000 participants in 2006.
- There is a national wildlife refuge in every state and within an hour's drive of most major cities.
- Refuges filter groundwater and rainwater before the water runs downstream to municipal water supplies.

Refuge visitation increased by nearly 10 million people, or 25 percent, in the decade prior to 2006.

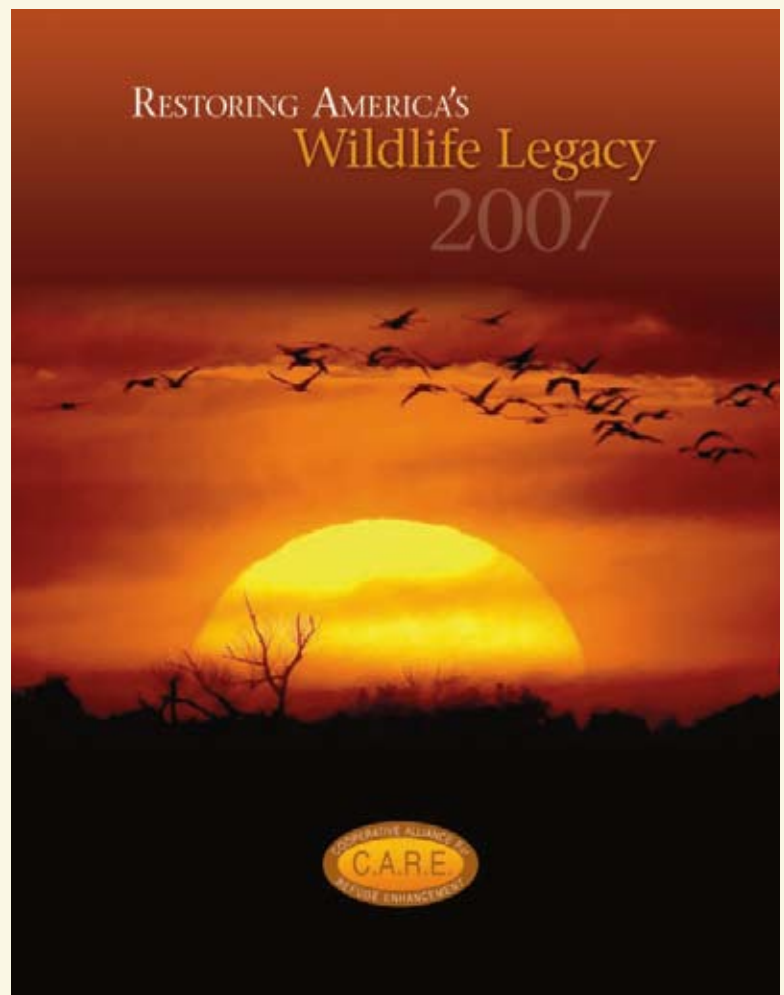
Operating with less money than in 2004, the Refuge System has reached a crisis point, according to CARE. In jeopardy are refuge law enforcement, trail maintenance, habitat restoration, facilities maintenance, recreational activities and educational programs. “Restoration is desperately needed on more than four million acres of degraded wetlands, desert, forest and grasslands. Public access to natural areas is restricted due to closures and unsafe infrastructure,” the report notes. Inadequate funding has led to a backlog of \$1.53 billion in deferred maintenance projects.

CARE says that the Refuge System needs an additional \$15 million annually just to keep pace with inflation and recommends that the annual funding level for the Refuge System increase to \$443 million for operations and \$320 million for maintenance by 2013.

“We take so much from the environment for our transportation systems, our energy usage and even our food needs,” said Congressman Jim Saxton of New Jersey, a senior member of the House Natural

Resources Committee, “but the National Wildlife Refuge System is one of the few places we actually give back.” ♦

The full report and fact sheets on refuge funding in each state are available at <http://www.fundrefuges.org/care/carehome.html>.



Restoring the Jewels of the Prairie

by Ken Torkelson

Waterfowl Production Areas (WPAs) in northeastern North

Dakota are ablaze with color this summer – the result of a continuing U.S. Fish and Wildlife Service effort to emulate wildlife habitat conditions of pre-settlement times.

The vivid colors come from a variety of wildflowers, native grasses and small shrubs planted by the Devils Lake Wetland Management District to provide better wildlife habitat. The new mixtures create habitat that better represents the vegetation that would have originally been prevalent and is easier to manage.

“Our attempts to restore elements from the original plant communities reflect our management vision of providing habitat for a diversity of wildlife, specifically grassland and wetland dependent birds,” says Cami Dixon, biologist for the Devils Lake WMD. She believes grassland birds historically would have been attracted to the structure and composition of the native grasslands. Grassland birds are a major concern since they are declining more quickly than other North American birds.

North Dakota has more Waterfowl Production Areas than any other state, but many are surrounded by tilled cropland. “By restoring complexes of wetlands and grasslands that form blocks of habitat, we believe we can reduce fragmentation on cropland-dominated landscapes like those in northeastern North Dakota,” notes Dixon. “Essentially, this is optimal for the entire ecosystem.”

Planting began in 2004. So far, 2,000 acres have been seeded; another 1,000 acres are ready for planting this year. Five hundred acres will be planted each year until 50,000 acres have been seeded with native vegetation.

The prairie replication hasn't been without some challenges. “Noxious



Canada wild rye – which is indeed native to North Dakota – is at its peak in Devils Lake Wetland Management District, where project leader Roger Hollevoet is examining the results of the second year of the seeding. (USFWS)

weeds will constantly threaten our efforts,” says Dixon, “especially in the establishment phase, so we use aggressive management.” This involves not only fire and grazing, but also integrated pest management, including focused hand-spraying of Canada thistle and wormwood. Cool-season invasive grasses, specifically Kentucky bluegrass and smooth brome, also are challenging. “Once the fields are established and functioning, the native species may be able to be more competitive,” said Dixon. “The establishment phase is the most difficult and critical.”

The initial phase is also the most labor intensive and expensive. “If we can control weedy species prior to the actual seeding, the opportunity for success is higher,” explains Dixon. It takes between 16 and 32 native species for an initial seeding, which means purchasing the seed is very expensive. Each field presents unique challenges

with a plethora of variables to consider, including soil types and quality, slope and aspect, and precipitation. Dixon says staff members have been creative in developing partnerships to make this project a reality.

But even so early in the process, the sight of those wildflowers in full bloom is one more reason to call WPAs the “jewels of the prairie.” There should be even more sparkle in time for the 50th anniversary of the Waterfowl Production Area program in 2008. ♦

Ken Torkelson is writer/editor in the North Dakota Wetland Habitat Office.

Geocaching on the Upper Mississippi River

High Tech Orienteering

by Cindy Samples

“It says it is about 40 feet that way.” “So what is squawking in the treetops?” “Did you find out what *Ardea herodias* means?” “Awesome view, I’ve never been here before!”

These are comments by virtual geocachers exploring the Upper Mississippi River National Wildlife and Fish Refuge. “Geocaching” is a combination of *geo*, for earth, and *cache*, for hiding or storing. Geocaching is a high-tech scavenger hunt/orienteering activity using a handheld Global Positioning System (GPS) unit to find a treasure, or cache. A typical cache is a small container with a log book and treasure, usually a trinket of little monetary value. However, hiding such a cache on a national wildlife refuge is illegal.

So, instead of searching for a canister with a treasure, virtual geocachers download clues and coordinates to find public places. The “treasures” are sites on the refuge, from tree frogs to paddlefish to spectacular views. Mary Stefanski, Winona District manager for the refuge, commented, “I think they will be surprised to see these places and think, ‘Wow! I’ve lived here all my life and I never knew they were here.’”

Virtual Geocaching uses landmarks and features already on the refuge. The geocacher prints a page of clues from the refuge’s Web site. Each clue includes coordinates leading to a place on the refuge. There, the geocacher can find answers to such questions on the clue sheet as “Which four amphibians start singing on the refuge in May?” or “What bird fishes the shoreline?” When geocachers answer all 10 questions, they sign a log book and receive a reward.

As refuge manager Don Hultman said, “Technology is here to stay, and I think we need to embrace it in a way that also safeguards the resource and the experience we want visitors to have. To

many, a GPS unit is a catalyst to get outside, to see a refuge in a new way and help us gently lead people to these places.”



Virtual geocachers download clues and coordinates and use a hand-held GPS unit to find sites at Upper Mississippi River National Wildlife and Fish Refuge. (USFWS)

Creating the Virtual Geocache was a partnership between refuge staff and Winona State University recreation intern Rory Ballard. Together they created the first Virtual Geocaching Series on the refuge which went online in March 2007. Given a map of the refuge with boat landings, kiosks and interpretive signs highlighted, Ballard “GPS’d” the location, photographed it and developed a clue.

Ready for Primetime?

I contacted Riverway Learning Community teachers Jamie Harper and Leslie Lehnertz to see if their students would be the first to try out the virtual geocache. Harper remarked, “This was

great for our students. They were outside, learning exactly how GPS units function.”

I didn’t think the activity was ready for the general public until we tested it with experienced geocachers, so I located three who put their skills to work. I learned that experienced geocachers record their finds just like a serious birdwatcher records birds – they both have life lists. They suggested improvements to the Web site and the clues, such as adding “elevation change” to one clue so a geocacher would know to go to the top of a bluff.

The first person to complete the virtual geocache was a trapper, who happened to notice the Virtual Geocache link when he visited our Web site for other information. He and his wife completed the route and came to the office to sign the log book and get his reward – a refuge pin.

Another geocacher wrote in the log book, “Awesome string of caches. I never would have ventured down to these areas marked by a ‘boat ramp’ sign because I don’t have a boat. I found more than boat ramps. Most spots had awesome paths, trails and viewing platforms. I even saw a muskrat at Riecks Lake.”

The virtual geocache has attracted new volunteers. Some are monitoring the Web site entries at Geocaching.com, and a “Cache in – Trash out” litter pick-up is in the works. With “virtually” little effort by the refuge staff, we are reaching new audiences and building our constituency for the refuge. ♦

Cindy Samples is a refuge ranger at Upper Mississippi River National Wildlife and Fish Refuge.

Fire Spotlights the Land of Trembling Earth



One of the largest fires in the history of Okefenokee National Wildlife Refuge in Georgia burned more than 300,000 acres by the middle of June. (Rocky Chesser/USFWS)

by Shawn Gillette

The U.S. Postal Service released the new 2007 Scenic American Landscape series “Okefenokee Swamp” International Postage Stamp on June 1. There was applause at the Folkston, Georgia, post office where the new stamp was unveiled, even as a huge column of smoke was visible to the west.

Of all the fires in drought-stricken Georgia and Florida, the fire at Okefenokee National Wildlife Refuge is the most remarkable in terms of size, complexity, and for the lasting benefits it will have on the Okefenokee, Choctaw Indian word for “Land of Trembling (or Quivering) Earth.” It had burned 75 percent of the 403,000-acre refuge by the middle of June.

The fire ignited April 16 near Waycross, Georgia, when winds blew a tree into power cables to the north of the Okefenokee Refuge. The fire escalated and threatened the refuge’s northern boundary, prompting a call for a Type II Incident Management Team.

A Team Effort

“This was truly a team effort,” says Tony Wilder, Incident Commander of the Southern Area Type II Team. “In addition to our resources, we had local volunteer fire departments, private industry equipment and state and national resources working with us.” Both Wilder’s Team and the Georgia Forestry Commission coordinated their suppression and control plans, and, wherever possible, combined resources. Both agencies made protection of life and private/public property their highest objectives.

Decades of experience have demonstrated that wildfire cannot be fought successfully inside the Okefenokee Swamp. The swamp’s sheer size and its mosaic of habitat types render ground suppression efforts impractical. Incident managers typically have adopted a confine-and-contain strategy on the refuge. A combination of ground and aerial suppression tactics is used at these lines to prevent the fire from spreading outside the swamp.

On May 6, lightning from a passing thunderstorm ignited a fire on Bugaboo Island, one of the many upland islands inside the refuge. Over the next four days, the new Bugaboo Scrub Fire tripled in size, forcing the evacuation of several hundred residents in Baker County, Florida, and briefly shutting down portions of interstate highways in Florida and Georgia.

On May 8, the Big Turnaround Fire threatened the Davis Community on the edge of the refuge. About 200 residents were evacuated while fire crews worked around the clock to save the community. “It was hands-down some of the most impressive firefighting I have ever seen,” says Mark Ruggiero, Incident Commander for the Type I Team. Ruggiero says the firefighters’ grit and determination to save that community were the stuff that sets wildland firefighting apart from other occupations.

After a flyover of the fire at the end of May, President Bush also praised the “brave men and women on the front lines fighting the fires.” The town of Folkston has decided to dedicate its annual Okefenokee Festival in October to these firefighters.

Largest Wildfire in Refuge History

This fire has become the largest wildfire in the eastern United States in modern history. Its benefits will be experienced in the swamp for decades to come. Fire is a force of nature that sustains the diversity and richness of a wide variety of plant and animal species, and is important in maintaining the swamp’s wetland habitat.

“Fire is just as much a part of this swamp as water lilies, alligators and the cypress tress,” says James Burkhart, supervisory ranger. “Without it, the swamp would dry-out and become a forested bog, losing many of the unique plant and animal communities that have made the Okefenokee a world-class resource.” ♦

Shawn Gillette is refuge ranger at Okefenokee National Wildlife Refuge in Georgia.

Around the Refuge System

information see <http://www.mac-web.org/Projects/DiscoverOurWildSide/BywaysToFlyways.htm>.

Oregon

Baskett Slough Loop Trail on Baskett Slough National Wildlife Refuge has been designated as the nation's 1,000th



Baskett Slough Loop Trail on Baskett Slough National Wildlife Refuge in Oregon was renamed in honor of former Refuge Manager Rich Guadagno, who died helping to bring down United Flight 93 on September 11, 2001. (USFWS)

National Recreation Trail. The trail is being renamed in honor of Rich Guadagno, the former manager of Baskett Slough Refuge, who died helping to bring down United Flight 93 on September 11, 2001. Guadagno's law enforcement badge was found in the wreckage.

In nominating the trail for this special designation, Service Director H. Dale Hall said it is a "fitting way to honor a passionate outdoorsman

California

Boat crews from San Francisco Bay National Wildlife Refuge and the Stockton Fish and Wildlife Office joined a multi-agency effort to guide two wayward humpback whales back to the Pacific Ocean. The cow and



A humpback whale cow and calf breach in the Sacramento River. Nineteen Service personnel helped guide the whales back to the Pacific Ocean. (Sarah Wilkin/NOAA Fisheries Service)

calf traveled through San Francisco Bay, up the Sacramento River Delta, to West Sacramento. A huge effort to return the whales – nicknamed Delta and Dawn – began May 13 and included boats and staff from the California Department of Fish and Game, the U.S. Coast Guard, NOAA and local law enforcement agencies. After a two-week stay in fresh waters, the whales eventually returned to the open ocean May 31. Nineteen U.S. Fish and Wildlife Service personnel assisted the rescue effort, including staff from Sacramento Refuge and the Sacramento FWO.

Maryland

Blackwater National Wildlife Refuge has replaced an observation tower with a brand new observatory, partially

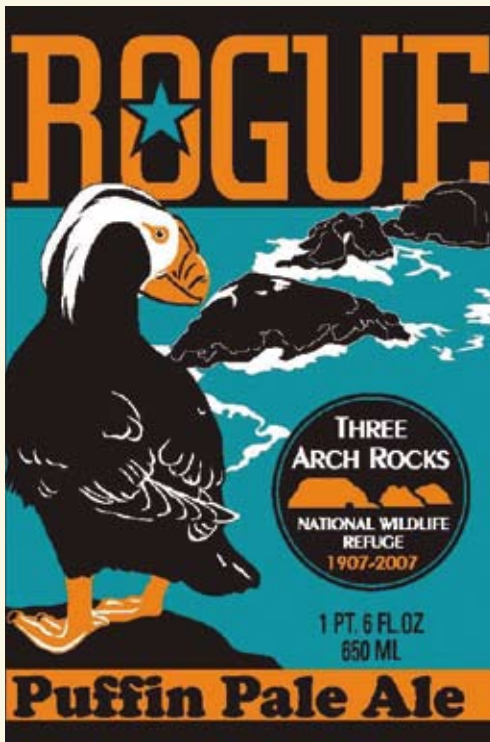
funded by a \$100,000 Wild Birds Unlimited Pathways to Nature grant obtained by the Friends of Blackwater. The observatory includes exhibits on waterfowl and birds of prey, a large observation window and spotting scopes looking out over wetlands, impoundments and the Blackwater River. One scope is accessible to children and visitors in wheelchairs; the entire observatory has elevator access.

Two monitors are focused on an eagle's nest while two others show an osprey platform. The osprey and eagle Web cam videos may be seen at the Friends of Blackwater Web site at www.friendsofblackwater.org. Visitors witnessed quite a soap opera on the osprey platform when a female intruder appeared this spring. The male disappeared – possibly with the female intruder – and when his original mate left the nest to find food, crows ate her three eggs. "Lots of excitement, but no young to watch this year," said Maggie Briggs, visitor services manager at Chesapeake Marshlands National Wildlife Refuge Complex.

Michigan

Detroit River International Wildlife Refuge is also the beneficiary of a Wild Birds Unlimited grant for its new wildlife observation deck. The deck was built by students from Lincoln Park High School's agriscience program; an educational kiosk was built by members of local carpentry, labor and electrical unions as well as DTE Energy's Trenton Channel Power Plant and Green Team. The observation deck was dedicated on International Migratory Bird Day, when a new bird driving tour map was unveiled. The Byways to Flyways map guides motorists to 27 birding spots in Southeast Michigan and Southwest Ontario, Canada. The observation deck, Byways to Flyways birding locations map and an educational kiosk were funded by a \$100,000 grant from Wild Bird Unlimited Inc. Pathways to Nature fund. For more

and a dedicated FWS employee.” The National Recreational Trail Roundtable, unanimous in its selection of this trail, noted that “no other trail nominated this year has such powerful national connections.” During the dedication ceremony, Deputy Interior Secretary Lynn Scarlett said Guadagno’s “focus and passion drove him to make every refuge where he was stationed not only the best for wildlife, but also a place where people could make a connection to nature.”



Rogue Ales of Newport, Oregon, is bottling Puffin Pale Ale in honor of the 100th anniversary of Three Arch Rocks National Wildlife Refuge.

The loop trail and observation platform provide visitors with an opportunity to view unique native habitats of the Willamette Valley, including rare native oak savanna and upland prairie. This habitat supports the world’s largest endangered Fender’s blue butterfly population.

Oregon

Three Arch Rocks National Wildlife Refuge is celebrating its centennial with a local brew. Rogue Ales of Newport is bottling “Puffin Pale Ale” for sale in local stores and Rogue pubs around the state. A portion of the proceeds from the sale of Puffin Pale Ale will be donated to the Oregon Coast National Wildlife Refuge Complex to support education and outreach programs.

The label was designed by Matt How, visual information specialist at Oregon Coast Refuge Complex, and includes a message written by 2007 Legends Award winner Dawn Grafe (see page 23). People who purchase this collector’s item will learn that “at the dawn of the 20th century just off the town of Oceanside, Oregon, seabirds were being shot by the thousands for sport and sea lions were being slaughtered for their skins and oil. Conservationists of the time, William L. Finley and Herman Bohlman, photographed the destruction and brought it to the attention of President Theodore Roosevelt. Their insistence on a sanctuary for these beleaguered animals led Roosevelt to declare Three Arch Rocks a National Wildlife Refuge in 1907, the first established in the west. This brew marks 100 years of protection for the refuge’s quarter million seabirds.”

In Memoriam

Richard Hoppe, a 30-year veteran of the U.S. Fish and Wildlife Service whose work included protecting endangered species, died at the age of 80 in Fort Collins, Colorado. Hoppe was a World War II veteran who received his biology degree from the University of Wisconsin. Friends may send tributes to the family at www.mem.com.

Protecting Refuge Resources

— continued from pg 8

is often provided by state or local law enforcement jurisdictions.

In this issue of the Refuge Update, you will read about a typical day in the life of a refuge officer as well as outreach activities that take officers into schools to promote careers in wildlife management and educate young people about conservation law. Refuge officers are even engaged in drug prevention activities when they educate teachers about the kinds of illegal drugs and paraphernalia that might be found in the parking lot of a national wildlife refuge – or a school.

You will also read about the refuge officer’s responsibility to enforce easements that are critical to habitat conservation and to protect cultural and historic resources – all the way back to the era when refuges provided habitat for dinosaurs. This just scratches the surface of the breadth and complexities of the National Wildlife Refuge System’s law enforcement program.

Protecting refuge resources and the safety of visitors is fundamental responsibilities of the Refuge System. Both the goal and motivator for refuge law enforcement is the furtherance of our conservation mission through excellence in law enforcement. ♦

Mark Chase is chief of Refuge Law Enforcement.

Creating a Prairie Mosaic

At Devils Lake Wetland Management District in North Dakota, private lands biologist Mark Fisher is leading the charge against leafy spurge, Canada thistle, musk thistle and absinthe wormwood. Fisher has received the 2007 Pulling Together Initiative (PTI) Award for his efforts, honoring his devotion to fighting weeds, building partnerships and fulfilling the PTI mission.

Supported by six federal agencies including the U.S. Fish and Wildlife Service, PTI is a program of the National Fish and Wildlife Foundation. It is dedicated to managing or eradicating invasive plants and increasing public awareness of their impact. Federal scientists have estimated that non-indigenous weeds infest an additional 3 million acres each year – about twice the size of Delaware.

Thanks to Fisher's efforts in North Dakota, 60,000 acres have been treated over the past six years. "We are looking to achieve long term control and get away from annual treatments," explains Fisher. There are many ways to achieve that through integrated pest management. Mechanical and chemical options include mowing the weeds and spraying herbicides. Biological control includes using beetles to eat the leafy spurge as well as planting diverse native grasses.

Competitive Exclusion

"Research has shown that if you plant a diverse prairie mixture, it will reduce weed invasion," says Fisher. An herbicide may be used initially to kill most of the weeds. Once the site is clean, it is planted with what Fisher calls a prairie mosaic in which the native species out-compete the invasives.

The model of invasive management at Devils Lake WMD is the 2,600-acre Nikolaisen Waterfowl Production Area. The invasives have been brought under control by planting a diversity of native

grasses, which in turn has generated more diverse wildlife. Fisher says there are many more butterflies and grassland songbirds. One field in the Nikolaisen WPA has 26 plant species, all from seed grown in North Dakota within 200 miles of the planting area.

The PTI award also honored Fisher for building partnerships, not only with other federal, state and local agencies, but with private landowners. Fisher recently worked with one farmer who wanted to set aside a 320-acre parcel for wildlife. Fisher helped create a 15-species mix of native seed that will help the farmer reduce or eliminate his costs for getting rid of weeds. The land will provide good quality habitat for waterfowl during the summer. After August 1, the farmer is permitted to cut and sell hay from the land.

Fisher says the farmer loves birds and will now have birds and wildflowers on his own native prairie. The farmer is spending his own time and some of his own resources to prepare the site for the new planting; that investment is used as a match for additional grants.

Fisher also leads big weed tours for landowners to demonstrate techniques for controlling weeds. "The most important thing we demonstrate is the effect of herbicides – leaching into the water table, leaching into sandy soil." Fisher asks farmers, "Do you have alternatives? Do you need to use



Devils Lake Wetland Management District in North Dakota has treated 60,000 acres over the past six years of fighting such invasives as leafy spurge, Canada thistle, musk thistle and absinthe wormwood. (USFWS)

herbicide in that field? Can you use biological or mechanical control?"

Fisher has led three tours so far, reaching at least 100 landowners who control 100 to 3,000 acres each. "What excites me is sharing information so they can think about what they are doing. The tours themselves are like planting a seed." ♦

The NFWS encourages applications to PTI for community-based weed management partnerships nationwide. For more information and current funding priorities, visit http://www.nfwf.org/AM/Template.cfm?Section=Browse_All_Programs&Template=/CM/ContentDisplay.cfm&ContentID=4790.

The Big Sit!™ May Be Coming to a Refuge Near You!



by Bill Thompson III

Some people call it a tailgate party for birders. The idea of doing a Big Sit – sitting in one place and letting the birds come to you – has been around for at least 30 years, but it has been refined to a high art in the past few years.

In 1992, the New Haven, Connecticut, Bird Club started holding an annual event called The Big Sit!™ on the second Sunday in October. By 2006, the idea had spread to 164 The Big Sit! circles registered in 36 states and nine countries outside the United States. More than 750 bird species were sighted.

The New Haven Bird Club has created rules and trademarked the name. Birders are encouraged to submit their count results from this free, fun, non-competitive event. This year, *Bird Watcher's Digest* is sponsoring the 24-hour The Big Sit! during Refuge Week, starting at midnight October 14 and running all day on Sunday. National wildlife refuges managers may want to consider organizing The Big Sit! circles as part of Refuge Week and as part of their “Children and Nature” programming.

Circles should be registered on the official Big Sit! Web site at <http://www.birdwatchersdigest.com/site/funbirds/>

bigsit/bigsit.aspx, where observations should be registered. Although it's a totally non-competitive event open to birders of all ages, there is recognition for the best overall count and the best state count as well as a special award from Svaroski Optik. The registration fee is being covered by *Bird Watcher's Digest*.

The Big Sit!™ is painless data collection, providing a nice snapshot of the birdlife around each circle. It may even turn up unexpected species. There's no limit to how many people can occupy one circle. Here are a few logistical suggestions:

- 🍃 Have people bring some chairs.
- 🍃 People can bring food and drinks, as the refuge deems appropriate.
- 🍃 Welcome passers-by. Work in shifts. No one needs to sit in the circle for the entire 24 hours.

Refuge Friends organizations may be able to use the event as a fundraiser by taking per-bird pledges from members and the public or accepting donations on-site. Funds can be used to support the Friends activities or other programs at the refuge. The Big Sit! can also be a great way to recruit new members for a Friends organization.

Here are a few details to help organize The Big Sit!:

- 🍃 Find a birdy spot. The circle location could be a spot where lots of birds can be seen and where lots of visitors could see the circle – and the birds. Consider observation towers or decks, interpretive stops along refuge driving routes, or a space adjacent to the visitor center as possible circle locations. Measure and mark a 17-foot diameter circle (a long piece of rope can help mark the boundaries).
- 🍃 Observations can only be made from within your 17-foot diameter circle.
- 🍃 If a bird is seen or heard from within the circle but is too distant

to identify, the circle can be left to get a closer look/listen to confirm the bird's identity. However, any new bird species seen or heard while confirming the original can't be counted unless it's seen or heard from an “anchor” who stayed behind in your circle, or is seen by you when you return to your circle.

- 🍃 Tally the number of species that you observe and send it to the Web site as soon as possible, but no later than a month after the event. Results are automatically posted and immediately added to the online rankings.
- 🍃 Invite the media. The Big Sit! always attracts good coverage because it's just goofy-sounding enough to get attention and provides great visuals and good interviews.

The Big Sit! is also an excellent opportunity for refuge staff and Friends groups to share important information with the birding public. There are natural lulls in the birding activity when participants can discuss any number of refuge-related topics.

More ambitious Big Sitters equip themselves fully with optics, reference books and field guides, all-weather gear, food, beverages, iPods, flashlights and everything else they can think of. Optics, a field guide and a checklist are the only essential elements. Extra optics and a spotting scope or two could be shared among visitors. Shelter during foul weather should be considered when locating The Big Sit! circle. ♦

Bill Thompson III is the editor of Bird Watcher's Digest.

High Tech History

Preserve America Grants Go “New Media”

From podcasts to electronic kiosks to downloadable audio files, this year’s Preserve America grants are taking advantage of the most modern technology to integrate history into refuge programming. The \$10,000 to \$15,000 grants are awarded by the National Wildlife Refuge System and the National Fish and Wildlife Foundation.

In Hawaii, the PAST Foundation is organizing a teachers workshop in October that will develop podcasts and lesson plans about federal marine research and management in the Hawaiian Islands. Teachers are being invited from all school districts in Hawaii to work with scientists from the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration (NOAA). The podcasts and lesson plans they develop together will help students and the public understand the government’s stewardship mandate for marine resources.

The project will teach the seafaring history of the Pacific Islands and how a network of government agencies and programs has developed to manage and research both natural and cultural resources, including the Northwestern Hawaiian Islands Marine National Monument, the Hawaiian Islands Humpback Whale National Marine Sanctuary and the Maritime Heritage Program. The first podcast will focus on issues of management and jurisdiction while the second will discuss technology and research used in maritime archaeological investigations.

A Touch Screen in an Eagle Tree

On the opposite coast, the Friends of Blackwater National Wildlife Refuge in Maryland are partnering with the Dorchester County Tourism Department, Hyatt Chesapeake Resort

and Cambridge Main Street to develop Web-based electronic kiosks to promote the refuge and other destinations in the area. “Compared to the old method of marketing the refuge and area historic sites by using brochures and print media, the electronic kiosk will greatly increase



The Friends of Blackwater National Wildlife Refuge will use a Preserve America grant to place a touch screen monitor in this Eagle Tree and three other electronic kiosks in Cambridge, Maryland, providing information about the refuge and surrounding historic sites. (USFWS)

the flow of information to the public and highlight the Refuge System’s ‘Big 6’ public use priorities in a new manner,” explains Friends Treasurer Tom Hook.

Using a touch screen in the refuge visitor center, visitors can browse Web sites for each partner as well as other tourist attractions and supporting area businesses. The system will also be available for people to use in their own homes when they are making travel plans. Three kiosks will be

strategically placed around Cambridge to attract travelers on their way to the Ocean City beaches.

“Having our own Blackwater Web site on all four kiosks and the Dorchester County Tourism Web site will present great opportunities to promote awareness of the refuge,” says Hook.

Iowa on Your iPod

The Iowa Academy of Science is developing 21 downloadable audio files to highlight the geology, flora and fauna, and human history of each of Iowa’s seven national wildlife refuges – DeSoto, Neal Smith, Driftless Area, Port Louisa, Union Slough, Upper Mississippi and Boyer Chute. Teams of volunteer teachers, biologists, geologists and archaeologists will work with staff at each refuge to identify themes and write scripts for the audio programs.

Visitors will be able to download the audio series free of charge onto MP3 players, such as an iPod, or burn the files onto a CD to be played before visiting one of the refuges. The programs are expected to be available by January 2008 on a project Web site and available for use by each refuge. The Academy is also producing related classroom activities for third through five grade classes on the history of Iowa. ♦

And the Winners Are . . .



Dawn Grafe, supervisory park ranger at Oregon Coast National Wildlife Refuge, has won this year's Legends Award from the American Recreation Coalition. (USFWS)

American Recreation Coalition Legends Award

Dawn Grafe, supervisory park ranger at Oregon Coast National Wildlife Refuge, has won this year's Legends Award from the American Recreation Coalition. The award recognizes extraordinary individual effort among federal agencies to expand recreational opportunities.

Grafe was the driving force behind the Oregon Coast Birding Trail, which crosses six refuges, stretching along most of the 400-mile Oregon coast. She was also instrumental in obtaining a \$559,100 Transportation Enhancement Grant from the Oregon Department of Transportation to develop public use facilities at Nestucca Bay National Wildlife Refuge. The refuge will open to the public for the first time next year.

Take Pride in America

Glenn and Carolle Aldinger, volunteers at Chincoteague National Wildlife Refuge in Virginia, have been honored with a 2007 Department of the Interior Take Pride in America award as individual volunteers. The Aldingers also have been honored by the refuge as "Cooks of the Year" in 2005 for "cooking up projects and adding key ingredients to make the

project efficient and successful." As liaisons for the Chincoteague Refuge Volunteers, this couple also helps coordinate a high quality experience that benefits volunteers and the refuge.

Steve Brimm, a 30-year veteran of the U.S. Fish and Wildlife Service National Fish Hatchery System, has been named this year's Federal Land Manager of the Year. For the past 11 years, Brimm has been the project leader of the D.C. Booth Historic National Fish Hatchery in Spearfish, South Dakota.

Brimm nurtures key partnerships by taking an active role in the many organizations that work together to keep the hatchery thriving, including the Fish Culture Section of the American Fisheries Society and the nonprofit Booth Society.



Steve Brimm has been named this year's Federal Land Manager of the Year. He is the project leader of DC Booth Historic National Fish Hatchery in South Dakota. (USFWS)

He has helped develop a Hatchery Helpers youth volunteer program as well as a youth outreach program that allows middle school students to work on the refuge. The Hatchery Helpers program won its own Take Pride in America Award in 2003.

Department Citation for Bravery

Michael Rucinski has been recognized for highly courageous action in saving three people who may otherwise have drowned. Rucinski was fishing on Bluff Lake at Noxubee National Wildlife Refuge in March 2006 when he noticed two young boys beginning to slide down the slope of a spillway. "In an instant, the older boy fell into the swift water. The younger brother tried to grab for him and fell in just as quickly," recalled Rucinski. The boys' mother jumped in after them and soon all three were in trouble. Rucinski rescued both boys and helped their mother get back to shore. For his actions, Rucinski received the Department of the Interior's Citizen's Award for Bravery.

Distinguished Service

Dennis Widner received a Distinguished Service Award, the highest recognition for employees in the Department of the Interior. During his 35 years with the Service, Widner worked on refuges in Arkansas, Florida, Georgia and Louisiana to restore and enhance wild land and turn marginal land back into prime habitat.

During this year's 64th annual Department of the Interior convocation ceremony, Meritorious Service Awards were given to **Larry Mallard** for his "ability to manage internal and external changes while contributing his common sense leadership" as project leader at White River National Wildlife Refuge in Arkansas; and **Philip Street**, retired refuge fire chief, for his "exceptional skills and professionalism in promoting safe and effective fire operations."

Also Honored...

Rob Jess, manager of the J.N. Ding Darling Refuge in Florida, has been recognized as 2007 Citizen of the Year by the Sanibel and Captiva Islands Chamber of Commerce. He is credited with protecting the Captiva and Sanibel Islands and educating residents about the water issues facing southwest Florida. ♦

Chief's Corner — *continued from pg 2*

wildlife refuge at Pelican Island was to protect brown pelicans, devastated by those who sought their feathers.

Occasionally, we need to remind ourselves of our common roots and reinforce connections. That is one aim of a 17-member Birding Team, created by Fish and Wildlife Service Director H. Dale Hall less than a year ago. The Birding Team is not only considering how to harness birders' enthusiasm for their pastime into support for the Refuge System. The team is also looking at how we can make national wildlife refuges even more welcoming to birders and their families.

We couldn't have a more prestigious and enthusiastic group of experts from all

over the country, made up of Service and non-Service folks alike. The team is led by chair Jon Andrew, Southeast Regional Refuge Chief. Assistant Director for Migratory Birds Paul Schmidt and I are ex-officio team members.

National wildlife refuges can use birding to bring real benefits to their communities. One example is the annual Festival of the Cranes at Bosque del Apache Refuge in New Mexico. It fills Socorro hotels and restaurants with people excited to see and photograph sandhill cranes, waterfowl and raptors.

National wildlife refuges already partner with state birding trails and related tour routes. The Great Florida Birding Trail, for one, includes Ding Darling,

Hobe Sound and Arthur R. Marshall Loxahatchee Refuges, among others. Today, the Refuge System is working with the National Scenic Byways Program to improve information on bird watching along many of the 126 Scenic Byways.

The Birding Team and the Birding Initiative are outlining important steps to help birders become knowledgeable supporters of the Refuge System and the lands that are the foundation of their love of the outdoors. It's another step in birders' and the Refuge System's long, common history on behalf of wildlife conservation. ♦

Women in the Outdoors: *Scrapbooking to Hunting* — *continued from pg 5*

says fly-fishing was very popular even though it's not readily available in the area.

Kudrna recommends partnering with as many organizations as possible, in addition to the National Wild Turkey Federation, to run a WITO event. Ducks Unlimited, Pheasants Forever and a local

bank were among 21 sponsors along with Squaw Creek Refuge. Two local Kiwanis clubs paid the registration fees for four teen girls to attend the event. "It's like a day camp for grownups," says Kudrna. ♦

Refuges interested in hosting a WITO event may contact National Wild

Turkey Federation coordinators Patty Molinaro (outdoorwoman@windstream.net or 912-843-8110) or Tammy Mowry (tammynwtf@zoominternet.net or 724-284-9201).

Visit www.womenintheoutdoors.org for more information.



Squaw Creek National Wildlife Refuge in Missouri drew participants from five states for its Women in the Outdoors event. (Ellen Benitz/ National Wild Turkey Federation)

Ocelot Recovery at Laguna Atascosa National Wildlife Refuge

by Jody Mays

Ocelots once roamed across most of Texas and as far north as Louisiana and Arkansas. As their habitats were cleared for agriculture, development and other uses, ocelot range and populations decreased. Today, they are found only in the southernmost tip of Texas.

For the first time in nearly two decades, the U.S. Fish and Wildlife Service Ocelot Recovery Team is revising the 1990 Recovery Plan for the endangered ocelot. New research on ocelot movements, habitat connectivity, genetic health and other information will be used to make recommendations for ocelot recovery.

Since most land in Texas is privately owned, an accurate count of ocelots is difficult but fewer than 100 are estimated to remain. The largest known breeding population of 25-35 animals occurs on and in the vicinity of Laguna Atascosa National Wildlife Refuge. Ocelots also occur on Lower Rio Grande Valley and Santa Ana National Wildlife Refuges, other public lands and private lands in the area.

To find enough habitat and resources to survive and reproduce, ocelots are forced to traverse an increasing gauntlet of obstacles. Once large, contiguous tracts of dense, brushy vegetation have become increasingly smaller fragments spaced further apart and criss-crossed with roads, cleared areas, housing developments, fences and other obstacles. With more roads to cross, ocelots increasingly risk being hit by cars. Collision with vehicles is the leading documented cause of ocelot mortality in Texas.

As a result, ocelots have become isolated into small pocket populations. Such isolation leads to inbreeding and a loss of genetic diversity that makes the ocelots more vulnerable to disease and

genetic defects. In fact, genetic evidence indicates that the only two known breeding populations left in Texas have become isolated both from each other and from ocelot populations in Mexico and have indeed lost genetic diversity.



Marea is a female ocelot first documented as a five week old kitten in 1997 on Laguna Atascosa National Wildlife Refuge in Texas. For the first time in nearly two decades, the U.S. Fish and Wildlife Service Ocelot Recovery Team is revising its 1990 Recovery Plan for the endangered ocelot. (Linda Laack and Marie Fernandez/USFWS)

Initiatives Promote Ocelot Recovery

The Service is working with partners such as The Nature Conservancy and Environmental Defense to protect and restore native brush habitat and to create corridors of habitat connecting existing protected areas. A new Safe Harbor program has been established with Environmental Defense to promote native brush habitat protection and ocelot conservation on private lands. Other landowner incentive programs encourage restoration and protection of these habitats. The Service is also working with the Texas Department of Transportation to install wildlife crossings underneath roads that will allow ocelots and other wildlife to cross safely.

Efforts to promote community awareness of ocelots and encourage local conservation have also been a priority at Laguna Atascosa Refuge. In 1997, the non-profit Friends of Laguna Atascosa started an Adopt-an-Ocelot program through which participants symbolically “adopt” an ocelot and contribute to ocelot conservation.

The Friends, the Valley Morning Star newspaper and Laguna Atascosa National Wildlife Refuge also host an annual Ocelot Conservation Festival in February. The festival provides an opportunity for visitors, area school students, conservation partners and residents of local

communities to have a close-up encounter with a live ocelot, thanks to the Naples Zoo in Florida. The event also educates the public about the challenges facing these elusive and endangered cats and promotes local conservation efforts to protect and recover these fragile populations. Proceeds from these programs are used by the Friends group for ocelot conservation, education and research. ♦

Jody Mays is wildlife biologist at Laguna Atascosa National Wildlife Refuge in Texas.

Lange's Metalmark Butterfly — continued from pg 1

butterflies, down from 232 in 2005 and a high of 2,342 in 1999.

Consulting biologist Travis Longcore suggests several possible causes for the decline, including a continuing invasion of exotic weeds that are choking out the butterfly's host plant, the naked-stem buckwheat, as well as several large arson fires that killed both buckwheat and butterflies.

Thick Carpet of Vetch

The task facing the refuge is how to save dune-dependent native plants – and the Lange's metalmark butterfly – when functioning sand dunes no longer exist. The native plants need the shifting sand, steep banks and clear ground of real dunes. But the increasingly thick weed base stabilizes the soil, which in turn leads to the growth of more weeds.

"It is not really a dune ecosystem any longer," said Refuge Manager Christy Smith.

Vetch, the refuge's new worst culprit, covers the ground with a thick carpet, choking out plants like the naked-stem buckwheat. "Vetch is just horrible because as it grows it covers and

encapsulates, creating an unsuitable micro-climate for the life cycle of the butterfly," Smith said.

Late last year the refuge outlined a new plan that calls for clearing and improving 10 acres of habitat each year – twice as many acres as in the past. Volunteers from the refuge Friends' group and such organizations as the California Native Plant Society are expected to play a big role in helping clear weeds and plant seedlings.

As they work the habitat and battle vetch, Smith and her team will assess what works and what does not. Among other things, they will test different methods of controlling the weeds by hand, heavy equipment or chemicals. They might even try grazing on a limited basis.

Equally important will be the effort to breed Lange's metalmark butterflies in captivity.

Biologists hope to capture at least five adult females this summer and transfer them in potted buckwheat plants to the San Diego Zoo's Beckman Center for Conservation Research. In netted

enclosures at the center, hatched larvae will be raised to the pupae stage, then transported back to the refuge and placed at the base of buckwheat plants. Eventually, as the habitat for the butterfly improves, the natural population will grow and become self-sustaining.

Or at least that is the plan.

"We hope that this comprehensive approach, which involves restoration and captive breeding and developing public-private partnerships, leads to the recovery of Lange's and the two plants," said Craig Aubrey, leader of the endangered species recovery team at the Service's Sacramento field office. "We want those species to be here for future generations." ♦

Jim Nickles is former deputy chief of external affairs for the Sacramento Fish and Wildlife Office. He is with the U.S. Geological Survey's California Water Center.

Reflections on a Day in March — continued from pg 7

efficient motorcade headed back to the airport for the return trip to Hawaii.

My lasting impressions include a new-found respect for our First Ladies. As I watched her answer question after question from the press and realized how demanding her schedule must be, I am in awe of her poise and ability to be under such scrutiny day after day. Our day with the First Lady, the Secretary of the Interior and all our guests is certainly a highlight for this refuge and me personally. It was a tremendous amount of work and fun – I would do it again in a heartbeat. ♦

Barry Christenson is refuge manager at Midway Atoll National Wildlife Refuge.

First Lady Laura Bush talked with refuge volunteers and went to the beach, where she learned about the endangered Hawaiian monk seal, among other issues. (Shealah Craighead/White House)



Study Confirms Popularity of Outdoor Activities

Record numbers of Americans are finding their recreation outdoors.

More than 87 million Americans – 38 percent of people 16 and older – hunted, fished or observed wildlife last year, according to the preliminary findings of the National Survey of Fishing, Hunting and Wildlife-Associated Recreation. They spent about \$120 billion in pursuing outdoor recreation, roughly equal to \$1

out of every \$100 of goods and services produced in national economy.

The overwhelming majority – 71.1 million people – reported that they observed wildlife when they took part in outdoor activities, up from 66.1 million who did so in 2001, the last time the survey was assembled by the U.S. Fish and Wildlife Service. The numbers of people engaging in activities such as

bird watching and wildlife photography have increased 13 percent since 2001. Spending on wildlife watching increased 19 percent to \$44.7 billion last year, up from \$37.5 billion in 1996.

Americans in 2006 spent as much on wildlife-associated recreational activities as they spent on all spectator sports, casinos, motion pictures, golf courses and country clubs, amusement parks and arcades, combined.

The preliminary data show decreases in both angling and hunting participation. The study found 30.0 million anglers in 2006, down 15 percent from 35.2 million anglers in 1996. The study includes some information on younger Americans, too: 1.6 million 6-to-15 year olds hunted, 8.4 million fished, and 11.5 million watched wildlife.

According to the 2004 *Banking on Nature* study, national wildlife refuges generated more than \$1.4 billion and created 24,000 private sector jobs from the nearly 39 million people who visited that year. ♦

More than 70 million people reported they observed wildlife when they took part in outdoor activities, according to the National Survey of Fishing, Hunting and Wildlife-Associated Recreation. (USFWS)



Selawik National Wildlife Refuge Joins GLORIA — *continued from pg 3*

helicopters to reach remote sites. Ayres says GLORIA is a way to contribute to an issue such as climate change in a meaningful way.

For native residents who subsist on the resources of the refuge, climate change

is a very real phenomenon, says Ayres. “They see it when they go hunting and the species aren’t there or they can’t reach their traditional hunting grounds due to changing ice conditions. It’s not something people just read about.”

She says there is an appreciation among the local community that the refuge is participating in a project that is of great interest to them. “Climate change is one of the refuge’s top resource issues. How could we not be involved in GLORIA?” ♦

Whatever Happened To...

Whooping Cranes, Sonoran Pronghorn, and Pelicans...

The only young whooping crane that survived deadly storms in February was found dead in April at the Halpata-Tastanaki Preserve in Florida. Eighteen young cranes had migrated behind an ultralight last fall from Necedah National Wildlife Refuge in Wisconsin to Chassahowitzka National Wildlife Refuge in Florida. As of mid-June, the cause of death for the last crane was not known.

A June report by the Whooping Crane Eastern Partnership, of which the Service is a founding member, outlined strategies to reduce the risk of storm-related bird deaths. The Partnership's action plan includes consideration of other wintering sites and less reliance on top-netted pens from which the cranes are unable to escape. (The full report is available at <http://www.bringbackthecranes.org>.) The Partnership reports outstanding reproduction of the captive flock this year with a strong possibility of providing up to 36 birds for the Class of 2007.

Cabeza Prieta National Wildlife Refuge, Arizona

Wildlife biologist Mike Coffeen reports that 18 Sonoran pronghorn fawns were

born this spring in a captive breeding enclosure on the refuge. "I was ecstatic," said Coffeen. "We're on a roll." The enclosure now holds 43 animals, including the fawns, their mothers, two adult bucks and nine yearlings from 2006. The refuge's wild population was 68 when it was counted in December 2006, with an unknown number of fawns born in the wild since then. The enclosure yearlings are gradually being reintroduced into the wild. (See a full story on the recovery project in the November-December 2006 issue of *Refuge Update*.)

Chase Lake National Wildlife Refuge, North Dakota

The American white pelican colony appears to be having a typical year – which is great news after some 30,000 pelicans abandoned the refuge in 2004. The abandonment is blamed on coyotes and the pelicans are still not nesting on the peninsula where

that intrusion occurred. The colony catapulted to a near-record high last year, possibly because chicks from an earlier population boom returned as breeding adults. This year's population is estimated at more than 22,000 birds. ♦



Chase Lake National Wildlife Refuge in North Dakota is once again home to one of the largest nesting colonies of American white pelicans in North America. (Lee Karney/USFWS).

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.



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