



RefugeUpdate

National Wildlife Refuge System

www.fws.gov/refuges



Monona Terrace Community and Convention Center in Madison, WI, will be the setting for the Refuge System Vision Conference in July 2011. (Monona Terrace Community and Convention Center)

Looking, Planning a Decade Ahead

The road to the Refuge System’s future vision runs through Madison, WI. In the city where Aldo Leopold, the father of wildlife ecology, became the University of Wisconsin’s first professor of game management in the late 1920s, more than 1,200 U.S. Fish and Wildlife Service employees, refuge Friends and partners will gather in July 2011 to discuss and ratify a new vision for the Refuge System, the nation’s premier network of public lands and waters dedicated to the protection of wildlife species and habitat.

But discussion won’t be centered only in Madison. Employees throughout the Service and the Refuge System – as well as partners across the country – will be linked into the process through a variety of high-technology media. Indeed, the Service has promised to make this conference carbon neutral and the “greenest” one yet held.

The new vision – built on the conservation legacy so evident in the sand counties that surround Madison – will guide the Refuge System into the next decade. “It will be a historic event,” said Refuge System Chief Greg Siekaniec.

Madison is about 40 miles from Baraboo, WI, where in 1935 the Leopold family purchased a worn-out farm – in an area known as the sand counties – and put into action Aldo’s beliefs that the same tools people use to disrupt the landscape can be used to rebuild it. Indeed, a trip to the heralded “Leopold shack” and farm, the locale that inspired his essays in *A Sand County Almanac*, will set the tone for the Vision Conference, at which the Refuge System’s 107-year legacy of conservation innovation

continued on pg 22

Crystal River Refuge Acquires Prime Manatee Habitat

Three Sisters Springs – one of the most important parcels of manatee habitat in the world – has been protected from development and will become part of Crystal River National Wildlife Refuge on Florida’s Gulf Coast. The transaction has been more than two years in the making.

As the result of a complex deal finalized in late July, the 57.8-acre property, which had been slated for residential development, is now owned by the city of Crystal River and the Southwest Florida Water Management District. The city and the water management district have entered into a long-term lease agreement with the U.S. Fish and Wildlife Service, which will manage the property as an addition to Crystal River Refuge.

continued on pg 22

Chief's Corner

Hear Our Tweets



Greg Siekaniec

The world is atwitter about Twitter, the social networking site – and the National Wildlife Refuge System has joined the flock.

Not only does the Refuge System

have a Twitter site (<http://twitter.com/USFWSRefuges>), but we now have a Facebook account (<http://www.facebook.com/USFWSRefuges>), too. We hope you follow us on both – and ask your friends to do the same.

These are bold steps for the Refuge System, but they're not the first bold communications steps. Since late 2005, we've tested a variety of media – print, television and most recently radio – with public service announcements. We've done well, receiving hefty returns on our investments, both in free advertising time and space and in seeing an increase in the number of hits on our Web site.

Those media are still valuable. If you're like me, you still like to get your news from a paper delivered to your doorstep. But, like most of you, I've also moved over to new media, following the news on the Web.

After all, communication is not only about reaching traditional audiences; it is also about building new ones. That means Twitter, Facebook, YouTube and more.

You Can't Argue With the Numbers

Facebook's circulation has hit 500 million people worldwide. Twitter has more than 106 million accounts worldwide. Some of you might ask how anyone can communicate something meaningful on Twitter in just 140 characters. Well, we're learning – and we'll keep getting better at it.

The infamous bank robber Willie Sutton was reputed to have been asked, "Why do you keep robbing banks." His answer: "Because that's where the money is."

Twitter and Facebook? That's where an audience we desire resides.

On Twitter, we communicate about events, newsworthy tidbits and other happenings on refuges. On Facebook, we post daily updates offering intriguing facts, opportunities to be outdoors and invitations to share personal experiences on refuges. We look forward to generating lively discussions and broadening awareness of the Refuge System as people share the page with friends.

And we think you should join us, too – not only as fans of our Facebook page and followers on Twitter.

Those of you in Refuge Friends groups should consider your own entry into "new media." Some of you already have made the plunge – and we congratulate you for your innovation and plain old guts. In fact, the Refuge System is helping Friends enter this new world with a soon-to-be circulated special issue of our quarterly *Friends Forward* newsletter devoted to helping Friends figure out the new media landscape.

Beyond Twitter and Facebook, we will use cutting-edge communications technology as we develop a renewed vision for the Refuge System leading up to our Vision Conference in July 2011 and during the conference itself in Madison, WI. You can read more about the Vision Process and the conference elsewhere in this issue of *Refuge Update*.

Don't worry, though. We aren't abandoning traditional communications for new media. You will continue to receive this newsletter in the mail. But we do invite you to join us in the world of new media – and invite your most youthful friends, too. If we are to welcome a new generation to the wonders of natural resources, we have to do so in the realms where they communicate. And we'll do it in 140 characters, if that's what it takes to stay relevant and engaged.

See you in cyberspace. 

Refuge Update

Ken Salazar
Secretary
Department of the
Interior

Rowan Gould
Acting Director
U.S. Fish and Wildlife
Service

Greg Siekaniec
Assistant Director
National Wildlife
Refuge System

Martha Nudel
Editor in Chief

Bill O'Brian
Managing Editor

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

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



Inside

Oil Spill

From Gulf Coast habitat to Capitol Hill, long-term recovery is a priority. Pages 4-7

Measuring Marsh Elevation

Chesapeake Marshlands National Wildlife Refuge Complex, MD, is in the vanguard on monitoring wetlands elevation to the inch. Page 8

FOCUS: Energy Conservation

The U.S. Fish and Wildlife Service is committed to carbon neutrality by 2020, and the Refuge System is doing its part. Pages 10-19

White Pelicans Thriving on Upper Mississippi

American white pelicans have found paradise on the Upper Mississippi River National Wildlife and Fish Refuge. Page 23

Refuge Officers Form First Service Honor Guard

By Bill O'Brian

Late U.S. Fish and Wildlife Service Director Sam Hamilton left many legacies to the bureau he served for three decades. Few are as poignant as the Service Honor Guard.

The honor guard, which debuted at a Flight 93 National Memorial dedication this summer, had been in the works for 10 years. But it was brought to fruition because of the sudden death of Hamilton in February.

“With the tragic passing of Sam Hamilton, we had to borrow honor guards from the Florida Fish and Wildlife Conservation Commission and the Mississippi Department of Wildlife, Fisheries and Parks in order to bury our own director,” says Jim Hall, the Refuge System’s chief of law enforcement. “Even though there were almost 50 uniformed Service officers at Sam’s funeral in Mississippi, we were blessed to have the Mississippi Department of Wildlife, Fisheries and Parks honor guard perform the 21-gun salute, Taps and the formal procession because we did not have our own honor guard.”

While other Department of the Interior bureaus, such as the National Park Service and the Bureau of Land Management, have had honor guards for some time, the Service has not had one since its founding.

“When I returned from Mississippi, Refuge System Chief [Greg] Siekaniec instructed me to form a uniformed, law enforcement honor guard for the Service,” says Hall, who spearheaded the effort with help from Division of Refuge Law Enforcement staff members Rebecca Bulls and Betsy Rosenbaum. Hall says he could not have completed the work on time without the assistance of, and groundwork laid by, law enforcement officer Jerry Olmsted, a long-time advocate of a Service honor guard.

Regional Help

Each region was asked to nominate three Refuge System law enforcement officers (and alternates, if desired) for

honor guard consideration. Fifteen were selected: Rene Avendano, South Texas National Wildlife Refuge Complex; Bruce Butler, Caribbean Islands Refuge Complex, PR; William Calvert, Arthur R. Marshall Loxahatchee Refuge, FL; Kimberly Chadwick Martin, Marais Des Cygnes Refuge, KS; Samantha Fleming, Crab Orchard Refuge, IL; Shelby Finney, Salt Plains Refuge, OK; Deborah Goeb, Charles M. Russell Refuge, MT; Amanda Hardaswick, Moosehorn Refuge, ME; Christopher Johnson, Kenai Refuge, AK; Richard Johnston, zone officer, KS; Silvester Martincic, Trinity River Refuge, TX; Rebecca Merritt, Mid-Columbia River Refuge Complex, WA; Daniel Shamhart, Illinois River Refuge; Wesley Verrill, Big Muddy Refuge, MO; and Stacey Welch, Harris Neck Refuge, GA.

The honor guard is made up of a commander (Shamhart), a seven-person rifle corps (to perform a 21-gun salute), a bugler or buglers (to play Taps) and a flag corps (to perform a casket flag ceremony). The guard is available if a Service member dies in the line of duty and his or her family requests its presence. It also will take part in wreath-laying ceremonies at the Department of the Interior, National Police Week events, competitions and “any occasion the Director approves,” Hall says.

“We asked for a two-year commitment,” says Hall, “because this is in addition to your job. You may get a call saying, ‘You have to be in Mississippi tomorrow.’ And



U.S. Fish and Wildlife Service Honor Guard members, back to front, Daniel Shamhart of Illinois River Refuge, William Calvert of Loxahatchee Refuge and Amanda Hardaswick of Moosehorn Refuge at the guard’s inaugural ceremony in Pennsylvania. (Audra Haddock Martenot/USFWS)

you have to grab your uniform, your gear, your rifle, whatever you need, and you have to get on a plane and get there. This is something you have to want to do.”

The honor guard’s first duty was to represent the Service at a July 15 ceremony in which the Pennsylvania Game Commission dedicated wetlands adjacent to the Flight 93 National Memorial in memory of Richard Guadagno. Guadagno, 38, a refuge manager/law enforcement officer at Humboldt Bay National Wildlife Refuge, CA, died on United Flight 93 on September 11, 2001.

“I personally believe that Rich was part of that whole effort on that airplane to take it back from the terrorists. It’s kind of cool that Pennsylvania honored him. He was the only federal officer on any of those flights that day,” says Hall. “It’s a good remembrance. It’s a historic moment for Rich’s family and for the Service.”

The honor guard itself, says Hall, “will be a program that evolves as time goes on. It was long overdue.”

At Bon Secour Refuge, First Do No Harm

By Phil Kloer

As a biologist at Bon Secour National Wildlife Refuge in Alabama, Jackie Isaacs is on the front lines of the BP oil spill response.

Since April, Isaacs and her colleagues have made it a priority to ensure that the response does no harm – that no workers inadvertently trample the nests of threatened loggerhead sea turtles or endangered Kemp’s ridley sea turtles, disrupt snowy plover hatchlings or spoil the dune ecosystem that is home to the endangered Alabama beach mouse. “Trying to clean up the spill and protect wildlife is sort of a double-edged sword sometimes,” she says.

“We normally have a permanent staff of three on the refuge, plus seasonal volunteer interns and a term park ranger,” says Isaacs. “However, since the oil hit, we now have contractors from BP cleaning up our beaches. We have Shoreline Cleanup Assessment Teams (SCAT) doing assessments, researchers conducting oil-related research, Natural Resource Damage Assessment and Restoration (NRDAR) teams conducting surveys, resource advisors minimizing the impact of clean-up operations on refuge property, as well as Fish and Wildlife employees helping the refuge conduct our daily oil spill operations.”

The SCAT teams look for oil on beaches at or near the refuge. The NRDAR crews document oil and the damage it may have done to the marsh, shoreline, various beach birds and species of concern. The researchers from the Dauphin Island Sea Lab and the University of Houston take soil core samples to determine the spill’s effect on the infauna (animals that live in sand below the surface), the spartina marshes and marine wildlife, such as fiddler crabs, snails and mussels.

“There has been a real outpouring from Fish and Wildlife employees beyond our refuge,” she says. “People have been willing to come down and stay for weeks or even months. I can’t thank them enough.”



Bon Secour Refuge wildlife biologist Jackie Isaacs in Alabama examines a dead Kemp’s ridley sea turtle. (USFWS)

“A New Level of Importance”

Isaacs, who worked 12- to 14-hour days, seven days a week, for almost 30 days after the spill, is particularly grateful to Steve Gard, project leader at Northern Mississippi Wildlife Refuges Complex, who has helped Bon Secour Refuge. “He’s made sure I’ve always had a certified wildlife biologist here so I can get a little time off to decompress and leave the spill behind for a weekend.”

Much attention at Bon Secour Refuge has focused on loggerhead sea turtles, which return to the Gulf of Mexico after laying their eggs. “Sea turtle surveys are normally a part of our summers here on the refuge,” Isaacs says. “But now the surveys we conduct to locate nests have taken on a new level of importance.

“Each day we try to locate nests at dawn to protect them from incoming oil, as well as from crews and equipment conducting clean-up operations. Once

we find a nest, we determine if we have to move it due to incoming tides, locate the eggs and mark the nest off with tape and predator screening,” Isaacs explains. This year, because of the oiled Gulf shorelines and waters, the refuge is also moving eggs in the late stages of incubation to the east coast of Florida for hatching and release.

“On a personal level, it’s hard to deal with it every day,” says Isaacs. “However, I try to keep my head up and am proud that during these hard times I am part of an organization that is doing all it can to respond to this disaster and uphold our mission as environmental stewards.”

Phil Kloer is public affairs officer for the Southeast Region of the U.S. Fish and Wildlife Service.

Documenting What the Gulf Has

By Nancy C. Brown

From where the Rio Grande empties into the Gulf of Mexico to the southernmost tip of Florida, U.S. Fish and Wildlife Service biologists have been documenting the birds of the Gulf Coast to develop a baseline and assess potential impacts of the oil spill.

“South Texas is pretty far from the spill,” says Mitch Sternberg, lead biologist for the South Texas Refuge Complex, “but we still want to document what we have on the off-chance we get hit.”

Sternberg is one of hundreds of biologists partaking in the Natural Resource Damage Assessment and Restoration (NRDAR) beached bird surveys for the spill. While birds are the primary focus, biologists survey the coastline documenting what they see, including anything that might have been impacted by the oil spill. NRDAR teams are composed of two biologists – one representing the Fish and Wildlife Service, another representing BP. “There is a protocol that everyone follows,” says Sternberg. “This way we know the science is consistent.”

Selected transects are surveyed every third day for a minimum of 10 times. During the survey, the two-person NRDAR team walks the designated transect recording birds and additional

information that will be used to establish a baseline. “We are recording every bird we see, including commonly seen species, those that might have been oiled by the spill or dead birds,” says Sternberg. “Obviously, birds die of natural causes, and these surveys help determine what is normal and what was because of the spill.” If a dead bird is found, it is collected and sent to a designated intake center to be logged as evidence.

NRDAR is a process authorized under the Oil Pollution Act of 1990 after the *Exxon Valdez* spill. It is used to establish the injuries to natural resources so the responsible party can provide for the restoration of affected resources to pre-hazardous conditions and appropriately compensate the public for lost or diminished resources. When this oil spill happened, NRDAR teams were organized and fanned out across the Gulf Coast states to begin surveying the natural resources before the oil reached the shoreline. With coordination and oversight from the Service’s Washington and regional offices, Service biologists from around the country deployed to assist the field stations with the surveys.



A recovered gannet is scrubbed clean at the Theodore Oiled Wildlife Rehabilitation Center near Mobile, AL. (Colin White/U.S. Coast Guard)

oil reaches our shores,” says Sternberg. “The information is not only helpful for this spill but will be useful for any future environmental impacts we might have.”

As of early August, 17 NRDAR teams from the Service had sampled from 25 to 50 percent of their respective shorelines. While the teams’ surveys have focused on birds, other federal and state agencies have been conducting similar surveys with established protocols for other species and natural resources, including sea turtles, marine mammals, vegetation, soils and water. At least five federal agencies from the Department of the Interior and the Department of Commerce have been working with their state counterparts that are part of the effort to document the resources of the Gulf and its coastline.

The hope is that oil from the spill will never reach many of these areas. But, if it does, the Fish and Wildlife Service will know what is required to restore these resources, thanks to a lot of long walks taken along a lot of Gulf shoreline. 🦋

Nancy C. Brown is a public outreach specialist at South Texas National Wildlife Refuge Complex.

“It’s an important undertaking by the government to document natural resources before



Fragile marsh reeds are oiled at the mouth of the Mississippi River in Louisiana. (Bill O’Brian/USFWS)

Lesser-Known Species Imperiled by Oil

By Susan Morse

Oiled pelicans and sea turtles have become symbols of the wildlife threatened by the BP oil spill in the Gulf of Mexico. Large, iconic creatures – one, Louisiana’s state bird; the other, a visitor favorite – they readily capture public sympathy. But there are numerous other less visible species, often heavily dependent on habitat found only on national wildlife refuges, also at risk. And their plight matters more than one might think.

Take the Alabama beach mouse. Five to six inches long, including its tail, the tiny rodent once inhabited a wide stretch of Alabama coast. Then development and erosion squeezed it into ever smaller pockets until today the endangered species can be found only at Bon Secour National Wildlife Refuge, where it feeds on the seeds of dune plants ranging from beach morning glory to sea oats and seashore elder.

Normally, its dune-dwelling habit gives it a survival edge over shore dwellers such as terns and pelicans. But a hurricane could change the picture, driving oil inland and poisoning the mouse or killing the plants it feeds on. Why would that matter?

“It’s our number one concern on the refuge because that’s a species that would probably not exist if not for Bon Secour Refuge,” says refuge manager Jerome Phillips.

The mouse, says Phillips, “is an important part of the food web. If it were to disappear, you would lose all of the small mammals in that ecosystem. It plays an important role in spreading seeds, helping to increase vegetation, and it serves as prey for owls and snakes and red fox and great horned owls. We don’t always know what would happen if you remove a species, but we don’t want to find out.”

The salt marsh vole is another small, seldom-seen refuge dweller in harm’s way if currents or storms take the oil to the Big Bend area of Florida’s Gulf Coast. That area reaches from



The Alabama beach mouse “would probably not exist if not for Bon Secour Refuge,” says refuge manager Jerome Phillips. (USFWS)

Tallahassee to Tampa, and includes St. Marks, Lower Suwannee, Chassahowitzka and Crystal River Refuges. The vole is a shy mammal, not easily studied, that lives in tidal grasses accessible only by airboat.

“Indicators of Health”

“They are indicators of the health of a marsh ecosystem,” says Billy Brooks, a wildlife biologist in the U.S. Fish and Wildlife Service’s Ecological Services office in Jacksonville, FL. “If we get a large quantity of oil in the salt marsh, they’re vulnerable to being covered, or the vegetation they feed on could be covered.” If worst comes to worst and many voles die from oil exposure, he says, biologists might have to consider capturing survivors and removing them from the wild, a desperate action scientists try to avoid. It would also be a difficult move because the animal has proven extremely hard to catch.

Timing will play a significant role in how hard a hit some creatures take from the oil, and timing is not in the piping plover’s favor. Piping plovers, small shorebirds whose U.S. breeding populations are threatened or endangered, began their yearly migration south to the Gulf in July to rest and refuel after breeding. The birds, among more than 70 migratory species (including peregrine falcons, snowy plovers and long-billed curlews) that rely on Gulf habitat for survival,

arrive exhausted and hungry on Gulf islands and barrier sand flats, where they hunt for insects, marine worms and crustaceans.

“The danger lies in the fact these birds show site fidelity returning to the swamp area each year,” says wildlife biologist Patty Kelly, with the Service’s Endangered Species and Ecological Services office in Panama City, FL. “They’re used to the Chandeleur Islands, part of Breton National Wildlife Refuge in Louisiana, all areas now affected by oil. We don’t know how heavily oiled they will have to become to figure out their food source isn’t there.” And should they seek other nearby feeding grounds, they’ll find more competition for a scarcer resource.

Why would the loss of one or another small species matter? To Kelly, the world would clearly be poorer without the plover: “It’s a beautiful species with a fascinating lifestyle,” she says. But beyond that, she and other scientists worry about unraveling the complex web of life on Earth – what scientists call biodiversity. “It’s one of the spokes in the wheel,” says Kelly. “How many can you lose before your wheel falls off? Nobody knows.” 🦋

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

Spill Illustrates Risk to Wildlife and Refuges

By Rep. Mike Castle

America faces the greatest environmental disaster of our time in the Gulf of Mexico oil spill, and the devastating impact on America's wildlife is ongoing. As clean-up efforts continue, we must take heed of the lessons offered by this disaster to better protect our nation's wildlife, waters, wetlands and beaches.

The oil threatens almost three dozen national wildlife refuges and countless species of fish, wildlife and birds, including sea turtles, bottlenose dolphins, rare migrating whooping cranes, manatees, American crocodiles and alligators, and whale sharks, not to mention the 445 species of fish, many of which play an essential role in the economy of the southern United States. In fact, the Gulf Coast produces 70 percent of the oysters harvested in our country, and the oil spill's impacts on those whose lives depend on the Gulf's fisheries are echoing throughout the country.

Impacts on wildlife are devastating, and recovery centers have been constructed across the Gulf Coast to meticulously treat hundreds of animals endangered by the oil. Workers and volunteers have faced sweltering heat and difficult conditions to rescue and treat more than 500 birds, including pelicans, and about 60 different kinds of sea turtles are going through the cleaning process each day.

These recovery efforts are impressive and continue to expand, but more dedicated attention continues to be needed. As oil creeps into new wetlands and beaches in coming weeks and months, even with the well capped, the demand for wildlife recovery efforts will undoubtedly increase. There is also the fear that once the treated animals are released, their instincts will compel them to return to their natural habitat, which may be oiled. Most troubling is that, through sheer limitation of resources, these wildlife recovery centers can only treat a small fraction of the wildlife most visibly affected by the oil. They can do nothing for the smaller and more remote sea creatures and



Rep. Mike Castle of Delaware: "The oil spill serves as a sobering reminder of how vulnerable our lands, waters and wildlife are." (Jereme Phillips/USFWS)

larger ecosystems upon which the Gulf Coast depends.

Without full-scale ecosystem restoration, the animals that are rescued will not have a home to which they can return.

Investment in the long-term recovery of the Gulf of Mexico and surrounding habitat is vital. In order to have a clear picture of the effects of the oil spill on water quality, habitat, wildlife populations, commercial fisheries and recreation activities, an accurate assessment of where things stand today and the anticipated long-term damage to the Gulf region, as well as potential impacts on our coastal communities along the Eastern Seaboard, is needed.

Additionally, sufficient funding is necessary for federal natural resource and environmental agencies and the work they do in partnership with state wildlife agencies to help monitor, protect and, where feasible, restore habitat damaged by the spill. While BP bears responsibility for clean-up costs, the federal government can serve as a bridge to deploying needed investments right now. Even in the absence of this oil spill, our national wildlife refuges are spread thin in managing wildlife on refuges nationwide – we must ensure our refuges have adequate resources to help countless species of fish, wildlife

and birds recover in the Gulf. Finally, we must prioritize funding for the Land and Water Conservation Fund, which has lagged for several years and neared its full authorization level of \$900 million annually only twice in its 45-year history.

While the Gulf of Mexico might never fully recover from this tragedy, the havoc wreaked by the oil spill serves as a sobering reminder of how vulnerable our lands, waters and wildlife are, and the need for a concerted effort to ensure their protection. Pop-up strip malls, multiple-lane highways and expanding suburbs have come to be commonplace throughout our country. It is hard to imagine life without these conveniences, but equally hard to imagine is an America without our treasured open spaces, oysters, pristine beaches and wild wilderness. In pursuing advancement, it is vital that we take the responsible steps to mitigate the risks to our natural world by conserving our cherished wildlife, habitat, water and land for future generations. 

Rep. Mike Castle of Delaware serves on the House Financial Services Committee and is co-chair of the Congressional Wildlife Refuge Caucus. This article originally appeared in The Hill newspaper on July 29, 2010.

Measuring Marsh Elevation to the Nearest Centimeter

By Laura Mitchell

How do you measure changes in elevation across miles of wetlands when such changes occur on the order of inches?

That's the challenge faced by the Refuge System when monitoring coastal refuges' vulnerability to rising sea levels. Biologists need exact measures of sediment elevation change to pinpoint processes responsible for wetland gains and losses, be they physical, biological, natural or human-caused.

Refuges have begun using surface elevation tables (SETs) to monitor wetland elevation. SETs are leveling tools. They are attached to concrete anchors underground and serve as reference points from which the distance to the sediment surface can be monitored precisely. However, because SETs operate at set locations and are not mobile, inferences often apply only to tiny portions of vast coastal marshlands.

Chesapeake Marshlands National Wildlife Refuge Complex on Maryland's Eastern Shore, for example, is hoping to measure the effect of prescribed burning on marsh elevation change. Over the past 50 years, the refuge complex has managed wildlife habitat on federal and state tidal wetlands using such burns. Largely because of concerns related to climate change and marsh loss, biologists recently have begun in earnest to evaluate effects of fire frequency on wetland surface elevation. Preliminary results using SETs suggest that burning a marsh annually may help conserve its integrity.

As a result, the Chesapeake Marshlands Refuge Complex has launched an adaptive management program to study effects of fire management on marsh elevation. To do this, the refuge complex must monitor wetland surface elevation changes over an area that is much larger than can be covered by stationary SETs.

So, the refuge complex and the U.S. Fish and Wildlife Service Northeast Region's Fire Management Program joined forces with the National Oceanic



Leticia Melendez and Matthew Whitbeck, wildlife biologists at the Chesapeake Marshlands National Wildlife Refuge Complex in Maryland, collect marsh elevation information using real-time kinematic geographic positioning system technology. (Philippe Hensel/NOAA National Geodetic Survey)

and Atmospheric Administration (NOAA) to use a technology known as a real-time kinematic geographic positioning system (RTK GPS). The tool, managed by NOAA's National Geodetic Survey, creates digital elevation models of tidal marsh surfaces relative to the National Spatial Reference System, a consistent coordinate system that specifies latitude, longitude, height, scale, gravity and orientation at points across the United States. RTK GPS can measure elevation within 1cm to 5cm of accuracy; it can collect data quickly; it is mobile; and its "rover" antennas can be positioned to collect elevation data at hard-to-reach points, such as outlying tidal marsh islands.

This summer, the complex's staff used RTK GPS to establish two-dimensional elevation monitoring transects, or "slices of marsh," in areas of frequent fire (average fire return of 1 to 1.5 years) and areas of less frequency (average fire return greater than 1.5 years). The goal is to determine whether fire is a better predictor of change in marsh surface elevation than other factors such as non-fire disturbance, herbivory (for example, geese or muskrats munching on marsh), dominant plant species, the previous year's elevation, vegetation cover and geomorphic setting.

Matthew Whitbeck, supervisory wildlife biologist at the complex, is excited about the groundbreaking potential of RTK GPS. "We are using cutting-edge survey technology to monitor wetland surface elevation at scales that have previously been unavailable to conservation agencies," he says.

Although the refuge complex will not have results from its research for at least a year, the National Geodetic Survey is using the project as a pilot to develop protocols for using RTK GPS technology. The eventual objective is to measure centimeter-scale wetland surface elevation change across the entire Refuge System or an entire park system. Should this research prove successful, RTK GPS could provide a valuable tool for the Refuge System and other agencies that manage coastal areas.

"We're proud and excited to be a part of this collaborative research," says Chesapeake Marshlands National Wildlife Refuge Complex manager Suzanne Baird. "It has implications not only for fire management but also for looking at the overall picture of sea level rise and wetland habitats." 

Laura Mitchell is a regional fire wildlife biologist stationed at Bombay Hook National Wildlife Refuge, DE.

Refuges Go to the Dogs

By Susan Morse and Karen Leggett

Service dogs? Check. Firehouse and hunting dogs? Check. But dogs searching for weeds? Or turtles? Check. Check.

Ornate box turtles can be surprisingly hard to spot. So, staff at Upper Mississippi River National Wildlife and Fish Refuge, which covers parts of Minnesota, Wisconsin, Iowa and Illinois, recently hired “turtle dogs,” Boykin spaniels trained to find box turtles by scent instead of sight.

In May, a turtle dog team delivered. Over 10 days, the dogs, deployed with Tennessee-based owner/trainer John Rucker, found 97 ornate box turtles in the refuge’s sand prairies. “Without the dogs, we could not have found that many in an entire summer,” says refuge manager Ed Britton, who anticipates a return engagement.

The dogs, which picked up the turtles soft-mouthed as taught, wore Vibram booties to protect their paws from prickly pear cactus. And they were given frequent water breaks to help them weather 90-plus-degree heat.

Many of the newfound turtles will be included in the refuge’s three-year-old radio-tracking study of turtle movements, habits and hibernation patterns. Refuge staff hope the data will help them time essential refuge management tasks (such as burning and mowing prairie to control invasive grasses and woody vegetation) to better protect the turtles.

Study data are already helping. Some turtles hibernate as long as seven months, researchers have learned. Last year, an October cold snap sent them underground early. But a warm November brought them back out. “That’s telling us we’ve got to be careful when we do fall burning,” says Britton.

If state agencies decide to expand the study beyond the refuge’s seven sand prairies to private property, the dogs likely will be back. And researchers will have to mind their mouths. Why? The spaniels like to sniff out other animals,



Handler Aimee Hurt teaches Wicket to identify the scent of *Lespedeza cuneata*, an invasive plant at Neal Smith National Wildlife Refuge, IA. (Karen Viste-Sparkman/USFWS)

too. To avoid throwing the dogs off track, researchers are warned not to speak the word “bird.”

On the Trail of Cuneata

At Neal Smith National Wildlife Refuge, IA, dogs spent 10 days searching 1,000 acres for *Lespedeza cuneata*, a weed that is threatening native prairie plants. “It would have taken people all summer,” says Karen Viste-Sparkman, Neal Smith Refuge biologist. “The plants are surrounded by other vegetation, and people walk right past.”

Three dogs from the nonprofit organization Working Dogs for Conservation trained at the refuge. Each dog had a handler, but the dogs ran free when searching for the weed. When a dog sat next to a plant, the handler flagged the spot and marked it on a GPS unit. Refuge staff returned to spray the plants. If the dogs return for a second season, refresher training would take less time.

“We’re trying to nip it in the bud,” explains Viste-Sparkman. “*Cuneata* is at a low level, but it could take off.” The \$30,000 price tag, covered by the Friends of the Prairie Learning Center, primarily covers transportation and payment of the handlers. The dogs’ reward? Playing with a ball while the handler is recording data.

Alice Whitelaw of Working Dogs for Conservation sees expanding opportunities for dogs in wildlife research. “Traditional monitoring methods are cost prohibitive,” she says, “especially when multiple landowners and agencies are patchworked across an area. It’s easier to use dogs.”

The most successful dogs are Labrador retrievers, German shepherds and border collies – high-energy dogs, says Whitelaw, who often finds them in shelters.

The organization’s dogs worked at Red Rock Lakes National Wildlife Refuge, MT, to detect grizzly bear, black bear, mountain lion and wolf scat in a DNA research project for the Wildlife Conservation Society and the University of Montana. They also spent three years detecting San Joaquin kit fox scat at San Luis National Wildlife Refuge Complex, CA.

“The capabilities of dogs and the targets they can find is almost unlimited,” says Whitelaw. “If you are having a hard time gathering data, consider the dogs.” 🐾

Susan Morse and Karen Leggett are writer-editors in the Refuge System Branch of Communications.

Focus...Energy Conservation

This Year's "Green" Projects by Region

The U.S. Fish and Wildlife Service's *Rising to the Challenge: Strategic Plan for Responding to Accelerating Climate Change* is unequivocal in its guidance on matters of energy efficiency. Item No. 5 among the seven bold commitments reads: "As a Service, we will ... become carbon neutral by year 2020 and encourage other organizations to do the same."

It is a lofty goal, and the Refuge System is doing its part.

Robert L. Williams Jr., a program analyst in the Refuge System Division of Budget, Performance and Workforce, has compiled the following list of significant energy-efficiency and renewable energy projects recently completed or underway. The American Recovery and Reinvestment Act funded approximately \$105 million of the projects' costs, and \$2 million came from the Refuge System fiscal year 2010 construction appropriation.

Pacific Region:

- new administration building and visitor contact station at Kealia Pond Refuge
- replacement of photovoltaic systems, housing and storage unit at Laysan Island at Papahānaumokuākea Marine National Monument
- energy-efficiency and renewable energy projects at Midway Atoll



Vertical wind turbines are being installed at Izembek Refuge, AK. (John Sarvis)

Refuge and Sheldon-Hart Mountain Refuge Complex

- new quarters and other energy-efficiency projects at Turnbull Refuge

Southwest Region:

- new administration/visitor contact station at Hagerman Refuge
- new administration/visitor contact station at Texas Chenier Plain Refuge Complex
- installing solar photovoltaic panels on buildings at the following refuges: Aransas; Bosque del Apache; Buffalo Lake; Cibola; Imperial; Laguna Atascosa; Sevilleta; and Texas Mid-Coast Refuge Complex
- photocell electrical pumps at Brazoria Refuge
- 20-kilowatt grid-tied solar voltaic system at Kofa Refuge
- replacing the bath house well, pump and solar panels at San Bernardino Refuge

Great Lakes-Big Rivers Region:

- new administration/visitor contact station at Upper Mississippi River Refuge LaCrosse District
- new administration/visitor contact station at Mingo Refuge
- photovoltaic array at Necedah Refuge
- photovoltaic array at Ottawa Refuge
- repairing the solar heating system at Agassiz Refuge

- converting to geothermal heating/cooling in the shop building at Boyer Chute Refuge
- energy retrofit at the Tamarac Refuge visitor center

Southeast Region:

- new administration/visitor contact station at Pea Island-Alligator River Refuge
- new administration/visitor contact station at Tennessee Refuge
- installing solar voltaic array and replacing heating/cooling system at Lower Suwannee Refuge
- improvements at Theodore Roosevelt Refuge Complex
- replacing refuge office and shop/storage shed at Big Lake Refuge
- rehabilitating the maintenance shop at Reelfoot Refuge
- upgrades at the maintenance shop facility at Chickasaw Refuge
- new environmental education building at St. Marks Refuge
- new visitor contact station at Bald Knob Refuge
- new office at Merritt Island Refuge
- upgrades at the administrative/visitor contact building at Overflow Refuge
- upgrades at the administrative office and quarters at Wassaw Refuge
- upgrades at quarters at White River Refuge



At Don Edwards San Francisco Bay National Wildlife Refuge, the administrative office is being remodeled. (John and Karen Hollingsworth)

Northeast:

- new administration/visitor contact station at Long Island Refuge Complex
- improvements at Monomoy Lighthouse
- geothermal heat pump in new seasonal housing at Rachel Carson Refuge
- rehabilitating administration/visitor contact building with solar photovoltaic at Back Bay Refuge
- improvements at Eastern Massachusetts Refuge Complex visitor center
- improvements at Great Swamp Refuge visitor center
- energy-efficient quarters at Great Dismal Swamp Refuge
- solar hot water and photovoltaic units at Parker River Refuge visitor contact station
- improvements on Patuxent Research Refuge visitor center ventilation and air-conditioning system.

Mountain-Prairie Region:

- new administration/visitor contact station at Audubon Refuge
- new administration/visitor contact station at Rocky Mountain Arsenal Refuge
- replacing inefficient pumps and pump sites at Browns Park Refuge
- geothermal, solar photovoltaic and wind turbine systems at Alamosa, Baca and Monte Vista Refuges
- replacing two residences and a bunkhouse at Seedskafee Refuge
- repairing a geothermal well field at Sullys Hill National Game Preserve
- renewable energy system at Crescent Lake Refuge office
- wind turbine at Quivira Refuge

Alaska Region:

- vertical wind turbines at Alaska Peninsula and Izembek Refuges
- reconstructing residence utilities at Innoko Refuge
- solar photovoltaic for water pump at Kenai Refuge
- solar hot water heater at Togiak Refuge airplane hangar
- renewable energy components at Kanuti Refuge residence
- replacing an office at Yukon Delta Refuge



Steps are being taken to improve the energy efficiency of the lighthouse at Monomoy National Wildlife Refuge, MA. (Zachary Cava/USFWS)

- energy-efficient windows and doors at the Adak bunkhouse and triplex at Alaska Maritime Refuge Aleutian Islands Unit

Pacific Southwest Region:

- new administration/visitor contact station at San Diego Bay and San Luis Refuges
- solar photovoltaic systems at refuges throughout the region
- replacing quarters at Ash Meadows and Modoc Refuges

- replacing the maintenance shop at Ruby Lake Refuge
- replacing shop building at Sacramento Refuge
- remodeling the administrative office at Don Edwards San Francisco Bay Refuge
- energy-efficient windows in the historic quarters at Desert Refuge
- expanding photovoltaic array at Stillwater Refuge 

Pacific and Northeast Regions Honored

Two National Wildlife Refuge System projects won 2010 Federal Energy and Water Management Awards presented by the Department of Energy.

The Pacific Region was cited for the new Inland Northwest National Wildlife Refuge Complex headquarters building on Turnbull Refuge, WA. It was constructed with stone from a regional quarry and includes a cool roof; daylighting features; low emissivity glazed windows; efficient light emitting diode (LED) lighting; occupancy sensors; and a 14 ton geothermal heat pump that improved energy performance 32 percent above an average building. A 4.9 kilowatt grid tied solar photovoltaic array produces electricity; hot water is provided by a roof mounted solar collector system; and 15.5 megawatt hours of renewable power generated on site saves 10 metric tons of greenhouse emissions annually.

The Northeast Region was honored for its installation of a new 32.48-kilowatt solar photovoltaic system and conversion from a fuel oil-fired to a natural gas-fired heating, ventilation and air-conditioning system in the already sustainable visitor center and administration building at Parker River National Wildlife Refuge, MA. The solar photovoltaic system generates approximately 48 megawatt hours per year and supplies 42 percent of the building's electrical needs.

Focus... Energy Conservation

Study Focuses on Reaching Refuges Without a Car

By Nathan Caldwell

In a perfect world, a national wildlife refuge visitor would not only enjoy the natural respite that such a haven offers but would do so in an environmentally friendly way. He or she could leave the car at home and ride a bike to a bog, a trolley to a marsh, a subway to view an eagle nest or a bus to a fishing hole.

The U.S. Fish and Wildlife Service and the Volpe National Transportation Systems Center are studying the feasibility of just that.

The study, funded by the Federal Transit Administration's Paul S. Sarbanes Transit in the Parks program, is identifying refuges that visitors can access via alternative transportation, particularly public transit and major regional bicycle and recreation trails. The study has examined 138 refuges so far.

Beyond environmental benefits, transit and trail connections enable individuals without motor vehicles to have access to refuges.

So far, the study has found that 62 refuges have some type of transit service; 41 refuges have no transit service within 15 miles; and 35 refuges have no or limited public access or did not have information on transit connections. The study also preliminarily found that 12 refuges had two or more bicycle or recreation trail connections; 23 refuges had one trail connection; and 103 refuges had none.

The study ranks each refuge based on: distance to an urban area; distance to nearest regional bicycle or recreation trail; distance to nearest transit stop; trail quality, based on trail length, service, connections to urban areas and regional destinations; and transit quality, based on frequency of service and ease of connection to population centers.

Based on the 138 refuges, the study preliminarily identified these as having

strong transit connections or high potential for new connections: Minnesota Valley Refuge near Minneapolis; Sweetwater Marsh and Tijuana Slough Refuges near San Diego; John Heinz Refuge at Tinicum near Philadelphia; Tualatin River Refuge near Portland, OR; Two Ponds Refuge near Denver; Occoquan Bay Refuge, VA, outside Washington, DC; Steigerwald Lake Refuge near Vancouver, WA; Wertheim Refuge on Long Island, NY; and Wallkill River Refuge in New Jersey.

The study preliminarily identified these as having strong bicycle or recreation trail connections or high potential for new connections: Minnesota Valley Refuge; Big Muddy Refuge near Columbia, MO; Upper Mississippi Refuge (Savanna, IL, district); Sweetwater Marsh Refuge; Don Edwards San Francisco Bay Refuge; Assabet River Refuge outside Boston; Upper Mississippi Refuge (LaCrosse, WI, district); and Big Branch Marsh Refuge near New Orleans. Just two refuges – Minnesota Valley and Sweetwater Marsh – are on both lists.

As a next step, the study's research team is interviewing Refuge System regional roads coordinators to identify more refuges with existing or potential transit and trail connections. The study will use those findings to focus Service marketing and outreach efforts and to seek Federal Highway Administration and Federal Transit Administration assistance to take advantage of such transit and trail connections.



Bear River Migratory Bird Refuge, UT, has designated parking for everybody – including bicyclists. (USFWS)

The Sarbanes Transit in Parks Program recently completed a study to help facilitate bus service to a planned new visitor center at Rocky Mountain Arsenal Refuge, CO, which is surrounded by a trail system. The program also is funding projects to improve nonmotorized access to National Elk Refuge, WY, and Chincoteague Refuge, VA.

Five other refuges received funds, directly or indirectly, from the program this year: Neal Smith Refuge, IA, for preliminary work on a bike/pedestrian trail; Parker River Refuge, MA, for a shuttle to a commuter rail station; Wichita Mountains Refuge, OK, to replace a tour bus; Presquile Refuge, VA, to plan the replacement of a cable ferry; J.N. "Ding" Darling Refuge, FL, for a transportation analysis on Sanibel Island.

For more information about the program and how to apply for fiscal year 2011 funding, go to http://www.fta.dot.gov/funding/grants/grants_financing_6106.html and sign up for e-mail updates. 

Nathan Caldwell is the Service trails, byways, transportation enhancement and alternative transportation coordinator.

Puffins Point the Way to Offshore Turbines

By Chelsea DiAntonio

Quirky and colorful describe the Atlantic puffin – so popular along the Maine coast. Now, with the help of state-of-the-art global positioning system (GPS) technology, this charismatic bird is leading Maine Coastal Islands National Wildlife Refuge biologists and their scientific partners into uncharted foraging areas to help determine where – and where not – to place offshore wind turbines.

The Department of Energy has ranked the Maine coast as a prime wind resource area. By 2020, the state of Maine hopes to establish 3,000 megawatts of wind power capacity – some of it via large offshore facilities. The number of turbines in the Gulf of Maine could reach 1,000 towers soaring 650 feet each. Their size and footprint could be larger than any terrestrial wind farm in the Northeast.

Offshore wind turbines pose three major threats to seabirds: stress-inducing avoidance behavior, habitat destruction or degradation, and collision mortality. So placement of turbines is crucial. Ideally, areas in the Gulf of Maine that seabirds frequently use as migration routes, seasonal flyways or foraging hotspots should be avoided. But how do researchers and conscientious wind power developers find these high-use foraging habitats? And why are these areas so appealing to the birds?

Cue the Puffins

Maine Coastal Islands Refuge – with more than 50 offshore islands and four coastal parcels spanning 250 miles along the Gulf of Maine – includes the Atlantic puffin's southernmost breeding range. In May, these pelagic birds return to breed and raise chicks in rock or sod burrows. After the chicks hatch in early July, adults must make several foraging trips daily to provide sufficient food for their young. A trip can be more than 30 miles one way.

The frequent trips provide researchers a perfect opportunity to log routes



Maine Coastal Islands Refuge scientists are using state-of-the-art GPS technology to study the foraging routines of Atlantic puffins and other seabirds. (Kirk M. Rogers)

from nest to foraging habitat. Tiny GPS loggers can do that with unprecedented precision. They operate with a small battery, are waterproof and measure just an inch long by a half-inch wide. Memory capacity and battery life enable five location points to be collected every three minutes for five to seven days. With help from the National Audubon Society and the University of New Brunswick, Maine Coastal Islands Refuge deployed 20 GPS data logging units on puffins breeding on four islands this summer.

Field technicians on Petit Manan, Seal, Matinicus Rock and Machias Seal islands trapped five nesting puffins on each island. The puffins were banded and equipped with a minuscule GPS logger. Each bird was released in about five minutes to continue to fly, swim and care for its chicks.

When a puffin was re-trapped four to seven days later, the GPS unit was removed and all data points were downloaded to a custom Google Earth globe to reveal foraging habitat hotspots and flyways. Biologists will analyze ocean surface temperatures and currents, and other characteristics of the feeding habitats, to better understand puffins' routines.

Resource managers are concerned that development of an offshore wind facility near a major breeding colony, in a critical foraging or staging area, or along a migration corridor could adversely affect numerous species. The Atlantic puffin is one of three seabird species the refuge tracked to help identify important habitats. It also has placed geolocators on Arctic terns to track their annual migration pathways, and it placed satellite transmitters on greater shearwaters. The satellite transmitters instantly transmit the location of the shearwaters as they forage throughout the Gulf of Maine.

Having the knowledge of these birds' foraging hotspots and habitat is important for strategic placing of offshore wind facilities. In addition to the GPS studies, other research involving seabirds, migratory songbirds and bats is being conducted by the refuge and partners.

Combining all research results will help the refuge understand how birds and bats use the landscape. Visualizing the paths and discovering the oceanic habitat of various species will enable wind facility developers to make educated decisions and understand conservationists' concerns. Ultimately, the research could lessen the sacrifice of wild creatures to meet human energy demands. 🦅

Chelsea DiAntonio is a student at Paul Smith's College of the Adirondacks and was a Student Career Experience Program (SCEP) intern at Maine Coastal Islands National Wildlife Refuge.

Focus... Energy Conservation

The Mandate Is Clear: Use Alternative Fuel Vehicles

By Robert L. Williams Jr.

Petroleum fuel reduction mandates, more than any other factor, will drive Refuge System fleet management practices for at least the next decade.

Federal mandates require that all federal agencies reduce petroleum fuel use from 2005 levels by two percent per year through 2020.

Section 12 of Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, signed by President Obama in 2009, provides guidance for fleet and transportation management. It requires: the acquisition of alternative fuel vehicles and the use of alternative fuels; the use of biodiesel blends in diesel vehicles; the acquisition of electric vehicles for appropriate functions; the improvement of fleet fuel economy; optimizing use of fleets to the agency mission; petroleum reduction strategies, such as the acquisition of low greenhouse gas emitting vehicles and the reduction of vehicle miles traveled; and the installation of renewable fuel pumps at federal fleet fueling centers.

Congressional mandates require that 75 percent of covered light-duty vehicle acquisitions must be alternative fuel vehicles and that 95 percent of the fuel used in non-waivered dual-fueled alternative fuel vehicles must be alternative fuel.

With approximately 72 percent of the U.S. Fish and Wildlife Service vehicle fleet, the Refuge System is taking the lead in reducing vehicle emissions by:

- adopting a new vehicle policy that enables regions to more actively manage fleet size.
- eliminating the “one-for-one” replacement policy to allow refuges to more easily purchase the vehicles most critical to fulfilling their mission and dispose of inefficient vehicles.

- requiring refuges to complete a cost analysis before vehicle purchase to determine if it is more efficient to rent vehicles on an as-needed basis rather than own.

Alternative fuel vehicles make up approximately nine percent of the Service vehicle fleet. However, alternative fuels account for less than one percent of the total Service fuel use. One of the greatest impediments to meeting alternative fuel targets is the difficulty in obtaining alternative fuels. While urban refuges may have easy access to fuels such as compressed natural gas or propane, remote refuges often have difficulty locating alternative fuels. To help in this regard, the Department of Energy (DOE) has an alternative fuels station locator at <http://www.afdc.energy.gov/afdc/locator/stations/>.

In partnership with the DOE National Renewable Energy Laboratory and New West Technologies, the Refuge System is identifying alternative fuel sources near refuges and determining the most effective way to begin converting gasoline-only vehicles to dual-use or alternative-fuel-use.

The Refuge System is planning a fuel conversion pilot program in fiscal year 2011 at Merritt Island Refuge, FL; Rocky Mountain Arsenal Refuge, CO; and Texas Mid-Coast Refuges Complex. These three were selected because they scored highest on these criteria: number of fleet vehicles; number of ethanol85 or flex-fuel vehicles; fleet large enough to consider conversion or acquisition of alternative fuel vehicles and fueling



Chincoteague National Wildlife Refuge, VA, has owned this Global Electric Motorcar for three years. It can carry a payload of 920 pounds and go 30 miles on a charge. (Nicholette Steffes/USFWS)

infrastructure; proximity to a federal facility already using alternative fuels that might be available via interagency agreement; and proximity to an urban area where alternative fuel is available.

Even so, some refuge managers object to the use of alternative fuels, such as ethanol and biodiesel, because of natural resource implications.

In response to this concern, Refuge System Division of Budget, Performance and Workforce chief Larry Williams says: “Producing alternative fuels can clearly have negative impacts to natural resources like wildlife and habitat. But producing conventional fuels causes the same kind of impacts. As a conservation agency, we should support the growing public interest in environmentally friendly fuels. The public wants to use fuels like that for all the right reasons. But we also need to show the public how to do it smartly, with minimal impact to natural resources.”

Robert L. Williams Jr. is a program analyst in the Refuge System Division of Budget, Performance and Workforce.

Wind and Gravity: Winning Combination for Water

By Mary Tillotson

Two western national wildlife refuges are using wind power and the natural force of gravity to benefit animals, save money and reduce the federal government's fuel consumption and carbon footprint: a win-win-win situation.

By this fall, National Elk Refuge in Wyoming hopes to have in place a new sprinkler irrigation system that relies on underground pipeline water distribution and gravity-generated pressure instead of diesel-fueled pumps. Refuge manager Steve Kallin estimates savings on diesel fuel for the pumps alone will be about \$20,000 annually, but advantages of the new system go well beyond dollars saved.

Kallin says the refuge has spent up to \$5,000 a week in some dry years to water about 900 acres of grass for the elk and bison that winter there. He says the new system, which distributes water through a pipeline instead of porous irrigation ditches, will let the refuge use less water and irrigate up to 5,000 acres. More forage means less need for the refuge to truck in alfalfa pellets to augment winter grazing for the elk and bison. Less supplemental feeding will decrease the amount of time animals are concentrated on the feed ground and should reduce the potential for disease transmission, says Kallin.

The alfalfa pellets are distributed in long, thin lines. The elk, he says, tend to feed nose to nose – a proximity that increases the risk of spreading a variety of diseases. With thousands of acres to graze, says Kallin, the herd will spread out and stay healthier.

Semi-trucks hauling the supplemental feed to the refuge, says Kallin, make a five-hour round trip from Idaho. In the severe winter of 2007-08, he says, it took 165 truckloads of alfalfa pellets to feed about 8,500 elk and 1,000 bison that had been driven to the lower elevation



A new irrigation system is expected to provide more and cheaper forage for National Elk Refuge's namesake animal. (Lori Iverson/USFWS)

by deep snows higher up – several thousand more elk than the average in milder winters.

Kallin knows the amount of forage grown on the refuge, supplemental feed needed and the number of elk and bison wintering on the refuge in a particular season are all subject to variables – such as rainfall in the growing season and the severity of the winter. But, he says, if the need for supplemental feed is cut by just 50 percent, the savings on fuel and emissions will be significant.

Solar Backup in Nebraska

Both National Elk Refuge and Nebraska's Fort Niobrara National Wildlife Refuge were set aside in 1912 to preserve wildlife and habitat. While gravity is only now replacing diesel pumps at the Wyoming refuge, wind has been powering water pumps at Fort Niobrara since the late 1800s, when it was a military installation, says Fort Niobrara Refuge manager Steve Hicks. Wind is a time-honored power source on the Nebraska prairies, after all.

What is new at Fort Niobrara, says Hicks, is that several of the pumps on the refuge now have solar-powered backup systems in case the wind drops. The refuge started adding solar backup in 2003.

There are now 128 wind-powered water pumps at Fort Niobrara-Valentine National Wildlife Refuge Complex to water the elk, bison and antelope that live there, as well as cattle whose grazing helps manage grasslands. Windmills are strategically located around the refuges to help the large grazing animals more effectively use the grasslands. The result is better forage use, better habitat management and money saved. Hicks estimates using wind power versus fuel-operated pumps saves more than \$250,000 a year in energy costs, plus tens of thousands in maintenance. 🦋

Mary Tillotson is a frequent contributor to Refuge Update.

Focus... Energy Conservation

Two Refuges, Two Approaches, One Goal

By Andy Smith

On the face of it, Sheldon-Hart Mountain National Wildlife Refuge Complex and Minnesota Valley National Wildlife Refuge are as different as night and day.

One is a rural, lightly visited refuge in the sunny, wind-swept high desert of eastern Oregon/northern Nevada, nowhere near public transit. The other is an urban, heavily visited refuge in chilly Minnesota, a stroll from a light-rail station.

So, when these refuges built new visitor centers using energy-saving technology, as they did in the past two years, you might have expected vastly different approaches and concerns. You would have been right, mostly.

There were differences in the scope, precise objective, cost, size and impetus for going “green.”

The Minnesota Valley renovation, completed in April, cost \$2.6 million. The Sheldon-Hart Mountain relocation, finished in May, was accomplished for a quarter of that – about \$650,000.

Minnesota Valley Refuge needed 35,000 square feet to accommodate 250,000 annual visitors and environmental education programs offered to local schools. The Sheldon-Hart Mountain facility is less than 5,000 square feet, plenty of space for a refuge complex that attracts fewer than 40,000 visitors annually.

Minnesota Valley’s primary incentive to go “green” was to cut down on energy use.

“The building itself was in good condition,” says Minnesota Valley Refuge manager Charlie Blair. “It was sturdy, well-constructed and physically meeting all of our needs. However, the mechanical systems were 20 years old and the building’s energy usage was some of the highest in the region. Given the Fish and Wildlife Service’s commitment to

the environment, we knew we had to make some changes.”

At Sheldon-Hart Mountain, the motivation was to move from a physically deficient space that it had been leasing since the 1930s into an energy-efficient, Service-owned space. To fill the bill, refuge staff found a 4,800-square-foot house on 78 acres for sale.

“It’s the former home of an engineer,” says Paul Steblein, who until recently was Sheldon-Hart Refuge manager. “So, even though it’s a ranch house, it was already a very highly energy-efficient building.”

What’s Similar

There were similarities, too.

Each refuge adapted to its climate and made the best use of its individual circumstance and available resources.

At Minnesota Valley Refuge, there are 24 solar panels on the visitor center and 60 geothermal wells under the parking lot. Pipes in the wells, filled with food-grade antifreeze, draw on the stable, roughly 50-degree temperature underground to cool the building in summer and, amazingly, to provide sufficient heat in the frigid Minnesota winters.

“As part of the renovations,” says Blair, “we added a little more insulation to the building. We have two backup boilers in case there’s ever a problem, but this system is more than capable of heating this space, and doing it in a very environmentally friendly way.”

Sheldon-Hart Mountain Refuge’s smaller building adapts to its location on a ridge in the high desert, a place of hot,



The roof of the Sheldon-Hart Mountain Refuge visitor center is angled to obscure some rays from the sun at its highest and most intense point in summer and to allow rays in during winter. (P.F. Steblein/USFWS)

intensely sunny summers and bitter cold, windy winters. The visitor center’s roof is angled to obscure some sun rays at the most intense times in summer and allow rays in when the sun is low in the winter sky. A geothermal heat pump was added for forced air heating and cooling.

“We’re also in the process of installing a photovoltaic solar-powered generator,” says Steblein. “That’s going to allow us to run a lot of our electricity from solar power. In the winter and spring, when there isn’t as much sun, it can also get quite windy up here. We’ve also got a wind generator planned so that, no matter the season, we can power the complex on renewable resources.”

The two refuges also share an important goal: savings – both fiscal and environmental.

Blair estimates that the eco-friendly building at Minnesota Valley Refuge should run 40 percent more efficiently than before. Steblein expects that reduced energy and leasing costs at Sheldon-Hart Mountain Refuge will pay for the new office within a decade or so. 

Andy Smith is a student at Georgetown University. He was a Student Temporary Employment Program (STEP) intern in the Refuge System Branch of Communications this summer.

Checking In With Two Award-Winning Refuges

By Jennifer Anderson

San Andres National Wildlife Refuge in southern New Mexico and Missisquoi National Wildlife Refuge in northern Vermont share at least one thing: past Department of the Interior Environmental Achievement Awards. So, how are they doing now on the energy front?

This year's expansion of a renewable energy system at San Andres Refuge should all but eliminate electric bills, says refuge manager Kevin Cobble.

The 3,600-watt expansion is intended primarily to cover summer electrical usage, which Cobble says has been running about \$200 per month. "We're just waiting for the electric company to come in and put a meter on it," he says.

San Andres Refuge launched its energy independence effort in 2005 with a self-installed, 6,000-watt hybrid solar cell and wind energy system that met approximately 80 percent of its electrical needs and greatly reduced an energy bill that was approaching \$4,000 a year. In 2008, those initiatives landed the refuge a DOI Environmental Achievement Award.

The original system included a 30-foot-tall wind turbine and solar panels set at an angle along the parking garage to capture sunlight, explains Coby Bartram, the maintenance mechanic who installed the panels. The system worked so well that in some months power bills amounted to no more than the electric company's \$12.43 service charge.

But the system fell short in summer when interns arrived and air-conditioners were running full blast. To offset this usage, Bartram installed the new panels, also on the parking garage but completely flat to capture direct summer sunlight. Cobble expects to make up for the \$60,000 cost of materials in 10 years.

Down the road, he says, he may convert the refuge's natural gas heating system to a solar electric system. Meanwhile,

the refuge is experimenting with a "solar shield," in which internal air is piped out, heated by the sun and then blown back into the building. Warmth last winter was not a problem, although, Cobble says, the fan was a little noisy. "We're going to try it on low speed."

Solar Power in Vermont

Missisquoi Refuge, a 2006 DOI Environmental Achievement

Award winner, recently expanded its solar panel array by approximately 50 percent, which has doubled solar energy production to 16 percent of total energy use, says refuge manager Mark Sweeny.

The new panels have been mounted next to existing panels on the roof of the refuge headquarters and visitor contact station, built in 2005. The system includes a wind turbine and other renewable energy features in the original design and construction of the building. The renewable energy features have enabled the refuge to reduce energy costs by 35 percent, Sweeny estimates.

He describes the solar panels and turbine as complementary. "We get a lot of power from the solar panels on sunny days, and in winter the wind blows a lot more," he says.

A separate, geothermal system provides air-conditioning, pulling water from a 370-foot well through a heat exchanger that Sweeny likens to a giant radiator. The 60-degree water, traveling through one set of pipes, cools antifreeze that circulates through a separate set of pipes that continues throughout the building to cool the air. "We had five



Missisquoi Refuge in Vermont uses solar and wind energy to power its headquarters and visitor contact station. (USFWS)

days of 90-degrees plus" last year, says park ranger David Frisque. "It kept the building very comfortable."

Other energy-efficient features include a four-foot overhang above a glass facade, allowing heat in during the winter, when the sun is lower in the sky. A dark concrete floor and dark walls inside absorb passive solar energy and gradually release it in the evening.

Although Sweeny says he has no immediate plans to expand the system, he might eventually add a second wind turbine, not only to increase energy self-sufficiency but also because of its impact on passersby.

"A lot of people come in and ask about the turbine," he says. Occasionally, homeowners serious about energy independence will stop by as a final step toward installing their own turbine. 

Jennifer Anderson is a frequent contributor to Refuge Update.

Focus...Energy Conservation

"Green" in the Extreme

By Jennifer Anderson

While national wildlife refuges increasingly are doing their part to reduce fossil fuel consumption and rely instead on renewable resources, many refuge staff members are personally walking the walk in their daily lives. Two live in Oregon.

Peter Martin III

A civil engineer/facility specialist in the U.S. Fish and Wildlife Service's Pacific regional office in Portland, Martin bought a 300-acre working timber ranch near the Pacific Ocean 21 years ago. He built a home primarily out of wood and powers it almost entirely by renewable energy sources.

Wind, he explains, crosses a lake and accelerates as it funnels through the trees, blowing into two well-positioned wind turbines. The turbines provide five percent of his power use.

Thirty-six solar panels arrayed on an angle in a skewed horseshoe shape are a major source of power. "The panels take maximum advantage of the sun before the afternoon fog rolls in," he says.

Martin does not have air-conditioning. Instead, screened sliding doors allow the breeze to circulate throughout the 4,000-square-foot house, and glycol-water in high-density polyethylene coils transfers heat from the roof to a hot-water tank. Sprinklers, also on the roof, use lake water to cool things down further; the overflowing water is collected and used in the garden.

For warmth, overhanging eaves allow only the low winter sun to penetrate a glass facade. High insulation helps keep in heat; slate floors absorb the heat and re-radiate it throughout the house.

Additional heat sources to generate hot water include propane, which costs approximately \$150 per year, and a wood-burning stove that incorporates a heat exchanger connected to the

water heater. Martin estimates he spends four hours each year maintaining his systems.

A member of the Pacific Region's carbon-neutral team, Martin says he would like to apply his energy self-sufficiency skills to the office – and, in particular, work with refuges interested in getting off the grid entirely.

Molly Monroe

An assistant biologist at William L. Finley National Wildlife Refuge near Corvallis, Monroe has transformed the refuge into a leading example of Earth-friendly operations by sharing with colleagues her knowledge of energy self-sufficiency and waste reduction.

"The main thing I've influenced here is introducing to everyone how far we can go with recycling," says Monroe. Even Styrofoam and various plastic and bubble wraps can be recycled in Corvallis, she says.

It started eight years ago when Monroe noticed yogurt containers, coffee cans, glass and plastic bottles – and even paper – ending up in trash cans. She arranged for recycling bins to be installed throughout the headquarters building of Willamette Valley National Wildlife Refuge Complex on Finley Refuge. In the kitchen, everything that can be recycled goes into one bin and ends up in a commingled roll-away cart picked up by Allied Waste, a local recycling company.

"I try to keep it simple," she says. She posts reminders in the kitchen and



Youth Conservation Corps members Jordan Long, Lexxs Bradburry and Levi Hoefler help biologist Molly Monroe with recycling at Willamette Valley National Wildlife Refuge Complex, OR. (USFWS)

makes sure recyclables end up in the proper containers.

The trash flow not only decreased, but it also "got hot because it ended up being mostly food waste," says co-worker Katie Folts, an AmeriCorps volunteer. The organic waste-to-recyclable waste ratio became so high that trash cans literally became warm. So, Monroe started a compost, Folts says. She also has brought in glass dishes and silverware to replace the throwaways for everyone's use.

With recycling established, Monroe is looking for other ways to install renewable resources in the building. Recent projects involved motion-sensor light switches and solar tubing in the ceiling to bring in more natural light. Solar panels are on Monroe's wish list.

"We may get an environmental education building down the road," she says. "If so, we would like to incorporate solar panels." 🦋

Jennifer Anderson is a frequent contributor to Refuge Update.

Off the Grid

By Karen Leggett

Even as many national wildlife refuges face the challenges of encroaching development, portions of some refuges remain so remote they are off the grid: unable to access public electricity no matter what the cost.

These refuges have always had to be energy self-sufficient, but they too are working to reduce their carbon footprints.

The power needs of California condor researchers at Hopper Mountain National Wildlife Refuge – in the rugged terrain 60 miles northwest of Los Angeles – have traditionally been met with propane, wood and the sun. Solar energy has provided electricity to a bunkhouse, cabin and toolshed since 2002. Upgraded solar panels, funded through the American Recovery and Reinvestment Act, will double the power capacity by this fall.

“Not only will this reduce the refuge’s carbon footprint,” says refuge manager Dan Tappe, “but the solar panels will provide enough electricity for researchers’ computers, as well as a water-filtration system, an upgraded communication radio, tankless water heaters and a water cooler.”

Propane will continue to power refrigerators, water heaters, stoves and the solar battery chargers. Two smaller solar systems power a water pump and a condor-holding facility. Wood stoves provide heat.

North to Alaska
Camp Island on Kodiak National Wildlife Refuge is



On Camp Island in Karluk Lake on Kodiak National Wildlife Refuge, AK, a new solar system should eliminate the need for propane and provide power for a refrigerator and computers. (USFWS)

way off the grid – an hour by floatplane from the city of Kodiak. A small solar system, propane, oil and wood now provide energy for two large bunkhouses and one cabin used by the pilot and the administrator for bear-viewing trips.

A new, larger solar system being installed this year will eliminate the need for propane and provide enough electricity for a refrigerator and

computers. Maintenance worker David King says the new solar panels will reduce the carbon footprint of refuge facilities on the island by half and produce considerable cost savings.

Kodiak Refuge days range from six hours of daylight in winter to 18 hours in summer. Even that daylight often can be cloudy. King says he worked with suppliers to customize state-of-the-art, completely upgradable solar panels that absorb more sunlight and store the energy in battery banks.

The biggest energy-related cost for a remote location such as Camp Island often is simply getting the fuel to the site. Every drop has to be loaded on a plane for a two-hour round trip, with empty containers brought back on the return flight. “Within four years,” says King, “we hope to get off fossil fuels entirely.”

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



New solar panels will reduce the carbon footprint of remote cabins at Hopper Mountain National Wildlife Refuge, CA. (USFWS)

Around the Refuge System

Hawaii

The United Nations World Heritage Committee has added Papahānaumokuākea Marine National Monument to the prestigious UNESCO World Heritage List. It is the first American site added in 15 years. Spanning nearly 140,000 square miles and protecting more than 7,000 marine and terrestrial species in the Northwestern Hawaiian Islands, Papahānaumokuākea is the nation's first site designated for its outstanding value as both a natural and cultural heritage site. The islands and atolls of the monument are nesting and foraging grounds for 14 million seabirds, making it the world's largest tropical seabird rookery. Two islands in Papahānaumokuākea feature the highest concentrations of ritual sites in Hawaii and bear testimony to the shared historical origins of Polynesian societies. "The monument will now be part of an exclusive list that includes sites such as the Egyptian pyramids, the Taj Mahal and the Great Barrier Reef," said Secretary of the Interior Ken Salazar.

Wisconsin

A \$1 million gift received by Ducks Unlimited will be dedicated to conservation of the marsh that is the centerpiece of Horicon National Wildlife Refuge. The donation from the Ted and Grace Bachhuber Foundation is a gift of \$500,000 up front and another \$100,000 per year for five years. The yearly donations must be matched by \$100,000 from Ducks Unlimited. Horicon Marsh is a Ramsar Wetland of International Importance and, at 32,000 acres, the largest freshwater cattail marsh in the nation. Horicon Refuge manages the northern two-thirds of the marsh; the southern one-third is managed by the Wisconsin Department of Natural Resources.

Oregon

The biggest tidal marsh restoration ever attempted in the state has been delayed by a year – until next summer. The \$9.5 million project on the Ni-les'tun Unit at



Papahānaumokuākea Marine National Monument, home to many archaeological and religious sites important to native Hawaiians, is now on the prestigious UNESCO World Heritage List. (Andy Collins/NOAA)

Bandon Marsh National Wildlife Refuge, which was scheduled to be completed this September, involves dismantling 100-year-old dikes so that the Coquille River can flow across more than 400 acres of historic marshland, restoring rich habitat for native fish, birds and plants. The project is delayed because of complications with rerouting of the Coos-Curry Electrical Cooperative transmission line under the river. "This large restoration project involves three simultaneous major construction projects and thus relies on precision and timely work that is choreographed among three different contractors," said Roy W. Lowe, project leader for the Oregon Coast National Wildlife Refuge Complex. The delay in undergrounding the transmission line has postponed removal of the outer dikes, which must

be completed by mid-September during the last low-high tides of the year.

Arkansas

Staff at Big Lake National Wildlife Refuge along the Mississippi Flyway in the northeast part of the state enhanced 5,800 acres of habitat in an effort to entice migratory birds and deter them from flying to the Gulf Coast, where they could be harmed by oil contamination. Besides drawing down the water, the refuge provided extra food for the birds, seeding 3,300 acres of mud flats with fast-growing Japanese millet. "It's almost like we took an

open-water lake and made fertile soil out of it," said refuge manager Jeremy Bennett. "This project is creating a lot of food, and we've definitely created quality habitat that was not available for them last year ... If we set the table and weather cooperates, the birds will rest and feed in Arkansas longer, thereby decreasing the chance of reaching the oil-impacted Gulf Coast region." Bennett said the project, which is aimed primarily at migratory shorebirds and ducks, will be evaluated weekly during the migration and that only time and duck numbers will determine its ultimate impact. The refuge plans to slowly restore water levels to normal beginning in October.

New Mexico

A Burlington Northern-Santa Fe Railroad train derailed on the southern edge of Bosque del Apache National Wildlife Refuge in late July, spilling approximately 30,000 gallons of vacuum gas oil onto the refuge. Nineteen railcars were involved when a trestle collapsed. Refuge and railroad staff responded immediately with heavy equipment and prevented the oil from reaching sensitive wetlands. Later, workers using vacuum trucks and earth movers successfully removed nearly 15,000 cubic yards of contaminated soil. The threat to the refuge appeared to be minimal, wildlife biologist John Vradenburg said. No injuries were reported.

Washington, DC

Delivering Quality Visitor Experiences, a series of case studies on quality visitor programs, has been mailed to staffed refuges. The 76-page report was also delivered to members of the Cooperative Alliance for Refuge Enhancement (CARE), the Congressional Wildlife Refuge Caucus and key Congressional committees. The report includes practical information about 15 visitor programs across the Refuge System – from a green visitor center in Rhode Island to science camps in Alaska and projects that capture the public interest in birding, sea turtles and nature photography. The special report is designed to give refuges ideas that they can adapt or adopt. If you would like additional copies, contact Martha Nudel in the Refuge System Branch of Communications (Martha_Nudel@fws.gov, 703-358-1858).

New Jersey

The Environmental Protection Agency has declared clean-up work at a Superfund site that includes a small parcel of Great Swamp National Wildlife Refuge successfully completed. It has removed the site from its list of national hazardous waste priorities. The refuge, just 25 miles west of Times Square, provides approximately 7,800 acres of significant wetland and upland habitats for more than 244 bird species and



The Columbia River flows past the White Bluffs at Hanford Reach National Monument, WA, which celebrated its 10th anniversary this summer. (USFWS)

29 state and federal threatened and endangered species.

Washington

The National Wildlife Refuge System's first national monument turned 10 this summer. Hanford Reach National Monument, a 196,000-acre landscape that surrounds much of the shuttered Hanford Nuclear Reservation along the Columbia River, was created by presidential proclamation in 2000. The monument is home to large expanses of endangered shrub-steppe grassland habitat as well as 40 mammal species, 246 bird and 1,500 invertebrate species, and 43 fish species, including threatened and endangered salmon and trout. "We try to manage it in a way that is ecologically and culturally sensitive" to preserve both the environment and Native American heritage, says Larry Klimek, Hanford Reach manager and deputy project leader at the Mid-Columbia River National Wildlife Refuge Complex. About 68,000 of the monument's acres now are open to the public. "Our philosophy is to have as small a footprint on the landscape as possible," says Klimek. "A lot of the unique quality out there is the

landscape. It is unique habitat, and that's why we'd like to preserve some of it as it is, while opening additional areas to the public."

Georgia

A video showing dozens of alligators in an apparent feeding frenzy near a boat ramp at Stephen C. Foster State Park, which is within Okefenokee National Wildlife Refuge, brought worldwide attention to the refuge this summer. Some 350,000 viewers have seen the video taken by a local man. "We have seen gatherings of alligators periodically," said Sara Aicher, a wildlife biologist at the refuge. "These usually occur with low water levels. The feeding 'frenzy' occurred in the boat basin, and what was actually seen on the video was the alligators moving into Billy Lake through a narrow channel. Most of the activity was due to the motorboat pushing them along." To see the video, go to <http://www.youtube.com/watch?v=2CQ1N1mAi9s&feature=related>. 🐊

Crystal River Refuge Acquires Prime Manatee Habitat — continued from page 1

The water management district is scheduled to construct flow-through wetlands to capture and treat urban runoff now entering canals adjacent to the property. Once these wetlands are constructed, the refuge will assume management responsibility for them as well.

Funding for the \$10.5 million project came from a variety of sources: \$3.3 million in federal funding through the Land and Water Conservation Fund and the North America Wetlands Conservation Act; nearly \$5 million from the state of Florida; \$300,000 from the city of Crystal River; Citrus County and the Citrus County Tourist Development Council; and nearly \$2 million through fundraising efforts by The Conservation Fund, National Wildlife Refuge Association, Friends of Chassahowitzka

National Wildlife Refuge Complex, Save the Manatee Club and others.

“Three Sisters Springs is one of Florida’s last remaining urban springs, an ecological marvel that supports a winter population of manatees in excess of 150, who rest, breed and give birth in the springs,” the Refuge Association said in announcing the deal.

Crystal River Refuge was established in 1983 specifically for the protection of the endangered West Indian manatee. There were an estimated 5,067 manatees in Florida in January.



Three Sisters Springs will become part of Crystal River National Wildlife Refuge. (K.C. Nayfield)

“Three Sisters Springs was the National Wildlife Refuge System’s top land conservation priority in the Southeast, and its critical importance to manatees was highlighted during last winter’s cold spell,” said Cindy Dohner, the Service’s Southeast regional director. 🦋

Looking, Planning a Decade Ahead — continued from page 1

will be melded with new ideas for a nation that is more urban and ethnically diverse than ever.

Madison was selected not only for its conservation history, but also for its “green” status. Monona Terrace Community and Convention Center – on the shores of Lake Monona – is the nation’s first convention center to receive silver level certification under the U.S. Green Building Council’s LEED (Leadership in Energy and Environmental Design) program. Architect Frank Lloyd Wright originally proposed the design for the center in 1938, but it was built just 10 years ago.

Core Teams at Work

The journey toward a new vision has already begun. About 70 Service employees – who nominated themselves – are meeting weekly in five Core Teams devoted to individual topics: conservation planning and design; conservation delivery; conservation science; relevance to a changing America; and leadership and organizational excellence. Each team will produce a paper that will form the centerpiece of the vision that is scheduled to be ratified at the July conference.

Each team is expected to create an outline by about October 1. Those outlines will be made available to Refuge System employees, partners, refuge Friends and others for their reaction and recommendations. The National Wildlife Refuge Association is working closely with the Refuge System to use cutting-edge technology to enable a broad spectrum of people to see the outlines and Core Team papers, and have their viewpoints considered well before the July conference.

Meanwhile, a Steering Committee – 17 people, including two regional refuge chiefs, two assistant directors of the Service and National Wildlife Refuge Association President Evan Hirsche – has begun meeting monthly. The Steering Committee, led by Siekaniec, will set the tone for the Vision Process and the Vision Conference. Among other tasks, the Steering Committee will help ensure collaboration among the five Core Teams that are writing the documents to guide the direction of the Refuge System for the next decade or so.

Already, Service employees can see a great deal of information online at: <https://inside.fws.gov/go/post/vision>. A more

widely available public site is scheduled to become operational in early fall.

The conference will feature not only an array of speakers and an exhibit hall, but also special programming for young people as a means of encouraging a new generation to connect with natural lands and consider natural resources as a career path. Specific programming is still being planned.

“Some have compared this conference to the 1998 conference we held in Keystone, Colorado,” said Siekaniec. “And there are some valid comparisons.” The Keystone conference was the first time in the Refuge System’s history that all managers of national wildlife refuges gathered in one location. From that meeting came a document, *Fulfilling the Promise*, which provided strategic guidance for more than a decade.

“But there also will be some significant differences in Madison,” Siekaniec said. “We will be taking this conference far beyond a single town in Wisconsin by using the best technology available to bring the excitement and innovation right to people’s desks or homes, no matter where they sit.” 🦋

White Pelicans Thriving on Upper Mississippi

By Ed Britton

Those great white fish trawlers known as American white pelicans have found paradise on the Upper Mississippi River National Wildlife and Fish Refuge. They are back in record numbers, gobbling up local sushi. Their summer population has reached an astounding 3,000 pelicans, up from a few hundred just a few years ago.

Pelicans are relative newcomers to the region, having arrived in the early 1990s. Small groups began lazily summering along the Mississippi River sandbars. Their summer population gradually increased, but no evidence of nesting was observed. Biologists began to investigate their population dynamics and found the pelicans all appeared to be non-breeding birds.

A significant milestone occurred in 2007 when the first nesting colony since 1909 was documented in Iowa on two Mississippi River islands north of Clinton; 50 young were produced. Despite floodwaters in spring 2008, the pelicans returned to the low-lying islands to nest, and the number of young increased to 200. In 2009, the colony

produced 400 young and expanded eastward to establish the first record of pelicans nesting in Illinois. This year, the colony doubled, with 825 young pelicans produced on three islands that are less than four acres.

A pelican nest consists of a slight depression in the sand rimmed with sticks or other debris. White pelicans lay two or four white eggs that incubate for about a month, and the naked hatchlings are pink. The young pelicans grow fast. When approached by humans, they make a low grunting or croaking sound. If you get too close, they regurgitate forcefully a half-digested fish soup that spurts toward you and is usually enough to make most intruders leave them alone.

A rare social network and interesting lesson in nature is taking place among six colonial nesting bird species. The pelicans have taken up residence with a nesting colony of great egrets, cattle egrets, great blue herons, ring-billed gulls and double-crested cormorants. These six species are social nesters and occupy different habitats on the island. The pelicans and gulls are ground nesters, the egrets and herons nest

midway in trees, and the cormorants nest at the top of trees.

White pelicans are large birds, weighing up to 15 pounds. They have a nine-foot wing span and stand five feet tall. They can live for more than 10 years. They have black wing tips and a large yellow-orange pouch. A knob protrudes on the upper bill in adults early in the nesting season.

They primarily eat fish, but they also enjoy a tasty frog, salamander or aquatic insects. They do not plunge-dive from the sky as their cousin brown pelicans do. Instead, they feed independently or swim in a group to herd fish and then scoop them up in their oversized pouches. A pelican can eat several pounds of fish per day.

Complaints from local fishermen have increased about going home empty-handed, and some blame pelicans for the lack of fish in the river. However, studies have shown that, in a big river system, pelicans have no significant impact upon fish populations.

Range expansion by birds is not uncommon. The primary factor in such expansion is the availability of preferred habitat. The sandbars provide ideal loafing and nesting habitat, and the Mississippi River provides great feeding opportunities. Substantial human activity on the river has potential for disturbance, but the pelicans have adapted and tolerate our presence. Entanglement in fishing lines and flooding of nests are a constant danger, but white pelicans stay close to the river year-round. In winter, they migrate south to the Lower Mississippi and the Gulf Coast. 🦶

Ed Britton is manager of the Upper Mississippi River National Wildlife and Fish Refuge's Savanna, IL, district.



White pelicans share this island with five other colonial nesting bird species at Upper Mississippi River National Wildlife and Fish Refuge. (Stan Bousson)



RefugeUpdate

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

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

A Look Back ... William L. Finley

Dramatic photography, captivating lectures, memorable movie scripts and magazine articles – William L. Finley used them all to convince the American public that it was time to give birds a home of their own. Finley, who was born to a pioneer family in California in 1876, and his boyhood friend Herman Bohlman hauled cumbersome camera equipment up cliffs and into marshes and trees along the Oregon coast. They used block and tackle to raise their equipment onto ledges. They followed the development of hawks, eagles, herons, murrens and cormorants from egg to fledgling.

In a history of the Audubon Society of Portland, Tom McAllister wrote that Bohlman and Finley spent four months photographing a California condor nest. “Bohlman was the reserved and skilled photographer ... Finley was the clean-shaven extrovert who spread a message across the land of the need to save habitat as well as pass protective bird legislation. Their derring-do and the results captivated audiences and readers nationwide. Finley packed the lecture halls.”



Finley/Bohlman hand-painted photographic slides of Three Arch Rocks in Oregon inspired President Theodore Roosevelt to establish the first bird refuge west of the Mississippi.

Their photos are striking. Hand-painted glass plates were the most effective way to produce full-color photos in the early 20th century. Many Finley/Bohlman photographs were considered the best of their time and are still in use today. In 1907, after President Theodore Roosevelt saw the team’s photos of Three Arch Rocks, he established the first bird refuge west of the Mississippi.

With his wife, Nellie Irene Barnhart, Finley wrote three wildlife books,

created popular wildlife movies and wrote articles for *Nature* magazine. He was a leader of the Oregon Audubon Society and was named Oregon state game warden in 1911. The Oregon Historical Society reports that, in 1913, Finley ordered a deputy to confiscate a headdress of 46 egret plumes from singer Lillian Herlein at Portland’s Orpheum Theatre.

Long before easy transportation or instant communication, Finley regularly made the case for protecting habitat on the West Coast with the leaders on the East Coast. Finley worked closely with J.N. “Ding” Darling, chief of the Bureau of Biological Survey, and then with Ira Gabrielson, the first director of the U.S. Fish and Wildlife Service, to add the 65,000-acre Blitzen Valley to Oregon’s Malheur National Wildlife Refuge.

Finley died in 1953. A decade later, wintering and resting habitat for the dusky Canada goose in Oregon’s Willamette Valley was set aside as a national refuge and named for him. 

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

Send Us Your Comments

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