U.S. Fish & Wildlife Service
National Wildlife Refuge System

Refuge Update

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Inside

Art on the Refuge
Artist and Refuge System employee Bonnie Swarbrick depicted this masked bobwhite as seen in the grassland habitat of the Buenos Aires National Wildlife Refuge in Arizona, where she is the outdoor recreation planner. Learn more about Swarbrick and the painting on page 23.

Delivering the Mission with Buildings and Boardwalks

Standardized facility designs for Refuge System visitor centers and administrative offices are one way to streamline the planning and design process, cutting the ultimate cost of facilities that welcome and orient visitors to national wildlife refuges. This new facility at Silvio O. Conte National Wildlife Refuge in Massachusetts is based on a design that will be adopted throughout the Refuge System. (USFWS)

"We had a problem with the cost of refuge visitor centers getting out of control," says Loretta Beaumont, staff assistant for the House Appropriations subcommittee that works on refuge issues. "We could do two visitors centers for the price of one with better standardized designs."

And so the new system of standard facility designs for national wildlife refuges was born.

The Northeast Region experienced the first opportunity to try out the idea of standardized design when funds were simultaneously approved for two facilities at Ohio River Islands National Wildlife Refuge in West Virginia and Silvio O. Conte National Wildlife Refuge in Massachusetts. Previously, said Northeast Region Chief Tony Léger, "it seemed like we were arguing with design contractors over and over again about all the same things. Every designer wanted to design a building that would win an award. This caused our costs to go up."

Northeast Deputy Regional Chief Susan McMahon added that operational costs are also reduced because energy efficient features are incorporated into the standard designs and maintenance costs are more predictable from one station to the next.

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Dale Hall

From the Director
Building Partnerships is Key

Conservation is not a spectator sport. It takes the combined commitment of Federal and state agencies, conservation organizations, local communities, industry groups and many other stakeholders to ensure that our natural resources will be preserved and protected today and for years to come.

This issue of *Refuge Update* focuses on the importance of partnerships in implementing the Endangered Species Act and the special role that national wildlife refuges play in our endangered species work.

Nearly 60 national wildlife refuges have been established specifically for endangered species. Whether you think of the bald eagle, the whooping crane or the California condor—to name just three widely-known threatened or endangered species—the unique work of national wildlife refuges is core to species' health.

To improve the effectiveness of the Endangered Species Act, we are working on innovative ways to work with the private sector. Landowners are more than just our partners in conservation; they are the leaders of the movement. We are committed to providing them with the tools necessary to help support their leadership.

But there is no one-size-fits-all solution to species conservation. So, we support a range of approaches. More than 325 landowners have enrolled more than 3.5 million acres in Safe Harbor Agreements that provide regulatory assurances for landowners who voluntarily aid in the recovery of listed species.

Another approach—conservation banks—offer a "free-market" type approach to species and habitat conservation. These banks are lands permanently managed and protected as mitigation for the loss of habitat of listed species elsewhere. A third approach—private stewardship grants—provides funding and technical assistance to landowners committed to conservation of at-risk species on their land.

As innovative as we become, the role of national wildlife refuges in species protection can never be replaced or displaced. Little wonder, then, that national and even international scientists look to our national wildlife refuges as models for work with imperiled species. There are no finer examples of this extraordinary work.

Geoff Haskett

Chief's Corner
Retirees' Voices for Conservation

Picture this: More than 200 Fish and Wildlife Service retirees – including former Director Lynn Greenwalt and his wife Judy – exchanging views about conservation developments and news from their communities, along with a fishing story here and there. The recent Service Retirees Reunion entailed more than people just renewing acquaintances. It was all about people still involved with conservation and still excited about the prospect of making a difference.

Some retirees had left the Service decades ago. Others were attending their first reunion. Together, they symbolized leadership that had carved out a path for those of us working on conservation today. Those at the reunion are still thoroughly involved with conservation. They avidly look for newspaper stories not only about the Service, but also about how decision makers are dealing with natural resource issues. They write to Congressional members and local legislators when they think lawmakers are on the verge of a bad decision.

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RefugeUpdate

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Least Bell's Vireos Are Back!

By Kim Forrest

After disappearing half a century ago from California's Central Valley, a pair of least Bell's vireos nested in San Joaquin River National Wildlife Refuge in 2005. To everyone's delight, last year's banded male returned, paired with a female, and nested again this year. The young hatched in August and were banded when they were only a week old. (USFWS)

San Joaquin River National Wildlife Refuge in California enjoyed a surprise visit from a totally unexpected – and endangered – resident last year: a nesting pair of least Bell's vireos. Following extensive riparian restoration, we had expected colonization by endangered riparian brush rabbits, endangered San Joaquin Valley woodrats, threatened valley elderberry longhorn beetles, state-listed endangered western yellow-billed cuckoos, and "fly-overs" by the recently de-listed Aleutian Canada cackling geese headed to other parts of the refuge.

However, least Bell's vireos have been extirpated from the Central Valley and have not been known to nest here for over half a century. Viable populations are largely restricted to eight southern California counties, mostly in the San Diego area – some 400 miles away.

The pair nested in a three-year-old riparian restoration site, in the dense herbaceous understory about three feet off the ground. They fledged two young, and then proceeded to re-nest and raise another four young. Vireo expert Barbara Kus of U.S. Geological Survey in San Diego mist-netted and banded the male after the young fledged.

Our hopes were high that we would enjoy a repeat visit by our pioneering pair of least Bell's vireo in 2006. However, the refuge suffered a major setback that impacted the vireos – heavy winter and spring rains caused flooding throughout the first six months of 2006, and extended past the 2005 vireo initial nesting time. In some locales, riparian restoration sites were under eight feet of water.

However, lo and behold, Refuge Biologist Ken Griggs discovered that last year's banded male returned, paired with a female, and nested again this year! It is not known whether his mate was the same female from last year. This was extremely late breeding due to the flooding of the San Joaquin River, which kept the refuge inundated through June.

This year's nesting was almost the latest in the state, and was two weeks later than the second nesting effort in 2005. The pair nested in three-year-old riparian understory (in an area planted a year after last year's nest site). The young hatched in early August. Kus again visited the refuge and banded the week-old young, who were monitored closely and successfully fledged.

We credit the return to the success of our riparian restoration. Over the past three years, we planted more than 200,000 native woody plants and employed intensive cultivation practices, resulting in a survival rate of 82 percent for woody plant species and 50-75 percent coverage. We also pursued a highly successful invasive weed suppression approach by promoting dense herbaceous understory, resulting in virtually complete coverage, and 3,000 linear feet of levee side planted to provide refugia in times of flooding for the endangered riparian brush rabbit.

The endangered species success story has "hit the news," including a two-minute news segment on KCRA-TV in Stockton. The California-Nevada Operations Public Affairs Office used our least Bell's vireos as a major poster and talk item at this year's California State Fair. ◆

Kim Forrest is manager of the San Luis National Wildlife Refuge Complex.

The Great Delta Bear Affair

…and other ways to promote eco-tourism

"Visit the South Delta" beckons the Web site of Mississippi's Lower Delta Partnership, which includes the seven national wildlife refuges of the Theodore Roosevelt National Wildlife Refuge Complex. Initiated informally about four years ago, the partnership became official last year when a director was hired. The Theodore Roosevelt Complex has been a key player from the beginning.

More than two dozen private organizations as well as local, state and federal agencies are working together through the partnership to promote and enhance the economic and environmental health of Mississippi's Lower Delta. This includes providing incentives for conservation on private lands, promoting education about cultural and natural resources and improving or developing compatible recreational opportunities.

The partnership has benefited the refuge complex in numerous ways. The partnership provides considerable support for festivals like the Great Delta Bear Affair, first celebrated in 2002 on the 100th anniversary of Theodore Roosevelt's famous bear hunt in Sharkey County, Mississippi. During the Refuge System's Centennial celebration in 2003, the theme of the festival was refuges. "Our participation has provided the opportunity to educate up to 800 fourth grade students on education day," says Yazoo Refuge Project Leader Tim Wilkins, "and some 7,000 to 2,000 visitors each year."

Butterflies and Visitors to Yazoo Refuge

The partnership was also instrumental in securing a grant through the National Fish and Wildlife Foundation Nature of Learning program to establish a butterfly garden at Yazoo National Wildlife Refuge. Last April, 90 Brownies and Girl Scouts came to the refuge to build a butterfly habitat. The grant has been renewed for a second year. Meg Cooper, coordinator for the Lower Delta Partnership, says the garden was an "opportunity to bring girls to the refuge and have them feel ownership in a part of it." Wilkins led environmental discussions about alligators, snapping turtles and wood duck nesting.

The Lower Delta Partnership is working with the Greenville Chamber of Commerce, Wildlife Mississippi, The Theodore Roosevelt Society (the refuge complex's Friends organization), the Mississippi State Tourism Department and others to find funding for a variety of projects, including a possible Native American Mound Driving Tour that would pass through Yazoo Refuge.

Wilkins believes the various partnership projects have helped increase visitation at the refuge complex – both local and from outside the area. This in turn has increased the purchase of annual public use permits that provide funding for public use activities.

Partnership staff writes magazine and newspaper articles that highlight opportunities to view wildlife on refuge lands. The partnership also worked with the refuge Friends group to obtain its non-profit status. Primarily, adds Wilkins, "the partnership supports our goals and our missions."

Wilkins knows that many refuges don't have staff that can commit time to initiate and nurture a partnership to promote eco-tourism. He recommends identifying a local group that is already supporting eco-tourism, including local governments looking for opportunities to attract visitors.

Then, says Wilkins, "Sell them on the benefits of wildlife/wildlands viewing and the array of possibilities on refuges." ◆

Mississippi's Lower Delta Partnership was also instrumental in securing a grant to establish a butterfly garden at Yazoo National Wildlife Refuge. Last April, 90 area Brownies and Girl Scouts came to the refuge to build a butterfly habitat. The seven refuges of the Theodore Roosevelt National Wildlife Refuge Complex are active members of the Lower Delta Partnership that promotes the environmental and economic health of the Lower Delta. (Lower Delta Partnership)

First Critical Step to Help Manage Ocean Wildlife

The Department of the Interior and the National Oceanic and Atmospheric Administration signed a General Agreement to develop a seamless network of marine protected areas that will better conserve ocean and coastal refuges, reserves, parks and sanctuaries. An earlier agreement between the National Park System and the National Marine Sanctuary Program expired in 2006.

The new agreement is a first critical step since at least 20 federal agencies implement more than 140 ocean-related laws in the United States. Among those agencies is the National Wildlife Refuge System, responsible for 169 refuges with marine or Great Lake islands or coastlines.

"Seamless" is the key word. Participants at a 2005 workshop agreed that the greatest challenge to local and national collaboration is the absence of a seamless network to facilitate such simple tasks as sharing resources, office space, transferring project funds and filling joint positions. The General Agreement "is a vehicle to begin eliminating bureaucratic red tape so we can more efficiently share each other's staff, boats, facilities, vehicles, and other resources," said Andrew Gude, Refuge System marine program specialist.

The interagency agreement is an outgrowth of the recommendations of the Commission on Ocean Policy, established by Congress in 2000. Four years later, President Bush submitted his U.S. Ocean Action Plan, charging the National Park System, the National Marine Sanctuary Program, the National Estuarine Research Reserve System and the National Wildlife Refuge System to better manage special marine and coastal areas in the United States.

Currently, there are separate agencies dealing with fisheries, marine mammals, shipping, oil and gas and mining, but as a recent article in *Science* pointed out, "Decision-making is often ad hoc, and no one has clear authority to resolve conflicts across sectors or to deal with cumulative effects." Other countries – including Belgium, China, Germany, the Netherlands and the United Kingdom – are already implementing what is being called marine spatial planning or ecosystem management.

The Department of the Interior and the National Oceanic and Atmospheric Administration recently signed an agreement to develop a seamless network that will protect and conserve the nation's oceans and coastal refuges, reserves, park and sanctuaries. (John and Karen Hollingsworth/USFWS)

Cooperating from Maine to California

These are some examples of successful networking and ecosystem management. Rachel Carson National Wildlife Refuge and Wells National Estuarine Research Reserve collaborate to conserve coastal habitat along 50 miles of coastline from Kittery to Cape Elizabeth in southern Maine.

In 1982, establishment of the Tijuana River National Estuarine Research Reserve in California brought together a mosaic of federal, state, local and privately held lands under a single management framework, including Tijuana Slough National Wildlife Refuge. There are seven refuge employees, 11 state park employees and seven employees of the Southwest Wetlands Interpretive Association working in Border Field State Park facilities, located on land leased from the U.S. Fish and Wildlife Service. The agreement gives participants the freedom to work on each other's projects and use each other's equipment.

Identifying threats and solutions

In the first year of the General Agreement, several regions will take part in workshops to set regional priorities. The workshops will not only provide a venue for partner agency staff to nurture new or existing relationships. They will also help establish a common agenda for priority collaborations in a particular region.

Those refuges interested in such collaboration should contact Andrew Gude at 703-358-2415 or by e-mail, Andrew_Gude@fws.gov. The workshops will be led by local area managers, with an agenda driven by local needs, priorities, goals and partners. More detailed information is available at http://ocean.ceq.gov. ◆

Volunteers Donate More Than $25 Million In Work for U.S. Fish and Wildlife Service

Nearly 34,000 volunteers donated almost 1.3 million hours to the National Wildlife Refuge System during fiscal year 2006, giving more than $23 million worth of work on behalf of wildlife conservation across the country, according to the recently issued "Friends and Volunteers Annual Report."

Subtitled "How People Are Making a Difference," the report notes that volunteers have included Boy Scouts and Girl Scouts as well as volunteers with the Student Conservation Association and those who participate in Take Pride in America programs and National Public Lands Day. They also include the 200-plus nonprofit Refuge System Friends organizations. Nine new Friends groups were established last year.

"Americans value their public lands, and they are happy to donate their sweat equity to make sure these lands are handed down to another generation," said Service Director H. Dale Hall. "Our volunteers want to give back to their communities not only because they want to set an example for our children, but also because they want to spread the word about America's great natural treasures."

The largest number of volunteer hours – more than 437,000 – was donated to wildlife and habitat work. A prime example is the annual Rio Reforestation Day, when hundreds of volunteers join Fish and Wildlife Service staff to plant seedlings that will provide food, habitat and cover for birds, butterflies and other wildlife at the Lower Rio Grande Valley National Wildlife Refuge in Texas. Since 1994, volunteers have planted nearly 132,000 native seedlings across 552 acres on the national wildlife refuge.

Coming second in volunteer interest are programs that deliver quality wildlife-dependent recreation, which garnered 351,000 donated hours. In August 2005, the Friends of Supawna Meadows National Wildlife Refuge in New Jersey spent more than 300 hours building a 15-foot by 15-foot observation platform that is wheelchair accessible.

A Student Conservation Association high school crew on Kenai National Wildlife Refuge in Alaska completed a new hiking trail and boardwalk to the Swanson River.

For more information about volunteering with the U.S. Fish and Wildlife Service, go to http://www.fws.gov/volunteers/. For more information about the Department of the Interior's Take Pride in America program, go to http://www.takepride.gov/. ◆

Volunteers from Girls and Boys Town in Nebraska pick seed at DeSoto National Wildlife Refuge. Thirty-three young people cleared two acres of invasives and harvested 440 pounds of seed on National Public Lands Day. (Dave Murcia/USFWS)

Volunteers: An Extra Pair of Hands

By Anthony F. and Marguerite Breda

We have spent the last five years performing volunteer duties at national wildlife refuges and state parks, using our RV as housing. During the past 2 1/2 years, we have concentrated on wildlife refuges.

The refuge manager who does not yet have a volunteer program may well ask, "Is all this work and expense worth it?" From the refuge managers who do have a program, the resounding answer is "absolutely yes!"

For refuge managers who are considering long-term volunteers who use their RVs as their temporary homes on refuges, I have a few tips:

Question: How does a refuge go about finding volunteers?

Answer: Some Refuges advertise in publications like *Workamper News* or *Caretaker Gazette*. *Highways* magazine, the official publication of The Good Sam Club, offers a service that matches volunteers with refuges or state parks. Volunteers can go to http://volunteer.gov/gov/, a Web site that all federal government agencies use. Better still is word of mouth, from one satisfied volunteer to a potential newcomer.

Having a prepared volunteer handbook is very helpful, including information about the refuge, volunteer duties, amenities provided, and a blank application form. A big plus is to have a cheerful, knowledgeable person make first contact with the prospective volunteer. In addition, an up-to-date Web page with the correct telephone number is very helpful.

Still Cleaning Up Along Gulf Coast

More than a year after Hurricanes Katrina and Rita ravaged the Gulf Coast, the damage is still being tabulated and repaired. A total of 81 Service-owned facilities was affected by hurricanes during the 2005 season, including 66 national wildlife refuges and three national fish hatcheries. The Service received an initial $30 million in emergency funds followed by $134 million approved this fall for hurricane recovery.

Rita left 1,700 acres of debris on Sabine National Wildlife Refuge in Louisiana, including 1,400 identified potentially hazardous items and up to 350,000 gallons of hazardous liquids and gases. Five of the eight buildings at Sabine Refuge were immediately condemned and required demolition.

Airboats and marsh buggies are being used to remove debris as gently as possible. In one case, a leaking 55-gallon drum of hydraulic oil was placed into a larger drum, sealed and brought out of the marsh on an airboat.

Don Voros, project leader for the Southwest Louisiana National Wildlife Refuge Complex, is hopeful that the hazardous materials cleanup can be completed at Sabine Refuge in early 2007. The refuge may re-open in late spring.

It may take years for some of the damage to show up. Sabine Refuge Biologist Roy Walter says oil drums that have disappeared into the marsh may not leak for several years.

"Part of our management program for some time to come will be to watch for these things," says Walter. So far, Walter says no animal deaths can be attributed to chemical spills.

"The natural marsh is responding," says Diane Borden-Billiot, refuge outreach coordinator for the Southwest Louisiana National Wildlife Refuge Complex. "As long as we take care of the man-made stuff, the marshes continue their natural healing process. It's a lot more positive than it was six to nine months ago."

"The best we can do is work on the habitat," says Voros. Rainwater is needed to flush out the salt water from the marshes. There is aggressive prescribed burning and mowing to remove dead plants. Big debris fields will also be burned at Lacassine, Cameron Prairie and Sabine Refuges.

Hurricane Rita dumped 7 million cubic meters of debris on Sabine National Wildlife Refuge in Louisiana, including this 21,000-gallon steel storage tank used to transport oil field drilling mud to and from drilling operations. (Ben Summerlin)

Three Islands Disappeared

More than 100 square miles of coastal wetlands have been transformed from marsh to open water by the storms. Breton National Wildlife Refuge lost 80 percent of its land, dropping from eight islands to five. Even the elevation and size of the remaining five islands have been reduced, says Refuge Biologist

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Question: What do volunteers who use their RVs as housing expect in return for their services?

Answer: A level site for their RV, along with water, electric (30amps, minimum; 50amps, really appreciated) and a sewer or septic connection are the basic requirements. Depending on the area where you volunteer, the daily reimbursement may be between $10 to $18 per eight hours worked to cover the cost of traveling to the refuge, along with the higher living costs associated with living in a remote area. Remember, your volunteer is responsible for supplying work clothes. Other amenities could include use of the office facilities, such as fax machine, telephone (long distance calls excluded) and photocopier. Laundry facilities somewhere on site would be terrific.

Question: How does a refuge manager insure that a volunteer returns next year, or that a new volunteer desires to serve?

Answer: The manager can insure that a good work atmosphere exists, the type of work is interesting and suited to the volunteer's capabilities and that work hours are flexible. Training is also appreciated. For example, training on heavy equipment may be interesting to many volunteers. It's a great investment for a refuge manager who then has a trained volunteer for important and often expensive work, year after year. The refuge manager can make a volunteer's life interesting. ◆

A Plan for Upper Miss Refuge

Reflections on planning and public involvement on Old Man River

By Don Hultman

It was the first public meeting after release of the Draft Environmental Impact Statement and Comprehensive Conservation Plan in Savanna, Illinois in 2002. I walked up to a large, burly man studying a wall map for a stretch of the 240,000-acre and 261-mile-long Upper Mississippi River National Wildlife and Fish Refuge. He glanced sideways at my uniform and asked, "Who came up with this crap?"

Through 46 public meetings and workshops attended by 4,500 people during preparation and review of our CCP, I would answer that question, in various forms, for many people. These were people distrustful of government, jealous of "their river" and how they use it, and fearful of what we all fear to some degree – change.

The Final Environmental Impact Statement totaled 800 pages, due to the large number of issues addressed, more than 3,000 written comments, and the complexities of a refuge established in 1924 that runs through four states, two U.S. Corps of Engineers' districts, and used by 3.7 million people a year.

A Record of Decision signed in late August meant we had a CCP and could move on to habitat management, land acquisition, biological programs, and management of wildlife-dependent recreation. Just hours later, the Associated Press released a story with reaction ranging from praise for the open and inclusive process to proposals for a law that federal officers be arrested if they tried to enforce the plan's provisions.

Some of the most controversial parts of the plan deal with hunting and means of access. The CCP calls for changes to a 45-year-old system of areas closed to waterfowl hunting and new power watercraft restrictions in sensitive backwater areas. Having a plan does not mean the job is done or the challenges over.

Despite the often sensational rhetoric, many people support the plan and the changes it outlines. And most importantly, the plan does the right thing, both for the resource and for the people who use and enjoy the refuge in diverse ways. In implementing the plan, we will rely on the same principles and lessons learned during four years of creating the plan:

A Foundation in Law. We have an excellent National Wildlife Refuge System Improvement Act that keeps us grounded and gives us the backbone to do the right thing. But don't flaunt it, and don't assume anyone knows what it says or what it means. To a crowd of 450 people anxious about changes to their use of a refuge, relying only on the concept that wildlife conservation is the Refuge System's top priority is not only insensitive, but will undermine the understanding you are trying to achieve.

Use the Best Science Available. When dealing with changes that affect people, you better have your ducks in a row. Our changes to the waterfowl hunting areas, unchanged since 1958, were based on extensive surveys and monitoring. People may still disagree regardless of science, but decision-makers above you will absolutely demand good science and logic for controversial changes.

Communicate, Communicate. It is almost impossible to communicate too much. We took great care to keep the staffs of the six Representatives and eight Senators who represent the refuge engaged early and often. This was also true of the four states and the U.S. Corps of Engineers. Our motto was "they know it first" as we reached various milestones in planning and public involvement.

Human Intelligence. The people who use refuges day in and day out, whether commercial anglers or birdwatchers, often know a resource and a refuge in an intimate way. They have knowledge

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Refuge Manager Don Hultman talks with a citizen about the proposed Upper Mississippi National Wildlife Refuge CCP. There were 46 public meetings and workshops attended by 4,500 participants. The CCP was approved in August. (USFWS)

It All Started with the Walsh Ditch Fire

The 1976 Walsh Ditch fire on Seney National Wildlife Refuge in Michigan burned more than 72,000 acres and cost more than $8 million. During a 30th reunion this fall, new and veteran firefighters reviewed the lessons of the fire, which led to development of the Service Fire Management Program. (Michigan Department of Natural Resources).

On August 1, 1976, lightning ignited the Walsh Ditch Fire on Seney National Wildlife Refuge in Michigan. By the end of September – a full two months later – the fire had burned more than 72,000 acres, requiring 88 miles of control lines and more than 1,000 firefighters from all over the United States. The Michigan National Guard gave logistical support.

The fire cost $8 million and led to the formal establishment of professional fire support within the Fish and Wildlife Service. Thirty years later – in September 2006 – history was recounted.

About 30 people who had fought the blaze shared their stories at a reunion held at Seney Refuge, offering insights to newer Service firefighters. It was an opportunity to review a fire that was pivotal in the development of the Service fire program.

"We saw things from all sides and filled in gaps of knowledge," said Gary Lindsay, prescribed fire specialist at Seney Refuge. "People came to the reunion with a career's worth of knowledge."

Cal Gale, a fire management specialist at the National Interagency Fire Center in Boise, shared much of that knowledge. He arrived at Seney Refuge soon after the Walsh Ditch fire as its first forester with fire-related responsibilities. To firefighters accustomed to operating within the current complex fire management system, Gale explained that at the time of Walsh Ditch, the Service had no designated firefighters and no standards for people or equipment.

Gale met a Michigan state forester who had been his son's neighborhood playmate in the late 1970s. The forester didn't recall the fire but was curious about the politics and second-guessing at the time. There were plenty of both.

Little Money

The fire started in a part of the refuge that had been declared wilderness only a few years earlier. The refuge manager thought no action could be taken in a wilderness area and besides, no one knew who could authorize the use of anything more than hand tools to fight the fire.

Ironically, the fire also took place during a "transitional quarter" when the federal fiscal year changed from a June 30 end to the current September 30 cut off. So, there was only a small operations budget to fight one of the largest fires in Service history.

By 2005, the Service fire program budget stood at $68.4 million, with more than 500 full-time fire employees, 100 seasonal or part-time employees and more than 3,000 Service employees qualified or "red-carded" to support wildland fire incidents.

On the scene of the Walsh Ditch fire, state and federal "fire bosses" created their own integrated command structure. Bob Webber, who supervised the federal control effort, said, "No one had ever heard of unified or joint command. I can't think of another fire that changed more attitudes, policies, or interagency procedures."

Oral histories filmed at this reunion will help document the evolution of the Service fire program and provide dramatic firsthand accounts to be used for education and outreach. ◆

FOCUS . . . *On Endangered Species*

Endangered Species on National Wildlife Refuges

By William MacDougall

On Midway Island, a noisy flock of Laysan ducks now brings new life to an island where wrecked ships and planes long underscored the horrors of one of the fiercest battles of World War II. Two years ago, 20 young Laysan ducks -- the rarest ducks in the United States -- were moved 400 miles from Laysan Island in the Hawaiian Islands National Wildlife Refuge to the Midway Atoll National Wildlife Refuge. Today, the new flock is thriving with more than 100 ducks, providing a valuable second population.

Midway Atoll Refuge is just one example of the Refuge System's success in working with the Division of Endangered Species and other agencies within the U.S. Fish and Wildlife Service in saving or restoring imperiled creatures since the first endangered species law in 1966, part of the National Wildlife Refuge Administrative Act.

National wildlife refuges are home to more than 280 of the nation's 1,311 endangered or threatened species. So far, 11 of those species have been removed from the list due to their recovery, and 17 others have improved in status from endangered to threatened. More than 500 listed species are now stable or improving.

The recovery of listed species is often a long and complicated process. The biology of some species – particularly those that are late maturing and have low reproductive rates – requires an inherently long time for recovery. Habitat restoration, the propagation and establishment of new populations, and the research often necessary to address the threats to species survival can take decades.

Fifty-nine national wildlife refuges have been created specifically to help imperiled species, including two whose stories are detailed in this *Refuge Update*

Kirtland's Warbler Wildlife Management Area is a collection of lands across eight counties in the northern Lower Peninsula of Michigan. The land is managed to protect the Endangered Kirtland's Warbler, whose population numbers have been steadily increasing since the early 1990s. (Cindy Lynne/USFWS)

Kirtland's Warbler

The Kirtland's Warbler has the right idea: it summers in the northern Lower Peninsula of Michigan and winters in the Bahamas. The Kirtland's Warbler Wildlife Management Area, managed by Seney National Wildlife Refuge, includes 125 parcels of land across eight counties in Michigan. The area was established in 1980 and is managed to provide the nesting habitat for the little warbler with a bright yellow breast.

Working in a multi-agency framework, the U.S. Fish and Wildlife Service partners with the Forest Service and the state of Michigan – which together own most of the land inhabited by this species during the breeding season – to implement research and management for the purpose of recovering the warbler. The Recovery Team meets twice yearly, generating a slow but steady increase in the research and management tools. The Fish and Wildlife Service, the Forest Service and Michigan's Department of Natural Resources jointly manage

– Lake Wales Ridge National Wildlife Refuge in Florida and Julia Butler Hansen Refuge for the Columbian White-tail Deer in Washington. Many other refuges created for waterfowl production or other purposes also conserve habitat for endangered and threatened species.

Key Role in Recovery

In the following pages, many successes are highlighted and problems explored. The articles show how a variety of approaches to saving endangered species is evolving, what is being done about habitat loss, and how long-term problems are being addressed.

National wildlife refuges have played a key role in the recovery of such well-known species as the whooping crane, bald eagle, Key deer, California condor and American crocodile, as well as lesser-known species like the cave crayfish and the valley elderberry longhorn beetle. Refuges also conserve habitat for endangered and threatened plants, such as the Mexican flannelbush at San Diego National Wildlife Refuge and the pygmy fringe tree at Lake Wales Ridge Refuge in Florida.

Natural disasters such as hurricanes, wild fires and drought have taken their toll, and projects like housing developments and the drainage of wetlands have reduced habitat important to rare plants and animals. Other threats include air and water pollution, the introduction of non-native invasive species and disease.

In some areas, crime has also become a problem. Buenos Aires National Wildlife Refuge in Arizona shares 5.5 miles of border with Mexico. The location, important for the survival of endangered plants and animals, has become the site of illegal immigration and drug smuggling. An estimated 250,000 people a year illegally enter this country across the refuge. The result is that much of the terrain has been scarred by illegal trails and refuge personnel have been diverted to law enforcement. Cabeza Prieta National Wildlife Refuge in Arizona is battling similar problems in protecting the endangered Sonoran pronghorn.

Service officials say the future of many endangered species depends on the kind of creative and cooperative efforts among federal, state and private groups and individuals that are already succeeding. Many scientists are convinced that the long-term capacity of the Refuge System to conserve species depends on the effectiveness and extent of voluntary conservation efforts on nearby private lands.

Bryan Arroyo, acting assistant director for endangered species, puts it this way: "The National Wildlife Refuge System is a key part of the conservation of endangered species. But the Service can't do it alone. We rely on our many partners – federal, state, tribal, and private – to help with the mission. We can do better, and we will do better." ◆

William L. MacDougall is a former assistant managing editor of U.S. News & World Report; and Washington coordinator for the Service's North American Waterfowl Management Plan.

approximately 190,000 acres of jack pine forest for just this purpose. At any given time, approximately 30,000 acres are early stage jack pine habitat available for the Kirtland's Warbler.

For this particular warbler, the partnership is very successful. A survey of singing males found 432 birds in 1951. The population fell to 200 and below during the 1970s and 1980s, but with the advent of active forest management in the 1990s, the warblers began a steady return. In 2006, 1,478 singing males were counted.

Management Techniques

Because the bird nests in young jack pine forests that are naturally fire regenerated, "the land must be actively and intensively managed," says Seney Refuge Forester Greg Corace. Each year, Corace clear cuts tens to hundreds of acres of mature (30-60 year old) jack pine trees. Two-year-old jack pine seedlings are then planted in very densely-packed trenches by the Michigan Department of Natural Resources to emulate restocking patterns that would result from wildfire. Typically, about five years later, the warblers move in. "But in 20 years," says Corace, "after the trees are fully mature, the birds are leaving, so we better have another stand ready somewhere else."

Research is also being conducted in the Bahamas, where development pressures threaten the warbler's wintering grounds. Radio collared birds are being used to help identify specific islands the birds inhabit as well as their food sources.

Scientists are also trying to understand multiple species benefits of forest management for the warbler. If a mature jack pine stand is cut to create habitat for the Kirtland's Warbler, another group of species is undoubtedly affected. "We are setting priorities," explains Corace. "If the birds in the mature stand were of greater concern than Kirtland's Warbler, then we wouldn't be doing what we are doing. I am studying different communities in terms of their conservation value." ◆

FOCUS . . . *On Endangered Species*

Attwater's Prairie Chickens

by Elizabeth Slown

When Herbert Hoover in the 1928 election promised Americans a "chicken in every pot," the Attwater's prairie chicken was already in trouble. The population of this unique member of the grouse family dropped to fewer than 10,000 in the 1920s. Today, it is on the edge of extinction.

Four Attwater's prairie chickens were released in mid-September 2006 west of Houston on the Attwater Prairie Chicken National Wildlife Refuge, established specifically to protect this species. They were the last of this season's 165 birds to be bred in captivity and placed in the wild. Timing is crucial.

Once chicks become capable of independent survival, they are brought to release sites. The birds are released into large enclosures for up to two weeks. While in the acclimation pen, they get their bearings and become familiar with the prairie grasses. They need to learn to select the right plants in which to hide during the fall migration, when more hawks, falcons and eagles are in the area.

"Avian predators are our biggest issue," said Terry Rossignol, manager of the Attwater Prairie Chicken Refuge. "We place spikes on the fence posts and other potential perches. The spikes deter hawks from perching and let them know they should keep moving."

Captive Breeding

Since 1996, wild populations have been supplemented with birds raised in captivity at six breeding facilities run by different partners. Rossignol says results from releases in recent years have shown promise, and private landowners have voiced support for having the endangered bird on their land.

The grass flats on Attwater Prairie Chicken Refuge become a frenzy of activity from Feburary through mid-May, prairie chicken breeding season. Males perform a mating dance each morning

Protecting the Rarest of Florida Plants

Lake Wales Ridge National Wildlife Refuge was the nation's first refuge established primarily to protect endangered plants, including 22 federally listed species, nine candidates and four globally rare plant communities. Some species like these pygmy fringe trees evolved from ancient times when the southeast resembled the desert southwest. (USFWS)

Florida's 1,850-acre Lake Wales Ridge National Wildlife Refuge was the nation's first refuge established primarily to protect endangered plants, including 22 federally listed species, nine candidates and four globally rare plant communities. There are small wildflowers, tiny flowering ground cover, varieties of mint and savory, and miniature forests of scrub plum and pygmy fringe trees.

To understand these species requires a bit of history. Millions of years ago, the southeast resembled the desert southwest. Eventually, as the sea level rose, much of the Florida peninsula was underwater, but one chain of islands stayed above water. The desert plants were isolated and evolved into new species; many remain unique to the sandy soil in the central ridge of Florida.

Wildlife biologist Mike Morrow measures an Attwater's primary feathers in preparation for releasing the bird into the wild on the Attwater Prairie Chicken National Wildlife Refuge. Each bird is radio collared to provide data that will be used to improve its chances of survival. (Elizabeth Slown/ USFWS)

and evening from February through mid-May.

Holding their tails erect and wings drooped, they inflate their yellow neck air sacs to create a loud "boom," then drop their heads to deflate the sacs with a low sounding "whur-ru-rrr" while stomping their feet extremely fast. The males face off and jump and charge each other, vying for the females. Once the female breeds with a male, she nests in a clump of bunchgrass like little bluestem. If her nest is destroyed early in the season, the hen returns to mate again.

Prescribed burns and grazing herds of cattle and bison help maintain the historical grazing ground. Refuge staff plant small food plots to make sure the prairie chickens have plenty to eat. Soybeans also provide shelter and an abundant source of insects for chicks during the summer months.

"When the railroad was being built in this area during the late 1800s, I understand that the railroad company promised workers at least one meal of prairie 'hens' each day as an enticement," said Rossignol.

"We humans have a responsibility to help save a species, particularly when we've had a hand in causing its demise," said Refuge Wildlife Biologist Mike Morrow. "Much of Houston was built on prairie chicken habitat." ◆

Elizabeth Slown is acting assistant regional director for external affairs in the Southwest Region.

The sandy soil was also perfect for citrus groves, residential and commercial development. With 85 percent of this habitat lost to development, land acquisition is the top priority and the greatest challenge for the refuge. Land values continue to escalate and pressure for development continues to mount.

The state of Florida, two county governments and The Nature Conservancy – all members of the Lake Wales Ridge Working Group – are providing funds to acquire land; to date about 32,000 acres are preserved. The state of Florida owns and manages the bulk of this land. The partnering agencies collaborate on management projects and research as well as sharing information and resources relating to Lake Wales Ridge.

Transforming a Planned Subdivision

The refuge's Flamingo Villas tract had been planned as a subdivision in the 1950s, with more than 1,000 absentee owners, each owning a quarter-acre lot. The Refuge System eventually purchased more than 70 percent of the undeveloped land for Lakes Wales Ridge Refuge, but further acquisition requires dealing with a checkerboard of ownership. Prices have jumped from $500 per lot in the late 1990s to $20,000 per lot today.

Land conservation is especially important for endangered plants, says Whitmore, because they don't bear the same status as endangered wildlife. They are not protected from "take" on private lands although it is illegal to collect or harm them on federal lands.

Although there is no public access to the refuge, all terrain vehicles, illegal dumping of construction debris and poaching are law enforcement issues and have left their marks. Lake Wales Ridge Refuge is managed from the Merritt Island National Wildlife Refuge more than 100 miles away, and protecting the refuge is challenging. Periodic workdays are scheduled so volunteers can build fences and remove trash.

Prescribed burns are used to restore habitat for the scrub species. Ziziphus, one of the rarer plants, is being reintroduced at a 629-acre site. The refuge partners with Archbold Biological Station, an independent research organization, and The Nature Conservancy to educate visitors and residents about the value and rarity of this ecosystem.

"What do you eliminate before the web of life starts coming apart?" asks Whitmore. "If we lose these rare species, the diversity of our world is diminished." ◆

FOCUS . . . *On Endangered Species*

Benefiting People and Wildlife on the Lower Colorado River

Six new ponds are being excavated at Imperial National Wildlife Refuge in Arizona as part of the Lower Colorado Multi-Species Conservation Plan. The ponds will provide new habitat for two endangered fish – the razorback sucker and bonytail. (USFWS)

Over the next half century, the Lower Colorado River Multi-Species Conservation Program seeks to create more than 8,100 acres of new riparian, marsh and backwater habitat in the Lower Colorado River watershed that serves upwards of 24 million people in Nevada, California and Arizona. Its impact on habitat for 26 species, including six federally protected species, is destined to be huge.

The program includes habitat restoration projects or studies on four national wildlife refuges – Imperial National Wildlife Refuge and Cibola National Wildlife Refuge in Arizona, Havasu National Wildlife Refuge in California and Pahranagat National Wildlife Refuge in Nevada. Indeed, the MSCP is the nation's largest and longest-term river system habitat restoration plan.

Not Always Pretty, But Ever Integral

The whooping cranes and bald eagles get all the good press. What about rats and mussels, lizards and grasses?

They aren't always pretty or majestic, but these microfauna and flora are integral parts of the ecosystems they inhabit. Many are endangered or threatened, and have recovery plans in which national wildlife refuges play an important role.

Mussels – Kidneys of the River

"Mussels are the kidneys of the Ohio River," explains Ohio River Islands National Wildlife Refuge Biologist Patricia Morrison. Mussels are the river's filtering system, taking out particles and silt and returning cleaner water to the river. Morrison says the river is noticeably more turbid without mussels.

There are 40 species of mussels at the Ohio River Islands National Wildlife Refuge, two of them endangered. The refuge is working with numerous partners to restore the mussel populations. Mussels raised in captivity are scheduled to be reintroduced into the river in 2008. (USFWS)

The Department of the Interior is paying half of the $626 million price tag and has assigned the Bureau of Reclamation the program lead. State and local partners will share the remainder of the cost.

Imperial National Wildlife Refuge

Former Refuge Manager Ken Edwards believes the five habitat creation projects on Imperial Refuge will enable it to become a "showcase for habitat creation and conservation partnerships." Among the projects are 90 acres dedicated to improving endangered fish habitat.

Two ponds have already been excavated. Four more will be excavated next year. Each pond will have its own drainage and water delivery system designed to meet two objectives: keep non-native fish out and maintain water quality by adding fresh water from the Colorado River. By the end of 2007, Edwards says the new ponds will be ready for the endangered razorback sucker and bonytail.

Two other projects at Butler and McAllister Lakes are still being planned. Water quality is a major issue in these natural backwaters, which are fed only by groundwater seepage. The lack of freshwater from the Colorado River has caused the lakes to become "hypereutrophic," an advanced state of nutrient enrichment that will not support fish or other wildlife. Imperial Refuge is working with scientists at the University of Arizona to evaluate ways to restore sustainable habitat for native fish in these lakes.

Imperial Refuge also has two land projects in the MSCP. Excavation of the Imperial ponds left 650,000 cubic yards of soil that is being planted with crops and trees. Ultimately, 65 acres of cropland for migrating waterfowl will be created. Native cottonwoods and willows are also being planted to provide nesting habitat for such migratory species as the endangered southwestern willow flycatcher and the yellow-billed cuckoo, a candidate for listing. By the end of 2007, 12 additional acres will be turned into new habitat for the California black rail and the endangered Yuma clapper rail.

Butterflies and Birds

There is also important habitat for the Yuma clapper rail and the southwestern willow flycatcher in Topock Marsh at Havasu National Wildlife Refuge in California. One MSCP project under consideration calls for installation of a pumping system to maintain acceptable water levels in the marsh.

At Cibola National Wildlife Refuge in Arizona, species research is underway to identify populations of yellow-billed cuckoos and MacNeill's sootywing butterflies. Results will be used to define habitat requirements and guide habitat creation. Surveys and life history studies of the southwestern willow flycatcher are ongoing at Pahranagat National Wildlife Refuge in Nevada. ◆

Two of the 40 mussels at Ohio River Islands Refuge in West Virginia – the pink mucket and fanshell – were endangered even before a toxic event in 1999 killed all mussels along a five-mile stretch of the Ohio River that included the refuge. At least a million animals died, says Morrison. Earlier this year, the U.S. Departments of Justice and Interior along with the Environmental Protection Agency settled allegations of Clean Water Act violations, providing $2.04 million to begin restoring the mussel, fish and snail populations.

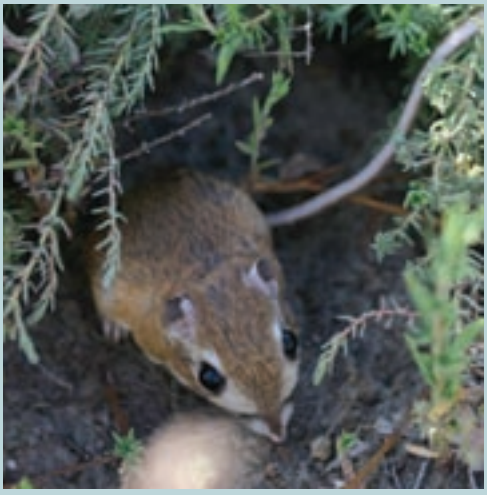
The refuge is working with state partners in Ohio and West Virginia, as well as the Columbia Zoo and Aquarium, Genoa National Fish Hatchery, Kentucky Center for Mollusk Conservation, Ohio State University and the federal fish hatchery in White Sulphur Springs, West Virginia, to restore the endangered mussels and augment their populations. Morrison expects the restoration plan for the pink mucket and fanshell mussels to be approved in 2007; the first mussels are to be reintroduced on the refuge in 2008.

Tipton Kangaroo Rat – Keystone Species

Like the keystone at the top of an arch, a keystone species supports many other plants and animals in its environment. An ecosystem can experience a dramatic shift if one keystone species is removed.

The kangaroo rat is just such a species. The presence or absence of kangaroo rats can affect the diversity and numbers of other small mammals, ants, plants, and even birds.

Kern and Pixley National Wildlife Refuges in California's San Joaquin Valley protect habitat for the kangaroo rat. This small seed-storing mammal



The tiny Tipton kangaroo rat is a keystone species at Kern and Pixley National Wildlife Refuges in California. The presence or absence of these small animals can affect the diversity and numbers of other small mammals, ants, plants, and even birds. (Steve Laymon)

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FOCUS . . . *On Endangered Species*

Saving Sea Turtles and Marbled Godwits

Volunteer John Kiesling inventories sea turtle eggs. For almost 70 years, Cape Romain National Wildlife Refuge in South Carolina has worked to save the threatened loggerhead sea turtle. Today, the refuge's Cape Island is the most significant nesting beach north of Amelia Island, Florida. Yet, even with an aggressive nest protection program, only one of every 1,000 hatchlings is estimated to reach sexual maturity. (USFWS)

For almost 70 years, Cape Romain National Wildlife Refuge in South Carolina has worked to save the threatened loggerhead sea turtle. Today, the refuge's Cape Island is the most significant nesting beach north of Amelia Island, Florida.

In their 1940 manuscript, "The Loggerheads of Cape Romain," Junior (Assistant) Refuge Manager William Baldwin, Jr., and Wildlife Technician John Lofton, Jr., reported 600 nests a season, with 400 on Cape Island – more than anywhere else along South Carolina's coast. Even today, 30 percent of South Carolina's loggerhead sea turtle nests are found on Cape Island. This season, there were 1,027 nests.

During the peak season in June and July, an average of 17 nests is laid each night. The highest number of nests laid in a single night was 36. A combination of Cape Island's topography and the intensity of the Cape Romain Refuge nest protection project have contributed to conserving the loggerhead.

The turtle was listed as threatened in 1978. Its decline resulted from loss of nesting habitat, pollution, incidental capture in large trawling nets, boat strikes and artificial lighting from development. Turtle hatchlings instinctively head toward the natural light over the ocean, the brightest light on an undeveloped beach. When hotels or houses cover the beachfront, turtles head away from the ocean toward those lights. It is estimated that only one of every 1,000 hatchlings reaches sexual maturity.

Nest Protection

The nest protection project, implemented in 1979, includes constructing protective hatcheries, relocating nests threatened by wash over and erosion into hatcheries, placing cages around nests left in place, and inventorying nests at season's end. Despite the summer's sizzling heat, biting insects and pop-up thunderstorms, volunteers were undeterred in their zeal to save turtles. This season, 53 volunteers gave 3,063 hours and protected 1,219 nests.

Nesting activity by the loggerhead sea turtle was also strong this year at Blackbeard Island National Wildlife Refuge in Georgia, which has been monitoring the turtle since 1966. There were 227 nesting sites in 2006, 10 percent more than last year and 22 percent more than the 30-year average.

There were just over 20,000 eggs in those nests; 77 percent hatched. "We've had two good years," says refuge biological technician Jake Tuttle, who credited habitat management and increased public awareness of sea turtles.

Keeping Marbled Godwits off the List

In Utah, Bear River Migratory Bird Refuge is partnering with the U.S. Geological Survey to find out more about marbled godwits, a species

Still Cleaning Up Along Gulf Coast — *continued from pg 7*

James Harris.

Before the hurricanes, the islands provided habitat for up to 10,000 brown pelican nests and 40,000 other birds. Last spring, there were 400 pelican nests and 3,000 nests for other colonial seabirds. Fewer than 100 pelican chicks survived since so many of the nests were washed over by normal tides. Harris says the Service and USGS are trying to determine if the elevation of the remaining islands can be restored.

Habitat for the Alabama beach mouse and sea turtles was destroyed. Exotic animals from zoos, aquariums and pet collections have been released into the

of high priority because of its small population globally. Although not yet federally protected, they are the focus of an international conservation effort involving USGS, the Service, Canadian Wildlife Service and the nonprofit organization Pronatura in Mexico.

Managers at refuges like Bear River need information about the routes the birds follow, and the link among the breeding, staging and wintering sites. The linking information allows conservationists, land managers and planners to discern how and where to deliver focused conservation.

This past summer, marbled godwits became the first migrant shorebirds in North America fitted with 12-gram solar-powered satellite transmitters, so small and light they can be used on birds weighing less than 400 grams.

Although Bear River Refuge is a major stopover point for migrating godwits, no one was sure where the birds were flying before or after Bear River. Using "Google Earth" technology, refuge biologist Bridget Olson and USGS scientist Adrian Farmer plotted data location points for Sassy, a godwit headed for Saskatchewan.

Bear River Refuge is recognized as a site of hemispheric importance to shorebirds as part of the Western Hemisphere Shorebird Reserve Network. After departing Bear River, Sassy made a non-stop flight of over 600 miles to another WHSRN site, Old Wives Lake in Saskatchewan.

This past summer, marbled godwits like Sassy became the first migrant shorebirds in North America fitted with solar-powered satellite transmitters that are so small and light that they can be used on birds weighing less than 400 grams. Biologists tracked Sassy to Saskatchewan. (Adrian Farmer/USGS)

Just days after her arrival, Canadian Wildlife Service Biologist Phil Taylor located Sassy at her final destination, Last Mountain Lake National Wildlife Area. "It's reassuring to know our system of protected areas really works for the birds," said Taylor. Sadly, Sassy died at Last Mountain Lake National Wildlife Area, although the cause of dead could not be determined. Her transmitter was still attached.

A second banded godwit went to Alberta in the spring, after stopping in an unprotected wetland in Montana. By July, the godwit came back through Utah and flew on to southern California and the Baja peninsula.

The birds' final destination confirmed that at least some of the godwits coming through the refuge are part of the prairie breeding population. The other two recognized breeding populations are in James Bay, Canada, and Ugashik Bay, Alaska.

"It used to be left to chance to recover a banded bird during migration," said Olson. "Now we can track an individual bird's movements on a daily basis." ◆

Patricia Lynch, park ranger at Cape Romain National Wildlife Refuge, contributed to this article.

environment. Alligators are roaming inland to avoid salt water. Deer have lost the forests where they hide.

At Big Branch Marsh National Wildlife Refuge in Louisiana, 70 percent of the cavity trees used by the endangered red-cockaded woodpeckers were destroyed. Forty-one artificial nest cavities were installed in standing trees, but the woodpecker population on the refuge is down by 40 percent. It is possible some of the birds could have found homes elsewhere. ◆

Recovering the Columbian White-tailed Deer

By Alan C. Clark

The 6,200-acre Julia Butler Hansen Refuge for the Columbian White-Tail Deer encompasses nearly one-third of the habitat for the lower Columbia River population of its namesake endangered species. Located along the Columbia River estuary, the refuge consists of fields, small woodlots, sloughs, seasonal wetlands, and both tidal and nontidal marshes and forested swamps.

Nearly two-thirds of the refuge lands are former farmland, diked in the 1920s to prevent tidal flooding and then cleared of the native Sitka spruce forest. Restoration of riparian forest is a major management activity.

Other management practices include seasonal cattle grazing to maintain fields of the short, nutritious grasses and legumes that provide high quality forage. Under Cooperative Land Management Agreements, ranchers conduct habitat improvement work such as mowing and weed control in return for grazing rights.

Coyote populations are managed to minimize predation on fawns. The refuge manages and creates seasonal wetlands that provide forage for deer during the dry summers and for waterfowl during the wet winters.

Returning to Historic Habitat

To reach the recovery goal of at least 400 deer in three viable subpopulations on secure habitat, the refuge took the lead in reintroducing the deer to areas of their historical habitat. Beginning in 1999, deer from the refuge and nearby private lands

To The Rescue of the Sonoran Pronghorn

2002 Drought Brought Crisis Response

The Sonoran pronghorn is hanging onto life in the desert southwest in part because U.S. Marines and the Air Force have worked closely with neighboring Cabeza Prieta National Wildlife Refuge to ensure the survival of the fastest land mammal in North America. A subspecies of the pronghorn family, the Sonoran pronghorn is now restricted to one sub-population in Arizona and two additional isolated subpopulations in Mexico.

The range of the Sonoran pronghorn covers Cabeza Prieta Refuge in southwestern Arizona as well as the Barry M. Goldwater Range, an active military training range managed by the Air Force and the Marine Corps. The refuge works with both military services as well as the Army National Guard, the Arizona Game and Fish Department and Mexico to protect and ultimately increase the Sonoran pronghorn population.

Efforts to recover the Sonoran pronghorn include a crisis response to a devastating drought in 2002 as well as a captive breeding program, funded in part by the Department of Defense (DOD). The drought brought the population to an all-time low of 21 in 2002, down from 150.

Bringing Water to the Desert

In an average season, the Sonoran pronghorn satisfy most of their water needs from the food they eat. But during the 2002 drought, they desperately needed food and water.

With the help of DOD and the Arizona Department of Game and Fish, water coolers were hand carried into the Cabeza Prieta Refuge wilderness.

The Sonoran pronghorn population fell to an all-time low of 21 animals in 2002. Its numbers are slowly but steadily increasing with the help of an active partnership between the Department of Defense and the U.S. Fish and Wildlife Service at Cabeza Prieta National Wildlife Refuge in Arizona. (USFWS)

were captured and moved to undeveloped Columbia River islands just upstream from the population's existing range. The islands are owned by the U.S. Fish and Wildlife Service, Washington or Oregon. To date, 131 deer have been moved to four islands, forming a new subpopulation.

The lower Columbia River population is now being evaluated for possible delisting, thanks in large part to the agencies and organizations that have cooperated in securing habitat and expanding the deer's range. These include the Washington and Oregon Departments of Fish and Wildlife, Columbia Land Trust, The Nature Conservancy, Bonneville Power Administration, Fort James Corporation, J & S Waterfowl Refuge, Foss Maritime, U.S. Army Corps of Engineers, Washington Department of Natural Resources, and Oregon Department of State Lands.

Continuing effort and cooperation will be needed to ensure the future of Columbian white-tailed deer along the lower Columbia River. The entire population numbers only 600-700.

Columbian white-tail deer are captured from Julia Butler Hansen National Wildlife Refuge and private lands in Washington. They are transported by helicopter to four undeveloped islands in the Columbia River to form a new subpopulation. (USFWS)

A population that small is extremely vulnerable to threats such as floods, predation, disease, and habitat loss. Yet, there is every reason to believe that the partnerships and cooperative efforts to relocate the deer and establish viable new populations will continue so that the Columbian white-tailed deer will once again occupy the entire lower Columbia River valley from the Cascade Mountains to the Pacific. ◆

Alan C. Clark is wildlife biologist at Willapa Refuge Complex in Washington.

Within 24 hours, the pronghorn were drinking from the coolers. During the following three summers, emergency water tanks and forage enhancement sites were built.

There are now two forage enhancement sites on the Barry M. Goldwater Range and three on the refuge – basically an irrigation system to nurture the existing native vegetation. Mike Coffeen, Sonoran pronghorn recovery program leader, says that a squad of Marines volunteered to dig the trenches for the pipe and the underground water tank by hand at two forage enhancement sites in order to protect the refuge's designated wilderness.

Captive Breeding Program

By 2004, the population had grown to about 58, helped in part by a captive breeding program on the refuge. With a special agreement between the state of Arizona and Mexico and funding from the Air Force, the Marines, the National Park Service, the Bureau of Land Management and the U.S. Fish and Wildlife Service, two does and a buck were brought to a protected breeding enclosure on the refuge. Veterinarians from the Los Angeles Zoo and Disney World also contributed expertise to the breeding project.

There was a steep learning curve on how to best transport these nervous animals. In spring 2005, pronghorn in the captive breeding area on the refuge gave birth to 10 fawns; six survived.

In 2006, four more Sonoran pronghorn were captured in Mexico and brought to the refuge. One died of an undiagnosed cause and the other three are doing well. Now, there are 27 pronghorn in the breeding enclosure, including nine fawns born this year, and about another 75 living on the refuge. The first yearlings from the enclosure are scheduled to be released to the refuge this winter.

Coffeen flies with Arizona Game and Fish every two years to count the Sonoran pronghorn population on the refuge, but this December's flight depends on funding. Coffeen would like to be able to put radios on eight animals this winter.

Eventually, the Sonoran Pronghorn Recovery Plan calls for establishing a second viable population, possibly at Kofa National Wildlife Refuge near Yuma, Arizona. Those plans are still under discussion in part because of Kofa Refuge's proximity to the Yuma Proving Ground, which tests medium and long-range artillery.

"We do see light at the end of the tunnel," says Coffeen, "but we can't even think about de-listing the pronghorn until we have that second viable population." ◆

FOCUS . . . *On Endangered Species*

Preserving the Magic of Ash Meadows

Ash Meadows National Wildlife Refuge in Nevada is a desert wetland ecosystem. More than 30 springs push 17,000 acre-feet of water to the surface from deep aquifers and faults. The refuge is home to 27 species found nowhere else in the world. Many of the endemic species are relics of the last ice age that survive because of this water. (USFWS)

Ash Meadows National Wildlife Refuge in southwestern Nevada is home to 27 species found nowhere else in the world, 12 of them endangered or threatened. Refuge Manager Sharon McKelvey calls Ash Meadows Refuge a "really magical" place. Established in 1984 to protect federally listed plant and animal species, it faces the immediate scourge of invasives and the long term challenge of water scarcity in working to fulfill that mission.

A Plan for Upper Miss Refuge — *continued from pg 8*

and ideas that need to be tapped and used as appropriate. At an early scoping meeting, our biologist was challenged by a commercial angler to go at 6 a.m. to see the river the way he sees it. Our biologist was there, much to the surprise of the weathered river rat.

Be Responsive. It means more than being timely. It means listening more than talking. It means weighing people's concerns and ideas objectively and using them if workable. It also means being straightforward, even when the answer is no.

Be Creative. Be open to new approaches. If a standard process doesn't fit, invent one that does.

Be Humble. Meeting after meeting, we were confronted with large crowds charged with emotion. We had to be strong and confident but never arrogant. This refuge belongs to all people, not to us, and we do not have all the answers.

Retain a Sense of Humor. When verbal attacks get personal, we had to remember that it was not about us, but our ideas. Many times a self-effacing remark timed right can take the edge off a crowd.

Ash Meadows is a desert wetland ecosystem, an oasis that was designated a Wetland of International Importance in 1986. More than 30 springs push 17,000 acre-feet of water to the surface from deep aquifers and faults. Many of the endemic species are relics of the last ice age that survive because of this water, including an aquatic bug (the Ash Meadows naucorid) and seven plant species that depend on alkaline soils and a shallow water table that provides high moisture.

Some species thrive in only a single spot on the refuge, like the Devils Hole pupfish. Devils Hole is actually a small pool in a crevice – a "window into the aquifer, rather than a spring," explains Refuge Wildlife Biologist Cristi Baldino.

The water in Devils Hole was dropping rapidly in the 1960s and 70s until a court order stopped pumping by a ranching corporation. For now, the population of Devils Hole pupfish is holding its own; both the fish and the water level in the aquifer are monitored.

"Devils Hole is our canary in the coal mine," says Baldino. "When the water drops in Devils Hole, which is at a higher elevation than the springs, it is giving us notice that it could eventually start dropping elsewhere."

Water, water – but not everywhere

Because of its scarcity, water is a volatile political issue all over Nevada. Refuges and other federal lands, private farmers and ranchers, and entities like the Southern Nevada Water Authority, which services the water needs of Las Vegas, are assigned water allocations from existing sources like the Colorado River. Ash Meadows Refuge is only now moving into a period of vigorous habitat restoration because its first two decades were devoted to establishing water rights in the region.

Although the refuge has rights to the water within its boundaries, there are persistent threats outside the refuge's sphere of control. Development around Las Vegas, 90 miles east of the refuge, shows no sign of slowing. Amargosa Valley to the north could become the center of residential development to service the proposed Yucca Mountain Nuclear Waste Repository. In either case, water pulled from limited sources could affect the refuge.

The refuge is responding by accumulating data on water quantity and quality. Ash Meadows Refuge is also actively restoring habitat that has been diminished by invasives, water pumping or diverted streams, and developing a Comprehensive Conservation Plan (CCP) that incorporates the results of a recently completed biological and geomorphic assessment. That assessment identifies the original drainage paths for the many springs and prioritizes the springs that need to be restored based on the number of species impacted.

Non-native fish like large mouth bass and other invasive fauna like snails, bullfrogs and crayfish threaten the endangered species by competing for the same limited resources and preying directly on native fish species and endemic spring snails. The overall goal of the refuge is to remove these non-native species and restore the area to the more natural conditions that existed before disturbance.

"Preserving the magic of Ash Meadows Refuge will require constant vigilance," said McKelvey, "over the immediate threat of invasives as well as longer term threats to the delicately balanced allocation of water in Nevada." ◆

In the end, we have a Comprehensive Conservation Plan that will be implemented as time, funding, and circumstance allow. It has been a wild ride, a ride that in some ways is ongoing, and always changing, like the Mississippi River itself.

As river sage Mark Twain once said, "Always do right. It will gratify some people and astonish the rest." We hope the plan, and our actions, will do just that.

For more information on the Upper Mississippi River NW&FR CCP, visit http://www.fws.gov/midwest/planning/uppermiss. ◆

Don Hultman is refuge manager at the Upper Mississippi River National Wildlife and Fish Refuge.

The Upper Mississippi River National Wildlife and Fish Refuge covers 240,000 acres and stretches for 261 miles. Refuge Manager Don Hultman says there are still many challenges even though a CCP was given final approval in August. (USFWS)

Around the Refuge System

Alaska

What do you do with a plane that is stuck on the wetlands of your refuge? Wait until the snow falls, says Jim Hall, deputy refuge manager at Kenai National Wildlife Refuge. After losing power about six miles north of Kenai Municipal Airport, a floatplane made an emergency landing into Kenai Refuge in August. Damage to the plane itself is minimal, but the fixed wing, single engine plane is too heavy for other planes to lift it out. Additionally, special permits are required to make sure the removal does as little environmental damage as possible. Refuge Park Ranger Rick Johnston says the soggy vegetation cannot serve as a runway so the removal options are limited: take the plane out piece by piece or wait until there is enough snow for the plane to use its floats as skis.

New York

A summer intern at Montezuma National Wildlife Refuge organized a dance performance on the refuge to attract visitors who might not normally seek out nature. It worked. Visitor Services Manager Andrea Stewart says 80 people attended the performance, including a few who asked about opportunities to volunteer. Sara Ford, an intern from Environmental Careers Organization, wanted the dancers to explore reactions to nature. The Kaleidoscope Dance Theatre of Auburn, New York, was given artistic freedom – an important element of the event's success in Stewart's opinion. She described the music as a "new age" sound that accompanied both modern dance and ballet. Choreographer Sean McLeod even danced in one number, wearing a U.S. Fish and Wildlife Service uniform as his costume.

South Dakota

Fifteen Girl Scouts from the Nyoda Council of eastern South Dakota, ages seven to 14, have enabled the blue goose to fly in a new way at Waubay National Wildlife Refuge. Split into two teams, the girls took turns creating a blue goose mosaic in front of the headquarter kiosk, where an overgrown bush had been removed. The result is stunning. Waubay Refuge staff thinks every refuge should have its own blue goose mosaic, according to Laura Hubers, the refuge's wildlife biologist. Although this is the first time a Girl Scout troop undertook a specific project on the refuge, Waubay Refuge has offered Girl Scout camps, lasting just a day or two, for the past decade.

Girl Scouts from the Nyoda Council created a mosaic of the blue goose at Waubay National Wildlife Refuge in South Dakota, giving the symbol of the National Wildlife Refuge System a new way to welcome people. (Laura Hubers/USFWS)

Illinois

Richard Bjorklund and son Sigurd have been honored with the President's Call to Service Award for their volunteer service. Richard Bjorklund has given more than 4,000 hours of service at Chautauqua National Wildlife Refuge in Illinois over the past 10 years; his son Sigurd has volunteered almost that many hours. The father-son team is credited with providing the best census information available on bird use at Chautauqua Refuge, where they have conducted weekly waterbird surveys since 1996. They spend about eight hours a week on the refuge. Matt Sprenger, refuge manager at Illinois River National Wildlife and Fish Refuges, says the Bjorklund data were used to determine when peak populations of different species were likely to be at the refuge for this year's avian flu testing.

Mississippi

"Hydrilla is the kudzu of the waterways," says Refuge Manager Henry Sansing at Noxubee National Wildlife Refuge. Dense aquatic vegetation such as water lotus, white water lily and hydrilla made the refuge's Loakfoma Lake unfishable for boaters. The rapid advancement of hydrilla (from three acres to 40 acres in a single year) warranted closing the lake to boaters to prevent unintentional spreading to other refuge waterways. Beginning in spring 2006, water was drained from the lake to assist with other control measures in getting rid of hydrilla once and for all. Draining the wet lake bed created a "dream buffet" for waterbirds. By next summer the lake will be dry and the refuge will rebuild a boat ramp and restore a creek channel before refilling Lake Loakfoma. In the meantime, Sansing is eager to hear other ideas for controlling hydrilla.

Richard Bjorklund and his son Sigurd (with the telescope) have systematically counted waterbirds at Chautauqua National Wildlife Refuge every week for 10 years. They have been honored with the President's Call to Service Award. (USFWS)

In another effort to fight invasive plants and animals, the U.S. Fish and Wildlife Service contributed funds to create national public service announcements aimed at hunters and anglers. Cable TV fishing host Babe Winkleman tells viewers to inspect, clean and drain their boats (http://www.winkelman.com/invasivespecies.php).

Arizona

Bonnie Swarbrick, outdoor recreation planner at Buenos Aires National Wildlife Refuge, has been inducted into the Arizona Outdoor Hall of Fame. The honor, sponsored by Wildlife for Tomorrow, recognizes individuals and groups for their outstanding contribution to the protection, management and enjoyment of wildlife in Arizona. Swarbrick is especially well known for her work in wildlife education and artistry. At the refuge, she painted a large mural depicting Buenos Aires grassland habitat flanked by the Baboquivari Mountains.

Swarbrick has illustrated several books and environmental publications and her artwork has raised money for conservation. Limited edition prints of her masked bobwhite painting, also with the backdrop of the Baboquivari Mountains, are being sold to raise money for the Friends of Buenos Aires Refuge. Signed prints are available in various sizes. For more information, contact Bonnie_Swarbrick@fws.gov.

In Memorium

William O. (Bill) McDermith, 70, died February 3 at his home in Clifton, Colorado, after a short battle with cancer. He was born in the San Luis Valley, where he spent most of his life. After serving in the U.S. Navy, he worked in maintenance for the U.S. Fish and Wildlife Service for 38 years. He served most of his career at the Monte Vista National Wildlife Refuge in Colorado and shorter periods at Arapahoe National Wildlife Refuge in Colorado and Las Vegas National Wildlife Refuge in New Mexico. He is survived by his wife, Carolyn, two sons, two daughters, a sister, 12 grandchildren and great grandchildren.

Marine Managed Areas: Best Practices for Boundary Making

This 66-page handbook is a brief, useful guide for writing and developing marine boundaries within a geographic information system framework for federal, state, or local marine managed areas. The Federal Geographic Data Committee's Marine Boundary Working Group developed the handbook. To request printed copies or download the .pdf version, go to http://www.csc.noaa.gov/products/mb_handbook/

Loakfoma Lake in Noxubee National Wildlife Refuge is being drained to try to rid the lake of hydrilla, an invasive weed that spread from two to 40 acres in a single year. Waterbirds feasted as the water level dropped. (Marion Sansing/USFWS)

Bringing Nature and People Together

Sense of Wonder Winner Personifies "Multitasking"

Supervisory Park Ranger Sherry James at Rocky Mountain Arsenal National Wildlife Refuge holds the hands of children afraid to step off a school bus onto a dirt road with no buildings in sight. She also operates tour vehicles, recruits volunteers, establishes partnerships, writes curricula and press releases, and organizes interpretive events.

Personifying "multitasking," James is the 2006 U.S. Fish and Wildlife Service Sense of Wonder award winner for excellence in environmental education.

Refuge Manager Dean Rundle says James interprets the history of the refuge landscape to countless adults from all walks of life. It is a landscape scarred by plow, industrial development and pollution, and is now being restored.

One of the country's largest urban refuges, Rocky Mountain Arsenal Refuge was one of the most complex Superfund cleanup sites under federal management. It is being returned to prairie.

James presents the possibilities and responsibilities of citizenship in the natural world, encouraging people to reflect on individual and collective human activities that affect natural and cultural resources. Her partnerships with Craigs and Children's Hospitals provided fishing opportunities for young people who are disabled or paralyzed.

Rocky Mountain Arsenal National Wildlife Refuge Supervisory Park Ranger Sherry James won the Sense of Wonder award for a multitude of achievements, including educational partnerships and the development of a children's learning laboratory at the refuge Visitor Center. (USFWS)

She organizes interpretive tours in Spanish and implemented the first Spanish-language Web page wthin the Refuge System. She coordinates public events like Bald Eagle Days, Eagle Fest and annual National Wildlife Refuge Week events.

Learning Laboratories

Her educational partnerships with Denver and Adams County Public Schools include curricula that also meet Colorado basic standards. Children learn the functions of a wetland or the behavior of a prairie dog while they are meeting state objectives in English, history and math. James spearheaded development of a children's learning laboratory at the refuge Visitor Center, which provides hands-on, self-guided activities including a live honeybee exhibit.

James is currently in charge of all visitor services at Rocky Mountain Arsenal Refuge, where she has been working for 15 years. Rundel says James has "touched the lives of tens of thousands of inner city youth and urban dwellers." ◆

Peeping at Peeps

By Laura Hubers

So there you are – staring at a drying wetland full of little peeps and larger birds busily feeding in the shallow water and mudflats. What are those little brown or gray birds?

Shorebirds can be some of the more difficult birds to identify, especially during fall migration, which can start as early as July. Then, they are molting into their drab winter feathers, making positive identification frustrating.

Big Stone National Wildlife Refuge and Morris Wetland Management District, both in Minnesota, and Waubay National Wildlife Refuge in South Dakota jointly offered the first-ever two-day workshop that united 40 participants with birding experts to help them learn how to make these tricky identifications. Held in August, the workshop included classroom instruction as well as field trips.

— continued on pg 27

Big Stone National Wildlife Refuge and Morris Wetland Management District in Minnesota and Waubay National Wildlife Refuge in South Dakota jointly offered a two-day workshop to help participants fine-tune their ability to identify shorebirds. (Kim Bosquet/USFWS)

Alternative Transportation Grants: Finding a Better Way to Go

Trams are a big winner among a new group of alternative transportation projects funded by the Federal Transit Administration. Six national wildlife refuges received a total of $1.6 million for various projects.

Santa Ana National Wildlife Refuge in Texas was awarded $510,000 to acquire newer, more reliable trams with improved fuel economy, room for more passengers, better safety features and accessibility for visitors in wheelchairs. Santa Ana Refuge acquired its first tram almost 25 years ago when personal vehicles were prohibited during most of the peak visitor season. Tram tours were an instant success, while traffic congestion was eliminated and vehicle noise and air pollution were minimized.

In asking to replace the aging trams, Santa Ana Refuge noted that "experienced and alert tram drivers, seated in an optimal viewing position and driving slower than the posted speed limit, virtually eliminate the chance of road kill. Drivers of personal vehicles, in contrast, are prone to excessive speed, driving the wrong way, and are unaware of wildlife crossing areas."

Planning dollars for J. N. "Ding" Darling National Wildlife Refuge

The Ding Darling Refuge in Florida, the City of Sanibel and the Lee County Transit Agency (LeeTran) jointly applied for funds to evaluate alternative transportation options that would reduce the number of vehicles entering the refuge. The Federal Transit Administration awarded $700,000 for consideration of non-motorized transportation systems, including pedestrian and bike travel as well as smaller vehicles using alternative fuels.

The refuge, the City of Sanibel and country transportation planners expect to use the planning funds to address transportation needs of both the refuge and the city in order to reduce impacts to wildlife and better manage traffic throughout the island. Last year, more than 800,000 visitors traveled Ding Darling Refuge's four-mile, one-way Wildlife Drive on foot, on bicycles and in vehicles. At the same time, more than 2.7 million vehicles drove onto Sanibel Island, using a single road system that connects several thousand condominiums, hotels, restaurants, schools and homes. A new airport terminal promises to bring yet more visitors.

Patuxent National Wildlife Refuge in Maryland has been awarded alternative transportation funds to maintain and upgrade its electric trams. Tram replacement funds were also awarded to Santa Ana National Wildlife Refuge in Texas and Back Bay National Wildlife Refuge in Virginia. (LaVonda Walton/USFWS)

More Trams, More Plans

Both Patuxent Research Refuge in Maryland and Back Bay National Wildlife Refuge in Virginia received funds to upgrade or replace existing trams. Rocky Mountain Arsenal National Wildlife Refuge in Colorado received funds to study the feasibility of a shuttle that would connect the refuge to the Denver regional transportation system. More than 2 million people live within a one-hour drive of the refuge; the refuge, Commerce City and the Stapleton area all expect to experience dramatic increases in the number of visitors, employees and residents in coming years.

The single non-motorized transportation project approved this year is at Parker River National Wildlife Refuge in Massachusetts. Funds will be used to plan off-road connections between the Newburyport MBTA (Massachusetts Bay Transportation Authority) Transit Center and the refuge.

The plan will guide development of a 1.7-mile bicycle/pedestrian trail to serve visitors arriving from Boston by train as well as local residents. The new trail is to be linked to 2.4 miles of bike lanes currently being built along the Plum Island Turnpike from the Refuge Visitor Center to Plum Island.

The Federal Transit Administration is authorized to award $23 million in fiscal 2007 for the Alternative Transportation in Parks and Public Lands Program. Agencies within the Departments of Interior and Agriculture as well as state, tribal and local governments are eligible to compete for funds. Additional information is available from Nathan Caldwell at Nathan_Caldwell@fws.gov. ◆

Delivering the Mission with Buildings and Boardwalks — *continued from pg 1*

The Regional Refuge Chiefs endorsed seven standard floor plans in late 2005 as they worked to meet Congressional mandates. Standardized facility design will also enable the U.S. Fish and Wildlife Service to enhance its business-like approach to construction and pursue consistent planning principals. The final plans are expected to be approved and issued in late 2006.

The seven floor plans combine administrative and visitor sections that can be enlarged and adapted to particular site conditions, staffing and visitation needs:

- Small administration/visitor facility
- Medium administration/visitor facility (one story)
- Medium administration/visitor facility (two stories)
- Large administration/visitor facility (one story)
- Large administration/visitor facility (two stories)
- Stand alone administration facility
- Stand alone visitor facility

During the design process, regional engineers raised very detailed concerns: Is there enough turning radius for a wheelchair once file cabinets have been placed in a room? Is there storage space for audio-visual equipment in the bookstore and multipurpose room? Will the standard exhibit area allow an aquarium?

Paul Rauch, chief of the Refuge System Division of Engineering, says the final versions will meet accessibility requirements of the Americans with Disabilities Act but allow regions to make adjustments that meet local needs. He says the standardized plans will reduce the substantial time and cost associated with selecting a facility design by creating a reliable and predictable process.

Rauch says the floor plans are also consistent with LEED (Leadership in Energy and Environmental Design), the nationally accepted benchmark for the design, construction, and operation of "green" buildings. The draft sustainability policy for the Department of the Interior requires that any DOI construction that costs more than $2 million obtain LEED certification.

Allyson Rowell, chief of the Refuge System division of visitor services and communication, notes the standardized facilities design process supports facilities that meet Refuge System priorities to welcome visitors, provide compatible wildlife-dependent recreation, and nurture cooperative relationships with Refuge Friends, volunteers and other partners.

"Facilities are an expensive investment," says Rowell. "We want to make sure the projects that get funded will help us deliver our mission."

Rowell also points out that there are other cost effective ways of improving visitor experiences on refuges even when funding is not available for an entire visitor center. Currently, there are $88 million worth of visitor facility enhancements in the Maintenance Management System database, including 646 small construction projects on more than 400 refuges. These include trails, observation towers, docks and piers, boardwalks, parking lots, and interpretive signs.

A Director's Order is being developed to address procedures and guidance on implementing the standardized design process, including required planning and design documents, use of the cost model and site selection guidelines. A cost estimating tool has been created to help individual refuges determine the costs of facility construction, site work (including surveys and land development as well as lighting, sidewalks, parking lots, fences, etc.) and exhibitry (all expenses required to allow for presentations, video productions and interpretive elements).

After the standardized administrative facility design process is officially issued, the next step will be to develop national criteria to rank proposed facilities. Those criteria will be used in the formulation of the fiscal year 2009 budget.

Rowell says, "We hope that the Refuge System Standard Facility Conceptual Designs will serve as models for other Service programs to consider." ◆

Peeping at Peeps — *continued from pg 24*

Although most participants were amateur birders, a few professionals joined, including those from the Minnesota Department of Natural Resources, U.S. Department of Agriculture and the U.S. Fish and Wildlife Service who wanted to fine tune their birding skills. The small group size enabled us to offer good opportunities to mingle with the five guides/instructors.

Most of the field trips were spent at Big Stone Refuge, where a drawdown of water levels produced many acres of shallow water and mudflat conditions perfect for attracting numerous shorebirds. Although the elusive and rare snowy plover was not observed, attendees felt great at being able to identify dowitchers, yellowlegs, and stilt, semipalmated, least and Baird's sandpipers, among others.

Bring Partners into the Planning

Shorebird workshops were held annually from 2000 to 2004. Doug Buri, a birder in South Dakota and president of Friends of the Prairie, was the driving force behind those. After we skipped 2005, we heard from people who wanted to resume the workshops. Buri returned this year, along with experts from the Minnesota Ornithologists Union and St. John's University.

When organizing such workshops, it helps to spread the workload between two refuges. A local chamber of commerce can provide advertising and supplies. We thank Friends of the Morris Wetland Management District, Minnesota Department of Natural Resources, Minnesota Ornithological Union, Big Stone Chamber of Commerce and the regional Migratory Bird Offices for helping this workshop successed. ◆

Laura Hubers is wildlife biologist at Waubay National Wildlife Refuge.

Not Always Pretty, But Ever Integral — *continued from pg 15*

San Diego National Wildlife Refuge is coordinating a project to prevent the extinction of the Mexican flannelbush. Seed will be collected from the wild population, grown in captivity and replanted in canyons where the shrubs have a chance to thrive. (Michael Charters)

that jumps like a kangaroo satisfies its water needs with seeds and succulent vegetation. If the ground is dense with old vegetation or thatch, it cannot move around easily or establish burrows.

So the U.S. Fish and Wildlife Service has contracts with area farmers who graze cattle on several thousand acres to thin out the grass. Vehicle access to the habitat is prohibited year-round so vehicles don't collapse the sandy soil right into a kangaroo rat's burrow.

Kangaroo rats are counted every year. While the number of one species (Heermann's) is increasing, the Tipton is holding on only in very small numbers, says Refuge Biologist Pam Williams. "There don't seem to be any easy explanations," says Williams.

Bristling with Interesting Features

Mexican flannelbush is a big, graceful shrub with showy and interesting flowers. In fact, says Refuge Biologist John Martin at San Diego National Wildlife Refuge, "It is literally bristling with interesting features, from the irritating bristles on the pods to the handsome black seeds. And it belongs to the same family as chocolate!"

Fewer than 10 historic native locations have been reported in the United States. It is currently found in only two locations. That makes the Mexican flannelbush vulnerable to extinction from a single catastrophic event like a fire.

With the help of San Diego National Wildlife Refuge Complex Project Leader Andy Yuen, Martin obtained funding intended to support projects that would head off imminent extinction of federally listed species. He plans to collect seed from the wild population, grow shrubs in captivity until they can be transported, and plant them in places where they have a chance to thrive.

So Martin joined forces with Jonathon Dunn, coordinator of the San Diego Seed Gene Bank at Conservation Research for Endangered Species (CRES), the research arm of the San Diego Zoo. Martin and Dunn collected seeds that are being stored at the CRES seed bank.

In spring 2007, a new contractor will plant the seeds and provide 200 plants. Volunteers from the California Native Plant Society will provide another 20 plants. By fall, the young shrubs will be transplanted to five canyons in southern California, carefully selected for their soil, elevation and chaparral vegetation. Martin expects the project to be finished in summer 2008. ◆

Chief's Corner — *continued from pg 2*

Retirees want to know their conservation legacy will be lasting. They didn't hesitate to give me their suggestions and guidance – good advice and ideas I will certainly take to heart.

Refuge System employees have been a leadership force for more than 100 years. Back in the 1940s, Refuge System employees became leading advocates for wetland conservation. In the 1990s, Refuge System leaders recognized that public awareness about refuges was the first step in ensuring the health of refuges and so helped build a network of Refuge Friends organizations that now numbers around 200.

The leadership evident at the Retirees Reunion shows that the Service attracts men and women who are smart, dedicated and always brimming with ideas. That doesn't change after retirement.

Service retirees are a force in their own communities. The expertise they brought to their careers is now at work on the home front, just as it was when they worked as biologists, refuge managers, public use specialists and in maintenance, among other specialties. Retirement does not mean dimming your interest in conservation. The retirees' leadership can light the path for all of us.

Two Refuges Honored for "Green Buildings"

From construction materials to power sources to the entrance mats in the vestibules, **Missisquoi National Wildlife Refuge** in Vermont was thinking green when a new headquarters and visitor contact station were built. In recognition, the refuge has been honored with a 2006 Department of the Interior Environmental Achievement Award.

The new center, formally opened in October 2005, sits on a wooded knoll, with a large glass façade designed as a passive solar feature, warming the stone floor and wall surfaces to radiate heat to the interior.

Efficiency Vermont, an independent utility company, helped the refuge design high-efficiency lighting, occupancy light sensors and a groundwater cooled HVAC (heating/ventilation/air conditioning) system.

Geothermal well water and runoff from roads and parking lots are directed to a series of basins that have been seeded with moisture-loving native plants.

During construction, building and packaging materials were recycled so landfill use was minimized. Recycled materials are used extensively. Decks and benches are made of recycled lumber. Wood veneer panels are made from recycled paper waste.

The **Rhode Island National Wildlife Complex Headquarters and Kettle Pond Visitor Center** earned an honorable mention from the Department. The center already received the Department of Energy's Energy Saver Showcase Award for its careful site planning, recycling and energy and water conservation. Pavement from an abandoned airfield runway at Ninigret National Wildlife Refuge was used to make the entry road.

Energy efficient technology is expected to save about 41 percent in energy costs compared to a traditional office building. ◆

Send Us Your Comments

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

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