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Yup'ik elders share knowledge with staff at Yukon Delta Refuge.

Lost

Stand still. The trees ahead and bushes beside you

Are not lost. Wherever you are is called Here,

And you must treat it as a powerful stranger,

Must ask permission to know it and be known.

The forest breathes. Listen. It answers, I have made this place around you.

If you leave it, you may come back again, saying Here.

No two trees are the same to Raven.

No two branches are the same to Wren.

If what a tree or a bush does is lost on you,

You are surely lost. Stand still. The forest knows

Where you are. You must let it find you.

"Lost" from *Collected Poems 1956-1976* by David Wagoner, Indiana University Press

RefugeUpdate

March/April 2006 Vol 3, No 2

Farm Bill: Healthy Habitat Beyond Refuge Boundaries



The Conservation Reserve Program, the Grassland and Wetlands Reserve Programs and several smaller programs, all administered by the USDA's Natural Resources Conservation Service, are the primary Farm Bill programs affecting national wildlife refuges. Refuge involvement differs by region. (USFWS)

Refuge managers and biologists in the Prairie Pothole region of the Dakotas and Minnesota know firsthand the value of the Farm Bill conservation programs.

The Farm Security and Rural Investment Act of 2002, also known as the Farm Bill, gives private landowners access to a variety of programs for habitat conservation and restoration, including cost sharing, land rental, incentive payments and technical assistance. With the approaching reauthorization of the Farm Bill in 2007, these conservation programs are a top priority for U.S. Fish and Wildlife Service Director Dale Hall.

A working group has been formed to develop a Service-wide approach to working with the Department of Agriculture (USDA) and other federal, state and private partners on Farm Bill conservation programs. The working group, which includes representatives of all regions and divisions of the Service, will identify how the Service's knowledge and expertise can contribute to maintaining and improving the benefits of the Farm Bill conservation programs.

"We are looking for ways we can enhance our cooperation with USDA to benefit fish and wildlife resources," says Dave Walker,

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From the Director

Shaping Our Future

Change is the only constant. That was an observation made about life

in Greece about 2,500 years ago. And it's just as true today, as we strive to maintain our proud tradition of national conservation leadership.

Society is rapidly changing and we need to change with it. Twenty or so years ago, most of the people who came to national wildlife refuges were interested in waterfowl hunting or wetlands. Now, as more people are living highly urbanized lives, they are using wildlife refuges as places to commune with nature. As our society becomes more diverse and as our children in this digital age spend less time in the outdoors, we face new challenges in creating an appreciation of the outdoors and enlisting Americans in our conservation mission.

Key to this challenge is being ready to face the emerging trends coming in the next three, five, ten years and beyond. What kind of skills sets does the Fish and Wildlife Service need? Are we doing things today the way we'll be doing them in five years? What are the things that will pay off the most for the resource, and what can we live without? What are the core values and goals for each program?

We took the first step in shaping our future in early March, when leaders in the Service met at the National Conservation Training Center for the Workforce Planning Workshop titled "Shaping Our Future." But it is just a start. As we move forward in this process, we will be sharing information about workforce planning throughout the Service so we can all benefit from the lessons learned.

Over time, we will identify necessary changes in the workforce and

organizational needs to position ourselves to succeed in the future.

I am willing to do everything I can to help you be heard. All I ask in return is that you keep an open mind, be creative and innovative in your thinking, and be flexible and ready to change with us as we adapt and move forward.

The Fish and Wildlife Service is not one person or one program. It is the collective experience, intelligence and commitment of people across the country – from the field office to the Director's office. When we talk about shaping our future, it starts with you and me. I know that we are up to this task. Just look at how far we have come.



Chief's Corner

Biology and Ecology Set the Pace

The Director's "Shaping our Future"

offices and the Washington Office; and delegating more authority to field stations.

workshop, held in early March, has set the stage for what could be this decade's most significant changes in the Fish and Wildlife Service.

The Director noted some months ago that, while the Service's work is excellent, we can't afford to take a "business as usual" attitude. That sentiment was reiterated during the workshop as some tradition-altering ideas were aired: co-locating offices in the field; establishing service centers for administrative functions; reviewing the size and organization of regional

Now's the perfect time to continue to blend the Refuge System's talents with those in other Service fields of expertise to create and promote a refined vision that better delivers wildlife conservation. We have to take into account our nation's changing demographics and shifting cultural values as well as the resource stresses that require continual monitoring.

We must maximize the efficiency of our work on field stations, where Americans experience firsthand the Service's

RefugeUpdate

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Energy Company Fine Benefits Ottawa Refuge

Ottawa National Wildlife Refuge in northwest Ohio is one of the beneficiaries of the largest fine ever imposed on the nuclear power industry in the United States. FirstEnergy Nuclear Operating Co. (FENOC) agreed to pay the record \$28 million fine to avoid criminal charges that the firm lied to government regulators about the safety of the firm's Davis-Besse nuclear power plant.

Ottawa Refuge, which is within sight of the Davis-Besse plant near the shore of Lake Erie, will receive \$1.35 million of the fine. Fifteen percent of the total \$28 million penalty is earmarked for such community service projects as those on the refuge. The other 85 percent of the fine will go to the U.S. Treasury.

The refuge will use \$800,000 to restore 170 acres of former farmland to high-quality wetland habitat for waterfowl and other migratory birds, including bald eagles. The refuge hopes to start work on the wetlands restoration project in 2007.

Ottawa Refuge will use the remaining \$550,000 for improvements to its Visitor

Education Center, including an outdoor, all-weather environmental education classroom; restrooms along a new trails system; a five-acre wetland demonstration area; and an accessible elevated boardwalk over the demonstration area. Work on those additions to the Education Center is scheduled for completion by this fall.

Ottawa Refuge Manager Doug Brewer said the Refuge System greatly appreciates the U.S. Attorney designating part of the settlement money to community service projects near the power plant. The refuge's projects, he said, "will benefit an array of wildlife that nests and rests on the refuge, and benefit the people who visit the refuge for wildlife-dependent recreation, environmental education and other uses."

Gregory White, U.S. Attorney for the Northern District of Ohio, says in addition to paying the fine, FENOC will cooperate with his office in the prosecution of three former Davis-Besse employees who have been indicted on charges they misled the Nuclear Regulatory Commission about the safety of the Davis-Besse plant. **u**



The cooling tower for First Energy's Davis-Besse nuclear power plant can be seen from Ottawa NWR in northwest Ohio. The refuge is one of the beneficiaries of the largest fine ever imposed on the nuclear power industry in the United States. (USFWS)

Healthy Habitat — from pg 1

farm conservation programs coordinator for the Service.

The primary Farm Bill programs affecting national wildlife refuges are the Conservation Reserve Program, the Grassland and Wetlands Reserve Programs and several smaller programs, all administered by USDA's Natural Resources Conservation Service (NRCS). The precise nature of refuge involvement differs by region.

Many refuges in the Mountain-Prairie Region, for example, have a private lands biologist on the staff to promote and broker these USDA conservation programs. In other regions, USDA

programs are administered through ecological services offices.

"From the beginning," explains Rick Schultz, chief of the Refuge System Division of Conservation Planning & Policy, "we built relationships with NRCS and became the experts on habitat restoration on private lands, because healthy habitat outside the refuge means healthy habitat inside the refuge."

Mike Malling, private lands biologist at Minnesota Valley National Wildlife Refuge, says those relationships and partnerships are the "staples of preserving the landscape." He sits down regularly with NRCS, local sportsmen's clubs and local government representatives from a 14-county area

surrounding the refuge. Together they prioritize wetlands restoration projects, identify appropriate and available USDA funds, and leverage the additional funding needed from other partners or private organizations. Successful grantwriting, adds Malling, is another key to successful habitat restoration.

Farm Bill Conservation Programs

Under the Conservation Reserve Program (CRP), first authorized in 1985, landowners enroll cropland that is converted to perennial cover for 10-15 years in exchange for annual payments.

The Grassland and Wetlands Reserve Programs were established in 1997. The Wetlands Reserve Program gives landowners financial incentives to restore,

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Data for about 2,000 deferred maintenance projects had to be entered with the Maximo software. Projects ranged in cost from \$5,000 to \$750,000, including kiosks at national wildlife refuges to education centers and repair of levees or bridges, among others. (Steve Hillebrand/USFWS)

Kudos!

The U.S. Fish and Wildlife Service is the first agency within the Department of the Interior to develop a five-year deferred maintenance plan entirely out of Maximo software as the agency makes outstanding progress in completing a major software transition.

Maximo software, implemented within the Refuge System as the Service Asset Maintenance Management System (SAMMS), has replaced the 19-year-old, homegrown Maintenance Management System (MMS) for all data involving maintenance and improvement of facility and equipment infrastructure, most of which is located on national wildlife refuges and fish hatcheries.

Using Maximo, the Service has accomplished three major objectives mandated by the Department: documenting comprehensive and annual condition assessment accomplishments and maintenance deficiency findings; calculating the Facility Condition Index (FCI) for each asset for reporting to the Federal Real Property Profile; and developing the Department's required Five-year Maintenance and Capital Improvement Plan for FY 2007-2011.

SAMMS/Maximo integrates the condition assessment information into the five-year planning process, and then tracks the actual costs and accomplishment of the projects.

Mike McGill, program analyst in the Refuge System's Office of Information Technology and Management, says the software first had to be tailored to handle both the National Wildlife Refuge System's and the National Fish Hatchery System's project information. Then, the data for about 2,000 deferred maintenance projects had to be entered using the new software. Projects range in cost from \$5,000 to \$750,000 and must meet certain guidelines to be considered deferred maintenance. The projects range from replacing an education center on a national wildlife refuge to repairing a levee or a bridge.

Hide and Seek...but Mostly Hide

Ivory-billed Still Elusive

A little more than two years ago, kayaker Gene Sparling spotted a large and majestic woodpecker in the Cache River National Wildlife Refuge in Arkansas. The Ivory-billed woodpecker was apparently not extinct as many had feared, but he has certainly been elusive.

Cornell Lab of Ornithology organized more than 100 volunteers from throughout the country into groups of 14 for two-week search parties from November 2005 to April 2006. Audubon Arkansas organized day searches by local volunteers.

Cache River Refuge Manager Dennis Widner has nothing but praise for the organizations working on the refuge – Cornell, The Nature Conservancy, Audubon – but he has been responsible for a tremendous amount of the planning, coordination and paperwork. Endangered species permits are required as well as a specific search and research plan.

“I'm responsible for protecting the one and only specimen of that bird and it's

hard to protect what you can't find,” says Widner.

Initially, the area where the woodpecker was first seen was designated a Managed Access Area (MAA) and access was limited to researchers. Refuge law enforcement officers were deployed to ensure compliance, to provide refuge maps and brochures, and to direct public to other viewing areas and trails established for birders. Gradually, the MAA was reopened to limited public use. Widner said he “made the decision to reopen the MAA to further increase the protection provided to the Ivory-bill and to increase the number of people looking for the bird. There's always a miniscule element of the populace that would do harm to a find a bird like this. Knowing that the public is allowed in the area and that some birder may be watching a poacher through a



Swamp searchers looking for the Ivory-billed woodpecker at White River National Wildlife Refuge must wear chest-waders, often contending with ankle-sucking mud, insects and snakes. (Kevin McGowan/Cornell Lab of Ornithology)

good pair of binoculars is an added deterrent.”

Binoculars and more

Searchers use traditional tools – like binoculars and digital cameras – as well as high tech methods such as listening



At least one coordinator and a supervisor from every Service Field Station are now trained to use the new software to handle all maintenance requests. The big advantage of the new software, explains McGill, is the quick availability of comprehensive, specific information for a wide variety of projects over a long time frame.

How Does It Work

Imagine you are a new refuge manager with an old visitor center that has had repairs over the years. In order to justify a request for additional repairs or even a new center, you need to know what's already been spent on this facility and what's wrong with it. That's where Maximo will prove its value.

With a few clicks of the mouse, you can see what was done, when, at what cost and what is still needed. Completed work orders will bring the maintenance history of every Service asset right to a computer screen.

Theoretically, said McGill, when the new financial and maintenance systems within the Department of the Interior are on line, managers and supervisors at all levels could key in the standard asset code for any facility or piece of equipment in the Refuge System or the Fish Hatchery System and see a complete maintenance history – plans, costs, progress, approvals and completions. This information will be critical to generating budgets, grant requests and reporting accomplishments to Congress. u

devices that are attached to the trees (Autonomous Recording Units or ARUs), sound-analysis software, time-lapse video systems and remote cameras. Some use sophisticated GPS systems while others just sit quietly in blinds, observing. They look not just for the bird but also for the habitat: nutall oaks and sweetgum trees with cavities where the woodpecker would build a nest.

In April, the active fieldwork will end. Cameras and listening devices will continue to collect information and researchers at Cornell will begin analyzing all the data collected so far.

Widner is pleased with the interest generated by the woodpecker sighting. The refuge supported plans in nearby Brinkley for a "Call of the Ivory-billed Woodpecker Celebration" in February, featuring bird-watching tours, book signings and speakers. Initially Widner acknowledged that he was expecting utter chaos and a flood of birders hoping to add the Ivory-billed woodpecker to their personal list of sightings.

He was pleasantly surprised that birders instead took responsibility for protecting

this bird. Messages on birder Web sites and listservs, he said, have discouraged birders from rushing to the refuge.

Both Widner and Larry Mallard, manager at nearby White River National Wildlife Refuge, say the woodpecker sighting has given their refuges international visibility among birders and other non-consumptive visitors. In December 2005, members of the national and local media were invited to tour the Cache and White River basins. The U.S. Fish and Wildlife Service is encouraging the public to participate in the search with guidelines and trail maps available at a Web site nicknamed "Finding Elvis" (<http://www.fws.gov/arkansas-es/BigWoodsBirding/index.html>).

The Service has published a detailed and colorful brochure filled with photos, maps, habitat history and bird biology. The Department of Agriculture has named Arkansas one of three pilot states for its new Healthy Forests Reserve Program. Two key program goals are to promote the recovery of endangered species and improve biodiversity in forest ecosystems.

Habitat Management is Key

Key to recovery of the Ivory-bill is continued habitat management and protection. Larry Mallard takes a long, philosophical look at the bird's return.

Woodpeckers need mature, decaying trees so they can reach nutritional grubs. Since White River became a refuge in 1935, older trees have been retained while still providing habitat for other wildlife species by managing the continuum of trees of all ages. Cache River Refuge, a much newer refuge, will also retain older trees while expanding the forest by planting new trees.

The Refuge System, The Nature Conservancy, Cornell, the state of Arkansas and other organizations have cooperated in a partnership that is successfully preserving this habitat. "The mission of the refuge has been realized," said Mallard with quiet pride.

And not quite so quietly, he added, "This glorious creature has come back to say, 'I told you, it's all about habitat.'" u

How a Salamander Brought Together Russian and American Students

By Ken Clarkson

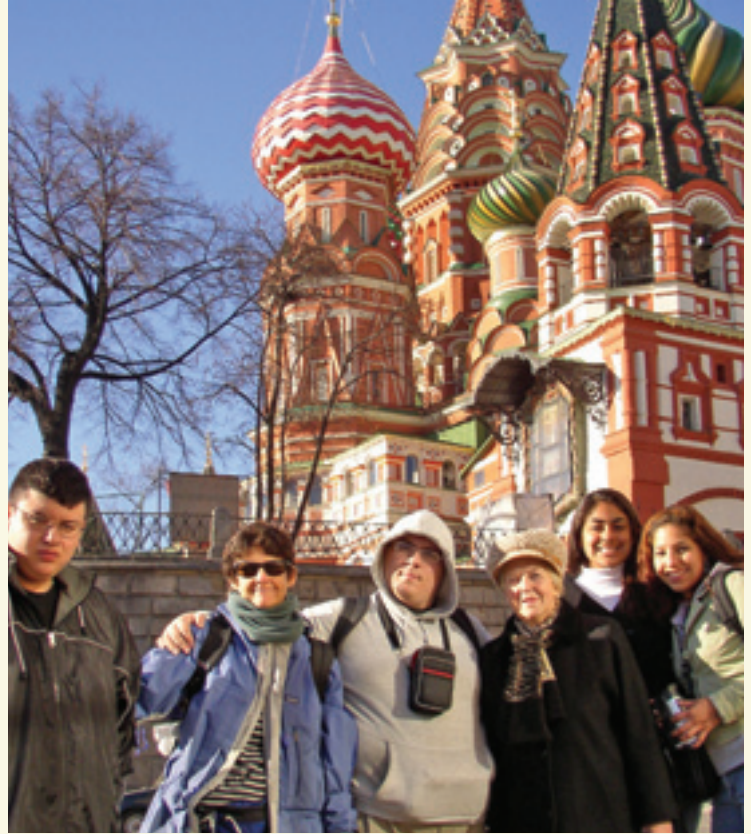
As we sat at the Children's Palace of Moscow, listening to the Russian-speaking emcee, we were able to ascertain a few familiar words "...United States... Ellicott Slough... Refuge..." and "...Renaissance ..." It was then that our translator leaned over and said, "You must stand now and wave! They are introducing you!"

At the suggestion of the U.S. Fish and Wildlife's Division of International Conservation, we had been invited by the nonprofit Zapovednik EcoCenter of Moscow to attend the week-long Third All-Russia Friends of Protected Areas Youth Congress in November 2005, the first time an invitation had been extended to international youth groups.

Our group of four seniors from Renaissance High School in Newark, Calif. – Tanya Felix, Daniel Mendoza, Jackie Renteria and John Bejarana – and teacher Shoshana Coplan joined about 550 youth, educators, dignitaries from the Russian Ministry of Natural Resources, land managers and local musicians to

share conservation information, visit area refuges, exchange music, and in the process, make new friends. Renaissance High School was the only group beyond Russia's borders to attend this gathering.

The Division of International Conservation began annual exchanges between American and Russian scientists back in 1972 with the signing of a bilateral agreement on cooperation in environmental protection. The Zapovednik EcoCenter coordinates the environmental education and interpretation for many of the natural protected areas across Russia.



Renaissance High School's delegation to the youth conference in Russia- (left to right) Daniel Mendoza, Shoshana Coplan, John Bejarana, their interpreter Evgeniya Parnasova, Tanya Felix, and Jackie Renteria in front of St. Basil's Cathedral in Moscow. (USFWS)

Students Take on the Refuge

Ellicott Slough National Wildlife Refuge in California, just 201 acres, is one of the few remaining homes for the endangered Santa Cruz long-toed salamander and the threatened California tiger salamander. The refuge, established in 1975 to protect these species, contains an ephemeral pool that is critical habitat for the salamanders.

A Helicopter Load of Shells

Repairing 100 Years of Damage

For some, the image of shells washing onto a beach with the tide brings to mind collectors and small children on vacation. Think instead of 250 tons of shells dropped from a Firehawk helicopter into the Indian River Lagoon around Pelican Island, the nation's first national wildlife refuge.

The Florida island was a little more than three acres when President Theodore Roosevelt established the refuge in 1903. Now it is a little more than two acres. The erosion has been blamed on natural wave action and boat wakes.

Restoring at least some of the island has been a joint effort among Pelican Island National Wildlife Refuge, the Florida Inland Navigational District, the St. John's River Water Management District, the Pelican Island Preservation Society Friends group, the Marine Resources Council, the Coastal Resources Group and others.

The goal, explains refuge assistant manager Takako Kashimoto, is to elevate the original footprint of the island by bringing in shells and sand. The first

attempt in 2001 prevented the island from washing away, but the water remained too deep for the new mangroves and smooth cordgrass that were planted. The oyster shells dropped that first year remained intact and the island did expand to 2.8 acres. In 2004, the restoration work was tested during Hurricanes Frances and Jeanne and the island survived, though a little battered.

In January, new sand was added to the shoreline to raise the bottom elevations by about three inches and ultimately expand

For the past two years, students from Renaissance High School – adjacent to the refuge and established to get students back on track for high school graduation – have been helping with habitat restoration and data collection for biological monitoring. Each fall, the students have ventured among the refuge lowland shrubs and trees to collect acorns and coffeeberries. Inside Renaissance High School's greenhouse, students have been propagating these native plants, which they eventually plant back on the refuge.

Outside the classroom window of teacher Shoshana Coplan sits a rain gauge and a digital thermometer. The annual salamander surveys need to be timed precisely when heavy storms saturate the ground. By collecting weather data adjacent to the refuge, students help biologists better predict the timing of the surveys.

A few students have assisted biologists with the surveys, strapping on headlamps and donning raincoats to search the refuge periphery for the migrating amphibians. The students are creating and deploying "coverboards," inconspicuous blocks of wood surrounding the pond where invertebrates live and where biologists can monitor salamanders. The students also use small handheld computers with GPS units to do "nature mapping,"

collecting and mapping wildlife tracking and observation data.

Preparations Began Months Earlier

The students prepared for the trip for months, learning about the local culture, language, creating a poster presentation and rehearsing a skit. Following a guided tour of the Kremlin, we navigated the Moscow Metro, with its elaborate mosaics, statues and chandeliers. During the poster presentations, a sea of small hands surrounded our group as students awaited Blue Goose tattoos and other gifts we had brought. On the main stage of the Palace, the Renaissance High students enlisted audience participation during the skit. "Oh nyet!!!" the audience cried on cue when they saw the antagonist scatter trash on the refuge. They cheered wildly as the superhero salamander came to the rescue.

During the week, students were divided into master classes, studying such topics as public outreach, how to create environmentally-themed plays and interpretive signs for a trail, and how to conduct a sociology study for a refuge. Each member of our group had a translator while at the meeting. Since English is taught in many Russian schools, most translators were young Russian students.

We also participated in an excursion to nearby Prioksko-Terrasny Refuge where we had close encounters with European bison or "zubers." Once reduced to only 50 animals in zoos, these giants are being bred for eventual release at refuges across Europe and Russia.

The most lasting memories for the Renaissance High students came from their time making friends and sharing experiences with their Russian counterparts. "When I start talking about what we did, all I can think of are all my favorite things, some of which were touring, eating Russian food, and of course meeting people," said Tanya Felix.

The fourth Russian Congress will take place in 2007, with hopes that American students helping on national wildlife refuges will again participate. Elena Knizhnikova, coordinator for the Zapovednik EcoCenter, envisions even larger goals. "It could be the start of a big joint effort to develop an international Friends of Protected Natural Areas movement," she said. u

Ken Clarkson is an environmental education specialist at the San Francisco Bay National Wildlife Refuge Complex.

Helicopters dropped 250 tons of oyster shells, mollusks and other shells around the edges of Pelican Island National Wildlife Refuge in Florida in an effort to expand the island's footprint. Erosion caused by natural and boat waves has caused the island to shrink dramatically. (Mike Marshall/ Coastal Resources Group)

the island up to about four acres. Shells were delivered from across the state and dumped strategically on an oyster bar northwest of the island.

The shells were dumped from a three-yard cement bucket carried by the

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Alaska Friends Speak for 16 Refuges

By Maeve Taylor

Carla Stanley attended the Refuge System's 2005 National Friends Conference as a representative from Homer, Alaska. She was inspired by the success of so many groups and started to think of ways a Friends group could help Alaska Maritime National Wildlife Refuge.

Ginny Harris, of Anchorage, recently found her National Wildlife Refuge Association membership card from the 1970s. She sent it to the Association to share in the nostalgia and also inquired, "Is there a refuge Friends group in Alaska that I can join?"

Sarah Ford, a volunteer at Kodiak National Wildlife Refuge, thought the refuge needed Friends. She made some inquiries, but then had to leave Kodiak to return home to Colorado.

Today, all three women and so many others have a place to turn: the Friends of

Alaska National Wildlife Refuges, which became a Friends organization in November 2005 with the help of the Refuge Association, the Refuge System's national Friends coordinator, and the Alaska Natural History Association. The official launch of the nation's first statewide Friends organization took place at a gathering at Kenai National Wildlife Refuge. Carla Stanley was a driving force in building interest in the new group in which she, Harris and Ford are all officers.

"Many of the problems that face our state, our country, and our world are seen in our refuges," says Stanley. "By starting in our 'neighborhood' wild areas, we can learn to observe and protect what we have. Alaska's refuges are so remote it will take a talented and motivated team to help bridge the gap between what needs to be done and what our refuge staff is able to do. That is where Friends come in."

Public Voice for Alaska Refuges

Many past efforts to create refuge Friends groups in Alaska have fizzled because national wildlife refuges in Alaska are remote and, to many Alaskans, inaccessible. The few people who live near them are busy with subsistence lifestyles.

Until last year, Alaska boasted only one Friends organization – the Friends of Kenai National Wildlife Refuge. Yet, the Kenai Friends face a dwindling membership and a busy executive board.

The idea of Friends for Alaska Refuges took off with new energy last year. The Alaska Regional Office introduced eight potential Friends to one another through a teleconference in March 2005. Trevor Needham, the Refuge System's national Friends coordinator, provided valuable information, including, for example, copies of "Taking Flight" a handbook that provides tips and ideas about launching and sustaining a Friends organization. "My office in Washington, DC, is thousands of miles away from Alaska," said Needham, "but distance is no factor. The Washington Office is ready with materials, information about grants, and expertise for any Friends organization."

The participants were somewhat overwhelmed by the notion of creating a Friends group to represent all 16 of Alaska's national wildlife refuges, but they agreed on the need for a public voice for Alaska refuges. The group decided to treat all Alaska refuges equally in terms of project requests and needs.

Current projects on the priority list focus on meeting needs for many refuges at a time, such as producing exhibits that can be displayed in airports and ferry terminals. Future projects will be proposed to the board by each refuge. The board will then discuss the importance, feasibility and timing of each project.

There are now 25 members, including David Raskin of Homer who stepped up to serve as the Friends president. Raskin



Many past efforts to create refuge Friends organizations in Alaska have fizzled because refuges are so vast and remote. Now all 16 Alaska refuges will be supported by a single Friends group, complete with a logo designed by Friends Vice President Carla Stanley. (USFWS)

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A Wildfire Tool for Wildlife Management

By Karen Murphy

During the years that I worked as a wildlife biologist, I often wished for more detailed land classification information that would allow me to tease out particular habitat components important to different species. I wanted, for example, to be able to model potential habitat for a given species and then look at its distribution relative to a management area, but I was often frustrated by the lack of detail in the available data, holes in the coverage, and the changes in vegetation types and conditions that occurred at ownership boundaries.

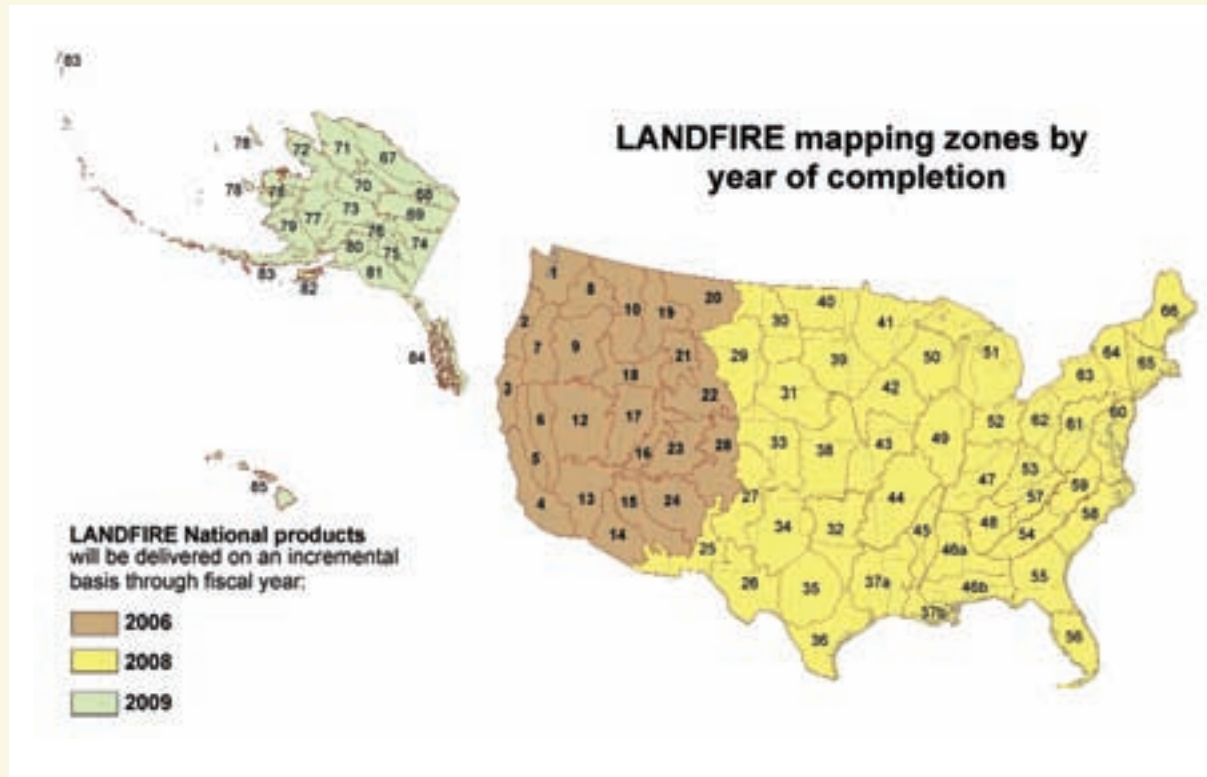
Now, thanks to a project originally intended to aid wildland fire managers, these frustrations will be things of the past by the end of the decade, sooner in some regions.

Simply put, the Departments of the Interior and Agriculture are working together to produce a whole suite of geospatial products including detailed vegetation maps of the entire United States, crossing all ownership boundaries, to provide better tools to land managers with wildland fire responsibilities. The interagency project is called LANDFIRE or the Landscape Fire and Resource Management Planning Tools Project.

As a fire ecologist in Alaska, I've become involved in order to help produce the best possible LANDFIRE products. The Fish and Wildlife Service manages more than

77 million acres of public land in Alaska, so we have a strong interest in the successful completion of LANDFIRE. Although the project is specifically designed to meet fire

Systems" classification describes dominant species at each of the vegetation layers: trees, shrubs, herbs and grasses, and the substrate cover.



This chart shows the stages in which LANDFIRE, or the Landscape Fire and Resource Management Planning Tools Project, will be implemented throughout the country. Although the project is designed to meet fire management needs, it should also help to understand habitat conditions across the landscape.

management needs, it should also help our biological programs because the suite of products will provide tremendous opportunities for understanding habitat conditions across the landscape. In fact, non-fire applications including conservation and land stewardship were one important reason why the project was funded in the first place.

The foundation for all of the LANDFIRE products is a classification for existing and potential vegetation. Developed by considering groupings of "alliances" and "associations" of vegetation communities on similar landscape conditions, the resulting NatureServe's "Ecological

The vegetation information is mapped at a 30-meter resolution, about one-third the size of a football field, by using satellite imagery, climate, topographic, soils and other data. The resulting data layers are incorporated into models to produce fuels data (the amount of standing and fallen dead vegetation) and data that describe fire regime characteristics.

Across Broad Landscapes

The underlying goal of LANDFIRE is to provide fire managers with tools needed to improve our management of wildland fires and fuels across broad landscapes. This can include planning for prescribed fires, defining appropriate areas for

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FOCUS... on Pollinators

Why We Should Care About Pollinators

By Mike Higgins
and Bob Adamcik

What do Contra Costa

wallflowers at Antioch Dunes National Wildlife Refuge in California, Masked Bobwhites at Buenos Aires National Wildlife Refuge in Arizona, and black bears at Seney National Wildlife Refuge in Michigan have in common? Their very existence depends upon pollinators. Pollination is an essential, if often under-appreciated, ecological function.

Pollinators encompass a diverse group of organisms, from insects such as bees, beetles and butterflies, to hummingbirds and even to

some species of bats. Pollinators are crucial for the reproduction of many plants, which in turn provide food and shelter for a multitude of other species. Indeed, without pollinators, most ecosystems would simply collapse.

Pollinators may also play an important role in the management of threatened and endangered species. Certain species of plants may evolve closely with one or only a few species of pollinators. Because of their close ecological ties, when either the pollinator or the plant declines, the other is adversely affected. Several species of plants, like the threatened Mead's milkweed, have declined at least in part because of a paucity of pollinators.

These usually small and often unobtrusive creatures do not come immediately to mind when we think of the National Wildlife Refuge System. However,



Pollinators can be considered guardians of the biological integrity of ecosystems. (USFWS)

Managing for Pollinators and Wildlife

By Kim Winter

Although a third of the food we eat and the fruits, seeds and foliage that so many wildlife species rely upon depend on pollinators, they often go “under the radar” for many ecologists. Yet today, possible declines in the health and population of pollinators pose a significant threat to biodiversity, global food webs, and human health.

In 1999, scientists and land managers concerned with pollinator conservation founded the North American Pollinator Protection Campaign (NAPPC), administered by the Coevolution Institute to promote the health of resident and migratory pollinating animals. NAPPC has grown to become a partnership of more than 100 organizations, ranging from universities and environmental groups to utility companies, zoos, and several government agencies

(<http://www.nappc.org/partners2005.html>).

The U.S. Fish and Wildlife Service recently signed a Memorandum of Understanding with the Coevolution Institute, giving the National Wildlife Refuge System access to a network of more than 120 experts in pollination biology. NAPPC will connect you with an expert in your particular project or concern if you call 301-405-2666.

NAPPC has inspired such outreach activities as *The Great Pollinator Partnership* traveling garden and photographic exhibit, lesson plans and educational materials about pollinators, and the expansion of Canadian and Mexican partner work groups. These Canadian and Mexican scientists will be inviting land managers in each country to the first-ever NAPPC meetings in Ottawa, Canada and Oaxaca, Mexico later this year.

pollinators can be considered guardians of the biological integrity of ecosystems, and with the National Wildlife Refuge System Improvement Act of 1997 came new responsibilities to “ensure that the biological integrity, diversity, and environmental health of the system are maintained.”

We now have a responsibility to recognize and incorporate the needs of pollinators into our management. Addressing their needs often has broader implications related to managing for biodiversity and biological integrity in general. We often think of birds as the indicators of environmental conditions, yet pollinators are in fact a far better way to measure whether an ecosystem is intact and healthy. When pollinators are in trouble, ecosystems are in trouble.

Taking the Lead

Because of the close ecological relationship between plants and pollinators, managing for one will often have a positive effect on

the other. Native pollinators thrive in abundant and diverse native plant communities and, in turn, help to maintain that diversity. Providing native pollinating species with suitable nesting sites, a diverse plant community that flowers throughout the seasons, and undisturbed habitats in which to overwinter will help maintain biological integrity and diversity within a national wildlife refuge and beyond.

There is increasing evidence that many pollinator species are in decline, so it is appropriate that the Refuge System take a lead in conserving them. Invasive species, inappropriate use of insecticides and herbicides, and the degradation of habitats and environmental health are all responsible for declines in pollinator populations.

Pollinator conservation involves providing for the needs of pollinating species and minimizing the threats. Management for pollinators on a national wildlife refuge

can occur at any scale. On a larger scale, consider a diversity of native vegetation when restoring areas treated for invasive species control or after prescribed burning. On a smaller scale, the construction and placement of bee nesting blocks (created by drilling different size holes into blocks of lumber or tree limbs) throughout the refuge can be a great volunteer project.

A modest native plant garden near a visitor center could be another volunteer project that results in a living educational display.

Simply planning for the conservation of pollinators when conducting other refuge management activities can go a long way in encouraging a diversity and abundance of pollinating species and maintaining the biological integrity of the refuge. **u**

Mike Higgins and Bob Adamcik are biologists with the Refuge System Division of Natural Resources, Wildlife Resources Branch, in the Washington Office.

The National Academy of Sciences has initiated a study of the “Status of Pollinators” that includes seven NAPPCC partners on its panel. The study should provide recommendations for further research and monitoring.

Refuges can become involved with the pollinator conservation campaign by:

- 🌿 Working with NAPPCC scientists to plan pollinator conservation projects.
- 🌿 Creating pollinator habitats using “Pollinator Friendly Practices” guidelines, a joint project of NAPPCC and the Wildlife Habitat Council. Guidelines are available online at: <http://www.nappc.org>. The guidelines focus attention on foraging, nesting and reproductive requirements of pollinating species.
- 🌿 Offering their insights as land managers on projects that help conserve pollinators and their habitats. A NAPPCC Task Force is drafting a

pamphlet for land managers that will outline best management practices. Interested refuge managers may contact Mike Higgins, a task force member who is with the Refuge System Division of Natural Resources, 410-573-4520, or Kim Winter at [NAPPCC kw@nappc.org](mailto:NAPPCC_kw@nappc.org) or 301-405-2666.

- 🌿 Learning more about NAPPCC activities at www.coevolution.org and www.nappc.org. To receive links to news articles and publications or inquire about pollinators or management practices, join the pollinator listserv at: <http://lists.sonic.net/mailman/listinfo/pollinator>, a great resource for finding collaborating scientists who can help with data collection and other refuge projects.
- 🌿 Offering feedback to the National Academy of Sciences Study on the Status of North American Pollinators

at http://www4.nas.edu/cp.nsf/Projects+_by+_PIN/BLSX-K-02-06-A?OpenDocument

- 🌿 Contributing to the pollinator conservation database about plants and their pollinators. If you would like to contribute to the database or use it in your habitat planning, send an e-mail to info@nappc.org. **u**

Kim Winter is a wildlife ecologist and coordinator for NAPPCC. She can be reached at kw@nappc.org or 301-405-2666.



FOCUS ..Pollinators

Buenos Aires Refuge: A Home in a Critical Corridor

By Bonnie Swarbrick

While all national wildlife refuges host pollinators, Buenos Aires National Wildlife Refuge, Arizona, has a special place in the life history of this uniquely adapted group of wildlife. Because many pollinators are migratory, they, like any migratory species, must find food and other critical resources all along their migration route.

The refuge's large size, broad swales of grassland and verdant streamside habitats provide abundant and varied food plants and breeding sites for pollinators. And it's positioned geographically within a major migration corridor that runs from southern Arizona, south along the Pacific coast of Mexico to the Mexican state of Jalisco and points beyond.

Pollinating species that move through this corridor and utilize the Buenos Aires Refuge's 118,000 acres of rolling grassland and riparian habitat include nectar-feeding bats with long dog-like muzzles, brilliantly colored

hummingbirds, butterflies, moths and native bees. The refuge's habitat diversity is enhanced by climatic and biological influences that come together here, at the confluence of the Sonoran, Chihuahuan and Mohave deserts, the Rocky Mountains to the north, and the dry tropical forests of the western Sierra Madres of Mexico to the south.

While the refuge is only a tiny piece of a corridor that extends thousands of kilometers, migratory pollinators face many problems elsewhere along the route. The refuge's healthy habitats are valuable, possibly critical, refueling stations for the many species that twice each year traverse a gauntlet of land use change, pesticides, invasive plants and multiple political boundaries.

Rich in Species

Hummingbirds – those feathered jewels that demonstrate such remarkable co-adaptation with flowers – are prominent on Buenos Aires Refuge. Many are important pollinators, including the rufous hummingbird (*Selasphorus rufus*), which

Cigar orchid flowers typically bloom in April, awaiting pollination from a bee or wasp. These natural pollinators seem to have disappeared. (Larry Richardson/USFWS)



Orchids, Panthers and the Weather

By Larry W. Richardson

Not long after the Florida Panther National Wildlife Refuge was established in 1989, I met a newly retired Smithsonian botanist, Dr. Robert Read. He became a volunteer, collected plants for us and started our refuge herbarium. Bob was a soft-spoken unpretentious man who made sense out of the myriad worldly plants he had

seen throughout his career, and he loved to talk about all of their fascinating intricacies.

Bob first showed me a cigar orchid (*Cryptopodium punctatum*) in April 1992. The blooms are faintly fragrant, but its real attractants are its color and shape. Bright yellow and reddish-brown flowers lure a wasp or bee to land on the bloom, mistaking the signature shape and colors for a potential mate. The insects carry away a speck of pollen and perhaps a bit of disappointment, too.



Intermittent streams, marshes, extensive grassland, and oak woodland produce many nectar sources at Buenos Aires Refuge for a great diversity of pollinators, including this rufous hummingbird. (USFWS)

is among the 11 species found on the refuge. Hummingbirds pass over the grasslands in migrating waves, some nesting or stopping over in riparian habitat.

The desert Southwest is also rich in bat species, and the refuge is no exception. Two specialized species include the endangered Mexican long-tongued bat and the lesser long-nosed bat, a species of special concern. While moving pollen between plants on their fur, these specialized feeders visit saguaro cacti in desert areas and century plants (agaves) in the grassland.

In April and May, nectar from saguaros provides energy for pregnant females and northward-bound migrants. Then, autumn-blooming century plants help mothers and young build fat reserves for their return migration to Mexico. The refuge and surrounding areas also provide roosting and maternity sites in rock formations and abandoned mines.

The long growing season enjoyed by Buenos Aires Refuge, coupled with its streams, marshes, grasslands and oak woodlands, means abundant nectar well into the spring and fall for myriad butterfly species, including the migratory monarch (*Danaus plexippus*).

Naturally occurring host plants for both larvae and adults include passionflower, sacred datura and milkweed, on which the monarch depends.

Buenos Aires Refuge embraces its special role in supporting the critical continuity of habitat as it fulfills its mission to protect and conserve the habitats and plant communities on which migratory pollinators and other species depend. The refuge will always be one place where pollinators, on their long and arduous migration, will find a home. u

Bonnie Swarbruck is Outdoor Recreation Planner at Buenos Aires National Wildlife Refuge.

The following experts also contributed to this article: Bob Adamcik, biologist, National Wildlife Refuge System; Ronnie Sidner, University of Arizona; E. Linwood Smith, Environmental Planning Group; Richard Bailowitz, Tucson; Bruce Walsh, University of Arizona; Steve Buchmann, founder, The Bee Works.

Unfortunately, these natural pollinators seem to have disappeared so we spread the pollen by hand. Bob showed me how to use a toothpick to pop the sticky *pollenia* from a flower, pollen attached, and drop it into an empty film can for later insertion into a flower on another plant. The resulting seed capsule, nine to 12 months later, will burst open, leaving the seeds to drift with the wind. To help them drift further, I sometimes use thumbtacks to attach a capsule higher up a cypress tree.

The Orchid Thief

Off and on over the next couple years, we made periodic swamp-tromps to catalog some of the 43 species of orchids that are

supposed to exist in south Florida. Popular novelist Susan Orleans, in her book *The Orchid Thief*, wrote about our swamps, where water moccasins were under foot and mosquitoes were inhaled with every breath, and a poacher tried to corner the market with the now-famous ghost orchid (*Dendrophylax lindenii*).

We had found the leafless ghost orchid, its mass of green roots clinging to a pop-ash or pond apple tree, and one, two or rarely three white flowers seemingly growing out of nowhere. But the snakes and mosquitoes were never that thick. We also found dozens of other species of orchids growing on trees (epiphytic) and in soil (terrestrial). Most are rare and

their beauty belies the trouble they are in from a changing environment.

The Orchids Return

In 2001, the refuge received a grant from the National Fish and Wildlife Foundation to start the Orchid Restoration Project. Now, Scott Stewart, a University of Florida doctoral candidate, and a growing cadre of professors and graduate students are defining orchid restoration technology and the science behind pollination. We are beginning to see orchids reestablished in historic habitats, after years of over-collecting, poor water management and an apathy that coincides with misunderstanding the balance of nature.

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FOCUS...*Pollinators*

Prairie Pollinators



Just like migratory birds, monarchs travel through different lands and cultures that have different attitudes about species, land use patterns and political issues. While monarch butterfly populations have fallen elsewhere, they remain steady on Neal Smith National Wildlife Refuge, Iowa. (USFWS)

*By Scott Ford
and Pauline
Drobney*

Pollinators are critical to the success of reestablishing native prairie, and so Neal Smith Refuge National Wildlife Refuge in Iowa, a major stopping point for monarch butterflies during their fall migrations to the mountains of Mexico, is supporting several ongoing studies of pollinators.

People rightfully think of monarchs as common. Yet, they have a complicated biology.

Just like migratory birds, monarchs travel through different lands and cultures that have different attitudes about species, land use patterns and political issues. You may have heard about monarchs in Mexico, but what about areas like Neal Smith Refuge, located in this critical middle part of the monarchs' range where they reproduce and migrate from, to and through? The prairie crossing is an increasingly difficult part of the monarch's life journey because less and less habitat is available each year.

A field study in Summer 2004 indicated that many monarchs are summering on the refuge. We do know that while monarch populations have fallen elsewhere, they remain steady on Neal Smith Refuge.

During the fall of 2004, migration numbers peaked in the second half of September with 465 monarchs counted in two hours on one day and 525 monarchs counted in 90 minutes on a single day the following week. Field reports from other parts of the country suggested the numbers of migrating monarchs were down that season, but monarch counts at Neal Smith Refuge showed strong migrating activity spanning over several weeks.

Orchids – from pg 13

Seeds from capsules formed by hand-pollinated cigar orchids are now mixed with specific fungi on agar-plated Petri dishes. The seeds are incubated for weeks, sit under grow lights for months and spend two years in a greenhouse before they are attached to native cypress. There, for perhaps a century, they will grow.

We hope to find the poor frustrated bee or wasp that is the genuine pollinator. Was it killed off by pesticides used on surrounding agricultural crops? Has it become extinct out of frustrated attempts at mating?

Even if a natural pollinator could be found for the cigar orchid, the ghost orchid still presents a mystery. We have isolated several species of fungus that symbiotically coexisted with the plant, but so far, seed pods have been difficult to find.

Before Bob passed away a few years ago, he convinced me that botanist or biologist, our jobs are largely the same – to read the signs around us, acting much like a meteorologist who senses changes in the weather by paying attention to the direction of the wind or a halo around the moon. Bob monitored the swamp through

Drake University Biology Professor Robert D. Woodward, having studied the annual monarch migrations since 2001, counted 50 or more monarchs consuming nectar on the refuge's wildflowers and winging their way across an old seed production site during two hours of observation in 2004. At different times during the 2004 study, the monarchs were attracted by the blossoms of common and Sullivant milkweeds and by stands of prairie coneflowers, cup plants, compass plants, blazing star, thistles and other wildflowers.

People tend to think that monarch populations are pretty stable. They eat milkweeds and milkweeds are, after all, weeds. So, milkweed and monarchs should be everywhere, creating spectacular shows when thousands of butterflies land on a single tree. But new technologies that improve agricultural output also reduce small perennial plant populations like milkweeds.

The refuge is working to increase the numbers and species of milkweeds and many other wildflowers as it pursues tallgrass prairie restoration, but progress is measured in days, weeks, months, years, decades and centuries. More than 96 percent of America's tallgrass prairie had been turned into farms and grazing

lands by the early 1900s. The refuge has been working since 1992 to restore the prairie, organizing, for example, "Sow Your Wild Oats" days, when people in surrounding communities come together to spread the hard-to-find seeds of prairie plants.

Diverse Prairie Plantings

One new agro-ecosystem research project on the refuge is addressing the possibility that certain prairie plantings interspersed in a crop field might be good for both farming and native ecosystems. Diverse prairie plantings could theoretically reduce erosion, increase water quality downstream and provide habitat for wildlife, especially invertebrates.

While grasses are the backbone of tallgrass prairies, more than 70 percent of prairies' plant species are nongrasses – especially the flowering plants that are essential to thousands of species of birds, bats and insects, all pollinators. For example, leadplant (*Amorpha canescens*), an indicator of a well-managed prairie, is also good forage for cattle. Used by millions of people today for the herbal medicine Echinacea, coneflowers provide nectar for many butterflies.

Because Neal Smith Refuge is relatively large, monarchs have a smorgasbord of offerings. Fields of clover proved to be the major attraction in the fall of 2004. Clover is not native but it is acceptable in the short term, if the areas not yet planted to prairie have vegetation that helps monarchs.

We think about the times we've have seen up to 25 monarchs clustered on one native stem of rough blazingstar, magnificent in a blazing red sunset. The spectacle is stunning with the contrast of lavender and purple blossoms with orange and black wings! We look forward to a much more attractive and appropriate future for nectaring on native prairie species here in the prairie bioregion.

Daily field reports and photographs for the monarch migration studies can be reviewed online at <http://www.drake.edu/monarch>. u

Scott Ford is supervisory park ranger at Neal Smith National Wildlife Refuge. Pauline Drobney is Land Management and Research Demonstration biologist at the refuge.

the cypress, strap ferns and orchids. I made assessments using the Florida panther, wading birds and gators. Our collective visions came together as we both sought to preserve or restore an ecosystem and a habitat.

For us on the Panther Refuge, cats and orchids are a lot alike – barometers to our environmental health. What's good for orchids is good for panthers. I think Bob would agree that no matter where we are, we can all be weathermen. u

Larry Richardson is a wildlife biologist at Florida Panther National Wildlife Refuge.

A very rare occurrence, three flowers on a leafless ghost orchid emerge from a system of roots that grow across the bark of a pond apple tree. (Larry Richardson/USFWS)



FOCUS ...*Pollinators*

Honeybees – Friend or Foe?



Before Columbus landed on North America, native bees alone satisfactorily pollinated native plants adapted for bees. That seems true today, even for the dozens of critically endangered flowering species. (USFWS)

By James Cane

While honeybees are not native to North America, they are important pollinators for the nation's agriculture, pollinating \$5 billion to \$10 billion of crops annually. What are the potential impacts of these non-natives on natural ecosystems and national wildlife refuges? What role do they play in the wild?

What is the history of the honeybee? They were originally brought to America by

European colonists and Spanish missionaries for their ability to make the wax used in candles. Today, honeybees are used to pollinate many tree fruits, almonds, berries, clovers, squashes,

pumpkins, and cucumbers. Among bees in the U.S., only the introduced Old World honeybee has perennial social colonies.

Native bee communities can be expected at every national wildlife refuge, except possibly rocky seabird rookeries. Even watery waterfowl refuges host native bee communities nesting in earthen dikes or pithy stems of emergent vegetation and foraging at and pollinating flowers of water-loving willows, water lilies and marsh mallows.

Are honeybees necessary to pollinate native plants? Not where native pollinator faunas are intact. Many native species provide pollination services, including bees and some kinds of flies, beetles, moths, butterflies or wasps, hummingbirds (think red tubular flowers), some bats, and wind (wind moves pollen of grasses, sedges, some trees and crops). North America has 4,000 species of native bees. On an average 25,000-acre national wildlife refuge, 100-400 bee species are possible, based on the few intensive bee surveys conducted at that spatial scale.

Before Columbus landed on North America, native bees alone satisfactorily

Pollinator Friendly Practices: North American Pollinator Protection Campaign

Foraging Habitat

- 🍃 Ensure sufficient foraging habitat, including plant species, and try to ensure continuous bloom from early spring through fall.
- 🍃 Cultivate native plants in clusters that can serve as sources of nectar, pollen for adult pollinators, or larval host plants. Consider flower shapes that are accessible to the pollinators. For example, deep or complex flowers may

be suited to bumblebees; open flowers like asters are easily accessible to a wide range of bees, flies and beetles.

Reproduction

- 🍃 For specific butterfly and moth species, appropriate larval host plants should be used. For native bees, sufficient ground nesting areas, snags, or bee blocks should be available. Hummingbirds and doves seek sufficient nesting habitat, while bats

pollinated those native plants adapted for bees. That seems true today, even for the dozens of critically endangered flowering species studied by Dr. Vince Tepedino at the Bee Biology and Systematics Research Laboratory of the Department of Agriculture/Agricultural Research Service in Logan, Utah.

Do honeybees help to spread and propagate invasive plants? Honeybees can help spread and propagate invasive plants because they avidly visit flowers of many invasive alien weeds, shrubs and trees. Examples include Japanese privet, melaleuca, yellow star thistle, purple loosestrife, Brazilian pepper, tamarisk, field bindweed, Russian olive, sweet clovers and Himalaya blackberry. Many of these produce copious nectar, helping beekeepers' colonies amass surplus honey. Research has shown that honeybees enhance yellow star thistle's seed production.

Where honeybee colonies reside for weeks, their foragers will find and pollinate such weed patches within a one- to two-mile radius. For quick stays of a few days, foragers venture only one-tenth that distance. Where proliferating weedy exotics are worrisome, temporary apiaries

should be placed far enough away to avert unwanted weed pollination.

Do honeybees compete with native species? A few small but well-designed manipulative studies found native bee reproduction little disturbed by honeybee foraging competition. A few scattered colonies may have little impact, but in one month an apiary of 100 strong colonies could take one *ton* of pollen and 1,000 *gallons* of nectar from the surrounding habitat!

Probably the most intense competition and resource depletion occurs in the few days following establishment of a large apiary, when worker bees unfamiliar with the new landscape concentrate their foraging within a few hundred yards around their hives.

Further study is needed to determine whether feral honeybees could displace cavity-nesting species. The natural nesting cavity of choice for feral honeybee colonies is a hollow tree bole. In regions of Australia where these nesting opportunities are scarce, it is clear that feral honeybees are competing with and displacing cavity-nesting birds, such as the

endangered cockatoos. No comparable evidence is available for North America. On refuges with cavity-nesting birds but few big hollow trees, cavity availability and occupancy (honeybees vs. birds) merits examination.

Can honeybees transmit disease to native bees? None of the parasites, pests and diseases, such as parasitic mites (*Varroa* and trachaeal), pests (wax moth and hive beetle), or larval diseases (chalkbrood and foulbrood) that plague feral and managed honeybees were known to transfer to any North American bee. Now one mite-transmitted viral disease hosted by honeybees has been detected in a European bumblebee. North American bees generally suffer their own suites of mites, parasites, predators and diseases. Native bees are at risk from other exotic bees (bumblebees, non-social bees) bearing undetected pestilence and disease that may spread, from states or countries where importation is not tightly regulated. **u**

Dr. James Cane is with the Department of Agriculture/Agricultural Research Service, Bee Biology and Systematics Laboratory, Utah State University.

require sufficient roosting and maternity habitat.

🍃 Habitat connectivity is important. For bees, both nesting and foraging habitat should be close together to benefit the most species and provide optimum conditions.

Shelter

🍃 Provide windbreaks, specific plantings and overwintering areas. Shelter belts such as snags and additional nectar/pollen sources (maples, wild cherries, linden) can provide nesting for hummingbirds as well as bees.

🍃 Nesting sites are more valuable when they are located near foraging areas

that receive sun early in the season. Bumblebees prefer partial shade for nesting. Most ground nesting sites should face south so they get the sun for more of the day. **u**



For specific butterfly and moth species, appropriate larval host plants should be used. (USFWS)

Great Storytellers in a Communications Thaw



This Emperor goose is caring for her chicks at Yukon Delta National Wildlife Refuge in Alaska. In December 2005, the refuge hosted the Yup'ik Calista Elders Council to share knowledge about migratory birds. (USFWS)

The ice is thawing in parts of Alaska. It has nothing to do with global warming, and everything to do with human communication.

In December 2005, the Yukon Delta National Wildlife Refuge hosted the Calista Elders Council (CEC) and their consulting anthropologist Ann Fienup-Riordan for a discussion of migratory birds – the first joint, topic-specific gathering that “gave us an opportunity to relax and take the time to listen to each other,” said Refuge Manager Mike Rearden.

Fienup-Riordan has been working with the Council since 1999, drawing on its 1,300 members to document traditional Yup'ik knowledge about a wide range of topics, including family values, kinship, harvesting and birding. At the meeting, Fienup-Riordan shared her document about migratory birds and waterfowl with Rearden and refuge wildlife biologist Brian McCaffrey.

The refuge hears from elders and other native residents about issues, but Rearden says such meetings are often confrontational and constrained by time. Last year's gathering was a rare time to

share knowledge and ask questions.

Refuge staff listened as Yup'ik elders shared their traditional ecological knowledge about wildlife along the southern coast of the Yukon-Kuskokwim Delta. Although birds were the primary focus, elders and refuge biologists also discussed populations and habitat trends for other wildlife as well, including fish and furbearers.

“Yup'ik people, particularly elders, are very observant and have a deep understanding about wildlife,” noted Rearden. “I particularly enjoyed hearing them talk about their wildlife observations that paralleled the knowledge we have, knowing that their information was gathered in a much different manner. It underlines the importance of realizing that there are many ways of learning things.”

“I couldn't pass up the opportunity to learn some of the elders' information about fish,” said refuge fisheries biologist Dan Gillikin. McCaffrey added that, “Frankly, it's just fun. They're great storytellers!”

The Land Was Undulating

What Gillikin and the other refuge staffers learned turned out to be fascinating. Elders and refuge scientists alike had noticed changes in wildlife populations as well as the evolution of some ponds and lakes on the refuge into bogs or even meadows. The elders commented that many of these changes were first noticed after a 1964 earthquake. Gillikin remembers the elders saying that they were on the delta when the earthquake struck and saw the land undulating.

For wildlife biologist McCaffrey, this was precisely the kind of broader perspective that provides more context to interpret patterns in habitat and wildlife changes. Until now, there has been very little research into the impact of that earthquake.

The meeting had quieter benefits, too. An elder from a coastal village diplomatically explained villagers' dislike and distrust of federal waterfowl and hunting regulations. Rearden – equally diplomatically – explained the benefit of regulations to sustaining wildlife populations so they can be harvested. At the end of the meeting, the elder came over to talk casually with refuge staff. “Doors were opening,” said Fienup-Riordan.

The December meeting was also a test for a much larger project in which five coastal villages on Nelson Island, never before receptive to government scientists, now want to work with several federal agencies. Even though the tribal land is an inholding within refuge borders, there has been no biological fieldwork on Nelson Island in the Bering Sea for 20 years.

If a grant from the National Science Foundation is forthcoming, McCaffrey will set up camp for a full summer's worth of fieldwork with groups of Yup'ik elders and students. McCaffrey sees an opportunity to inventory breeding birds on Nelson Island and study upland waterfowl, providing baseline data that will be trusted by both tribal leaders and government scientists.

Refuge staff is optimistic that these initial conversations will lead not only to a better understanding of long-term wildlife population trends from the perspective of indigenous residents but also lay the groundwork for continuing collaboration between the elders and the refuge.

“Between diverse cultures,” concluded Rearden, “it takes a lot of effort and willingness to listen to each other to begin to really communicate.” **u**

Around the Refuge System

Pacific

Record numbers of Laysan and black-footed albatross were counted at Midway Atoll National Wildlife Refuge in December and January. Numbers of both species climbed to the highest level since the annual count began in 1991. Counters tallied 511,612 nests during a three-week period. "More nests meant more work, but it was extremely rewarding to see the numbers just keep rising," said Annie Marshall of the Fish and Wildlife Service's Pacific Islands office in Honolulu. Total breeding population is about twice the number of nests. Volunteers came from Minnesota, Oregon, California and Hawaii. Some counters have waited three years to come to Midway Atoll, which hosts the world's largest populations of Laysan and black-footed albatrosses.



Volunteers Nara Takakawa, Annie Marshall and Breck Tyler joined in a count that found a record population of Laysan and black-footed albatross at Midway Atoll National Wildlife Refuge. (Roy Lowe/USFWS)

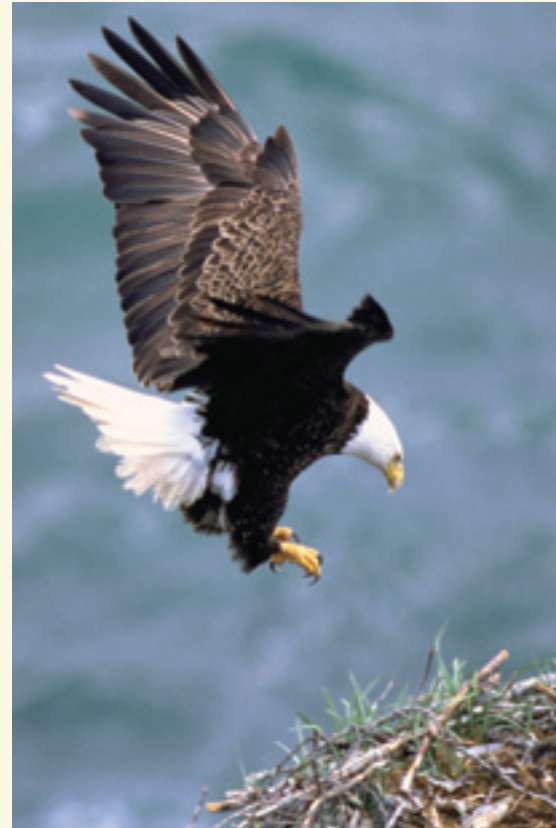
Nebraska

Rainwater Basin Wetland Management District has been harvesting nearly 20,000 pounds of native grass seed every year for the past four years for its grassland seed and restoration program. About 2,000-3,000 acres have been reseeded or interseeded this year with a highly diverse grass seed mix. The program has saved around \$800,000 in seed purchases, according to Brad Krohn, biological science technician. The harvested seed has been shared with LaCreek (S.D.), Kirwin (Kan.), Boyer Chute (Neb.) and DeSoto Bend (Iowa) National Wildlife Refuges as well as Waterfowl Production Areas, Ducks Unlimited, Pheasants Forever, Nebraska Game and Parks Commission, Joint Venture and The Nature Conservancy.

The seed is harvested by hand, a pull-behind seed stripper and a combine. "The big thing to know," says Krohn, "is that it can be done." He notes that a lot of the best practices being used in the seed harvest at Rainwater Basin WMD were learned from Detroit Lakes Wetland Management District and Neal Smith National Wildlife Refuge, which is working to recreate 8,000 acres of tallgrass prairie.

In Memoriam

Friends of White River National Wildlife Refuge Treasurer Nell-Ruth Newkirk passed away January 16 due to injuries sustained in a car accident. Newkirk helped spearhead the Friends group at White River Refuge and spent countless hours volunteering in the bookstore and at special events. She and her husband Robert, president of the White River Friends, were the backbone of the small group. Newkirk was available whenever there was a need. Co-workers say her positive attitude, warm personality, creative thinking, and exceptional organizational skills were a great asset to the refuge as well as anyone who had the pleasure to work with her.



A record 161 active bald eagle nests were counted at Upper Mississippi River National Wildlife and Fish Refuge 2005, an increase of 31 from the previous year. It is estimated that 279 eaglets were born in these nests. (USFWS)

Alaska

The Alaska Moose Federation says moose-vehicle collisions caused \$18 million worth of property damage across the state in 2003. On the Kenai peninsula alone, approximately 270 moose are killed every year in accidents with vehicles, the major cause of death for female moose on Kenai National Wildlife Refuge. Kenai Refuge organized a working group to address the problem, along with the Federation, Federal Highway Administration, and Alaska Departments of Transportation & Public Facilities, Fish & Game, and Public Safety.

Refuge wildlife biologist Rick Ernst initiated the study when he learned that the state planned to widen Sterling Highway through the refuge, potentially causing even more moose-vehicle collisions. Thirty-one cows were captured

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Around the Refuge System

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on Kenai Refuge and fitted with global positioning collars. Before the state begins reconstructing the Sterling Highway, the working group will recommend mitigation based on two years' worth of data collected from moose collars, motorist reports and road-kill reports. Mitigation may include wildlife crossing structures (overpasses or underpasses), flashing wildlife-activated crossing signs, fencing or lighting.



Vehicle collisions are the major cause of death for female moose on Kenai National Wildlife Refuge in Alaska. Thirty-one cows were fitted with global positioning collars so their movement can be tracked and actions taken to reduce collisions. (USFWS)

Florida

Research is underway to locate the best highway crossings to accommodate Florida panthers and other animals. Researchers from the University of Central Florida are expected to recommend locations for animal crossings in Collier County, just north of the Florida Panther National Wildlife Refuge. The study, due in September, is also expected to recommend specific designs for the crossings. Vehicle collisions are a major cause of death for

the highly endangered Florida panther, second only to the territorial animals killing each other.

Minnesota

The number of moose at Agassiz National Wildlife Refuge is dwindling but it has nothing to do with vehicle collisions. A research project, initiated in 1995, concluded that liver flukes and brain worm were a major apparent cause of death; both are deer parasites that have adverse effects on moose. The deer population was high during the 1990s when moose declines were noted.

Researchers also found that the moose population often decreased in the years after summers with higher mean temperatures. Winter and summer temperatures in the past 41 years have increased by about 12° F and 4° F respectively. Higher temperatures in spring and fall require moose to expend more energy to keep cool. The additional heat stress may accentuate other problems including the parasites. The study concluded that global warming combined with increases in the number of deer and parasite transmission rates may have made Northwest Minnesota inhospitable to moose - problems that cannot be changed by management actions. "Until the climatic factors that are making the moose range shrink to the North are reversed," stated the report, "we will probably see fewer moose in Northwest Minnesota."



Vehicle collisions a major cause of death for the highly endangered Florida panther; second only to the territorial animals killing each other. A study by the University of Central Florida is expected to recommend locations and designs for potential animal crossings across highways near Florida Panther National Wildlife Refuge. (USFWS)

Current moose counts are bearing this out. Population surveys between 2000 and 2004 indicated the moose population on the refuge and adjacent Wildlife Management Units was holding steady between 70 to 80 moose. The 2005 and 2006 census estimates indicate that the population has decreased to 40 to 50 moose.

Minnesota

The Upper Mississippi River National Wildlife and Fish Refuge hosted 161 active bald eagle nests in 2005, a record number and 31 more than in 2004. The number of active nests on the refuge, which stretches from Wabasha, Minn., to Rock Island, Ill., has doubled over the past five years. Refuge Manager Don Hultman says, "Bald eagle numbers are one measure of habitat health. The increasing number of active nests and the number of eagles that use the refuge during migration and wintering is a good reflection of how the water quality has improved since the 1970s." In 1972, there was only one known eagle nest on the refuge, which today is believed to host more eagles and nests than any other refuge outside Alaska.



Biological technician Curtis Knight designed and built an erosion-preventing grated walkway at a remote administrative cabin on Kanuti Refuge in Alaska. The walkway is built in easily movable sections to minimize damage from the annual spring breakup of river ice. In addition to the Department of the Interior Environmental Awards won by Kanuti, Sachuest Point and Brazoria Refuges, Knight won the Workplace Improvement Award for the Alaska Region. (Mike Spindler/USFWS)

And the Winner is... Kanuti, Brazoria, Sachuest Point

Three national wildlife refuges were honored with the Department of the Interior Environmental Achievement Awards in 2005 – Kanuti National Wildlife Refuge in Alaska, Brazoria National Wildlife Refuge in Texas and Sachuest Point National Wildlife Refuge in Rhode Island.

Kanuti Refuge, which lies about 150 miles north of Fairbanks, was honored for its Environmental Management Team and a plan to ensure that refuge activities have minimal impact on a sensitive ecosystem. Although the refuge straddles the Arctic Circle, for example, solar power provides a significant amount of energy. The sun generates virtually all the electricity for an outlying residence for the refuge visitor services professional. A remote field cabin is being converted from gas to primarily solar this spring. Refuge Manager Mike Spindler says solar is more economical largely because hauling gas or diesel fuel to remote locations is so expensive, exceeding \$6 per gallon at Kanuti.

Kanuti was also recognized for its work with local villages to improve management of subsistence use. The native villages of Bettles/Evansville and Allkaket use the refuge for subsistence hunting to feed their families. Spindler explains that before World War II, these villages relied almost entirely on subsistence resources and were largely “in balance” with the surrounding ecosystem. Wasting a fish or animal was considered a social taboo.

With the advent of a cash economy and consumer luxuries, hunting and fishing became supplemental and the spiritual connection to the land diminished, especially among the younger generations. Spindler said the refuge is cooperating with local tribal councils to help educate villagers about the connection between fish and game regulations and the goal of providing a sustainable harvest.

Sachuest Point National Wildlife Refuge

From the largest state to the smallest: Sachuest Point National Wildlife Refuge in Middletown, R.I., was honored for environmental stewardship in remediating a municipal landfill and restoring the original wetlands habitat. Project leader Charlie Vandemoer proudly says that, “we literally turned a mountain of trash into high quality saltmarsh, which has become a favorite birding spot for the local community.”

Vandemoer says engineer V.A. Sridhar is primarily responsible for the success of the complex project, but he also credits the ideas and flexibility gained by working with a wide variety of partners.

About 21 acres of the refuge had been used as a landfill from the mid-1950s until 1972. The trash was consolidated in one area and capped in part with soil from neighboring Ninigret National Wildlife Refuge, immediately restoring several acres of wetlands on that refuge. The final seed mixture will be placed on the cap this year, creating a 15-acre grassland of native species.

When areas adjacent to the work site were excavated to provide clean soil for the cap, invasive phragmites was removed and long lost saltmarsh/wetlands were restored. The tidal flow has returned and shorebirds came back almost immediately. Birders have identified at least 17 new species in the newly created wetlands, and piping plovers are already nesting on some of the remediated landfill area.

A research project funded by NOAA will monitor the progress of the salt marsh as wildlife and vegetation come in naturally over the next several years. “This project had lots of twists and turns,” said assistant refuge manager Sharon Ware, “but we accomplished lots of goals.”

Brazoria National Wildlife Refuge

Moving west again to Texas, Brazoria National Wildlife Refuge was honored for designing the Fish and Wildlife Service’s first energy-independent facility with its new Environmental Education Center and Visitor Contact Station.

Electricity at the 2,000-square-foot facility is entirely solar powered. Built in a remote area of the refuge, the Brazoria Discovery Center also features energy efficient windows, sustainably harvested construction materials and an exceptionally efficient air conditioning system.

The Friends of Brazoria Refuge raised funds to purchase scientific educational equipment for the center. Soon, a screened pavilion will be added, providing seating for more than 100 schoolchildren. u

Learning Lessons of the Past in Hawaii's Lava Tubes



Paleontologist Helen James collected bones of ancient geese in lava tube at the Kona Forest Unit of the Hakalau Forest National Wildlife Refuge on the Big Island of Hawaii. Dr. James's research has shown that the Laysan duck once lived throughout the Hawaiian Islands. Laysan ducks are one of only two endemic duck species still found in Hawaii. (Debbie Ward)

Helen James spent the first few weeks of 2006 rescuing ancient bones from the rats in the dark lava tubes of Kona Forest Unit of the Hakalau Forest National Wildlife Refuge on the Big Island of Hawaii.

The lava tubes of the Hawaiian Islands are the largest and longest in the world and are comparable to vaults full of gold to paleontologists like Dr. James. She works for the Smithsonian Institution's Division of Birds at the National Museum of Natural History in Washington, D.C.

Most lava tubes are formed when molten lava flows downhill from the mouth of a volcano. As the upper crust of the lava cools, it hardens and insulates the river of hot lava still flowing beneath the surface. When the lava flow subsides, what's left is a tubular passageway underground.

In Hawaii, some of the tubes run for dozens of miles. They can be as cavernous as a subway station or as cramped as a

sewage pipe. And they are a repository for the bones of ancient birds.

For more than 20 years, Dr. James and her husband, fellow Smithsonian scientist Storrs Olson, have been collecting bones from the sand dunes, caverns and lava tubes of the Hawaiian archipelago.

Their findings and research have persuaded her that the pattern of massive extinctions among prehistoric birds in the islands could foretell modern disasters of biodiversity if human beings don't learn the lessons of the past.

Reading the Bones

Scientists believe the first aboriginal Polynesians arrived in the Hawaiian Islands between 1,300 and 2,000 years ago. Paleontologists and carbon-dating have determined that when humans first stepped onto those shores, the islands were home to hundreds of native species of birds that had survived the last ice age, the Late Pleistocene period, and other events of nature throughout pre-history. Because the string of islands lies 2,000 miles from any continental land mass, birds were the vertebrates best able to reach and colonize there.

Scores of those species would not survive the arrival of man.

Dr. James estimates that 90 percent of the native species of the Hawaiian Islands present 2,000 years ago are now either extinct or threatened with extinction. She calls it "catastrophic." Some of those

extinctions, she says, are as recent as 500 years ago: the blink of an eye to paleontologists.

We have good evidence from radio-carbon dating," she says, "that those extinctions occurred after and are associated with human changes to the ecology."

For example, the Polynesians introduced new and invasive animals to the islands. There were no native, ground-dwelling mammals in the Hawaiian Islands when man arrived. When he did show up, stowaway rats came with him. The rats thrived on seeds and seedlings and bird eggs. They were a new competitor for existing food in the natural world, and a new predator for birds that, erstwhile, had not had to defend themselves from such predations.

Humans converted wild places to farmland, and burned off areas to create grasslands for grazing. "The structure of the vertebrate community was affected by human habitation, and that affected the structure of the plant habitat," says Dr. James. Establishing what existed in the natural ecological order before humans intruded can help refuge managers set "targets" for restoration, says Dr. James.

The Laysan Duck

For example, it's long been thought that the endangered Laysan duck was native only to the tiny atoll of Laysan, a speck of land vulnerable to hurricanes and typhoons and utter destruction. Dr. James's research has shown that, in reality, the Laysan duck once lived throughout the Hawaiian Islands. Laysan ducks are one of only two endemic duck species still found in Hawaii.

The Refuge System has already gotten the message. Fearing that a single weather event could wipe out the species, U.S. Geological Survey and Service biologists in October 2004 transferred 20 ducks from Laysan Island in the Hawaiian Islands National Wildlife Refuge to Sand Island in Midway Atoll National Wildlife

continued pg 27

Winners Inspire Spirit of Conservation and Stewardship



Glenn Carowan, manager of the Chesapeake Marsh National Wildlife Refuge Complex in Maryland, was honored as Refuge Manager of the Year by the National Wildlife Refuge Association and the National Fish and Wildlife Foundation. Interior Secretary Gale Norton made Blackwater National Wildlife Refuge – one of the refuges within the Chesapeake Marsh Complex – one of her Earth Day stops in April 2005. (USFWS)

Glenn Carowan, manager of one of the most ecologically diverse refuge complexes in the National Wildlife Refuge System, has been honored as Refuge Manager of the Year by the National Wildlife Refuge Association and National Fish and Wildlife Foundation. As manager of the Chesapeake Marsh National Wildlife Refuge Complex in Maryland, Carowan is credited with employing strong partnerships, including an extremely active Friends organization, and sound science to protect and restore wetlands, forests and islands.

Through a successful collaboration among several agencies, Carowan led a campaign to remove the highly invasive and destructive nutria from the refuge and the surrounding Chesapeake Bay area. He

also worked with local leaders to promote the expansion and renovation of the Visitor Center.

Under Carowan's leadership, the Chesapeake Marshlands Complex hosts scientific meetings and research projects, such as using clean dredge material to restore marsh and wetland habitat.

The Refuge Manager of the Year award is named in honor of Paul Kroegel, the first manager of the nation's first refuge, established in 1903 on Pelican Island, Florida.

The Employee of the Year Award goes to Great Lakes Region Refuge Planning Specialist **John Schomaker**, who made significant contributions to streamlining the Comprehensive Conservation Plan

process. Schomaker implemented a national refuge manager survey on the CCP process (see *Refuge Update* November-December 2005) and a system to track CCPs. He is currently coordinating an approval process for public surveys that will help refuge staff improve visitor services programs.

Tim Anderson won the 2006 Volunteer of the Year Award. Volunteers contribute more than 1.5 million hours to U.S. Fish and Wildlife Service, mostly to the Refuge System. Anderson alone has contributed 10,000 hours to Seal Beach National Wildlife Refuge in California, the only refuge completely enclosed within a naval weapons station. Anderson has been instrumental in finding innovative ways to bring the community and the refuge together while respecting the Navy's security requirements and the refuge's wildlife management needs.

Anderson has designed and built platform nests for endangered light-footed clapper rails and trained docents to give refuge tours. He also developed the Pelican Van project, which brings multimedia presentations to schools, museums and festivals. A founding member of the Friends of Seal Beach NWR, Anderson helped upgrade the Friends school presentation to conform to California State Science Standards.

The **Friends of Great Swamp National Wildlife Refuge** in New Jersey won the 2006 Friends of the Year award. The Friends' education program includes a "swamp in a box" kit that is borrowed by school classes; the kit includes educational videos and guides written by Friends. The Friends host at least two public educational programs each month on this refuge, just 26 miles from New York's Times Square. They also developed a Wildlife Tour Route guide and a Discovery Den for young visitors. u

DuPont's Gift to the Nation



In the largest land donation ever made by a private company in Georgia, DuPont Corp. gave 16,000 acres of land to The Conservation Fund. The Fund gave 7,000 acres to Okefenokee National Wildlife Refuge. The acreage includes upland pine habitat, critical foraging area for the refuge's population of endangered red-cockaded woodpeckers. (USFWS)

By Shawn Gillette

It's every land manager's nightmare: a corporation decides to establish a strip mine next to a protected natural ecosystem. Okefenokee National Wildlife Refuge, Ga., faced this possibility in 1994, when DuPont Corp. announced plans to establish a titanium strip mine on 16,000 acres along Trail Ridge, adjacent to the refuge.

Solid relationships with refuge partners, and open and frank discussions with the surrounding community and DuPont turned what could have been a potential problem for the refuge into a celebration of the largest corporate land donation in Georgia history.

In November 2005, representatives of DuPont, The Conservation Fund, International Paper, Georgia Wildlife Federation, state and federal congressional districts, and local and county government joined representatives of the U.S. Fish and Wildlife Service and Okefenokee Refuge in celebrating the transfer of 7,000 acres to the Service.

Southeast Regional Director Sam Hamilton praised the partnership that

made the donation possible when he said, "Dupont's donation will not only be remembered as a gift to the Service, but also a gift to the entire nation."

History

DuPont's 1994 announcement about the strip mine stirred controversy not only for the Service, but also for local citizens and others who did not want to see a mine developed next to one of Georgia's longstanding treasures. "With its world-class wetlands and magnificent forestlands, Okefenokee Refuge is a natural wonder to be treasured by all Americans," said Larry Selzer, president of The Conservation Fund, which played a crucial role in the outcome of the situation.

Beginning in early 1997 and continuing for the next two years, DuPont hired an arbitration group to coordinate a series of meetings with interested stakeholders. DuPont representatives listened as representatives of nonprofit organizations, some local officials and area business leaders, and even representatives of the local Cherokee Nation stated their opposition to the strip mine.

"This wasn't an easy process for DuPont," said Skippy Reeves, former Okefenokee

Refuge Manager. "DuPont's representatives continued to take an active role even though it seemed everyone was aligned against them. I admired their determination to keep negotiating, since at any time they could have simply walked out and left us with a titanium strip mine in our backyard!"

"No Mine" Resolution

In 1999, DuPont announced that it would support a "No Mine" resolution on the Trail Ridge property. That same year, DuPont took the bold step of donating the 16,000 acres to The Conservation Fund through its Lands Legacy Program. The Georgia Wildlife Federation holds a conservation easement on the entire 16,000 acres – ensuring that the whole tract will be permanently protected from mining or other development. With DuPont's consent, The Conservation Fund donated 7,000 acres of the original 16,000 to the Service in 2005.

The 7,000 acres received by the Service includes upland pine habitat, which provides critical foraging habitat for endangered species such as the red-cockaded woodpecker, gopher tortoise and indigo snake. Though the Service owns the property, it will cooperatively manage it with International Paper (IP), through a cooperative forest management agreement initiated in 1999 and revised in 2005.

Under the cooperative agreement, IP will retain both the timber and recreation rights to the land until 2081, which were granted to them through an earlier agreement with DuPont. But IP will work with the Service to modify their forest resource operations by initiating longer crop rotations and replanting with native longleaf pine.

Refuge staff will use prescribed fire on the land to reduce the threat of wildland fire and promote suitable foraging habitat for the critical wildlife species that depend on the upland environment for their survival. **u**

Shawn Gillette is a refuge ranger at Okefenokee National Wildlife Refuge, Ga.

Second DVD of Refuges Now Available

Those who loved the first DVD volume now can order “America’s Wildest Places – Volume 2,” featuring video tours of six national wildlife refuges. The first volume sold more than 1,500 copies, giving people an action-packed window on wildlife right in their own homes.

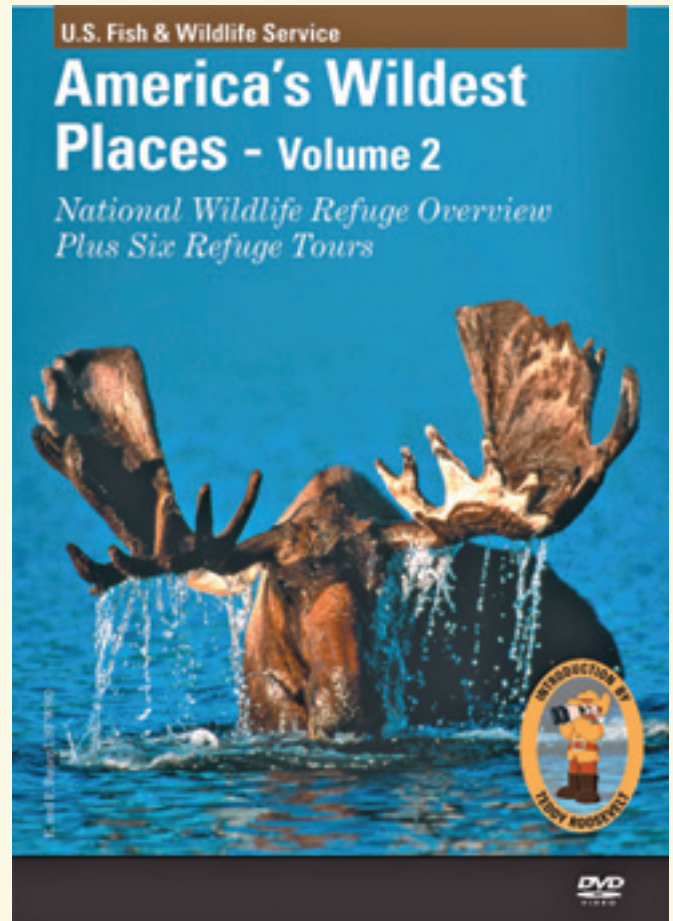
Volume 2 goes through Mississippi’s Noxubee National Wildlife Refuge’s backwaters and woodlands, filled with the natural music of a southern serenade. Ride with mighty bison herds at Montana’s Bison Range, or see Yukon Flats National Wildlife Refuge, filled with moose and other majestic mammals in America’s last frontier. Then fly to Bosque del Apache, Blackwater, and Crab Orchard national wildlife refuges, where viewers can see sandhill cranes, great flocks of Canada geese and secretive songbirds of deep forests.

The newest DVD also contains the 12-minute feature, “The National Wildlife Refuge System – A Place for Wildlife and People,” which presents an overview the nation’s 545 national wildlife refuges. It presents more than 90 minutes of the most stunning and dramatic scenes from

the National Wildlife Refuge System, shot by the outstanding videographers of the U.S. Fish and Wildlife Service. It is close-captioned for the hearing-impaired.

“America’s Wildest Places – Volume 2” sells for \$6 each, plus \$2.50 each for shipping and handling. Each order includes a copy of the National Wildlife Refuge System Visitor Guide, a convenient road map to all national wildlife refuges and a listing of public use activities at each refuge. Volume 1 is still available, also for \$6 plus \$2.50 shipping.

To order, go to <http://www.fws.gov/>, and click on the image of the “America’s Wildest Places” DVD. u



Wildfire Tool – from pg 9

wildland fire use, or assessing potential wildfire impact to better plan fuel reduction projects. In Alaska for example, LANDFIRE should enable us to determine the relative wildfire risk for villages scattered across refuges. We will also be able to model how that risk could be reduced by establishing firebreaks in different locations.

Biologists could use LANDFIRE modeling to determine species-specific habitat information: does a particular bird, for example, known to nest only in tall willow with an open canopy and moss understory, have nesting habitat on the refuge or on neighboring land? Because

LANDFIRE will be a national database, the information will be consistent no matter who owns the land. After all, neither fire nor wildlife respects man-made boundaries.

If you live and work in the Rocky Mountains, Colorado plateau and Great Basins, you may already be able to use LANDFIRE data developed for prototype areas. You can download final products or the intermediate data layers, or work with data online through the LANDFIRE Web site, landfire.gov.

Although LANDFIRE work for Alaska is not scheduled until 2008, I’m already involved in interagency coordinating group efforts to make sure that some

Alaska-specific quirks can be accommodated. For instance, fuel models for Alaska are more similar to Canada than the rest of the United States because of similar latitude and forest vegetation.

It’s both challenging and exciting to be on the ground floor of a project that should benefit fire managers and biologists throughout the Service for decades to come. For more information about LANDFIRE and its scheduled implementation, go to the landfire.gov Web site or contact Chris Pease, acting Refuge System Chief of the Division of Natural Resources at 703-358-1870. u

Karen Murphy is a regional fire ecologist in Alaska.



The Wetlands Reserve Program gives landowners financial incentives to restore, protect and enhance wetlands in exchange for retiring marginal land from agriculture. (USFWS)

Healthy Habitat – from pg 3

protect and enhance wetlands in exchange for retiring marginal land from agriculture. Landowners receive either a permanent or a 30-year easement on their property and they retain ownership of the

land. USDA pays for the easement and either all or most of the costs of restoring the wetland.

The Grassland Reserve Program protects grassland from being used for crops or urban development but still allows it to be

used for grazing. This program emphasizes support for working grazing operations as well as enhancement of plant and animal biodiversity.

Prairie Potholes and the Farm Bill

The landscape of the Fergus Falls Wetland Management District in Minnesota is dotted with thousands of prairie potholes, small wetlands created by glaciers. Legislation that preceded the Farm Bill protected thousands of these small wetland areas, but it was the CRP that permitted restoration of the upland cover surrounding the wetlands.

Half to three-quarters of all the ducks in North America nest and raise their young in the prairie pothole region of the Dakotas, eastern Montana and western Minnesota and the southern Canadian Provinces. The ducks nest in the upland areas but need the brood marshes to raise their young.

The CRP alone resulted in converting approximately 4.7 million acres of cropland in the region to grass, making this acreage much more attractive to breeding ducks. Staff at Fergus Falls provided technical assistance to help landowners restore wetlands.

Alaska Friends – from pg 8

had worked with Alaska Maritime Refuge through the conservation community for more than a decade. “I was impressed by the talent, energy and commitment of these special Friends,” he said.

Initial Projects

The Friends seek to educate the public and decision makers about Alaska’s refuges, implementing a communication network for those interested in refuge news and raising money for refuge projects. They have developed a logo, are designing a brochure and applying for non-profit status with the Internal Revenue Service.

The Friends meet monthly by teleconference, while conducting their work through e-mail. They will meet face-to-face in one annual meeting. The Friends are recruiting board members who live in rural locations close to Alaska’s national wildlife refuges and can serve as representatives for those communities and refuges. Eventually, the Friends hope to help organize “sub groups” to work on local projects.

They are also gearing up for their first big project this summer – a statewide exotic weed pull. Friends’ representatives in communities such as Anchorage, Tok, Soldotna, Homer, Cold Bay and Unalaska will work with refuge staff to coordinate and train volunteers.

Please Join

The Friends of Alaska National Wildlife Refuges is currently looking for members. If you would like to become a member to participate in an educational network or to work on a project, please contact the Friends at akrefugefriends@gmail.com or through the mail at 2440 E. Tudor Road, PMB 283, Anchorage, AK, 99507-1185. u

Maeve Taylor is volunteer and grants coordinator in Alaska.

When the Wetlands Reserve Program began, Fergus Falls WMD Manager Kevin Brennan explains, federal, state and local partners saw an opportunity to achieve even greater goals. This partnership began working together to acquire fee or easement interest on land surrounding the wetland areas already owned by the Fergus Falls Wetland Management District and the Minnesota Department of Natural Resources. In cooperation with the Buffalo-Red Watershed District, the Manston Slough Restoration Project will ultimately restore the natural hydrology of a 1,986-acre wetland within a larger 5,000-acre protected area. This will help reduce flood damage, control erosion, and improve water quality for both wildlife and people.

Willamette Valley Refuges

Farm Bill conservation programs have also helped fund restoration projects on private lands near three refuges in Oregon's Willamette Valley – William L. Finley, Baskett Slough and Ankeny. Cooperative agreements among the Service, NRCS, and private landowners provided Farm Bill funds that enabled Service personnel to prepare restoration plans for each site.

Several thousand acres of wetlands, wet and dry prairie and oak savannah habitat have been restored and the result has been very good for wildlife. Nelson's checkermallow, a threatened plant, could be recovered within five years. The Oregon chub, an endangered fish, is now found at 33 locations, up from 10 less than a decade ago. Two species of native birds – the western meadowlark and western bluebird – nested at Baskett Slough Refuge in 2004 for the first time in recent memory. u

Detailed information about individual Farm Bill programs is available at <http://www.nrcs.usda.gov/programs/farmbill/2002/index.html>



Several thousand acres of wetlands, wet and dry prairie and oak savannah habitat have been restored thanks to programs of the Farm Bill, all for the benefit of wildlife. (Gary Kramer/USDA/Natural Resources Conservation Service)

Lava Tubes – from pg 22

Refuge, about 1,250 miles northwest of Honolulu. In October 2005, a second translocation took 22 birds to Midway Atoll Refuge, including 16 ducks to Eastern Island.

All but two of the translocated ducks have survived – and thrived. At least 13 ducklings have fledged, and Midway Atoll Refuge now has at least 55 Laysan ducks. Refuge Biologist John Klavitter hopes that the population at Midway Atoll Refuge will someday equal or surpass the Laysan Island population.

Tools of the Trade

The tools of Helen James's research are the bones. She's in a race with time, and

the rats, to find the bones before they're destroyed.

While the 500-year old skeletal remains of a Laysan duck offer no meat for rats to feed on, Dr. James says the calcium and phosphorous still present in the ancient bones do appeal. The very cave darkness that saves the bones from sunlight and its damaging UV radiation also makes the bones an appealing appetizer for rats: the rats gnaw the bones for the calcium and phosphorous.

"The bones have a limited shelf-life," Dr. James says. So she's in a race with the rats to recover evidence of the past and clues to the future before the evidence is destroyed.

Islands and Continents

The Hawaiian Islands, with their limited size and access, are particularly vulnerable to species extinction. But Dr. James believes the same human factors that have led to island extinctions all over the world should be a cautionary tale for conservationists on the larger land masses called continents.

"We are facing a major biodiversity crisis worldwide," she says. "We need to understand why the island extinctions happened, so that we can prevent the same thing from happening on continents."

Dr. James's January visit to Kona Forest brought her a step closer to the answers. u

Chief's Corner – from pg 2

mission and where the science of conservation is a daily activity.

We must look critically at current staffing on refuges and use modern workforce planning strategies to deliver the best wildlife conservation. We will continue our emphasis on partnerships to leverage the funding we get. Base funding for our refuges can not only increase efficiency, but also eliminate the annual budgetary uncertainty. We will find management efficiencies where we can, and we will better integrate our activities with other disciplines.

The National Wildlife Refuge System, established for migratory birds, is the very foundation of the Fish and Wildlife Service. That is why, in this climate of change, the Refuge System stands ready to lead, especially as we look at cross-program issues.

As Director Dale Hall said during the workshop, change will be an ongoing process. We focus on our conservation priorities. Biology and ecology must determine focal areas.

As so many workshop participants said, we're ready to go.

Shells – from pg 7

helicopter. Kashimoto says the helicopter has much less impact on the aquatic environment surrounding the island than a barge.

Additional Foraging Habitat

The Marine Resources Council, an environmental group from Palm Bay, Fla., donated 50 mature mangroves instead of the young plants used previously. Twelve thousand smooth cordgrass plugs will also be planted. Contractors and volunteers from the Preservation Society and a local environmental science academy will do the planting. "We are repairing 100 years of damage," said Kashimoto, at cost this year of just under \$300,000.

Refuge Manager Paul Tritaik says, "The oyster shell bed, smooth cordgrass flats and mangrove shoreline will not only protect the island from erosion, but will provide additional foraging habitat and future nesting habitat for more than a dozen species of waterbirds and shorebirds." The adult mangroves will provide instant habitat for pelicans and other shorebirds.



Pelican Island is ringed with a yellow turbidity barrier that reduces sedimentation in surrounding water and protects adjacent sea grasses while helicopters drop bucks of shells in the area. (Mike Marshall/Coastal Resources Group)

In 1910, about 10,000 pairs of brown pelicans nested on the island. That's down to about 50 to 100 pairs now. The brown pelicans should begin nesting April with other species beginning a little earlier.

More than 30 species of birds have been observed on the island, as well as loggerhead sea turtles and several other endangered or threatened species.

In a separate project, the Sebastian Inlet Tax District is working with the refuge to create an offshore wave break and restored seagrass bed near Pelican Island to reduce the erosion caused by boat wakes. Tritaik says that project should begin later this summer. u

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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