



U.S Fish & Wildlife Service National Wildlife Refuge System

RefugeUpdate

November/December 2005 Vol 2, No 6

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With help from refuge experts, roads and bridges can be built to accommodate wildlife.

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Extraordinary diaries from refuge staffers who were there when Katrina came calling.

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Refuges give young people a chance to learn art, poetry, native culture, service – and stewardship.

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The Outstanding Refuge Plan of 2005 opens the door to the largest estuary restoration project in the Pacific Northwest.

About the Refuge System

Which national wildlife refuge is the largest?

With 19,286,242 acres, the Arctic National Wildlife Refuge in Alaska constitutes the largest wildlife refuge, followed closely by Yukon Delta National Wildlife Refuge, also in Alaska. Yukon Delta NWR has 19,162,295 acres.

Which refuge is the smallest?

Mille Lacs National Wildlife Refuge in Minnesota is the smallest, with just 0.6 acres.

20-Year Veteran Named Refuge Law Enforcement Chief



The Division of Refuge Law Enforcement has more than 470 full-time and dual-function refuge officers on the 545-unit National Wildlife Refuge System. (USFWS)

Mark Chase, a 20-year veteran of the U.S. Fish and Wildlife Service, was named to head its Division of Refuge Law Enforcement. In his new post, Chase leads more than 470 full-time and dual-function refuge officers on the 545-unit National Wildlife Refuge System.

“Mark is an outstanding addition,” said Refuge System Chief Bill Hartwig. “He brings long experience from the field. He has sterling leadership abilities that will help assure the safety and security of the 40 million people who each year enjoy wildlife refuges and the wildlife resources

we are committed to conserving.”

Chase will lead a force dedicated to enforcing laws that protect wildlife while facing growing threats along the border with Mexico as well as stopping drug trafficking and cultivation. Dual-function refuge officers fulfill critical resource management responsibilities in addition to their law enforcement duties.

Chase will lead implementation of the Refuge System’s first law enforcement deployment model, developed by the International Association of Chiefs of Police (IACP). Using workload data and hazard analyses,

it calculates appropriate staffing levels to meet the Refuge System mission. The IACP deployment model recommends 845 full-time equivalent officers. In addition to recommending that the Refuge System add full-time law enforcement officers, the deployment model also suggests the Refuge System increase its law enforcement coverage by increasing the number of mutual agreements or memoranda of understanding with other federal, state and local law enforcement agencies.



From the Director

Healing After Natural Disasters

For decades, the National Wildlife Refuge System has proven itself to be the

backbone of wildlife conservation in the United States. This fall, we witnessed moving examples of just how vital refuges have become to the communities that surround them.

In the aftermath of hurricanes Rita and Katrina, refuges became staging areas for relief efforts, while refuge employees, many of whom lost their own homes in the storm, risked their lives and health to bring aid to people in desperate need. For example, more than 600 Service employees from all programs worked in shifts at a command post at Big Branch National Wildlife Refuge, set up just days after Hurricane Katrina's landfall. Cooperatively with other agencies, including the Louisiana Department of

Wildlife and Fisheries, we participated in rescuing more than 4,500 people.

Thirty-seven national wildlife refuges were hit by back-to-back hurricanes Katrina and Rita. The damage is extensive. Even a short list of the damages is arresting.

National wildlife refuges in the Southeast saw about 150,000 acres of coastal and bottomland wetlands lost or damaged. Fifty sea turtle nests on the Alabama coast, including all 10 nests at Bon Secour National Wildlife Refuge, were lost. Breton National Wildlife Refuge – the second oldest in the National Wildlife Refuge System and globally important for colonial nesting birds – may have lost as much as 70 percent of its land mass. Noxubee National Wildlife Refuge in Mississippi and Big Branch Marsh National Wildlife Refuge in Louisiana lost a huge number of trees, including cavity

trees used by roosting and nesting red-cockaded woodpeckers.

We have our work cut out for us as we start to restore our national wildlife refuges. But the Fish and Wildlife Service has shown the resiliency and determination to overcome challenges. Now, we will use those assets in rebuilding our national wildlife refuges.

We can pinpoint the buildings and facilities that were damaged or destroyed, but we are still assessing the full ecological impacts of Hurricanes Katrina and Rita. Some will manifest themselves over time, including the spread of invasive species and the effects of contaminant releases. Right now, we are working with other agencies, states and partners to identify how we can divide responsibility for restoration and recovery, combining our capabilities and strengths. We know that the Friends organizations, so vital to national wildlife refuges, are anxious to help as they can.

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Chief's Corner

The Best of Times

I'm reminded of Charles Dickens' phrase "It was the best of

times, it was the worst of times" when I think about the past year for the Refuge System. Battered by the trifecta of Hurricanes Katrina, Rita and Wilma, national wildlife refuges suffered the ravages that only Mother Nature can inflict. Recovery will take a long time, but as tragic as those losses are, we also had huge gains.

The sightings of the Ivory-billed woodpecker at Arkansas' Cache River National Wildlife Refuge confirmed what we all know: The Refuge

System's mission of habitat protection carries benefits far into the future. The "Lord God" bird flies freely today because, for the past 102 years, we have never lost sight of our mission.

We now have a strategic plan that puts into action the vision embodied in both the National Wildlife Refuge System Improvement Act and *Fulfilling the Promise*. With this year's launch of the Refuge Annual Performance Plan, we can analyze exactly how far we have come in achieving our vision and how much further we still have to go. With these tools in hand, we have created a road map to excellence.

No road to excellence is taken as a solo journey. The "Friends in Action"

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RefugeUpdate

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Take Pride in America

Four of the 2005 Take Pride in America award winners have connections to the National Wildlife Refuge System as the national campaign works to turn stewardship of public lands back to its owners – the public. The annual awards honor groups and individuals who demonstrate exceptional stewardship.

Mark Musaus has been named one of five Federal Land Managers of the Year. As refuge manager of Arthur R. Marshall Loxahatchee National Wildlife Refuge in Florida, he collaborated on a variety of initiatives with the University of Florida, the U.S. Geological Survey and the South Florida Water Management District. He facilitated cooperation among biologists and other scientists and, working with partners, was able to more than triple the amount of funding available to remove invasive exotics from Loxahatchee Refuge. Musaus also serves on the Refuge System's National Mentor team to strengthen Friends organizations and their community partnerships with volunteers. (See sidebar on page 22)

Friends of Anahuac Refuge (FOAR) in Anahuac, Tex., received an award for a particularly successful public-private partnership. FOAR supports the Anahuac National Wildlife Refuge that lies along the upper Texas Gulf Coast. Over the last year, Friends members designed and constructed a 1.5-acre butterfly and hummingbird landscape that provides nectar and host plants for 15 butterfly species as well as nectar for ruby-throated hummingbirds. Friends president Chuck Redell noted, "Volunteers did everything from helping to pour and stamp the accessible concrete



Volunteers at Ash Meadows NWR helped restore habitat for 25 endemic species, 12 of which are threatened or endangered. The Desert NWR Complex in Nevada participates in the award-winning Southern Nevada Interagency Volunteer Program. (USFWS)

trail to planting, weeding, mulching and watering."

FOAR received a National Fish and Wildlife Foundation Centennial Refuge Legacy grant for \$13,500 to fund the new landscape. Cash and in-kind donations from individuals, businesses and foundations more than doubled that amount. More than 110 volunteers donated about 2,000 hours. Individuals or organizations have adopted nine of the 16 butterfly or hummingbird "beds."

The Texas Master Naturalist Program was honored as a statewide initiative. Since its beginning in 1998, the program has grown to 27 self-sufficient volunteer-led chapters of highly trained naturalists. In 2004 alone, the program trained 531 Master Naturalists and reached out to 333,387 youth, adults and private

Friends of Anahuac Refuge designed and constructed a Butterfly and hummingbird landscape that provides nectar and host plants for 15 butterfly species as well as nectar for ruby-throated hummingbirds. (Michele Whitbeck/USFWS)

landowners. Seven of the 11 national wildlife refuges in Texas work with Master Naturalist chapters. At Aransas NWR, the Friends and Master Naturalist chapters worked together to obtain a \$50,000 grant for the refuge.

The Refuge System's National Master Naturalist Initiative, launched less than a year ago and based on the Texas model, is working to support establishment of the program in each of the 50 states and serve as the primary nexus of information about program, according Anna Toness, National Master Naturalist Initiative coordinator. For more information, contact Toness at 703-358-1889 or Anna_Toness@fws.gov.

The Southern Nevada Interagency Volunteer Program was honored for its "Get Outdoors Nevada" program that established a community connection for all volunteers interested in working on public lands. A single Web site (<http://www.getoutdoorsnevada.org/>) offers a calendar of events, training schedules and volunteer applications. The program recruited 585 volunteers who contributed almost 3,000 hours to clean-up, trail repair, habitat restoration and planting, visitor services and education.

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Make Way for Ducklings...and Snakes and Bears and Deer

There was a time when highways and wildlife were such bitter enemies that co-existence was a remote dream. It took nearly 40 years of gridlock before six government agencies and 21 environmental groups could agree on a plan to widen U.S. Route 17 next to Great Dismal Swamp National Wildlife Refuge in Virginia. That plan, however, is an example of a new atmosphere of cooperation that is yielding surprising results for the benefit of drivers, wetlands and wildlife.

The Transportation Research Board of the National Academy of Sciences will feature a workshop on the subject for its annual meeting in Washington, D.C. in January 2006. The workshop, called "Wildlife and Highways: Considerations and Solutions," will provide transportation officials, highway engineers, transportation planners, safety engineers and environmental planners a better understanding of how wildlife and fisheries issues can be integrated into planning, engineering, design and maintenance of highways. Participants will learn how wildlife and fisheries issues can be integrated into highway programs and where they can get technical assistance to address their own particular issues.

One example that workshop participants are likely to hear concerns Route 17 in Virginia. A citizen actually proposed a shift in the alignment that reduced the impact on wetlands and literally paved the way to a solution. A mitigation committee from the Environmental Protection Agency, U.S. Fish and Wildlife Service, Federal Highway Administration, Virginia Department of Transportation (VDOT) and the U.S. Army Corps of Engineers came up with a plan that accommodates large and small wildlife as well as the traveling public.

VDOT installed several culverts under Route 17 to allow passage of smaller animals. Natural walkways called bear terraces will be built under two parallel bridges to allow passage by deer, bears



Route 17 Project Manager Wayne Williams with the Virginia Department of Transportation looks at a new pair of parallel bridges. Animals can cross under the bridge on the rocks. There will also be a natural wildlife walkway installed underneath the bridge. (Tom Saunders/Virginia Department of Transportation)

and bobcats. The parallel bridges themselves are being built above ground level to allow water to flow from the Great Dismal Swamp to the Northwest River, providing a natural path for wildlife.

There is even a small pot of gold at the end of the rainbow: when the old Route 17 closes to traffic, the nearby city of Chesapeake will receive \$1.75 million in federal funds to turn part of the road into a Dismal Swamp Canal Trail.

Not surprisingly, this transportation project is one of seven in the country designated by FHWA as a 2004 Exemplary Ecosystem Initiative for developing innovative ways to preserve and enhance ecosystems.

More Wildlife and Migratory Birds

A road-widening project through McNary National Wildlife Refuge also won an award for environmental design from the state of Washington. Refuge biologist Howard Browers and Refuge Manager John Gahr worked with Washington state transportation planners over many

months to ensure that the project would include aspects benefiting wildlife.

The first goal was to increase traffic capacity and improve public safety on a highway through Walla Walla County. Along the way, designers also excavated a new wetland on the refuge where both Service employees and the Audubon Society have noted an increase in wildlife and migratory birds.

The material excavated to create the wetland was used as fill for the newly widened road. Transportation engineers also breached a levee that had divided Casey Pond, opening up 100 acres of previously unavailable shallow-water aquatic habitat to seven listed species of salmon.

When a 20-foot bridge needed to be replaced, refuge staff made sure that the 88-foot replacement bridge included a path constructed underneath to allow wildlife to cross. Washington State planning officials credited multi-agency coordination and public communication

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Scholars to the Refuge



Tandi Perkins, a student at South Dakota State University, wants to learn everything there is to know about greater

sandhill cranes. Perkins has been paying attention to sandhill cranes for more than seven years. Now she has won a \$15,000 *Refuge Centennial Scholarship for Conservation* to pursue doctoral research on the Rocky Mountain population of sandhill cranes.

Perkins is one of 14 students to win a scholarship under a program initiated by The Walt Disney Company, the National Wildlife Refuge System and the National Fish and Wildlife Foundation in honor of the 100th anniversary of national wildlife refuges. The 2005 scholars include five doctoral candidates, eight graduate students and one undergraduate.

Perkins' research on the distribution and ecology of the Rocky Mountain population of greater sandhill cranes will take her to seven national wildlife refuges from Montana and Idaho to Colorado, Utah and New Mexico. Bosque del Apache National Wildlife Refuge Manager Jim Savery says Perkins' research project is "one of the most comprehensive doctoral endeavors in recent years and will fill many gaps in managing the Rocky Mountain population of sandhill cranes."

The Disney scholarships are awarded on the basis of merit, academic achievement and efforts to improve conservation on national wildlife refuges. The selection committee is also looking for future leaders in conservation.



Michael Anguiano, a student at San Diego State University, has been honored with a \$5,000 graduate scholarship to study the

California kingsnake at San Diego National Wildlife Refuge. Anguiano is especially interested in studying the loss and fragmentation of snake habitat caused by urban and agricultural expansion. The Coastal Sage Scrub ecosystem in southern California is one of the 25 global biological diversity hotspots in the world; Anguiano believes his research can provide some of the science-based knowledge that will be required for effective management of this endangered ecosystem.

The Disney scholarship winners for 2005 also include doctoral awards to:

- Wendy Cover, University of California, Santa Cruz
- Carolyn Kurle, University of California, Santa Cruz
- Laurel Larson, University of Colorado
- Joshua Reece, Washington University

At the graduate level, \$5,000 scholarships have been awarded to:

- Angela Battazzo, University of Montana
- Ryan Berger, Georgia Southern University
- David Jachowski, University of Missouri
- Joel Martin, Utah State University
- Lindsey Wagner, Yale University
- Christopher West, Humboldt State University
- Ryan Wilson, University of Arizona

At the undergraduate level, a \$5,000 scholarship has been awarded to Sarah Spencer, who is an officer in The Wildlife Society at the University of Maine.

The scholarships enable students to continue their education and increase their ability to make an impact on conservation in general and national wildlife refuges in particular. Disney's Senior Vice President of Corporate Environmental Policy, Kym Murphy, believes the scholarships are part of a legacy with animals that began nearly 50 years ago with Walt Disney himself.

Through a partnership with Disney guests and DisneyHand, worldwide outreach for The Walt Disney Company, the Disney Wildlife Conservation Fund annually supports more than \$1 million in conservation projects around the world. ♦

"The scholarships enable students to continue their education and increase their ability to make an impact on conservation."

Around the Refuge System

North Dakota

Is there such a thing as a “purebred” bison herd? Though that may be nearly impossible to authenticate, preliminary analysis has found that the bison herd at Sullys Hill National Game Preserve in North Dakota may be closer to that pure standard than any other herd within the U.S. Fish and Wildlife Service. The bison herd at Sullys Hill National Game Preserve does not have any detectable hybridization, according to Cami Dixon, biologist at nearby Devils Lake Wetland Management District.

In 1904, President Teddy Roosevelt established the game preserve to provide breeding grounds for wild animals and birds. Bison were reintroduced to Sullys Hill in 1918, and the bison now at the game preserve are descendants of those original herds. The herd has held steady at 30-35 bison for several decades.

Over the years, bison were sometimes crossed purposely and accidentally with cattle. Efforts are currently being taken to identify the level of this hybridization of the Service herds.

Oklahoma

Alligator snapping turtles used to be common in eastern Oklahoma. With only one or two viable populations left in the



A new Alligator Snapping Turtle Work Group is drafting a conservation agreement to reinvigorate the declining population of this once-common species in Oklahoma. (USFWS/Tishomingo National Fish Hatchery)

state, several organizations and agencies have formed an Alligator Snapping Turtle Work Group to draft a conservation agreement. In addition to the Tishomingo National Wildlife Refuge and National Fish Hatchery, the U.S. Corps of Engineers, the National Park Service and Oklahoma State University, there is interest in the snapping turtle in Louisiana, Texas, Mississippi and Arkansas. Kerry Graves, manager of Tishomingo National Fish Hatchery, already has 260 hatchlings from three years of nesting. Snapping turtles come out of the water once a year to lay eggs. “We take the eggs before the raccoons and fire ants get them,” says Graves.

Next summer, transmitters will be attached to some of the young turtles, which will be released at Sequoia National Wildlife Refuge, where graduate students will help track them. The research will help determine if snapping turtles can be reared in captivity and successfully returned to the wild.

Maine

High atop a utility platform at the Moosehorn National Wildlife Refuge, a pair of eagles has produced its 17th hatchling in 15 years. The nest is near busy Route 1 – an unusual departure from the eagles’ more common nesting sites in white pines near the water. This pair spends the winter along the coast in the Cobscook Bay area and returns each spring to rebuild its nest on the refuge. Moosehorn Refuge Biologist Maury Mills says the chicks have not been tracked because of the difficulty of banding them on the utility platform.

Alaska

More than 40 students are keeping their eyes on five cow moose around Tetlin

National Wildlife Refuge. Each moose is wearing a satellite collar. Tetlin Wildlife Biologist Gail Collins receives regular satellite locations by email, then forwards the information to teachers in three schools, where students track the moose on large wall maps. Students in grades 5-12 are gaining hands-on experience in wildlife research techniques while learning about moose ecology and behavior. Because moose are an important food resource for both Native and rural Alaskans, the project has been



Tetlin NWR wildlife biologist Gail Collins attaches a satellite collar to a cow moose. Students in three schools near Tok, Alaska, track the wanderings of five cow moose on wall maps in their classrooms. (Rick Swisher/QuickSilver Air)

an excellent opportunity for interaction among refuge staff, local teachers, students and the community.

Nevada

After suffering decades of neglect, the restored pioneer cabin of Andrew Jackson “Jack” Longstreet, a western folk legend, opened to the public in October on the Ash Meadows National



Western folk legend Jack Longstreet built a cabin into a mound, giving him private access to a spring and a storage cavern. The cabin has been restored and opened to the public at Ash Meadows NWR in Nevada. (USFWS)

Wildlife Refuge. The stone cabin, which had almost collapsed, has been restored to its original state and will be used as an interpretive site, bringing to life the cultural and natural history of the refuge.

Longstreet tried to avoid the law by living in remote places like Ash Meadows, where he built his cabin into the side of a mound, giving him private access to a spring and a storage area. He was reputed to “settle arguments with a gun, and champion those who could not protect themselves,” according to the *Death Valley Forum*. His cabin, located beside one of the refuge’s warm water springs, was built in 1896.

Pacific Islands

A ship that was cleaning marine debris from the Hawaiian Islands coral reefs actually ended up running aground on one of the reefs in the Hawaiian Islands National Wildlife Refuge. The M/V *Casitas* had been chartered by the National Oceanic and Atmospheric Administration (NOAA) to help remove nets and other debris from the Northwestern Hawaiian Islands. The ship ran aground on Pearl and Hermes Reef, named for two English whalers that hit the reef in 1876. (Ironically, black-lipped pearl oysters were discovered in the reef’s lagoon in the 1920s but a few short years of over-harvesting almost eliminated them

from the atoll.) Nearby, Midway Atoll National Wildlife Refuge became a logistical support base for workers trying to move the *Casitas* off the reef. The *Casitas* was successfully removed from the reef and entombed in waters about 7,200 feet deep. Damage to coral reef resources is believed to be minimal.

was some discussion about whether to release the hatchlings in Virginia or take them to their more common breeding grounds further south. “Nature knows best” was the conclusion, although refuge staff helped nature by moving the eggs to the more protected, relocated nest site.

The relocated nest was placed inside a cylindrical wire mesh cage to protect the eggs from both predators and storm events. The cage was buried in the sand behind the primary dune. Seven loggerhead nests received the same care. When the first hatchlings emerged during the night of September 28-29, they were placed in coolers and carried to the open beach, which had been scraped flat to ease their walk to the open ocean.

Virginia

Under the watchful eye of local media as well as staff and volunteers from Back Bay National Wildlife Refuge in Virginia Beach, 99 Green sea turtle hatchlings emerged from a nest relocated from southern Sandbridge onto the refuge. The female that came onto the beach to make her nest in early August was the first documented green sea turtle to lay eggs in Virginia. Back Bay Refuge wildlife biologist John Gallegos said there

Gallegos said the two-inch hatchlings were too small to tag but it was important to let them walk to the water themselves so they could imprint on the beach where they were born. The survival rate for these small turtles is only 1 percent or less. Volunteers sat by the nest from 7:30 p.m. to 3:30 a.m. every day for about two weeks before the hatchlings emerged. ♦



Green sea turtles are found throughout the world’s oceans, with major U.S. populations usually found off of Florida’s coasts. So when a female came to nest on the beach at Back Bay National Wildlife Refuge in Virginia, volunteers and staff did all they could to give the hatchlings their best chance of survival. (USFWS)

In the Aftermath

Three of the most powerful hurricanes in decades blasted through the Southeast this fall, leaving little time for refuge staff to assess and clean up damage from one storm before they were responding to the next one. Most recently, Hurricane Wilma temporarily closed five refuges in south Florida.

Impact on wildlife is widespread along the coastal areas with significant fish loss due to the salt water storm surge; flooding and related impacts caused substantial loss of land-based wildlife.

During all of these storms, but most especially Katrina, the daily tasks of many refuge staff bore little relation to their usual job descriptions.

Refuge Update is pleased to share the stories of just two of the many heroes working for U.S. Fish and Wildlife Service. ♦

Director – from pg 2

We are also working through the Service's ecological services programs to develop plans for building in wetland areas in a way that considers the need to restore ecological functions that will help prevent future flooding and minimize the impact of future storms. We are working with stakeholders to minimize the potential for oil spill and oil leakages that can rob coastal wetlands of the ability to act as natural buffers.

National wildlife refuges are the public face of the Fish and Wildlife Service, the places where Americans see firsthand just how the Service cares for natural resources that are the foundation of our nation. We will feel fully healed from the ravages of natural disasters when our national wildlife refuges on the Gulf Coast can again welcome Americans to their lands.

Not Exactly in Your Job Description



Buddy Goatcher, at back of boat, a Service contaminants specialist, and Mark Johnson helped an elderly gentleman and his two dogs out of danger. The elderly man left the flooded area only after Goatcher promised to care for the two dogs. The men exchanged contact information, and the dogs went home that night with Buddy. (USFWS)

Jim Durrwachter is Fire Management Officer for District 6. He was called into service to support the emergency response teams at New Orleans International Airport after Hurricane Katrina. He shared these notes of the days' activities.

On the runway to Concourse D at the New Orleans International Airport, there were 10-12 military helicopters, sitting side by side, rotors turning. It became the most horrific display of evacuation by helicopter that anyone could have imagined.

Katrina Diary

By William B. Davison

Day 1 9/3/2005

I was getting ready to do some home improvement projects on Saturday morning when the phone rang at around 9 a.m. Our office had received a request through our fire program for a security specialist to be deployed to Louisiana for Hurricane Katrina relief. I loaded up the truck, grabbed my gear and left Savanna for Metairie at 1:30 p.m. The rest of the day was uneventful, but the next day and those after would prove to be some of the most heartbreaking and yet rewarding of my life.

Day 2

By 9:30 a.m. I was performing search and rescue in the 9th ward of New Orleans, one of the hardest hit. Buddy Goatcher (a contaminants specialist) and Bill Ferguson (special agent from Lake Charles, LA, and a native of New Orleans) met us. They proved to be some of the most dedicated people I met.

We went on a hasty search, motoring up and down the streets of the Elysian Fields neighborhood to rescue anyone who wished to come out and to try to convince those who were hesitant to leave. The water was 4 to 5 feet deep in places; in others, we had to get out and drag the boat. Most people wanted to stay. We did get a husband and wife to

Office chairs became wheelchairs and conveyor belted baggage carts became automated litters. Although patients were packed on carts as tightly as possible, even three rigs pulling three carts apiece on each side could not at times keep up with the number of evacuees. Wheelchair-bound hospital patients were placed on baggage tugs for transport to the terminal. Passengers were running between helicopters, possessions in hand, paper bags ripping and spilling contents onto the deck. One of the saddest realizations to me was that the bags were the last possessions they owned.

A triage center was established in the lower baggage terminal. There were patients on every available surface. The lucky ones were on stretchers, but most were transferred to the floors to free up the litters to carry more people from the flight deck. Patients were moaning for medical attention. Several people had passed away in the triage area.

The evacuees coming off the aircraft were simply terrified. I talked to some who didn't have the money to evacuate, didn't have any relatives to evacuate to, or didn't

own an automobile. Many had not eaten or had any water for several days.

People were asking when they would see a doctor, where they were going to fly to, when would food be handed out, was change available to make a phone call, how long would they be here.

Safety First

One challenge was getting the Disaster Medical Assistance Team and military people to understand safety procedures around the helicopters. One stretcher flew up and hit one of the DMAT workers in the back and could have caused a serious injury. Others approached helicopters from the wrong directions for the exhaust and rotor blades and did not have eye contact with the pilot.

Those who helped load the very sick onto military aircraft to be air lifted to a military hospital had a reality check. When asked what they thought, they all said, "I will never complain about anything. These people have lost everything."

Almost all of the evacuees were grateful when they got off of the helicopters. I

received many sentiments including "God bless you," and "Thank you for helping me and New Orleans." Almost every group waved as the helicopters flew off to retrieve more evacuees. ♦



leave but only because we helped them set food and water out for their cats.

Day 3

After a hot meal and baby wipe "shower" Sunday night, I slept on the Astroturf inside the indoor practice field in the Superdome. Logistics were a nightmare. The one thing I noticed was the number of pets, mostly dogs, who were left behind. I will never forget the dogs that were chained to porches and had the choice of swimming or dying. I believe that the residents thought that once the hurricane was over, they would return for their pets. We left our lunch and some water on the roofs, hoping it would buy them time until someone could help them.

Day 4

An elderly gentleman was evacuated, in no small part due to the generosity of Buddy Goatcher. The elderly man would not leave because he could not get his two dogs out. Buddy offered to take the dogs home. They exchanged contact information, and the dogs went home that night with Buddy. It is small tokens of kindness and respect that buffers the tragic stories.

I feel compelled to tell another story of the 84-year-old man rescued by one of our teams. He was found wading in chest deep water, looking for water for his 40-something son who was mentally disabled. The son (who wouldn't make eye contact or speak) was dressed like he was going to church. His clothes were

perfectly pressed and his shoes were shined. To many, their dignity was all they had left.

Day 5

Back to the Canal District. Someone shouted "Blackhawk Down!" About 300 yards to our rear, a helicopter had crash landed. We launched an airboat ... I couldn't get it pushed off easily so I put my rear on the tailgate of the truck and push with my feet. Bad move! I slipped on the trailer and went in up to my waist in that nasty water.

As it turned out, the first airboat out was the first at the scene. It was positioning to rescue the pilots (it was a private helicopter) when a Blackhawk came in over the top of them and created such a

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FOCUS ...On Reaching Youth

Ecology and Service at Hanford Reach National Monument

by Ron Crouse

A new type of volunteering called “service learning” is increasingly making a presence in schools across the country. Service learning offers students an opportunity to gain hands-on learning

experiences in a real world environment while they provide community service

with tangible results. I was intrigued to learn from Jeff Dong, a veteran teacher at Pasco High School in Pasco, Washington, about a new service learning requirement for every student in the school.

Dong asked me to create a research-based service learning project for 50 “at-risk” students. Most were bilingual and struggling with poor English reading and writing skills, and two were hearing impaired. I saw an opportunity to create a program in which students could learn about monument resources while conducting habitat inventories. The goal was to engage them in real life research at their level and not bedazzle them with scientific theory.



Students participate in a research-based service learning project at Hanford Reach National Monument. Information and Education Specialist Ron Crouse saw an opportunity to create a program in which students could learn about Monument resources while conducting habitat inventories. (Ron Crouse/USFWS)

Arts on the Refuge

*"I see quiet water and a white and black bill
looking for food.*

*I see purple red and orange weeds standing
straight and tall.*

*I see yellow and gray stems there are little weeds
for birds to nest.*

I see sandy sands crunching away.

I see a hawk circling around and around.

I see a duck swimming through the water.

I see the water is so wavy and gentle.

I see a dead weed waiting for help.

I see the water is so warm for me and the ducks..."

This is the way Don Lee Wade saw and felt Bosque del Apache National Wildlife Refuge near Socorro, New Mexico, when he was a young boy. Inspired by a workshop with children's author Uma Krishnaswami, teacher Suzanne Borchers takes her third or fourth graders to the Bosque every year to sense its magic by writing poetry. Led by Bosque Friends volunteer Steve Green, the children follow a trail in the refuge, stopping seven or eight times to close their eyes, listen, write and read aloud they have written.

Green remembers one visit during an unexpected snowstorm. "Sue said to the kids, 'Stick out your tongue and close your eyes.' After a few minutes, she had them write about it. It's environmental education that is very sensory, very participatory, a total involvement of the senses." Borchers remembers that trip too when kids held pencils in mittened hands.

Two in-school programs were presented, one to familiarize the students with monument history, resources and management, and another to outline field trip protocols. These provided an opportunity to assess their skill and knowledge level and determine what could be incorporated into the program without overwhelming them.

During the day-long field session, two groups of 25 students each conducted a terrestrial inventory or an aquatic survey in the morning and rotated in the afternoon. Refuge Operations Specialist Jack Heisler had his terrestrial groups conduct a line-point indicator inventory in shrub-steppe habitat, recording plant species at one meter intervals along a 100-meter transect. The first inventory was in an undisturbed shrub-steppe habitat of sagebrush and native bunchgrasses and the other in an overgrazed site with heavy cheatgrass infestation. The youngsters learned the composition of native shrub-

steppe habitat, the loss of plant diversity with annual cheatgrass versus perennial bunchgrass, and the interdependence of plant species.

I facilitated the aquatic sampling inventory, studying juvenile fish and macroinvertebrates. Armed with kick nets and beach seines, students swept the Columbia River and Spring Creek in search of life under water. Students recorded their catch using identification manuals and dissecting scopes to determine numbers of each species. Students learned to compare species diversity and density between the river and the stream and relate those figures to tolerance indices for pollution to determine a level of water quality for both habitats.

The program garnered excellent feedback. By day's end, students with minimal science knowledge and low interest were actively participating. To learn by doing, without struggling through foreign textbooks, was the highlight. For staff, it

was an enlightening experience to perform beneficial scientific investigations that expand our resource database with students who would otherwise never experience the Monument from a biological perspective.

This was the first field trip for many of the students; hands-on learning made a strong impression. Student Yasleidy Boada echoed the class' sentiment when he said, "I remember that you said that if you at least got through to one student, then you were doing your job. Well I'd like to let you know that I did learn something and that I'm more aware of what is really going on in that waste land outside of the city." Success can be measured one student at a time. ♦

Ron Crouse is the information and education specialist for Hanford Reach National Monument and is a graduate student in the Master of Science Teaching program at Portland State University.

"We never cancel," she insists, "Whatever the Bosque is, we are in it."

Krishnaswami, who has written of the project in her book *Beyond the Field Trip: Teaching and Learning in Public Places*, encouraged the young poets to use different "containers" for their words, writing list poems or using a bird's voice, repeating lines for effect. She even suggested, "If you want to climb a fence, pull up a plant, throw a rock, jump in the lake, do anything else you know the park won't want you to do, write about it instead of using your body."

The children come from a suburban area and many have never seen the diverse habitats of the refuge, which range from the Chihuahuan desert to wetlands in the floodplain of the Rio Grande. Many of the children's poems are submitted to the River of Words contest

(<http://www.riverofwords.org/index.html>), an annual poetry and art contest "connecting kids to their watersheds and imaginations." The poem written by one newly arrived student was the winning entry in Spanish and Don Lee Wade's poem was a New Mexico finalist. Like a number of the children and many of the adult chaperones, Borchers says Don had been a very reluctant poet. In fact, when asked at the awards ceremony what made him write his poem, he quite honestly responded, "My teacher."

Nevertheless, Borchers believes the experience bonds the students to each other and to Bosque del Apache Refuge. Even the reluctant ones seem ultimately willing to take a risk and write what often turns out to be winning poetry. "I'll come back every year until I can't walk down the trail," says Borchers.



Brigham City, Utah, celebrates the Bear River Migratory Bird Refuge as the "World's Great Game Bird Refuge." This parent and child are working on an entry for the annual "Children's Street Banner" contest sponsored by the refuge. Winning posters are displayed on Main Street in Brigham City. (USFWS)

In Other Parts of the Country

Words and pictures are used in a wide variety of ways to familiarize young people with their natural surroundings, building interest and respect along the way. North Platte National Wildlife

continued pg 14



*Togiak National Wildlife Refuge in Alaska runs three camps to begin educating young people about managing the natural resources that are so much a part of the area's culture and life.
(Allen Miller/USFWS)*

Salmon and Culture at the Top of the World

By Allen Miller

Rural Alaskans have a profound relationship with the area's renowned biological resources. Many depend on the over 76 million acres of National Wildlife Refuge System lands and waters in Alaska where they collect fish, wildlife and plants for their survival and livelihood. In southwest Alaska, these people are predominately Yup'ik Eskimos, several thousand of whom live in villages within the boundary of Togiak National Wildlife Refuge and use refuge resources intensively.

Togiak Refuge runs three camps to begin educating the youngest villagers on managing these resources. A camp at Cape Pierce centers on marine mammals. A rafting camp focuses on management priorities in a riparian ecosystem while the Southwest Alaska Aquatic Science Academy is driven by salmon.

Bristol Bay, which defines hundreds of miles of the refuge's coastline, is home to the world's largest commercial salmon fishery. The Southwest Alaska Aquatic Science Academy was started for the young people who will someday manage that industry. They have a natural curiosity, ability to share the information within their families, and many years of resource use to come. One camp participant who fishes commercially with his family began explaining the meaning of "biological escapement goals" and the anatomy and life history of sockeye salmon to his family, surprising them all with his newfound expertise.

The Academy is based out of the community of Aleknagik and outdoor sessions are held on area lakes and streams. There are camp sessions for middle and high school students with time

divided among field research, laboratory analysis and classroom instruction. Students from 20 communities throughout southwest Alaska must complete a rigorous application process.

Leaders of Tomorrow

Campers develop a better understanding of salmon biology and current management approaches as well as a sense of stewardship for natural resources. Developing an understanding of the roles of various agencies in the area, and the value of working cooperatively is important as these students may become community leaders and important links in collaborations. Students hear about commercial, sport, and subsistence fisheries as well as conservation and habitat protection groups. The highlight of the camp for many is flying into the heart of the 2.2 million-acre Togiak Wilderness Area in a WWII vintage Grumman Goose flying boat where students help biologists estimate numbers of returning adult salmon.

The Academy also builds awareness of fisheries-related careers and the skills needed for these careers. Students who have successfully completed the Aquatic Science Academy are excellent candidates for internships and full-time positions with any Academy partners.

One key to the success of the camp is the expertise and breadth of these partners. Staff include both certified teachers and biologists. The Bristol Bay Economic Development Corporation provides funding and acts as the lead agency to coordinate and plan the camp. The program leverages non-federal funds at an impressive 6 to 1 ratio. Togiak Refuge provides funding and equipment along with biologists and education staff to teach classroom and field sessions.

The Fisheries Research Institute provides laboratory facilities, professors and graduate student teachers. Instructional staff also come from the Bristol Bay Science and Research Institute and the

Alaska Department of Fish & Game. Peter Pan Seafoods hosts a tour of their Dillingham fish processing facilities. The Choggiung Native Village Corporation allows access to their lands for field studies. The University of Alaska Fairbanks manages a credit program for students who conduct research projects in coordination with the camp, and two school districts help with recruitment and logistics.

Part of the success for all three camps is being responsive to local needs. Since there is no written Yup'ik language, cultural traditions have been passed along orally. Elders must now compete with the Internet, video games and other modern distractions, and many feel their culture is being lost.

The marine mammal and float camps are science and Yup'ik culture camps where each lesson is presented from scientific and traditional viewpoints. Respected village elders are invited to the camps to present traditional information.

Wild salmon stocks are a valuable and dwindling world resource currently being displaced in world markets by farm raised salmon. Their value was captured in the slogans that appeared on T-shirts given to Academy participants the past two years: "Wild salmon don't do drugs" and "Wild salmon never dye." ◆

Allen Miller is a park ranger at Togiak National Wildlife Refuge.



Students at the camps run by Togiak National Wildlife Refuge in Alaska develop an understanding of the roles of various government and nonprofit agencies in the area and the value of working cooperatively. These are important lessons for youngsters, many of whom could become community leaders. (Allen Miller/USFWS)



The quickly assembled Earth Day program for 200 youngsters focused on four habitat essentials and such fascinating species as wolves, otters, mink and bears. (USFWS)

400 Kids, 30 Minutes: An Earth Day Puzzle

By Sandy Edmondson

My eyebrows shot up and an incredulous look spread across my face. The person on the phone had just made a typical request for me to do an Earth Day program at a local elementary school. As a park ranger and assistant refuge manager, I've given many interpretive or educational programs. But this local elementary school principal was inquiring if I could give an Earth Day program for her 200 kids, aged kindergarten through second grade.

Usually my educational programs had 30 or sometimes as many as 50 kids. But 200? How in the world would I conduct an effective program for so many kids so young all at once? How would I catch and keep their attention at the end of the school day on a Friday?

I had a surprising amount of time, 20-30 minutes, for a program in the school gymnasium as part of an Earth Day convocation. I came up with lots of ideas, but nothing that blended all the concepts I wanted to address while incorporating Earth Day themes. After a couple of days of brainstorming and researching, I suddenly remembered the refuge outreach listserv* of which I was a member. Every once in awhile, people would email the listserv to get ideas or help in meeting some new challenge. I decided to give it a try.

Within a couple of hours, I received an overwhelming response. One person from Alaska said she'd once presented a program to some very excited third-graders before lunchtime. Ninety hot pizzas literally stood between her and 400 hungry kids. With what she termed a "desperate dramatic flourish," she started pulling skulls and other items from a habitat trunk and telling their stories. The pizzas went cold, and nobody cared.

Some suggested playing jeopardy games or using live animals or costumes. Several suggested teaching the kids Earth Day

Arts – from pg 11

Refuge partnered with the Nebraska Department of Education to create an environmental education curriculum for smaller schools in rural western Nebraska. With partial funding from the refuge and requests from individual teachers, a naturalist and an artist visit classes of 3rd to 6th graders.

Integrating environmental education with other subject matter, the naturalist might talk about observing wildlife, identifying habitats, or measuring dams. The artist talks about gathering photos that can be

used for drawing or painting illustrations of wildlife, choosing chalk or acrylics and getting body and head proportions right. Students then have the opportunity to enter the Junior Duck Stamp contest. Because of the active "Environ-Art" curriculum program, Deputy Refuge Manager Brad McKinney says half of all the Nebraska entries in the contest come from the western part of the state, even though it only has a tenth of the state's population. The 2005 Best of Show stamp in Nebraska, a drake wood duck painted by 16-year-old Brett Cooper, will be used

songs or poems they could recite later for friends or family. I even received Internet links to favorite lyrics. Ideas started pouring into my head, linking all the fragmented notions of the last few days.

Four Habitat Essentials

With feverish excitement, I created my program. The theme centered on the four habitat essentials – food, water, shelter and space. I wanted to address these four elements one at a time, by assigning each habitat word to a group of kids. I asked the children to be seated in four groups as they were brought into the gymnasium. Because there were so many kids, they sat on the floor. We created an “aisle” of empty space halfway back, while at the same time creating another “aisle” vertically. The effect was a large group divided into four smaller groups.

I wanted to grab my audience immediately. I stepped up to the podium and pulled a bobcat fur from a habitat truck (borrowed from a nearby refuge). The effect was awesome: 200 kids came to attention. I offered a little information about the bobcat’s habitat and survival needs. One of my emails had suggested pulling items from the trunk one-by-one to keep the kids’ attention. This piece of advice worked extremely well, eliciting screams, ooohs or grimaces as each item was revealed. I pulled out mink, otter,

bear and wolf skins. Where possible, I also showed skulls to provide a clearer picture of the animal’s needs.

The kids loved to hear how the wolf uses stealth to hunt, or how the black bear uses its claws to scramble up trees. I tried not to be graphic with my choice of words, as I didn’t want to create fear or apprehension. Instead, I wanted to evoke a sense of understanding of what animals need to survive.

After capturing their interest, I assigned each group one of the four habitat essentials. I quickly picked four volunteers to join me on stage, making sure to select both boys and girls. Volunteers from each group acted out short wildlife skits that demonstrated the group’s word. Kids hopped around stage as marsh rabbits, clapped their arms together like alligator jaws, or stood straight and tall with raised arms and outstretched hands as proud oak trees sheltering songbirds. After being seated to applause, the children shouted out their word as I pointed to each group. The four habitat essentials echoed throughout the school.

By the end of the program, they were all willing to take an Earth Day pledge. I didn’t come up with anything fancy or poetic, just a simple phrase that reflects

the uniqueness of each species I’d presented and its place in our environment: “I pledge to respect all life on Earth.” I probably could have visited Earth Day Web sites or industry magazines to choose a well-written or well-known pledge instead of making up my own. But the kids really seemed to enjoy taking ownership of the facts and ideals I’d presented through the pledge.

After the kids were dismissed, I presented bookmarks and stickers to the principal. Thankfully I’d brought extras with me, because it was at that moment I learned that there had actually been 400 kids in the gym with me that day, not 200! I was also presented with the best news I’d heard all week. A kindergartner, hardly five years old, had told the principal on her way out, “Please make sure you tell that nice woman for me how much I enjoyed her program.” ♦

Sandy Edmondson was assistant refuge manager at Roanoke River National Wildlife Refuge, NC, until she returned to school in September to earn a master’s degree.

**Anyone interested in joining the Outreach Listserv should email Anita Noguera at Anita_Noguera@fws.gov.*

on Nebraska’s first-ever state stamp for waterfowl hunting.

Refuge art can be as tiny as a stamp or as big as a street banner. Bear River Migratory Bird Refuge in Utah, sponsors a Children’s Street Banner Contest every spring. Schools are given long lists of birds for the children to draw. Several dozen “winners” are invited to a drawing party where the birds are re-drawn on banners to be displayed along Main Street in Brigham City.

“Although the colors aren’t always just right, legs and bills are often too long or

too short, it just adds to the fun. Most species, however, are quite recognizable,” says Betsy Beneke, outdoor recreation planner at Bear River Refuge. “It’s a wonderful way to celebrate birds, provide bird education, and bring attention to associated local events.” ♦

This Junior Duck Stamp of drake wood duck was designed by 16-year old Brett Cooper of Harrisburg, Neb. It is the third time Brett has won Best of Show in the state; this winning design will be used for the new Nebraska state stamp for waterfowl hunting. (USFWS)



Creativity, Energy, Passion: Hallmarks of a Winner

“If I had influence with the good fairy who is supposed to preside over the christening of all children, I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life.”

— Rachel Carson

Rachel Carson’s 1965 book *Sense of Wonder* gave birth to a national environmental movement and inspired the U.S. Fish and Wildlife Service’s award for excellence in the field of environmental education. The 2005 Sense of Wonder award winner is Laurie A. “Poppy” Benson, public programs supervisor at Alaska Maritime National Wildlife Refuge, one of the most remote refuges in the country.

“Not only does Poppy have a sense of wonder about her work on the refuge,” says Alaska Maritime Refuge Manager Greg Siekaniec, “She lives that life too. She is always trying to figure out where her next adventure will take her.”

Benson has worked for 15 years to design and deliver educational programs to the public. Asked what makes Benson special, Siekaniec pointed to her “creativity, energy and passion.” She is the inspiration behind the Kachemak Bay Shorebird Festival, is now a weekend-long event that attracts up to 4,000 participants every spring. The festival touches everyone in the community.

Art galleries feature a “gallery migration tour” while experts in a conservation booth show how injured raptors are rehabilitated. Benson herself leads a birding tour dressed as the popular children’s book character Miss Frizzle from the Magic School Bus. Sustained enthusiasm for the Kachemak Bay Shorebird Festival has led to protection of critical shorebird habitat for hundreds of thousands of shorebirds that use the area as feeding grounds during their spring migration.

Benson also collaborated with Homer middle school teacher Dave Brann to spearhead the Shorebird Sister School Program. Students use the Internet to track shorebirds as they migrate along the Western flyway.

Benson’s desire to reach out knows no bounds. She has developed programs to reach preschoolers and elderhostels, Russian fishing families and visiting Japanese tourists.

Siekienac laughingly says Benson “can drive a manager crazy because her office is a mess, but that’s not where she is – she is out there!” ‘Out there’ can include anything from getting the community involved in the design of the Alaska Islands and Ocean Visitor Center to expressing concern that not enough is being done to “improve the bottom line for wildlife” when there are oil spills or accidents in the Aleutian Islands. As the application supporting her nomination concluded, Poppy Benson’s “exceptional contributions will ensure that the story of the Alaska Maritime Refuge and the National Wildlife Refuge System will ring clear for a diverse public.”

The other regional nominees for this award bring their own unique passion and creativity to the goal of keeping that sense of wonder alive in children of all ages.

Sandra Rancourt, Supervisory Park Ranger, Turnbull National Wildlife Refuge, Washington, has expanded refuge’s environmental education and outreach programs through volunteerism.

Bryan R. Adams, Training Technician, Texas Mid-coast National Wildlife Refuge Complex, Texas, manages the Discovery Environmental Education Program.



After Sense of Wonder Award Winner Poppy Benson saw this wild javelina “piggy bank” being used for museum donations, she returned to Alaska and set up a sea otter made of recycled metal. People have been generously putting donations into the clamshell held by the otter ever since. (USFWS)

Al Murray, Park Ranger, Neil Smith National Wildlife Refuge, Iowa oversees a very successful environmental education stewardship program on tallgrass prairie restoration.

Lorna Patrick, Endangered Species Recovery Coordinator, Panama City Ecological Services Office, Florida has provided hands-on experience in interpretation and environmental education about sea turtles to numerous organizations and agencies throughout the Florida panhandle.

Janis Nepshinsky, Supervisory Outdoor Recreation Planner, Rhode Island National Wildlife Refuge Complex, built an outstanding program that includes overseeing volunteers, public use programming, and the Junior Duck Stamp program, as well as mentoring and coaching her staff.

Robert Danley, Outdoor Recreation Planner, Lee Metcalf National Wildlife Refuge, Montana, promotes conservation education for 150,000 annual visitors, including a program in which high school students teach about ecology. ♦

Largest Estuary Restoration Project in the Pacific Northwest

Nisqually Refuge Garner's Widespread Support

The premise that significant human changes often start with a vision is as true today as it was 5,000 years ago, when aboriginal people followed their vision of a better life by creating a village at the mouth of the Nisqually River. Now, an eight-year planning process has created a bold new vision for the Nisqually National Wildlife Refuge, located where the freshwater river meets the saltwater of Puget Sound in Washington.

The Comprehensive Conservation Plan (CCP) for Nisqually Refuge, selected by the Refuge System as the Outstanding Refuge Plan of 2005, makes dramatic changes: expanding the refuge boundary to double its size (from 3,936 to 7,415 acres); restoring 699 acres of historic estuary; increasing the environmental education program to serve 15,000 students, up from 5,000; reducing the main trail and developing new trails; opening the refuge to waterfowl hunting; providing new fishing access; and establishing improved wildlife sanctuary through area closures and new boat speed restrictions.

Implementation of the CCP was also furthered by a unique cooperative agreement with the Nisqually Indian Tribe to allow management of tribal lands within refuge boundaries as part of the refuge.

Both internal and external audiences were extensively involved in the planning, through a broad combination of presentations, workshops, public meetings, open houses, focus groups and newsletters. More than 1,700 public comments were received on the draft plan released in 2002. The vision itself became a focal point to engage others in identifying management actions and resolving issues.

Interior Secretary Gale Norton visited Nisqually Refuge last summer and praised 20 years of cooperation by the Nisqually Watershed Council, a coalition of tribal, federal, state and local

governments and private individuals. Refuge Manager Jean Takekawa says the council provided an easy way to connect with all the partners and gain their input, adding that ultimately there was widespread support for the CCP from almost all partners, agencies and organizations.

Public Support Grew Steadily

Takekawa says there was a progression of public understanding for the dramatic changes called for by the plan. Part of Nisqually's mission has always been to protect the Nisqually estuary, a large portion of which had been diked off for farming in the 19th century and managed as freshwater wetlands since the refuge was established. The CCP calls for restoring nearly 700 acres of estuary – 70 percent of the diked area. It is the largest estuarine restoration project in the Pacific Northwest. Takekawa explains that estuarine habitat is increasingly beleaguered on the west coast and this is an opportunity to increase tidal salt marsh habitat by 46 percent in south Puget Sound.

The refuge is in a unique position to provide leadership in habitat restoration in the Puget Sound area. The restored acreage will return to its historic state as a tidal salt marsh system. As the CCP explains, "With the recovery of federally threatened Chinook salmon in the Nisqually watershed a regional priority, this restoration effort will also enhance the ecological functions of Puget Sound, where 80 percent of estuarine habitat has been lost in the last 150 years, primarily to development." Estuarine restoration is identified as

a top priority to recover Chinook salmon in the Nisqually watershed and many migratory bird species that use estuaries will also benefit.

The estuary restoration project is in the site design and permitting stage now. The plan broadly calls for removing much of the large Brown Farm Dike, allowing the tide to flow in and reconnect much of the historic slough systems in the Nisqually delta to Puget Sound. A trail that now loops through the refuge on top of the dike will be replaced with a shorter, boardwalk trail. With the overall expansion of the refuge, there is the potential for more freshwater and riparian habitat restoration as well.

Although the overall timeframe for CCP implementation is 15 years, within the coming years, the newly restored estuary should begin to provide important habitat to many salmon and a wide variety of migratory birds. ♦

Jean Takekawa, refuge manager at Nisqually National Wildlife Refuge, contributed to this article.

The CCP for Nisqually Refuge in Washington will bring dramatic change. (USFWS)



Where are the Pelicans of Chase Lake Refuge?

Where have all the pelicans gone? It is a question that continues to baffle scientists and citizens alike. Concerned citizens send letters and emails about their pelicans, says Ken Torkelson, writer-editor for the U.S. Fish and Wildlife Service in Bismarck, North Dakota.

North Dakota Senator Byron Dorgan even asked that a report be prepared for Congress on the disappearance of the pelicans from Chase Lake National Wildlife Refuge. One woman was certain she had spotted the pelicans in a parking lot (they turned out to be gulls). Someone else on an Internet chat line saw more than the usual number of pelicans at a spot in the Canadian province of Manitoba. Now *that* could actually be a useful tip, said Torkelson.

Chase Lake Refuge has had the largest colony of white pelicans in the United States since record keeping began in 1905. Unlike other colonies with populations that fluctuate depending on the availability of food, the Chase Lake population never recorded any abandonment – until 2004.

Up to 30,000 white pelicans left Chase Lake Refuge, abandoning their nests and chicks. During the previous two years, higher than normal chick mortality had been observed late in the season and some of this mortality could be attributed to West Nile virus. As the 2004 nesting season approached, scientists from the

U.S. Geological Survey's Northern Prairie Wildlife Research Center, the North Dakota Game and Fish Department, Department of Agriculture, and the North Dakota chapter of The Wildlife Society prepared to closely monitor the colony to determine the impact of the West Nile virus on the pelicans. Then suddenly, without warning, the pelicans abandoned their nests. Satellite transmitters were placed on four adult pelicans, which promptly flew in four different directions.

In preparation for the 2005 nesting season, an electric fence was erected to keep predators like coyotes and foxes out of the peninsula colony. Visitor access to nesting areas was restricted more than usual and television cameras were in place to monitor the birds. However, no pelicans nested on the peninsula.

During the 2005 nesting season, about 18,000 breeding adults returned to Chase Lake Refuge. But out of more than 9,000 nests, only 150 chicks made it to fledgling stage – unusually high mortality for the Chase Lake colony. Although dead birds are taken to the National Wildlife Health center in Madison, Wisconsin, the colony is in a remote area where it is not possible to collect carcasses quickly enough to provide a definitive cause of death. Scientists do not believe West Nile virus or avian flu killed



White pelicans at Chase Lake NWR are banded as part of an effort to figure out where they go and why they have not returned to Chase Lake Refuge. Satellite transmitters were placed on four adult pelicans, which promptly flew in four different directions. (USFWS)

this year's chicks, and food sources are also not believed to be an issue because the birds feed in many places within a 100-mile radius of the refuge.

Kim Hanson, supervisor at the Arrowwood Refuge Complex, says it is entirely possible that the deaths and the abandonment were caused by a combination of the West Nile virus, coyote activity and severe weather. It is also possible, added Torkelson, that the abandonment was a “quirk of nature, one of those strange occurrences that never gets explained.” Acting Manager David Bolin at Chase Lake Refuge says, “We’re realizing how little we know about the breeding practices of colonial nesting birds.”

The learning process will continue with a pelican workshop this winter. Pelican experts from North and South Dakota will gather to organize new monitoring and research programs and begin to analyze the small amounts of information collected over the past two seasons. “Every time we think we have it figured out,” says Hanson, “the birds do something different.” ♦

North Dakota Senator Byron Dorgan visited Chase Lake NWR with (left to right) Dave Bolin, acting Chase Lake Manager; William Hartwig, Chief NWRS, (Senator); Kim Hanson, Supervisor Arrowwood NWR Complex and Marsha Sovada, Researcher USGS Northern Prairie Wildlife Research Center. Senator Dorgan asked that a report be prepared for Congress on the disappearance of the pelicans from the Refuge. (John Steiner/The Jamestown Sun)



30 Years Later, Former Service Employees Meet at Bulls Island

by Patricia Lynch

Warren Parker and Burkett Neely, retirees from the U.S. Fish and Wildlife Service, stood beneath the massive, moss-covered oak behind the Dominick House on Bulls Island, SC, meeting again for the first time in 30 years. In 1975, they had worked together clearing impoundments of cattails for the Puerto Rico Department of Natural Resources. This year, they met by pure chance, both working on behalf of natural resource conservation on a national wildlife refuge.

Neely spent a summer weekend at Cape Romain NWR, clearing trails and assisting visitors. Since his retirement in 1998, he has been coming to Cape Romain Refuge annually as a volunteer. “Cape Romain was the first refuge where I held a management position and it holds a special place for me and my family,” said Neely, who began volunteering almost immediately after he retired. Of particular interest to Neely is Cape Romain’s loggerhead sea turtle project.

With an average of 1,000 nests annually, Cape Island is the most significant loggerhead nesting beach north of Cape Canaveral, Florida. Not only is the ongoing work with the loggerhead sea turtles fascinating to Neely, but he also wants his grandson to understand why Cape Romain Refuge and Bulls Island are such special places. “Thirty-something years after I worked at Cape Romain, I keep coming back,” he notes.

That same weekend, Parker presented firsthand accounts of the red wolf recovery project at the Sewee Visitor Center. Parker began his career as a wildlife biologist at Savannah NWR in Georgia. In 1984, he became the first Red Wolf Project Coordinator for the Service, four years after the red wolf was declared extinct in the wild. Bulls Island was the experimental site for the wolf in the mid-70s to determine whether wolves could be reintroduced back into the wild; Parker

worked with the experimental pairs at Bulls Island and then led the first North American reintroduction at Alligator River NWR in northeastern North Carolina. He also initiated a reintroduction program in the Great Smokey Mountains National Park.

“I still love to talk about the Endangered Species Act, wolves and predator-prey relationships,” said Parker. “The act, passed in 1973, has served to force public attention on the plight of all wild things, from the humble freshwater mussel to the four-legged predators – and on a system that, many years ago, was a perfect system of wildness.”

“If we can help people understand that some degree of wild habitat is necessary, then we help preserve a part of ourselves,” he continued. “What a dull world it would be without the fauna and flora I talk about.”

Parker retired in 1991 after a distinguished 34-year career. He was recognized with five Special Achievement Awards during his career. “Coming back to the refuge brings back a lot of memories about my years in the Service,” said Parker. “Red wolf recovery is a project that’s dear to my heart. I wish I had stayed on a few years longer,” he concluded.

Each year, Neely participates in a variety of volunteer activities at Bulls Island. He clears trails and removes fallen limbs from the roads, provides information to island visitors and documents wildlife



Burkett Neely, pictured with his wife Lee, has come to Cape Romain Refuge as a volunteer since 1998.

observations. Neely is currently a consultant for the Miccosukee Indian Tribe in Florida and also consults with individuals seeking environmental permits for construction.

Neeley held various management positions on national wildlife refuges during his 33-year career. While at Pee Dee NWR, he was designated as the Service representative to the Eastern Brown Pelican Recovery Team. During his assignment at the Arthur R. Loxahatchee NWR, Florida, Neeley instituted a water monitoring system that revealed the causes of pollutants affecting water quality and the area’s fish and wildlife. He was instrumental in negotiating the agreement between the state of Florida and the Service to restore the pristine character of the Loxahatchee–Everglades environment. Neeley received the Meritorious Service Award and the Distinguished Service Award, the highest honor bestowed by the Department of the Interior. ♦

Patricia Lynch is the park ranger with the Sewee Visitor & Environmental Education Center at Cape Romain National Wildlife Refuge, SC.

Fire: Not Always a Threat

By Mary Kwart

Fire education for young people, fire suppression training for their parents and wildland fire use are all tools being used to manage fires at Tetlin National Wildlife Refuge in Alaska.

Every other summer, students in the village of Tok have the opportunity to take a fire science course. They learn about fire effects and behavior, fire suppression techniques, protecting dwellings from wildland fire using FireWise principles, and using fire as a management tool. Mary Timm, environmental education specialist at Tetlin, says student projects in the course have ranged from an imaginary resume for a Hot Shot crew boss to a book report on *Fire on the Mountain* and creative fire cartooning.

As part of the course, refuge and state forestry employees presented FireWise programs to students and their families. The class evaluated the wildfire risk of several homes on the Tetlin Refuge and students then rated their own homes. Evening workshops were held for property owners to stress what they can do to make their homes more defensible from wildfire and provide an opportunity for local people to sign up for home risk

assessments. Tetlin Refuge is partnering with the local State Forestry office to construct a fuel break around the town of Tok to protect refuge offices and homes from wildfire damage.

Tetlin Refuge is also working with fire crews from Northway Village on another cooperative approach. The village as well as Northway Junction and Pt. Alcan are all considered at high risk for fire damage. Crews of village residents have been trained in chainsaw operations and safety as well as fire suppression. The crews respond nationally to suppress fires during the summer and return to fire hazard reduction projects in between their fire assignments. Village crews have thinned many acres of highly flammable black spruce around homes and

businesses. Firewood is then made available to local residents.

About 25 percent of the people of Northway Village have been employed during three fire seasons as members of suppression, thinning and firebreak



Northway Village teacher Dale Lackner tries one of the lab activities in the FireWise curriculum. Refuge and state forestry employees present the FireWise programs to teach students and their families about wildfire prevention. (Mary Timm/USFWS)

20-Year Veteran – from pg 1

Chase was first commissioned as a U.S. Refuge Officer in 1988 after completing the Land Management Police Training at the Federal Law Enforcement Training Center in Glynco, GE. Chase has also held a variety of posts on wildlife refuges in Alaska, Arizona, Oklahoma and Texas. Most recently, Chase was the project leader for the Detroit Lakes Wetland Management District in Minnesota, one of 37 such districts in the Refuge System. He also completed the Service's Advanced Leadership Development Program in 2004.

Chase set out his philosophy about law enforcement in a short interview with *Refuge Update*:

What are your top priorities?

First, to ensure that policies and resources are in place to protect our officers, further the Service mission, and demonstrate sound stewardship of public funds.

Second, to assist in recruiting, developing and retaining a cadre of outstanding officers committed to furthering the conservation of wild things and wild places in this country through excellence in law enforcement.

How will the demands of Homeland Security affect law enforcement on refuges?

Homeland security requires that we provide enhanced security of Service

facilities. In addition, our officers are more involved with the greater law enforcement community to ensure efficient national response. As demonstrated with the recent hurricanes, Service officers will be asked to respond to societal needs where their expertise is required. Service law enforcement officers have answered the numerous calls for hurricane victim assistance, and have done so with consummate professionalism. We are very proud of that.

How will the IACP deployment model change the way the Refuge System handles law enforcement?

Ideally, the deployment model will result in greater law enforcement coverage for

construction crews. In the summer of 2006, crews from Tetlin Village plan to start a thinning project around their village.

A Historic First

This multi-pronged approach to fire management was spurred in part by a small lightning fire in 2003 that came to be known as the Black Hills Fire. It was the first fire on the Tetlin Refuge – and one of the first in Alaska – to be managed under national guidelines for Wildland Fire Use.

Wildland Fire Use, also known as “managing wildland fire for resource benefit,” provides managers with a tool that helps fire play its natural role in the environment. Under this strategy, fires are monitored and suppression actions are implemented only when safety or resource values are threatened. The physical and behavioral parameters of a fire, pertinent environmental conditions, and potential threats are assessed daily and used to develop management strategies and contingency plans for resource protection. These plans change as the fire grows and require active coordination between suppression agencies and adjacent landowners.

The Black Hills Fire eventually burned 42,800 acres, entirely on federal lands managed by Tetlin Refuge and Wrangell St. Elias National Park and Preserve.

Drought conditions on the refuge delayed the season-ending precipitation, allowing the fire to actively burn well into September. A Rare Event Risk Assessment Program (RERAP) analysis was conducted in mid-August to predict probabilities of the fire reaching Native allotments, cabins and other areas of concern.

Throughout the lifespan of the fire, risk remained low as determined by a model used in the analysis that incorporated the fire’s physical parameters, fire behavior, local fuels distribution, and historical climatic conditions. Although contingency plans were in place to protect private property, the results of the RERAP analysis proved correct and the fire never posed a threat to public or private values. No direct suppression action was ever required.

In 1982, the Kennebec fire burned within the same area as the Black Hills fire. Fire effects monitoring plots installed after the Kennebec fire were monitored again after the Black Hills fire. It looks like forested communities that burned in 1982 provided an effective barrier against the spread of the Black Hills fire; however tundra communities tended to reburn easily. Additional research being conducted on the Black Hills fire includes development of a burn severity index based on LandSat

imagery, post-burn berry, vegetation, and small mammal inventories, and inventory of fuels burned on the forest floor to help predict smoke emissions.

Wildland Fire Use is a fire management tool that results in healthy ecosystems and cost savings, while protecting values at risk. In Alaska, this more “natural” use of fire helps allocate scarce suppression resources over large areas and multiple fires. It also allows refuge staff to take a more active role in fire management decisions and capitalize on research, public outreach and environmental education opportunities. For example, Tetlin Refuge has worked with state forestry officials, the Lions Club, the Bureau of Land Management and the Alaska Public Lands Information Center to organize a carnival for families and tourists that focused on fire management and prevention. ♦

Mary Kwart is regional fuels specialist and former Tetlin Refuge fire management officer, with contributions from Jody DeMeyere, Kanuti National Wildlife Refuge park ranger, and Mary Timm, environmental education specialist, Tetlin National Wildlife Refuge.

the Refuge System. It also gives decision makers an additional tool to prioritize where new officers are stationed so we can address the highest priority needs, whether on the national, regional, or a smaller scale.

In 1998, the Refuge System welcomed about 33 million visitors. Last year, that number rose to 39.8 million people. How will we continue to protect wildlife habitats and species as we welcome more people?

Education and awareness. Except possibly in Alaska, the sustainable salvation of wildlife, habitats and ecosystem function depend on far greater landscapes than what we can provide

through the Refuge System. Getting back to the vision set out in the *Fulfilling the Promise* document, refuges will provide the “anchors for biodiversity” and the centers for education and awareness that moves, in a positive direction, the national conscience and environmental ethic.

It is the role of law enforcement to protect both the resources and the public when visitors come to enjoy, learn about, and appreciate our incredible wildlife resources. ♦



Mark Chase, a 20-year veteran of the U.S. Fish and Wildlife Service, was selected Chief of the Division of Refuge Law Enforcement. (USFWS)

Take Pride – from pg 3

Callie Le’au Courtright is volunteer coordinator for the Desert NWR Complex. She represented the Service in the interagency partnership that includes the National Park Service, the Bureau of Land Management and the Forest Service. “People don’t recognize all our different uniforms,” says Le’au Courtright, so the partnership provides a central clearinghouse for anyone interested in volunteering on public lands. Paperwork is reduced, training can be combined and volunteer skills can be more

effectively matched with opportunities and needs. Le’au Courtright says extensive publicity about the “Get Outdoors Nevada” campaign has also made more people aware of public lands like national wildlife refuges. ♦



Volunteer in the Desert NWR Complex, Nev., removes debris and rehabilitates an area damaged by illegal off-roading activity. The complex participates in the award-winning Southern Nevada Interagency Volunteer Program. (USFWS)

Some Guiding Philosophies

Award-winning Federal Land Manager Mark Musaus shared some of his operating philosophies as a refuge manager:

Center of excellence: This phrase and another – “creating a memory” – are two important concepts I’ve brought to my management. I try to make the refuge a center of excellence at all levels – from science to stewardships, even to such mundane work as mowing. Aristotle said that excellence is not an act, but a habit. As to “**creating a memory**,” we work to show the public this is a special place, a national treasure. I’ll never forget a local high school student who told us the refuge was the most fascinating place he had ever seen. We serve two customers: wildlife primarily, but we also manage the refuge for the public to enjoy it.

Know core mission and values: Historically, people thought of this refuge as not welcoming. If you went to the refuge, it would be a negative experience. So I had to decide – as we started to work with the Comprehensive Conservation Plan team – what were the core mission and values we had to protect. We couldn’t allow certain activities even if they were tremendous experiences, but we could, for example, open the levee to bicycle riding. It had no real impact on the core mission of the refuge, and it

created a public use opportunity. Once I identified, with staff input, the core mission and values, I was better able to deal with issues as they came up.

Audible ready: It’s a phrase from the “Little Book of Coaching” by Don Shula and Ken Blanchard. Essentially, be prepared, know your job and know your teammates so you can make quick decisions to take advantage of opportunities. I know what we can do, our strengths and our limitations.

Personal involvement: People appreciate that I am personally involved. You learn so much faster when you are. When I got here, the Friends group felt isolated, but I saw their potential. Of the refuge’s 145,000 acres, we only own 2,500 acres. The rest are an overlay of state lands, and I found out that the state wanted to renegotiate renewal of licensing agreement. I couldn’t expect the Friends group to take on an advocacy role unless I showed support. So I attended every board meeting. They saw I was committed to them. Even today, when I don’t attend every meeting, the Friends know that my door is open. We treat Friends and volunteers as an extension of the staff. They keep us pumped up.

\$\$ and sense: We try to stay accountable for dollars and use them



Mark Musaus was cited as a Federal Land Manager of the Year by Take Pride in America. He is refuge manager of Arthur R. Marshall Loxahatchee National Wildlife Refuge in Florida. (USFWS)

wisely. Programs have to make sense to the public, as do our decisions not to allow certain activities or projects.

Walk in their shoes: When dealing with contentious issues, it is important to appreciate that other agencies have totally different missions. We try to understand their missions and needs, find common ground, and see how we can work together to move forward.

Keeping perspective: I always remember how fortunate I am that that I have been entrusted to safeguard this special resource. However, my faith and my family are my highest priorities. I also know I work with a talented, dedicated staff who really get the work done. It is a team effort. ♦

Katrina Diary – from pg 9

prop wash that the airboat was flipped over; all three occupants were thrown into the water. We washed them off with ice water from our coolers before they were then flown by a Coast Guard Helicopter to a decontamination site.

I learned some things that day.

1. Don't be the first guy or the last guy to get in a boat.
2. Don't operate an airboat underneath a helicopter.
3. The first guy contaminated *don't* get no chopper ride.

Day 6

The focus of operations changed today. We switched to primary searches, going house to house. The stench of the water hung heavy in the air. I didn't know what one of the rescuers in our boat looked like for the first six hours because he had a blue bandanna over his face. He kept shoving Vicks up his nose. It couldn't hurt.

Day 7

The water was starting to recede. The ASPCA had begun dropping off 50-pound bags of dog food at our launch sites for the dogs that had started to congregate there. Things were looking better.

Day 8

I learned that Darryn Witt and three other law enforcement officers were on their way down to Zephyr field. With vehicle and boat parking at a premium, I began negotiating for space for their vehicles and boats. The demobilizing Coast Guard unit agreed to rope off the spaces that they had occupied. They also had a premium sleeping area on the Astroturf, where fans actually made the air move a little bit

Day 9

I decided to stay at the launch site and provide logistical support as well as communications support for our folks. I was not unhappy about staying back today. I had seen enough death, destruction and human misery in the past week to last me a lifetime.

Day 10

I decided to go home last night. There are no formal sign-out procedures or debriefings. Just thank you, good luck and drive safe. I guess I had served my purpose, and there was plenty of force protection with the military in place. About two hours into my drive home, I felt like turning around. Had I done all I could?

The adrenalin rush was gone and the enormity of what I had witnessed was starting to set in. When I have been on travel in the past, I would always drive straight through to get home. This time, I stopped half way in Blytheville, Arkansas. All this time, I tried to get my head around what had happened to that city and its citizens. It still doesn't seem possible that in a few short hours, a metropolitan area in the most powerful country in the world could be brought to its knees by wind and water.

Home

I have had some weeks to absorb everything. What sticks in my mind most is the water. The water is what took the innocent and the opportunist by surprise. The water is what made working conditions, at times, unbearable. In time, the memories will fade, but I don't want to forget. In the end, I would not trade my experience for anything. I would do it again without pause, and I pray that I never have to. ♦

William B. Davison is Refuge Officer at Upper Mississippi River National Wildlife and Fish Refuge.

William B. Davison pictured on Tulane Avenue. He and other Service employees – including Clyde Male, Darryn Witt, Rob Hirschboeck and Jim Hjelmgren, all from Upper Mississippi River National Wildlife and Fish Refuges – performed search and rescue missions in the 9th ward of New Orleans, one of the areas hardest hit by Hurricane Katrina. (USFWS)



Chief's Corner – from pg 2

Summit in February strengthened the Refuge System's working relationships with some of our most important partners. Next year, five Friends Workshops in different regions of the country will help those organizations fully participate in our strategic plan.

What about wildlife? The Ivory-billed woodpecker got all the publicity, but not all the attention here are just a few examples.

Laysan ducks brought to Midway Atoll Refuge are thriving, giving us new hope that a second population of these endemic duck species will ensure their survival. St. Vincent Refuge in Florida celebrated the birth of a wild litter of red wolf pups. We hope some of them may be released into the wild. We have at least 274 California condors thanks to the California Condor Recovery Program, which includes Hopper Mountain National Wildlife Refuge as an important partner. Riparian restoration work at San Joaquin River Refuge brought back least Bell's vireos, extirpated from California's Central Valley for about half a century.

There's lots of work to be done. There always is. But the successes make all the work "the best of times."

Highways – from pg 4

with expediting the environmental approval process while protecting and improving natural habitats.

Squaw Creek National Wildlife Refuge in Missouri has a highway-wildlife story with a different twist. The Missouri Department of Transportation decided to widen a highway and replace a bridge next to the refuge. Almost 150,000 cubic yards of dirt were removed from a marshy corner of the refuge and used to raise the bridge and the road above floodwaters.

Removal of the dirt enabled the refuge to convert a reed canary grass upland to a viable 40-acre wetland called Teal Pool. The refuge also worked with state planners to provide a variety of elevations in the wetland to attract shorebirds and produce moist soil.

Several Web sites provide information to help biologists and engineers find common ground. FHWA features best practices for roadside wildlife conservation on "Keeping It Simple: Easy Ways to Help Wildlife Along Roads"



A new air of cooperation is yielding results for drivers, wetlands and wildlife. (USFWS)

(www.fhwa.dot.gov/environment/wildlifeprotection). Utah State University created a "Wildlife Crossings Toolkit," (www.wildlifecrossings.info) which includes a searchable database of individual cases and mitigation measures. The Center for Transportation and the Environment at North Carolina State University's Institute for Transportation Research and Education created "Wildlife Fisheries and Transportation Web Gateway," (<http://152.14.30.150/CTE/gateway/home.asp>) which includes information on research, best practices and training opportunities. ♦

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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