U.S. Fish & Wildlife Service

ENDANGERED Species BULLETIN

September 2001 *Vol. XXVI No. 1*

Americans have a long history of caring about our rich and diverse wildlife resources. But when landowners find an endangered species on their property, their feelings are likely to be mixed. Most property owners want to conserve unique organisms if they can, and they take pride in the fact that their land supports rare wildlife. Yet, most property owners have an understandable concern about how the presence of a protected species may affect the land's potential uses. In recent years, the Fish and Wildlife Service has been emphasizing conservation approaches designed to minimize the impacts on landowners and offer them incentives for protecting important habitat. This edition of the Bulletin *highlights some examples of such new partnerships to conserve endangered species.*

U.S. Fish & Wildlife Service

Photo by Michael Bender

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On the Cover
Rancher Jim Weaver of New Mexico, a standard-bearer for the High Plains Partnership, is shown here with a trained hunting falcon, a peregrine (*Falco peregrinus*)/gyrfalcon (*Falco rusticolus*) cross. Co-founder of the Peregrine Fund while he was a researcher at Cornell University in New York, Mr. Weaver was a leader in the captive-breeding program that was key to the recovery of the once-endangered peregrine falcon.
Photo courtesy of Grasslans

The Endangered Species Bulletin welcomes manuscripts on a wide range of topics related to endangered species. We are particularly interested in news about recovery, habitat conservation plans, and cooperative ventures. Please contact the Editor before preparing a manuscript. We cannot guarantee publication.

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IN THIS ISSUE

Incentives for Conservation on Private Lands

by Susan Pultz

In Wisconsin, the Endangered Species Landowner Incentive Program has restored and protected important habitat for the massasauga rattlesnake, Karner blue butterfly, and a variety of other species.
Photo by Dick Dicksenson

Feral pigs are a grave threat to many of Hawaii's native plants and animals. Funding for a fence at a Nature Conservancy preserve on the island of O'ahu will help to protect over 20 vulnerable species from habitat destruction by feral pigs.
Nature Conservancy of Hawai'i photo

As the number of species listed or awaiting listing under the Endangered Species Act increases, so do the challenges this situation presents for those of us tasked with implementing the Act and, increasingly, for the public at large. These challenges are compounded by the fact that most listed species depend at least in part on privately owned land for their long-term survival. The cooperation of landowners therefore is necessary for the conservation and recovery of these imperiled species. Fortunately, many private landowners want to help. Often, however, the costs associated with conserving listed species are simply too great for landowners to undertake without financial assistance.

To assist conservation-minded landowners, the Service launched its Endangered Species Landowner Incentives Program in 1999. For the past 3 years, Congress has appropriated $5 million to provide private landowners with monetary incentives to carry out conservation actions on their lands for listed or otherwise imperiled species. This program already has met with great success. In Fiscal Year 1999, the Service received 145 proposals for projects worth $21 million. Decisions about which proposals we could fund with a budget of $5 million were not easy, but 22 of the most beneficial projects received money. In Fiscal Year 2000, we received 138 project proposals, and 34 high quality projects were funded. In Fiscal Year 2001, 48 projects will be funded.

For a project to be eligible for financial assistance, it must: 1) occur on private or tribal land; 2) benefit a listed, proposed, or candidate species, or a species likely to soon become a candidate species; 3) include a 10 percent cost share on the part of the landowner or other non-federal partner; and 4) be a one-year project or a discrete portion of a larger project that can yield distinct and lasting benefits with a single year of funding, since there is no guarantee for funding in subsequent years. Proposals may be for projects that fit into a larger regional plan for conservation of a species, or they may be for projects undertaken by a single landowner who simply wants to promote species conservation on his or her parcel of land. Factors used to evaluate the merit of the proposals are: 1) the number of species that would benefit from the project; 2) the importance of the project to the recovery of the species; 3) the magnitude and type of anticipated ecosystem benefits; 4) identification of landowners who have indicated an interest in undertaking the project; and 5) the degree of cost sharing by non-federal entities, which may include the landowner, state or county government, or non-governmental organizations.

Examples of some projects that have been funded include:

Kaluaa Gulch, Hawaii: This funding is enabling the construction of a 70-acre (28-hectare) fenced exclosure on the island of O'ahu to protect 8 endangered species, 3 candidate species, and 13 other species of concern from the destructive rooting activities of feral pigs in the lowland mesic and wet forest of The Nature Conservancy's Honouliuli Preserve. Feral pigs, among the gravest threats to many native plant and animal species in Hawaii, are expensive to control. After the fence is

completed, The Nature Conservancy will conduct aggressive alien plant and animal control within the exclosure, which will also serve as a reintroduction site for at least three more endangered plant species.

Karner Blue Butterfly and Eastern Massasauga Rattlesnake, Wisconsin: Over the past 2 years, Wisconsin's Karner blue butterfly *(Lycaeides melissa samuelis)* and eastern massasauga rattlesnake *(Sistrurus catenatus catenatus)* Endangered Species Landowner Incentive Program has worked with 178 landowners contributing over 3,137 acres (1,270 ha) of habitat restoration and protection in the oak and pine barren regions of central Wisconsin. The Service's Partners for Fish and Wildlife Program serves as the delivery mechanism for this endangered species program. By developing management agreements and habitat restoration projects, the Partners program maintains a positive, results-oriented approach to conservation of endangered species on private lands.

Red-cockaded Woodpecker Safe Harbor Program: The successful efforts in North Carolina, South Carolina, and Georgia to conserve the red-cockaded woodpecker *(Picoides borealis* or RCW*)* through "Safe Harbor" agreements with private landowners is being expanded through Landowner Incentive Program funds. Recovery activities such as prescribed burning, planting of longleaf pine, and installation of artificial RCW nesting cavities are being undertaken on over 200,000 acres (80,940 ha) throughout these states. Under the Safe Harbor programs, landowners who reach agreements with the Service to improve habitat for listed species on private lands will not be subject to further restrictions on land use if the improvements attract additional individuals of the protected species. For most of the enrolled landowners, this results in no significant land management changes since they are performing these actions, such as burning and planting longleaf pine trees, anyway. The difference is that these landowners are now actively encouraging the presence of this rare bird instead of discouraging its presence.

Alaskan Longline Fishery, Alaska: Funding of Alaska's longline fishery under the Landowner Incentive Program exhibits the flexibility of the program. Rather than providing a landowner incentive funds to conserve or restore habitat on their lands, this project supplied $857,300 in funding over 2 years to the Pacific States Marine Fisheries Commission to be disbursed to longline fishermen for deployment of tori lines on privately owned craft. Tori lines have been shown to be an effective way to minimize seabird bycatch, including taking of an endangered bird, the short-tailed albatross *(Phoebastria albatrus)*.

As the Service seeks to refine and enhance programs for private sector conservation, the Landowner Incentives Program may have a new name and change slightly in the coming year. One thing that will not change, however, is the Service's commitment to increase and improve its assistance to conservation-spirited landowners.

Susan Pultz is a Wildlife Biologist with the Endangered Species Program's Division of Consultations, HCPs, and Recovery in the Service's Arlington, Virginia, headquarters office.

The short-tailed albatross should benefit from funding to reduce seabird bycatch during commercial fishing.
Photo by Steve Moore

Preventative Medicine for Species at Risk

by Terry B. Johnson and Nancy Gloman

Partnerships to conserve species such as the Umpqua mariposa lily (above) and the Cuyamaca Lake downingia (opposite page) have prevented them from declining to the point that they need Endangered Species Act protection.
USFWS photo

By May 1 of this year, 1,243 U.S. species have passed through the emergency room to the intensive care unit to be cared for under the Endangered Species Act (ESA). About 16,800 other species have begun to exhibit symptoms of decline and need preventive care. Will they receive that care? Past experience suggests they will not, but some people are trying to change that.

Throughout the country a new conservation movement is being developed by federal, state, and local agency representatives; Tribes; private landowners; conservation organizations; industry representatives; academics; and other stakeholders. They are writing the prescription for preventative medicine. These people are concerned about the increasing numbers of endangered species, concerned that more species are being listed federally than are being recovered, frustrated about the contentious nature of endangered species issues, and wonder what could be done to ensure that species are conserved without the need for protection under the ESA. They believe that waiting until species are on the brink of extinction to conserve them is simply bad business, whether from an ecological or an economic perspective, and it is time to get ahead of the curve.

Examples of partnership agreements and programs that have precluded the need to list under the Endangered Species Act include the Pecos pupfish *(Cyprinodon pecosensis)* in New Mexico and Texas, the Umpqua mariposa lily *(Calochortus umpquaensis)* in Oregon, and a California plant, the Cuyamaca Lake dowingia *(Dowiningia concolor* var. *brevior)*. Building on this success, the state fish and wildlife agencies, working through the International Association of Fish and Wildlife Agencies (IAFWA), in cooperation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, and Bureau of Land Management, are hosting a series of invited-participation workshops from March through May 2001 to bring together parties interested in conservation of the Nation's fish and wildlife resources. The purpose of these professionally facilitated discussions is to:

- explore ways to make State Conservation Agreements (SCAs) an effective means by which to maintain healthy species and ecosystems;
- provide for constructive exchange of information and ideas regarding development and implementation of SCAs among a wide range of interests; and
- synthesize and disseminate the results of the workshops in a way that will help all parties advance the use of SCAs.

The workshops are being held in Las Vegas, Nevada; Portland, Oregon; Chicago, Illinois; Frankfort, Kentucky;

Atlanta, Georgia; and Albany, New York. Expected outcomes include:

- clarity as to how state SCAs can be used to achieve conservation objectives;
- guidelines that interested parties can use to develop effective SCAs;
- increased communication, collaboration and understanding among current and potential partners about the role and value of developing SCAs;
- identification of incentives for states, industry and landowners to develop SCAs
- reduced need for reliance on the federal ESA to prevent adverse impacts to species and habitats; and
- increased application of limited resources to effective, on-the-ground conservation and fewer resources dedicated to litigation.

In November 2000, state and federal agency representatives met twice to share their experiences to date with Conservation Agreements and develop a sense of issues and concerns the agencies need to explore with other parties involved in development and implementation of SCAs. A primary outcome of these sessions was a decision to enhance the use of SCAs as a proactive conservation tool that complements existing approaches for those species that are already in the federal listing process (i.e. candidate and listed species).

The government partners in this enterprise intend to develop a functional model for an SCA that can be adopted by the collective state fish and wildlife agencies at the IAFWA conference in September 2001, and which can be implemented under state leadership in collaboration with willing cooperators. By using SCAs to conserve species that may be declining but which are not yet imperiled, we can better fulfill our roles as wildlife steward and at the same time help stem the flow of federal listings under the ESA.

The model the agencies envision will not be a restrictive formula. There are just too many variations in species-specific circumstances for a "one size fits all" approach. Instead, it is envisioned as a set of comprehensive guidelines that identify the crucial elements that should be considered in drafting an SCA. The better the elements are addressed, the more likely it will be that a petition or legal action would result in a decision that federal listing is unwarranted. To facilitate broad collaboration in these agreements, the model will clearly delineate mechanisms and incentives for participation by private and public stakeholders.

The work will not end with the model. The agencies have already begun tackling how to develop dedicated funding for the SCA program and how to determine state, regional and national priorities for allocating the funds. This phase will be even more challenging than developing the model, but it is essential to see it through to closure over the next year or so. As the plan comes together, we will provide more information to stakeholders.

Enthusiasm for this new proactive approach is growing. Stakeholders across the country are collaborating in crafting state and local solutions to conservation of natural resources and prevention of species declines: A prescription for success. This is just what the doctor ordered.

Terry B. Johnson is Chief of the Nongame and Endangered Wildlife Program in the Arizona Game and Fish Department. Nancy Gloman is Chief of the Office of Partnerships and Outreach for the endangered species program in the Fish and Wildlife Service's Arlington, Virginia, headquarters office.

Photo © Mark Elvin

Partners for Fish and Wildlife

by Ann Haas and
Martha Naley

The Partners for Fish and Wildlife program began in the Midwest about 15 years ago, mainly as an effort to help restore "prairie potholes" on private lands for migratory waterfowl. Landowners who valued these birds looked to the Fish and Wildlife Service for assistance in making the small wetlands a key feature on their landscapes once again.

Private landowners are the stewards of over two-thirds of our nation's land, and their participation in conservation is essential to the long-term health of our nation's fish and wildlife resources. We recognize that effective partnerships are the key to success. Our Partners for Fish and Wildlife program provides restoration assistance and funding to landowners to restore habitat for trust species such as migratory birds, anadromous (migrating between salt and fresh water) fish, and declining animals and plants.

From its humble beginnings, the program has fostered partnerships with private landowners and tribes to restore over one million acres (0.4 million hectares) of wetland, prairie, and forest, and 3,200 miles (5,150 kilometers) of stream and streamside habitat. Some sites are as small as a single acre while others are as large as several hundred acres. Available in every state and Puerto Rico, the program has a waiting list of people who want to participate.

The Partners for Fish and Wildlife program is a strictly voluntary effort and landowners retain complete control of their property. "We help with quality assistance," says Mike Johnson, a biologist in our headquarters office, "by creating diversity in agricultural landscapes. When we restore wetlands, I call it the 'English muffin effect'—we add nooks and crannies. High spots dry out sooner. Different plants and animals live and grow in the different habitats."

This Salmon Creek fish ladder allows salmonids, particularly bull trout and West Slope cutthroat trout, to migrate to native spawning grounds in tributaries of the Blackfoot River in Montana.
Photo by Greg Neudecker/USFWS

Partners for Fish and Wildlife program biologist Dean Vaughn with Bill Lundstrom (left), a landowner in Mission Valley, Montana.
Photo by Greg Neudecker/USFWS

What began in 1987 as an effort to restore small prairie wetlands has evolved into a wider initiative to incorporate other land and water management activities that benefit a broad range of species. The growing sophistication of ecological restoration techniques has made it possible to address a variety of habitat types that require careful reconstruction of their physical, biological, and biochemical components. We're now helping landowners restore stream channels and stream banks, replant native plant communities (e.g., bottomland hardwood forests, native prairies, and longleaf pine communities), control invasive plant species, and remove barriers in streams (e.g., small dams and culverts) to allow fish passage.

Partners projects also benefit species that are listed as endangered or threatened. In Montana, for example, the Partners program is assisting landowners and other partners in habitat restoration for a variety of wildlife, including such listed species as grizzly bears *(Ursus arctos)*, gray wolves *(Canis lupus)*, and bull trout *(Salvelinus confluentus)*. In one restored creek, bull trout returned to spawn the first year after the habitat restoration was accomplished!

The Partners program places a priority on working with landowners located near national wildlife refuges, thereby enhancing refuge activities. We also work in cooperation with the U.S. Department of Agriculture, helping it incorporate fish and wildlife considerations into the conservation provisions of the Farm Bill (e.g., Conservation Reserve Program, Wetlands Reserve Program, Wildlife Habitat Incentive Program). In Fiscal Year 2001, Congress appropriated approximately $25 million for the Partners program nationwide. So far, the Partners program has had the pleasure of working with landowners and tribes on 24,000 restoration projects, and we smile every time the phone rings.

Ann Haas is a Program Specialist with the Endangered Species Program's Office of Partnerships and Outreach. Martha Naley is Chief of the Fish and Wildlife Service's Branch of Habitat Restoration, Division of Fish and Wildlife Management Assistance and Habitat Restoration, in the Arlington, Virginia, headquarters office.

Almost 42 acres (17 hectares) of wetlands were restored at this site on the Geoff Foote ranch in the Blackfoot Valley of Montana. Before the Partners project, bull trout were not documented in the stream. The next year, biologists found the species in the restored area.
Photo by Greg Neudecker/USFWS

Landowners Help Karner Blues

by Michael Engel

A female Karner blue butterfly
Photo by Mike Engel

What Wisconsin Landowners are saying about the Partners Program:

"We are impressed that our tax dollars are being used for projects like this, and we hope your program expands and continues. Our next personal effort will be to encourage our local township road-mowing crew to be sensitive to shoulders where lupine [the Karner blue butterfly's larval host-plant] grows…Thanks again for your program."
David and Shelley Hamel in a note to Kurt Waterstradt, U.S. Fish and Wildlife Service biologist. Private landowners restoring native lupine as habitat for the Karner blue butterfly on 120 acres (48 ha) near Westfield, Wisconsin, the Hamels are managing the site through the Partners for Fish and Wildlife program.

In 1995, 3 years after the Fish and Wildlife Service listed the Karner blue butterfly *(Lycaeides melissa samuelis)* as endangered, our Wisconsin Partners for Fish and Wildlife program initiated habitat restoration projects for the butterfly in cooperation with private landowners. Success was immediate in terms of landowners willing to participate in voluntary endangered species recovery efforts. In terms of conservation, success soon followed as Karner blues began to colonize the restoration sites (see "Partnerships Take Flight" in *Endangered Species Bulletin*, Vol. XXIII, No. 5).

Since 95 percent of Wisconsin's land is non-federal, the involvement of private landowners in restoring habitat is essential to conservation of the Karner blue. The Service's challenge was to provide technical and financial assistance to help landowners restore and enhance Karner blue habitat. Many quality habitat restoration projects are developed while sitting around a landowner's kitchen table. These discussions foster an understanding of appropriate management techniques and appreciation for the butterfly. But more importantly, they establish trusting relationships.

The Karner blue butterfly is associated with oak savanna and pine

David and Shelley Hamel walking through their oak barrens after a fall burn that benefitted Karner blue butterfly habitat.
Photo by Kurt Waterstradt

Fish and Wildlife Service biologist Mike Engel presents landowner Bill McCartney with a sign and certificate for helping to restore the Karner blue butterfly. Mr. McCartney and his wife Joan converted 30 acres (12 ha) of former crop land to a diverse prairie habitat. This photograph was taken by John Crass, an area landowner who seeded the field.

barrens, which support a variety of wildflower species. As larvae, the butterfly's sole food plant is wild lupine *(Lupinus perennis)*, but the adults feed on nectar from a number of flowering plants. The Partners for Fish and Wildlife program fosters the restoration and enhancement of oak savanna and pine barrens by providing technical and financial assistance to landowners. These ecosystems once occurred across large landscapes throughout the Midwest. Fire suppression, agriculture, pine plantations, and development have reduced these habitats to less than 0.02 percent of their presettlement range. Many of these remnant habitats lie within the 95 percent of the state that is non-federal land. To protect these rare ecosystems and their associated rare species, it is critical for the Service to work cooperatively with private landowners.

While the Partner's program was progressing, another conservation program commenced. After 5 years of development, the Wisconsin Statewide Karner Blue Butterfly Habitat Conservation Plan (HCP) was completed in 1999 (see "Butterflies Benefit from Statewide HCP" in *Bulletin* Vol XXV, No. 4). The HCP was developed by 26 partners, including major forestry stakeholders, county forests, The Nature Conservancy, utility companies, and the Wisconsin Departments of Natural Resources, Agriculture, and Transportation. It includes a plan that encourages small private landowners to participate in conservation of the Karner blue butterfly voluntarily. The permit issued for the HCP automatically covers the "incidental take" of Karner blues on these lands in accordance with the terms of the plans. This removes regulatory burdens for small private landowners and promotes conservation on private lands.

A third program provides funding to restore Wisconsin's Karner blue habitat on private lands. In 1999, Congress authorized funding for the Endangered Species Act Landowner Incentive Program (ESLIP), an innovative program to provide much needed financial assistance to private property landowners to conserve listed, proposed, and candidate species, and otherwise imperiled species. The Service's Wisconsin Private Lands Office and its three Service partners (Necedah National Wildlife Refuge, Green Bay Ecological Services Field Office, and Leopold Wetland Management District) received an ESLIP grant in 1999 to promote conservation of the Karner blue

"This prairie experience will enrich our campers and our community."
Leroy Latham, operations manager of the Wisconsin Christian Youth Camp at Fallhall Glen, a project to restore 60 acres (24 ha) of prairie as habitat for the Karner blue butterfly and other native plants and animals.

"The [Wisconsin] DNR vigorously supports the continuation and increased services from your private lands program in the future. The Karner blue butterfly is the 'poster child' that is driving private landowner support for savanna restoration right now."
David Lentz, Karner Blue Butterfly Habitat Conservation Plan Implementation Coordinator, Wisconsin Department of Natural Resources, Bureau of Forestry, in a note to Jim Ruwaldt, Wisconsin Private Lands Coordinator.

Wild lupine and other wildflowers spring up on Jon Peterson's property, a Partners site, about one month after a prescribed burn.
Photo by Kurt Waterstradt

"I went out there this morning, and it looked good. There was still a little smoldering from the chunks of wood on the south slope of the hill. That was the area next to the small prairie. There was no wind, and there is really nothing around to catch on fire. It's supposed to rain this weekend so I'm not worried. I'll be out at the land again tomorrow for awhile. Thanks for your vision and all of your help. You do good work."

Jon Petersen, writing to Kurt Waterstradt, U.S. Fish and Wildlife Service, about a prescribed burn to remove undergrowth around jack pines and red oaks on a site occupied by Karner blue butterflies in Waupaca, Wisconsin. The fires also suppress exotic cool-season grasses and stimulate growth among native grasses. Mr. Peterson is managing 43 acres (17 ha) for the endangered butterflies.

butterfly and eastern massasauga rattlesnake *(Sistrurus catenatus catenatus)* in voluntary cooperation with private landowners.

Funds from the ESLIP grant are used for planting wild lupine and wildflowers that produce nectar for adult Karner blues; restoring oak savanna and pine barrens habitat to promote establishment of viable metapopulations of butterflies; and creating dispersal corridors to connect isolated local populations. In 1999, we exceeded our first year's restoration goals by restoring 542 acres (220 hectares) of Karner blue habitat. Partners included small private landowners, The Nature Conservancy, and two county forests, who together contributed more than $14,000 for habitat improvement projects. Building on our success, we were awarded additional ESLIP funding in Fiscal Year 2000. Interest in restoring Karner blue habitat by so many landowners allowed us to increase our restoration goal to 800 acres (324 ha) with 25 partners. These partners are contributing nearly $68,000 to the restoration cost. Our continuing success suggests that additional opportunities may exist for long-term habitat restoration.

A few of the private land sites restored in 1999 have already been colonized by Karner blues. We have every reason to believe that more sites will be colonized as nectar plants and lupine become established.

We plan to measure the success of our restoration program by monitoring for butterflies, lupine, and nectar species at restored sites. The monitoring data collected thus far are stored in a geographic information system (GIS) system by the Leopold Wetland Management District. In addition to analyzing the success of past projects, this information will assist in selecting the best future project sites. Restoring habitat on private lands will benefit not only the owners that care about wildlife but also the butterfly and a variety of associated species.

Michael Engel is a biologist for the Service's Wisconsin Private Lands Office in Madison, Wisconsin.

Working Together for Riparian Conservation

by Ann Haas

In southeastern Arizona, a Partners for Fish and Wildlife project provides water for cattle grazing while protecting a sensitive riparian area for two endangered species—a fish and a plant—and a springsnail species that is a candidate for listing.

"It's something we all believe in. We want to hang on to what we've got," said the owner of the ranch, Davis Merwin, about the conservation initiative. "We're happy that we've done it," he added.

The Partners project is conserving Cottonwood Spring for two endangered species, the Gila topminnow *(Poeciliopsis occidentalis occidentalis)* and Huachuca water umbel *(Lilaeopsis schaffneriana recurva)*, along with the Huachuca springsnail *(Pyrgulopsis thompsoni)*, a candidate species. "This is an exceptional spot," said Marty Jakle, Arizona Coordinator for the Partners program, "with two listed species and a candidate species in high-priority riparian habitat featuring cienegas. The Nature Conservancy was the catalyst in restoring the area by contacting the landowner about our partnership opportunities."

Cottonwood Spring, situated near the headwaters of Sonoita Creek and the town of Patagonia, Arizona, supports about a mile (1.6 kilometers) of perennial stream habitat. It is home, said Marty Jakle, to "a diverse assemblage of neotropical migratory birds: the yellow-billed cuckoo, Cassin's kingbird, Bell's vireo, summer tanager, yellow warbler, yellow-breasted chat, and gray hawk. The spring also supports a healthy riparian plant community."

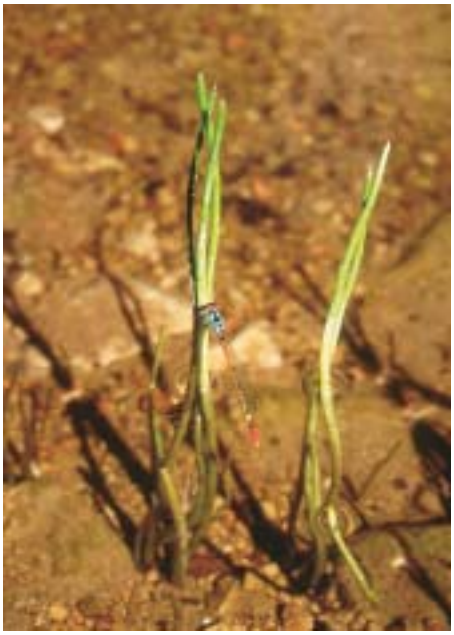
"The headwaters population of Gila topminnows is particularly important because of its capability to replenish and restock downstream populations in Sonoita Creek that may 'wink out' due to drought, exotic species competition, or other calamities," added Frank

(continued on page 15)

Gila topminnows
Photo by John Rinne

What is a "Cienega"?
Cienega ("see-en'–ee-ga") habitats are watered areas surrounded by dry or semi-arid deserts. These oases provide shelter and water to many plants and animals. Many cienegas have developed isolated and unique flora and fauna of their own. Written accounts of the settling of the Southwest are replete with descriptions of travelers relying on these areas and frequently settling along them, as had Native Americans. Today, few cienegas remain undisturbed. Many have been lost, largely due to knowing or unconscious activities of humans, including their livestock-watering practices.

Cienegas, such this one at Buenos Aires National Wildlife Refuge in southern Arizona, provide important riparian and aquatic habitats in an arid region.
Photo by Michael Bender



Huachuca Water Umbel

The endangered Huachuca water umbel and "bonus" damselfly. A member of the parsley family, the Huachuca water umbel is a wetland species found in cienegas in Sonoran desert scrub habitat, grasslands or oak woodlands, and conifer forests between 4,000 and 6,500 feet (1,210 and 1,970 meters). The plant requires perennial water, a factor in its decline in rare wetlands of the Southwest. Protected by the Endangered Species Act since 1997, the Huachuca water umbel is also protected by the Arizona Native Plant Law and as a Forest Service sensitive species.

Photo by J. Rorabaugh/USFWS

Gila Topminnow

The endangered Gila topminnow is a small (2-inch, 5-centimeters-long) guppy-like, live-bearing fish. The Gila topminnow historically occurred throughout the Gila River drainage in Arizona, and even into New Mexico and Mexico. The species declined due to exotic fish competition and predation, water diversion, stream channelization, groundwater pumping, and water pollution. The Gila topminnow is found in streams and springs below 4,500 feet (1,350 meters) elevation, primarily in shallow areas with aquatic vegetation and debris for cover.

Although it can live in a variety of water types such as springs, marshes, and streams, the Gila topminnow likes shallow, warm, quiet waters. It feeds primarily on the larvae of insects, including mosquitos, but also on other small aquatic and terrestrial invertebrates. The species can tolerate relatively high water temperatures and low dissolved oxygen. The introduction of the predatory mosquitofish in the 1920's was a significant factor in the decline of the Gila topminnow. Cottonwood Spring is home to one of the remaining natural populations of the Gila topminnow.

The species is being raised at Dexter National Fish Hatchery and Technology Center in New Mexico for reintroduction into many sites in Arizona. Topminnows live about two years. Since its listing in 1967, the Gila topminnow has been reintroduced into more habitat than any other native fish species in the Southwest.

Photos by John Rinne/U.S. Forest Service

Huachuca Springsnail

The Huachuca springsnail, a candidate for listing under the Endangered Species Act, shown next to a straight pin to give an idea of scale. Loss or degradation of spring and cienega habitat including erosion from overgrazing and timber harvest, drought, mining effluent, altered fire regimes, and water development have contributed to the decline of this tiny aquatic snail in its historic range in Arizona and Mexico in the upper San Pedro River drainage and upper Santa Cruz River drainage. A healthy habitat resulting from relocating livestock will help the species.

Photo by Marty Jakle/USFWS

Baucom of the Arizona Partners program. The headwaters population is a "pure" population, with no nonnative mosquitofish *(Gambusia affinis)* that compete with and prey on the native topminnows.

The objective of this project was to remove grazing animals from the sensitive spring and provide an alternate water source for livestock in the uplands. The challenge was to move cattle across a highway, which meant going through a wetland, under a culvert, and over a rangeland.

"The problem was that once cattle got into the wetland during our Arizona summers, they didn't want to move," TNC's David Harris commented. "The result was black mush, with a negative impact on the plants, snails, and topminnows." The solution was a "driving lane" for the livestock. Now constructed, the lane provides an effective means for moving livestock from the southwest side of the highway to the northeast side.

"The recovery of the area is remarkable," David Harris said. "The site has been transformed from a bog to a stream course, heavily vegetated with cottonwoods and willows. It's become habitat suitable for southwestern willow flycatchers!" he exclaimed, looking ahead to its further potential for endangered species.

The Partners project provided an alternate water supply by installing a solar-powered automated pumping system along the stream, and pumping water to tanks in the adjacent uplands and to a driving lane, so the cattle can drink en route from one pasture to another. The project fenced the riparian corridor, about 20 acres (8 hectares) of cottonwood and willow forest and cienega, to prevent year-round grazing. Both of these important habitats are dwindling in the arid Southwest. The pastures themselves, comprised of thousands of acres, include a diversity of habitat with water sources. After the project was completed, the ranch foreman commented that it used to take three cowboys to move the cattle through the area and out of the stream, but with the project he needs only one cowboy to do the same job.

Begun in 1993, this Partners project was one of the earliest in Arizona. The recovering habitat has benefitted many species, not just the listed ones. Thanks to this Partners project, an adjacent property-owner also has become a participant in the program.

The project is a cooperative effort among the landowner, the Arizona Chapter of The Nature Conservancy, and the National Resources Conservation Service (a U.S. Department of Agriculture agency that assisted in designing the water-supply system). The Arizona Game and Fish Department and The Nature Conservancy are monitoring the Gila topminnow and Huachuca water umbel populations at the spring. The Arizona State Parks Board participated in surveys that catalogued rare species in the area.

Mr. Merwin is donating 170 (69 ha) acres of the property to the Conservancy's Patagonia-Sonoita Creek Preserve, which is downstream from Cottonwood Spring. The preserve attracts between 30,000 and 40,000 visitors a year.

Ann Haas is a Program Specialist with the Endangered Species Program's Office of Partnerships and Outreach in the Service's Arlington, Virginia, headquarters office.

Solar Panel: Power in the Desert

This solar panel powers a pump to move water from Cottonwood Spring to cattle away from the fragile stream bank, providing an important source of energy to make possible relocating the animals and restoring the habitat. Cottonwood Spring is home to the endangered Gila topminnow and Huachuca water umbel.

USFWS photo

A Safe Harbor for the Red-cockaded Woodpecker

by Lori Duncan, Lee Andrews, Ralph Costa, and Steve Lohr

The red-cockaded woodpecker *(Picoides borealis)*, or RCW, is an endangered, non-migratory bird found only in the southeastern United States. This species breeds within family groups that typically consist of two to four individuals (including a breeding pair and one or more non-breeding helpers, usually male offspring from previous breeding seasons). Its habitat is generally mature pine forest stands greater than 60 years old with an open, fire-maintained herbaceous ground cover. The woodpeckers nest in cavities they excavate in living pine trees. From the late 1800's through the 1980's, most RCW populations suffered precipitous declines due to extensive logging, short-rotation forestry, the conversion of forests to non-forest uses, and habitat modification due to fire suppression.

In 1998, the Fish and Wildlife Service took a major step toward the ultimate recovery of the RCW by signing the South Carolina Red-cockaded Woodpecker Safe Harbor Agreement, a cooperative project with the South Carolina Department of Natural Resources (SCDNR). This program is voluntary for private landowners and is designed to encourage their participation in the recovery of the species.

Private landowners who agree to conduct land management practices beneficial to the RCW, under individually negotiated cooperative agreements with the SCDNR, can enroll in the program. These cooperative agreements identify the land management activities that the landowners agree to undertake and establish the baseline conditions present on the covered properties.

Photo © Derrick Hamrick

This open habitat is the product of a prescribed burn at the Brosnan Forest funded through the Endangered Species Landowner Incentive Program. Brosnan Forest, owned by the Norfolk Southern Railway, is managed by Mark Clement.
Photo by Lori Duncan

The baselines for RCW Safe Harbor agreements are generally expressed in terms of the number and composition of RCW groups present. Such baselines are required for determining the level of regulatory assurances that a private landowner will receive.

The regulatory assurances protect private landowners from additional management responsibilities under the Endangered Species Act if the RCW population increases as a result of the landowner's beneficial management practices. A landowner can withdraw from the program at any time, but the regulatory assurances provided by the Safe Harbor program are valid only if the landowner remains enrolled in, and in compliance with, the program.

Once enrolled, private landowners are responsible for maintaining the habitat necessary to maintain their baseline responsibilities and conducting activities that provide a net conservation benefit to the species. Often, this results in no significant changes to a landowner's management practices. For example, many participants operate hunting plantations where they maintain long timber rotations and regularly conduct prescribed burns. Both of these practices are beneficial to RCWs, so little more would be expected of these landowners in order to maintain their baselines. Several participants have agreed to install artificial roosting/nesting cavities to encourage increases in their RCW populations. If new (i.e., above-baseline) groups of RCWs become established on the landowner's property as a result of the enhancement activities, the landowner is not responsible for any additional management for these groups, nor is the landowner liable for any incidental take of these additional RCW groups (since they would not be present except for the actions of the landowner). In other words, the landowner can modify the habitat where the Safe Harbor groups exist, provided that the landowner's RCW baseline is maintained. Landowners must, however, inform state and federal authorities 60 days prior to performing an activity that may result in an incidental take of birds covered by a Safe Harbor agreement, and the activity must not take place during the RCW breeding season (to minimize direct effects on the birds). Incidental take is defined as take that is incidental to, but not the purpose of, an otherwise lawful activity.

Benefits to Landowners

The Safe Harbor program has many benefits to private landowners, but the primary incentive is the certainty they gain regarding future land use on their property. They may conduct RCW-compatible management actions on their lands without the fear that additional birds will result in land use restrictions. This type of certainty has garnered the program significant support from participants. Without the Safe Harbor program's regulatory assurances, some of these private lands (or portions thereof) would not likely continue to serve, at least of the long term, as RCW habitat.

Benefits to RCWs

Safe Harbor agreements benefit the RCW by helping to restore or enhance occupied or potential habitat for the species. In many cases, private land that is currently capable of serving as RCW habitat or land that could be made suitable for the species is not being managed for RCWs due to the perception that their presence will restrict traditional land uses or future development. As a result, many landowners have managed their forests in ways that are not beneficial to RCWs, including

conversion to short rotation silviculture and the elimination of natural fire regimes. By removing this disincentive, the Safe Harbor program has encouraged management of southern pine stands, particularly longleaf pine, that favors the RCW and other species dependent on fire-maintained ecosystems. In this way, the Service is cooperating with the SCDNR, non-governmental organizations, timber companies, and other private landowners to assist with the conservation and recovery of the RCW and its associated habitat in South Carolina.

Program Successes

The early results of the South Carolina RCW Safe Harbor Program are promising. As of January 2001, the Program had 48 properties enrolled or pending enrollment, encompassing more than 143,272 acres (58,004 hectares) containing 191 RCW groups. This accounts for about one-third of the RCWs known to occur on private lands in South Carolina. Landowners have enrolled tracts ranging in size from 81 to 16,000 acres (33 to 6,475 ha) in the program. The population of RCWs on private land in South Carolina has increased by at least eight groups since the Safe Harbor program began.

Another positive aspect of the program is that landowners have less anxiety over federal laws and the participation of the Service in private lands management. This has helped alleviate negative feelings and fears about the RCW itself. Many landowners are actually developing an affinity for "their" RCWs and are seeking to increase the population on their lands once they have enrolled in the program.

Landowner Incentives Program

The South Carolina RCW Safe Harbor Program received $405,000 in Fiscal Year 1999 and $85,000 in Fiscal Year 2000 under the Service's Landowner Incentives Program. These funds are provided directly to landowners to perform Safe Harbor-related management activities. According to Mr. Al Epps, consulting forest manager of the Good Hope Plantation, "The money provided by the Landowner Incentives Program has helped us get things done for the woodpecker that we couldn't normally tackle due to other priorities and funding problems. We enjoy having the birds on Good Hope Plantation, but they aren't our top management priority. We appreciate Fish and Wildlife's help to do what's right for the birds, and we hope the funding will continue. Nothing encourages a landowner to protect endangered species more than some type of financial incentive."

In addition to prescribed burning at the Brosnan Forest, the Endangered Species Landowner Incentive Program has funded the installation of artificial nesting cavities for red-cockaded woodpeckers.
Photo by Lori Duncan

In 1999, 23 program participants used funding from the Landowner Incentives Program to enhance or restore habitat for the RCW. The funding ranged from $1,500 to $68,400 per landowner, and it was used for a variety of activities including prescribed burning of 21,802 acres (8,823 ha), installation of 164 artificial cavities, and planting 260 acres (105 ha) of longleaf pine *(Pinus palustris)*. These activities directly benefitted 127 RCW groups on these properties. In 2000, 14 enrollees conducted prescribed burns on 5,780 acres (2,340 ha) and installed 86 artificial cavities, including 7 recruitment clusters.[1] This work benefitted 26 existing groups. In addition, $40,000 of the Fiscal Year 2000 Landowner Incentive Program funds are funding cost-share baseline surveys for new Safe Harbor participants.

The growing involvement of private landowners in these cooperative programs is giving us all hope for the future of the RCW and associated species.

Lori Duncan is an Endangered Species Biologist in the Service's South Carolina Ecological Services Field Office. (Landowners interested in participating in the RCW Safe Harbor program can contact her at 176 Croghan Spur Road, Suite 200, Charleston, South Carolina 29407.) Lee Andrews is the Service's Southeast Region Safe Harbor Coordinator in Atlanta, Georgia. Ralph Costa, the Service's RCW Recovery Coordinator, is located at the College of Forest and Recreation Resources, Clemson University, in Clemson, South Carolina. Steve Lohr, the Safe Harbor Biologist for the SCDNR, is with the Sandhills Research and Education Center in Columbia, South Carolina.

[1]Recruitment clusters are essentially designated areas established to encourage the formation of a new group. The cluster itself will be 10 acres (4 hectares) or so in size. Four or more pines within the cluster will be given artificial cavities for the birds. Some 100+ acres (40+ ha) of contiguous foraging habitat adjacent to the cluster (or surrounding it) will burned, have the hardwoods removed, and basically be made into quality RCW habitat. Once the cavities are installed and the foraging habitat prepared, dispersing RCWs will find the site and take up occupancy.

Stewardship on the Plains

by Ben Ikenson

After the sale of his family farm in Illinois some 25 years ago, Jim Weaver acknowledges mournfully, "It was a feeling I'll never forget. I cannot begin to imagine what fourth-generation ranchers must feel when they're faced with the reality of having to leave the land. I felt an emptiness because I didn't have that place I could call my own, that place where I had grown up, that place I had come to understand. I didn't fully appreciate how attached I had become to that land."

Years later, determined to provide the best environment for his family, he returned to the land, this time in eastern New Mexico about 40 miles (64 kilometers) south of Portales. Today, his property is a 15,000-acre (6,000-hectare) ranch of mid- to tall-grass prairie that supports about 350 head of Mashona cattle. It also supports a healthy and diverse wildlife base, including the lesser prairie-chicken *(Tympanuchus pallidicinctus)*, black-tailed prairie dog *(Cynomys ludovicianus)*, ferruginous hawk *(Buteo regalis)*, burrowing owl *(Athene cunicularia)*, and dunes sagebrush lizard *(Sceloporus arenicolus)*.

Weaver is working voluntarily with the Fish and Wildlife Service for the

The lesser prairie-chicken has been called "the little grouse on the prairie."

Except where noted, photos are courtesy of Grasslans, a charitable foundation established to support habitat conservation for species at risk

Jim Weaver's ranch supports crops, cattle, and wildlife. "Landscape restoration is the only thing that will work in the long-term," he says. "What is good for the prairie-chicken is good for the prairie dog — and it's good for the ranch and the family, too." Southwest ranchers like Mr. Weaver are striving to deal with a 10-year drought, interrupted briefly by a couple of "good springs," he said. "Our 'chickens' are starting to come back, but we've only had one normal year."

Controlling Shinnery Oak: Good or Bad?

In one of the first extended studies of its kind, Jim Weaver has arranged for a 10-year scientific research project on part of his land to determine the impact of short-term herbicide use on plants and wildlife.

"Biologists have been monitoring prairie-chickens here for some time," says Weaver. "The application of Tebuthiuron last fall to control shinnery oak and help restore the native tall- and mid-grasses should benefit the chickens and a range of species, but biologists will be checking vegetation composition, available plant cover, soil moisture, seed and herbaceous production, and populations of birds, mammals, reptiles, and insects to make sure."

Shinnery oak *(Quercus havardii)* is a low-growing, rhizomatous shrub that can grow into dense stands. Weaver terms it a "water-robber," noting its ability to absorb and store water in its vast root system at the expense of native grasses around it. "In years when we only get five inches of rain, the grasses really suffer."

Some conservation groups have questioned the use of an herbicide with potentially detrimental effects to wildlife such as the lesser prairie-chicken. Their concern was the further decline of this and other members of the prairie ecosystem, including the dunes sagebrush lizard.

After the experience on the Weaver ranch, the Natural Resources Conservation Service has a new policy of cost-sharing with eastern New Mexico ranchers to control shinnery oak with the herbicide, provided that 40 percent or more of their land is covered with the brush. The agency also is focusing on incentive payments to ranchers to defer grazing some pastures in favor of wildlife habitat. "This is a big move on their part," says Chuck Mullins, the New Mexico coordinator for the Partners for Fish and Wildlife program. "We are encouraged by what we can accomplish together."

Biologists at the nest of a lesser prairie-chicken on the Weaver Ranch near Causey, New Mexico

conservation of sensitive species through the Partners for Fish and Wildlife program. It came as no surprise that Weaver signed up for the program. Wildlife has been important to him throughout much of his life. While a researcher at Cornell University's Laboratory of Ornithology in Ithaca, New York, he co-founded The Peregrine Fund, an organization dedicated to preserving the peregrine falcon *(Falco peregrinus)* and other birds of prey. Thanks to the hard work of the Fund and its partners, including the Fish and Wildlife Service, the peregrine recovered and was removed from the endangered species list in 1999. Peregrine falcon recovery has been a model for cooperation and hands-on management of imperiled wildlife and their habitats.

Today, Weaver is largely occupied with managing his livestock and land. He does so with the conviction that the future of both ranching and wildlife management hinges on good science and responsible landowners. Weaver may not be a fourth-generation homesteader, but he does understand the traditions of ranching and the values they represent. An advocate of holistic ranching, he enjoys a lifestyle that keeps him close to the land, a lifestyle that some people fear could become as endangered as some of the species that once thrived on the range.

Weaver and other landowners in Oklahoma, New Mexico, and Texas are working to improve 80,000 acres (32,375 ha) in the southern High Plains. For example, ranchers have installed watering facilities or fencing or have replanted native vegetation to benefit candidate species such as the lesser prairie-chicken. "It's not an overnight fix," says Weaver. "It will require at least 50 years to restore healthy water and nutrient cycles to some of these lands. It is most important that we start now."

How can conditions be improved? Biologists hope that by systematically addressing the needs of such vulnerable or listed species as the mountain plover *(Charadrius montanus)*, long-billed curlew *(Numenius americanus)*, grasshopper sparrow *(Ammodramus savannarum)*, burrowing owl, swift fox *(Vulpes velox)*, black-footed ferret

(Mustela nigripes), and black-tailed prairie dog, the High Plains the ecosystem will eventually be restored.

Adequate nesting cover is an important limiting factor for the lesser prairie-chicken, which requires standing dead grass at least 20 inches (50 centimeters) tall in which to nest each spring. To promote this, ranchers typically rest some areas from grazing late in the growing season, a practice that can improve the overall condition of the range and, ultimately, its profitability. Biologists from the Natural Resources Conservation Service and the Fish and Wildlife Service will help participating ranchers implement conservation practices to create a mosaic of nesting habitats.

Over the long term, Weaver said, practices that prove to be good for wildlife are also good for the ranching operation. "Additionally, one of the more obvious benefits to the landowner is that eventually, if ecosystem conditions improve, species will not require protection under the Endangered Species Act. Listing species as endangered or threatened indicates that ranchers, as well as scientists and environmentalists, have failed at their respective duties. We want to get ahead of the curve."

Weaver has offered his ranch as a demonstration site for some of the programs and techniques at work. He has also traveled to Washington, D.C., on behalf of a variety of regional ranch conservation programs. "Environmental Quality Incentives Program, Wildlife Habitat Incentives Program, Wetlands Reserve Program, Conservation Reserve Program—actually a lot of good resource management programs are available in the area but are badly under-funded." He adds, "If we can just get people from all sides of the issue to support the under-funded programs, there are few things that we can't accomplish."

Like his neighbors, Weaver has a vested interest in taking care of his land. He wants give his grandchildren the chance to enjoy the kind of lifestyle that he has become so attached to through the years. "Living this kind of life should be an option available down the road. It's a good life. Human closeness to the land and its non-human inhabitants is necessary to the survival of both."

Ben Ikenson is a Writer/Editor with the Service's Albuquerque Regional Office.

Wetland restoration at the Weaver Ranch

U.S. Fish and Wildlife Service biologist Ken Williams releases a lesser-prairie chicken after gathering biological data.
USFWS photo

Male lesser prairie-chickens inflate orange sacks on the sides of the neck and perform elaborate "dances" during breeding season in an effort to attract a mate.
Photo courtesy of Outdoor Oklahoma

The Partners for Fish and Wildlife program helped fund the first-year project to renovate grasslands by planting. The next year, ranchers made a $50,000 challenge grant that the National Fish and Wildlife Foundation matched. The Western Governors' Association provided $12,000 as part of the High Plains Partnership for species at risk, a cooperative five-State initiative with private landowners. With continued financial support, farmers and ranchers like Jim Weaver can continue the landscape effort. "We think the conservation partnership is a pretty big deal. In time, it will provide the solution by saving our natural heritage—and a way of life that we treasure."

A Partnerships to Restore the Aplomado Falcon

by Marta Curti and
Peter Jenny

Photo © Cliff Beittel

The northern aplomado falcon *(Falco femoralis septentrionalis)* once inhabited open grassland savannas throughout the southwestern United States, much of Mexico, and parts of Guatemala. Feeding mainly on small birds and large insects, aplomado populations suffered due to land altering practices, egg and skin collecting, and pesticide use. As a result, this small raptor has been absent from most of its historic range within the United States for nearly half a century. Now the aplomado falcon is making a dramatic comeback due to a strong partnership among The Peregrine Fund, the Fish and Wildlife Service, Texas Parks and Wildlife, private landowners, the U.S. Coast Guard, and conservation organizations, with generous financial support from a number of corporations, individuals, and foundations.

Almost a decade before the aplomado was listed as an endangered species in 1986, the first steps were taken toward creating the successful captive breeding program that exists today. Beginning in 1977, biologists from the Chihuahuan Desert Research Institute (Ft. Davis, Texas) and The Peregrine Fund collected 25 nestlings in Mexico. With the help of those falcons and their offspring, the Santa Cruz (California) Predatory Bird Research Group and The Peregrine Fund developed breeding and release techniques for this species. "[The] pilot study helped us work out most of the problems associated with the releases. Since then, the restoration efforts have really taken off," said Angel Montoya, field manager for the project.

Armed with this new-found knowledge, The Peregrine Fund intensified its captive breeding program and, between 1990 and 1993, collected additional falcons from the wild. During this time, releases were postponed and the focus shifted to obtaining a healthy population of aplomado falcons that would serve as the genetic base for all future aplomados bred in captivity. Full-scale releases were initiated in Texas in 1994. In May of 1995, the first known successful hatching and fledging of a wild aplomado in the U.S. in more than 40 years was documented. The historic nesting event occurred on a powerline pole near Brownsville, Texas, owned by Central Power and Light.

Central Power and Light played a part in the aplomado falcon restoration effort by placing an artificial nest structure on a power line pole.
Photo by A.B. Montoya

The captive-bred falcons spend roughly the first month of their lives at The Peregrine Fund's breeding facility in Idaho, where they are artificially hatched and hand fed for up to 25 days. They are raised in small groups until transported to their release site at 32-37 days of age. Often, biologists remove the first clutch of eggs an aplomado falcon lays and place them with a captive peregrine falcon *(Falco peregrinus)* for incubation. The aplomado will then lay a second clutch.

Hack site attendants and landowners observing released aplomado falcons at the Welder Wildlife Refuge
Photo by Brian D. Mutch

This surrogate parenting, by a species once requiring surrogate parenting itself, nearly doubles the captive aplomado production.

Once release sites are chosen, the aplomado falcons are transported from the captive breeding facility. To prevent over-heating and over-stressing the birds, the falcons are flown on a commercial airline to Texas. However, it is often a 5-7 hour drive from the nearest airport to the release sites. This is where the Coast Guard steps in. Using their pilots and planes, the Coast Guard has made several trips back and forth between commercial airports and previously arranged pick-up sites at all hours of the day and in all types of weather, even transporting the falcons directly to release sites on occasion. Their assistance has helped to ensure the health and safety of these highly endangered birds of prey.

At the release site, the young falcons are placed in a specially designed box, called a hack box, where they may remain for 5-8 days until they are released. The time spent in the hack box allows the falcons to become acclimated to the site. During this time, they are also fed and observed daily, though their contact with humans is kept to a minimum.

Since the private sector owns 97 percent of the land in Texas, access to the excellent habitat that exists on private land is essential to the recovery of this species. At The Peregrine Fund's request, the Service drafted a Safe Harbor Agreement to encourage private sector involvement. This agreement, signed in 1997, provides private landowners with a "safe harbor" against any future restrictions placed on them or their land practices due to the presence of this endangered species on their property. It also gives biologists the opportunity to choose from the best possible release sites in parts of Texas based upon present land conditions, historical records, prey diversity and abundance, and the relative absence of aerial predators such as great horned owls *(Bubo virginianus)*.

So far, more than 1 million acres (404,700 hectares) of private land, situated primarily along or near coastal Texas, have become part of this agreement, and many private landowners have become actively involved in the recovery effort. In fact, some private landowners are so enthusiastic about the project that they often call Peregrine Fund biologists with updates and sightings. A few private landowners have even contacted The Peregrine Fund in the hopes of getting aplomados released onto their land, too! The success of this cooperative effort led the Service to expand the Safe Harbor Agreement into parts of west Texas. Releases may begin there this year.

Since 1985, The Peregrine Fund has released 578 aplomado falcons. After the first documented recent nesting in 1995, numbers have continued to increase, and in 2001, biologists documented 33 pairs and 22 nests. Says Montoya, "This [success] is amazing, and we hope it continues to get better and better." There is no evidence to suggest that things will go otherwise. In fact, there are hopes of expanding the reintroduction range into New Mexico in the future.

Peregrine Fund biologists predict that it will take several more years to have a self-sustaining population of aplomados throughout much of the bird's former range. With the continued financial support and collaboration of agencies, individuals, corporations, and foundations, the future looks bright for this magnificent species.

For more information, please call The Peregrine Fund at 208-362-3716 or visit their web site at **http://www.peregrinefund.org**.

Marta Curti is a writer/editor at Sevilleta National Wildlife Refuge in Socorro, New Mexico. Peter Jenny is Vice President of The Peregrine Fund in Boise, Idaho.

New Habitat Conservation Plan Grants

by Hugh Vickery

The golden-cheeked warbler is one of two listed songbirds in Texas that will benefit from the purchase of high quality habitat.
Photo by Maria Elena Tolle

A grant will help the state of Florida acquire habitat for the Choctawhatchee beach mouse and two listed sea turtle species.
Photo by Bryan Arroyo/USFWS

The Fish and Wildlife Service is providing $68 million in grants to 10 states in Fiscal Year 2001 to help acquire vital habitat for threatened and endangered species ranging from loggerhead sea turtles *(Caretta caretta)* in Florida to two imperiled songbird species in Texas.

The funds, distributed as part of the Service's Habitat Conservation Plan (HCP) Acquisition Program, will pay up to 75 percent of the cost of HCP land acquisitions in California, Florida, Georgia, Maryland, Montana, North Carolina, Texas, Utah, Washington, and Wisconsin. Non-federal partners are contributing at least 25 percent of the cost of each project.

Congress created the HCP Land Acquisition program in 1997 to complement the use of HCPs for reducing conflicts between the conservation of listed species and land development and use. Under the program, the Service provides grants to states or territories for land acquisitions that are associated with approved HCPs. The lands acquired under the HCP Land Acquisition program are purchased only from willing sellers. They complement, but do not replace, the conservation responsibilities contained in an HCP.

An HCP is an agreement between a landowner and the Service that allows a landowner to incidentally take a listed species in the course of otherwise lawful activities when the landowner agrees to conservation measures that will mitigate and minimize the impact of the taking. Some large HCPs involve multiple species and an entire community. More than 300 HCPs covering approximately 20 million acres (8 million hectares) are already in effect, and more than 200 other HCPs are being developed.

This year's grants are:

California:

Multiple Species Conservation Plan (San Diego County): $14,225,000 will be used to help acquire two key properties integral to the reserve design. The proposed acquisitions will protect the coastal California gnatcatcher *(Polioptila californica californica)* and at least 10 sensitive animal species and numerous sensitive plants. At least four listed vernal pool species also will benefit. The California Department of Fish and Game is providing matching funds.

Assessment District 161 Multiple Species Conservation Plan (Riverside County): $10 million will help acquire several key parcels for the regional reserve design for both the approved AD 161 multi-species HCP and the

pending regional multi-species HCP. The acquisitions will add to the adjacent conservation areas and are essential to recovery of the Quino checkerspot butterfly *(Euphydryas editha quino)*. The California Department of Fish and Game, Riverside County, and private citizens are providing matching funds.

Coachella Valley (Riverside County): $2 million will be used to help acquire land to preserve the sand corridor and the sand source from Indio Hills to the Thousand Palms Preserve. Maintaining the sand source is crucial to the Coachella Valley fringe-toed lizard *(Uma inornata)* and other endemic species. The California Department of Fish and Game is providing matching funds.

San Bruno Mountain HCP (San Mateo County): $509,200 will help purchase Brisbane Acres, an area that provides 10 percent of the habitat for the callippe silverspot butterfly *(Speyeria callipe callipe)* on San Bruno Mountain. The City of Brisbane is providing matching funds.

Florida

Stallworth Preserve (Walton County): $2,000,000 is allocated to help acquire undeveloped beachfront coastal dune habitat. The acquisition will benefit the Choctawhatchee beach mouse *(Peromyscus polionotus allophrys)*, green sea turtle *(Chelonia mydas)*, and loggerhead sea turtle. The State of Florida is providing the matching funds.

Georgia

Georgia Statewide Red-cockaded Woodpecker HCP (Appling County): $400,000 will be used to purchase a 394-acres (160-ha) tract of land to link two conservation areas and buffer the Moody Tract mitigation site. This acquisition will benefit recovery efforts for the red-cockaded woodpecker *(Picoides borealis)*. The Georgia Department of Natural Resources is providing the matching funds.

Maryland

Home Port HCP (Queen Anne's County): $856,000 will be used to purchase conservation easements on two parcels to conserve Delmarva Peninsula fox squirrel *(Sciurus niger cinereus)* habitat and reduce ongoing fragmentation. The Maryland Environmental Trust is providing the matching funds.

Montana, Idaho, and Washington

Plum Creek Native Fish HCP: $5,000,000 will be used to acquire a conservation easement on Plum Creek Timber Company riverfront and bench lands within the Thompson and Fisher River basins. This would protect approximately 7 miles (11 kilometers) of habitat for the bull trout *(Salvelinus confluentus)*. The Montana Department of Fish, Wildlife, and Parks and private landowners are providing the matching funds.

North Carolina

Sandhills (Cumberland, Harnett, Hoke, Moore, Richmond, and Scotland counties): $274,000 will help acquire an important parcel to conserve the longleaf pine ecosystem needed by the red-cockaded woodpecker. The North Carolina Wildlife Resources Commission is providing the matching funds.

Texas

Balcones Canyonlands Conservation Plan (Travis County): $14,362,500 will help purchase six priority parcels to protect high quality habitat for the golden-cheeked warbler *(Dendroica chrysoparia)* and the black-capped vireo *(Vireo atricapillus)*. Travis County is providing the matching funds.

Houston Toad Lost Pines Ecosystem Conservation Initiative (Bastrop County): $900,000 will be used to purchase land to protect the Lost Pines ecosystem, which contains unique bog and wetland habitats for many rare, endemic, and migratory species. The Lost Pines area of Bastrop County contains the largest population of the Houston toad *(Bufo houstonensis)*. Local private landowners are providing the matching funds.

Delmarva Peninsula fox squirrel
USFWS photo

Utah

Washington County (Washington County): $6,063,750 will be used to purchase three identified acquisitions that are valuable habitat for the desert tortoise *(Gopherus agassizii)*. The Utah Department of Wildlife Resources, Washington County Water Conservation District, Washington County, and private organizations are providing the matching funds.

Washington

Washington State DNR (Pacific County): $5,675,000 will be used to help purchase more than 900 acres (365 ha) of old-growth forest and portions of critical habitat for the marbled murrelet *(Brachyramphus marmoratus marmoratus)*. The Washington State Department of Natural Resources is providing the matching funds.

Wisconsin

Wisconsin Statewide Karner Blue Butterfly HCP (Adams and Waushara counties): $1,470,000 will help acquire three parcels to benefit recovery of the Karner blue butterfly *(Lycaeides melissa samuelis)*. The Wisconsin Department of Natural Resources is providing the matching funds.

Hugh Vickery is a Public Affairs Specialist in the Service's Washington, D.C., Office.

A Private Effort to Conserve Biological Diversity

by Mike Phillips

The large Vermejo Park Ranch in New Mexico and Colorado protects a wide range of ecosystems from short-grass prairie to alpine habitats.
Turner Endangered Species Fund photo

I first met Ted Turner in the spring of 1995 when he visited Yellowstone National Park, where I was working with the National Park Service on the gray wolf *(Canis lupus)* reintroduction program. During the day, we discussed the world's woes. It quickly became apparent he believed that, among the world's many problems, the accelerating loss of biological diversity ranked near the top of the list. His concern, based on the realization that thousands of native species and their attendant ecological interactions disappear at the hand of humankind every year, was that this problem would eventually have profound and negative consequences for all of us. He expressed frustration over this trend which, as the wolf project illustrates, is often reversible.

Later, after conferring with his son Beau and other family members who are equally concerned about biodiversity loss, Ted realized that his active involvement in the conservation of imperiled species could improve the recovery prospects for many imperiled plants and animals. As the owner of more than 1.7 million acres (0.7 million hectares), he could help show that coexistence between landowners and endangered species is possible under the Endangered Species Act. In 1997, this interest prompted the family to form the Turner Endangered Species Fund (TESF) and Turner Biodiversity Divisions (TBD). I agreed to come on board as Executive Director of the TESF.

The TESF and TBD are dedicated to conserving biological diversity by ensuring the survival of imperiled species and their habitats, with an emphasis on private actions. We concentrate on carnivores, grasslands, plant-pollinator complexes, species with historic ranges that include Turner properties, and dissemination of credible scientific and policy information about biodiversity conservation. Our projects, which are based on the principles of conservation biology, involve state and federal agencies, universities, non-governmental organizations, and private citizens. We operate on the belief that wrapping many minds around a problem is a certain route to success. Whether we seek to manage extant populations or restore extirpated populations, the ultimate goal is population survival with minimal management. We believe that self-sustaining populations of native species

Grizzly bears are among the rare animals welcome at the Flying D Ranch in Montana.
Corel Corp. photo

indicate a healthy or at least a recovering landscape.

The TESF is recognized by the Internal Revenue Service as a non-profit, private operational charity. Such recognition provides a tax-exemption as long as TESF funds are used solely for projects involving species that are considered threatened or endangered by a state or by the federal government. In contrast to the Turner Foundation, which provides grants, the TESF helps to conceive, design, and implement field projects. The TBD operates under the auspices of Turner Enterprises, Inc., and was formed to focus on vulnerable species (and their habitats) that are not listed as threatened or endangered.

Since our inception in 1997, the TESF and TBD have:

- developed contracts or formal relationships with two federal agencies, five state agencies, six universities, and 18 non-governmental organizations;
- built a staff of 13 biologists, a veterinarian, and a veterinarian technologist;
- been involved in more than 23 projects, including reintroduction efforts for plants, birds, fishes, and mammals;
- begun connecting several Turner properties to large-scale reserve design efforts;
- accepted several appointments to recovery teams, advisory teams, and World Conservation Union (IUCN) Species Survival Commission specialist groups; and
- begun publishing popular and technical articles about biodiversity conservation.

Although our fieldwork emphasizes Turner properties, we are eager to participate on projects with benefits that transcend Turner property boundaries. Several of our efforts dovetail nicely with well-known large-scale reserve design initiatives:

Yellowstone to Yukon Reserve Design and the Flying D Ranch

The Flying D Ranch encompasses 113,000 acres (45,730 ha) in southwestern Montana. As the largest tract of private land in the Greater Yellowstone Ecosystem, the "D" is one of best known ranches in the west. Integrating the D in the mix of lands available to large carnivores and using the field skills of the TESF will greatly advance carnivore conservation, which is a central feature of the Yellowstone-to-Yukon (Y2Y) Conservation Initiative. The Y2Y project, sponsored by a network of over 80 organizations, institutions, and foundations in the U.S. and Canada, seeks to stitch together some 1,800 miles (2,900 kilometers) of North America's most celebrated mountains in a series of protected reserves, wildlife corridors, and transition zones.

Upon its purchase, Mr. Turner donated a conservation easement on the D to The Nature Conservancy. The

Gray wolf
Corel Corp. photo

ranch is dominated by montane rangeland and spruce forests, and it shares a border with the Lee Metcalf Wilderness of the Gallatin National Forest. Maintaining the health of the resident elk *(Cervus elaphus)* herd is an important management objective for the ranch. In collaboration with the Montana Department of Fish, Wildlife, and Parks, the ranch fosters elk that provide recreation to hunters who use adjacent public land throughout the elk season and to hunters who participate in the D's own late-season elk cow hunt.

Grizzly bears *(Ursus arctos)* and wolverine *(Gulo gulo)* have been sighted on the D. During the winter of 1998-1999, TESF biologists also observed one wolf and detected wolf tracks on three other occasions. Large carnivores are welcome on the D. Recently, the TESF began assisting the U.S. Fish and Wildlife Service with monitoring gray wolves that settle the public/private land interface in the northwest corner of the Greater Yellowstone Ecosystem and developing aversive conditioning techniques to reduce livestock depredations.

Southern Rockies Ecosystem Project and the Vermejo Park Ranch

The Vermejo Park Ranch in New Mexico and Colorado encompasses more than 580,000 acres (235,000 ha) along the southeastern border of the Southern Rockies Ecosystem Project.[1] Elevations at the Vermejo reach from 6,000 to 12,000 feet (1,830 to 3,660 meters). Because of this elevational range, myriad ecotypes can be found on the Vermejo, including short-grass prairie, pinyon-juniper woodlands, ponderosa pine forests, mixed conifer stands, spruce-fir forests, and alpine habitats.

Like all Turner properties, the Vermejo is managed to ensure the persistence of native species. If it were ever determined that wolves should be reintroduced into the southern Rocky Mountains, then the Vermejo would provide the TESF a great opportunity to advance wolf recovery, a central feature of the Southern Rockies Ecosystem Project. Without doubt, the Vermejo could support a self-sustaining population of wolves. *(Editor's note: The Fish and Wildlife Service plans to continue to focus its gray wolf recovery efforts in the northwestern United States to Wyoming, Idaho, and Montana. For the Mexican wolf, our recovery efforts remain focused on Arizona and New Mexico. In the midwest states, the Service's gray wolf recovery program is nearly complete, and we are evaluating the northeastern U.S. for its wolf recovery potential as well.)*

To fully appreciate the Vermejo's potential for wolf recovery, it is useful to note that:

- the ranch is five times larger than Isle Royale, Michigan, which has supported a wolf population since the late 1940s;
- the density of the Vermejo's elk herd compares favorably with the density

[1]The Southern Rockies Ecosystem Project is a network of organizations established to restore and protect the ecological integrity of the southern Rocky Mountains in south-central Wyoming, western Colorado, and north-central New Mexico.

of Yellowstone's northern range elk herd, which supports the densest and arguably the healthiest wolf population ever studied (health being measured by body weights and reproductive performance);
- poaching and accidental human-induced mortalities (e.g. collisions with vehicles) would be virtually non-existent because access to the ranch is strictly controlled; and
- the ranch is well within dispersal range of public land that contains suitable wolf habitat (e.g. the San Juan National Forest).

Sky Islands Wildlands Network and the Armendaris and Ladder Ranches

Ted Turner owns two other large properties in New Mexico: 1) the Armendaris Ranch, consisting of more than 335,000 acres (135,600 ha) of Chihuahuan Desert grasslands and desert scrub, riparian habitats along the Rio Grande and the Fra Cristobal Mountains, and 2) the Ladder Ranch, containing more than 250,000 acres (101,2000 ha) of mixed desert grassland, riparian areas, pinyon-juniper stands, and mixed-pine forests. Both ranches are situated along the northeastern edge of the Sky Islands Wildlands Network.[2] The emphasis of these ranches is on native species conservation, and their diverse habitats, elevational range, large size, and proximity to public land ensure that they will always figure prominently in large-scale reserve design efforts within the region.

The Sky Islands Wildlands Network emphasizes the restoration of carnivores, and efforts at the Ladder Ranch contribute mightily to this end. For example, at the Ladder we maintain a captive breeding facility for Mexican wolves *(Canis lupus baileyi)* for release to the wild by the Fish and Wildlife Service. Additionally, the TESF fully supports the reintroduction of Mexican wolves into the Gila National Forest, hopefully on the Ladder's allotments, and has offered the services of a biological technician to assist with radio-tracking. Finally, the Ladder's management team greatly improved the suitability of the region for large carnivores by developing an agreement with the U.S. Forest Service for removing livestock from the Ladder Ranch's two grazing allotments, which cover 65,000 acres (26,300 ha) in the Gila's Aldo Leopold Wilderness.

The TESF enjoys a close working relationship with the Fish and Wildlife Service on many efforts to conserve imperiled species. Our collaborative project to restore red-cockaded woodpeckers *(Picoides borealis)* to Ted Turner's Avalon Plantation in Florida is highlighted in the following article. A meeting between the TESF and the Service's senior staff in Washington, D.C., resulted in the decision to develop a Memorandum of Understanding to ensure that collaborative wildlife conservation efforts will continue.

The TESF and TBD have made good progress conserving native species since 1997. However, we realize that much work remains if we are to establish our efforts as a continuing force and to properly integrate Turner properties into large-scale conservation reserve design efforts. We recognize that these tasks will be difficult because emphasizing private stewardship of biodiversity is still a fairly recent approach, the problems are complex, and effective solutions require broad-based socio-political, geographic, and fiscal considerations. The difficulty of the tasks, however, does not diminish our resolve, which is based on the belief that any real solution to the extinction crisis will rely on the genius and determination of all humankind.

Mike Phillips is Executive Director of the Turner Endangered Species Fund in Bozeman, Montana.

[2]The Sky Islands Wildlands Network is an ecological preserve system proposed by environmental organizations in the U.S. and Mexico. It would restore and protect "islands" of mountain habitats in the region stretching from the Mogollon Rim in east-central Arizona and west-central New Mexico to the northern Sierra Madre Occidental in Chihuahua and Sonora, Mexico.

The Armendaris Ranch in New Mexico
Turner Endangered Species Fund photo

Rare Woodpeckers Reintroduced to North Florida

by Greg Hagan and
Ralph Costa

Red-cockaded woodpecker at its nesting cavity
Photo by Greg Hagan

In 1970, the Fish and Wildlife Service listed the red-cockaded woodpecker *(Picoides borealis)*, or RCW, as an endangered species. Few biologists were optimistic about the long-term survival of the RCW, particularly on private lands, until the early 1990's. Since that time, however, the growing success of the Service's private lands conservation strategy has been providing new hope for saving the bird on private lands. The strategy is founded in the development of innovative conservation partnerships among the private, state, and federal sectors.

In March 1998, the Turner Endangered Species Fund (TESF) initiated just such a partnership with the Service. Other partners included the Forest Service, Florida Fish and Wildlife Conservation Commission, and The Nature Conservancy. The partnership was formed to investigate the possibility of establishing a "new" population of RCWs on the pine forests of the Turner-owned Avalon Plantation in northern Florida. This research represents the first attempt by a private landowner, state, or federal agency to reintroduce a population of RCWs where no founder population exists. Additionally, it is the first attempt to reintroduce RCWs to a second growth forest having no evidence of previously supporting RCWs, although the plantation is within the historic range of the species.

In recent years, the development of new conservation tools and techniques, including artificial roost and nest cavities and the translocation of subadult birds, convinced the TESF that it was time to attempt establishment of a "new" population. The objectives of this reintroduction project are to: 1) restore a viable population of RCWs to Avalon Plantation that will persist with minimal management; 2) develop reintroduction techniques that can be used to promote recovery of the species throughout the southeast; and 3) clearly demonstrate that private landowners can coexist with this endangered species.

Preparations for translocations began in April 1998 when the TESF, in cooperation with the Forest Service, began banding RCW nestlings on the Apalachicola National Forest in northern Florida. This effort supplemented the Forest Service's own annual banding program. From the nestlings banded by the TESF, 20 subadult birds were

Installation of an artificial nesting cavity
Photo by Todd Engstrom

available for translocation annually. Of these, five unrelated pairs (five males and five females) were translocated to five artificial "recruitment clusters" on Avalon Plantation. A recruitment cluster consists of four artificial cavities (insert boxes) installed in four different pine trees on about one acre (0.4 hectare). Approximately 60-75 acres (24-30 ha) of additional mature pine foraging habitat is associated with each cluster. The TESF facilitated the translocation of the remaining additional five unrelated pairs to other RCW populations selected by the Service.

November 5, 1998, was a historic day in the recovery of the red-cockaded woodpecker. Five subadult pairs were released simultaneously into previously unoccupied habitat on Avalon Plantation. Representatives from six different organizations witnessed this watershed event. On May 1, 1999, five birds (two breeding pairs and a solitary male) remained on the plantation. Four fledglings (three males and one female) were produced in 1999.

A second successful attempt to reintroduce five unrelated subadult pairs was carried out on October 14, 1999. Seven birds from this release remained on the plantation through the 2000 breeding season, resulting in the formation of an additional four breeding pairs on the plantation. Eight fledglings (seven females and one male) were produced in 2000. Currently, 23 RCWs, including 6 potential breeding pairs and a solitary male, reside on the plantation. Multiple pair reintroductions will continue until 30 potential breeding pairs are established.

The emerging success of the reintroduction project at Avalon Plantation exemplifies the types of conservation partnerships that are necessary to promote and ultimately save RCWs and other listed species on private lands. The Avalon project will not only establish a new population in north Florida, but will also potentially contribute to conservation and recovery of the RCW throughout the southeast. For example, under the Service's RCW "Safe Harbor" program, dozens of landowners have enrolled tens of thousands of acres that currently have no RCWs in the hope of someday harboring these endangered birds.

The ongoing TESF research on RCW reintroduction will help develop and refine the techniques, time, and costs required to establish new populations on private land. Additionally, the project will serve as a blueprint for federal and state agencies interested in restoring RCWs to public lands. Perhaps most importantly, however, the Avalon project provides a template for how private landowners and the Service can work together to conserve and restore listed species while continuing to meet the landowners' objectives.

Greg Hagan, a Conservation Biologist with the Turner Endangered Species Fund, is located at Avalon Plantation. Ralph Costa, the Service's Red-cockaded Woodpecker Recovery Coordinator, is stationed at the Department of Forest Resources, Clemson University, in Clemson, South Carolina.

Banding a nestling woodpecker
U.S. Army photo

Biologists hope that RCWs will prosper in the open mature pine forests of the Avalon Plantation.
Photo by Tracey Mader

by Sonja Jahrsdoerfer

Training Courses Highlight Partnerships

What do the bull trout *(Salvelinus confluentus)*, golden-cheeked warbler *(Dendroica chrysoparia)*, grizzly bear *(Ursus arctos)*, and Texas cave invertebrates have in common? They were all the subject of field trips conducted during National Conservation Training Center (NCTC) courses last year. In these courses, we've explored some of the many tools available to protect listed species on non-federal lands. The courses highlighted just how important strong partnerships are to the recovery of listed species on non-federal lands.

Since the early 1990's, the Fish and Wildlife Service has been increasing its efforts to cultivate different approaches for working with private landowners to conserve endangered species on their land. Over the last several years, NCTC has developed several workshops and courses to address this very important topic. In 1996, our workshop "The Endangered Species Act: Private Land Strategies for Working Together" attracted a wide variety of participants from federal agencies, private industry, universities, conservation organizations, and other groups. A similar workshop ("Endangered Species Partnerships on Private Lands") was sponsored by the Service, The Conservation Fund, and the Anheuser-Busch company in 1997.

In September 1999, NCTC offered the pilot session of the week-long course "Conserving Endangered Species on Non-Federal Lands" in Chattanooga, Tennessee, and the second session was held in Austin, Texas, in March 2000. We took a different approach to designing this course by including representatives of private industry and conservation organizations on the design team. James Sweeney, formerly of Champion International (and now with International Paper), and Michael Bean of Environmental Defense (an

Greg Neudecker of the Montana Partners for Fish and Wildlife Program and two landowners spoke to the Partners class in May of 2000.
USFWS photo

environmental organization) have played an active role in this course since its inception, and their willingness to share their expertise has been invaluable during course design and presentation.

These courses have explored a wide range of tools available to aid non-federal landowners and land managers in their conservation efforts for listed species. These tools include Candidate Conservation Agreements with Assurances, Safe Harbor Agreements, the habitat conservation planning process, conservation easements, land exchanges, landowner incentives and funding, and the Partners for Fish and Wildlife program.

The courses also included a session on how to work with people to build common ground, even if they come from different backgrounds and have different values and perspectives. A field trip allowed participants to observe current conservation efforts using some of the tools we discussed in class and to hear from some of the partners in these efforts.

Both sessions involved a diverse group of participants from federal and state agencies, tribes, national and local conservation organizations, and industry, as well as private individuals. The wide range of experiences among the participants generated a great deal of discussion all week, and many people commented that the diversity of the participants was one of the strengths of the class.

In May 2000, NCTC held the "Partners for Fish and Wildlife—Habitat Restoration" course in Missoula, Montana. Under its Partners for Fish and Wildlife program, the Service works in voluntary partnership with private landowners to restore important fish and wildlife habitats on their properties. Participants learned how to set priorities, identify partners, find funding, and select, design, and construct projects. One of the highlights of the week was getting out in the beautiful Blackfoot Valley of west-central Montana to see Partners projects that encompass wetland and stream restoration, grazing systems, fish screens, removal of fish passage barriers, off-site water development, noxious weed management, and methods to reduce predation on livestock. These projects have restored habitat for bull trout, bald eagles *(Haliaeetus leucocephalus)*, grizzly bears, gray wolves *(Canis lupus)*, and many other species.

The Partners program doesn't do all this impressive work on its own. Local landowners play a vital role in habitat restoration efforts in the Blackfoot Valley. One project, the Blackfoot Challenge, was started over 20 years ago to "enhance, conserve, and protect the resources and rural lifestyle" of this area. This group, comprised of private landowners and federal, state, and county land managers and officials, takes an active role in habitat improvement projects, conservation easements, recreation plans, weed management workshops, and landowner workshops. The Blackfoot Challenge has made a name for itself as a group that gets things done, from restoring and protecting habitat to dealing with the inevitable impacts that go hand-in-hand with an increasing local human population.

The Big Blackfoot Chapter of Trout Unlimited was formed in 1989 by concerned private landowners and recreationists, and has since been joined by the Service (Montana Partners for Fish and Wildlife Program) and the Montana Fish, Wildlife, and Parks Department. With a goal of restoring the Blackfoot River's native trout fishery, the Big Blackfoot Chapter worked to implement a catch-and-release fishing regulation change and started working with private landowners to restore degraded tributary streams. Results have been promising already; bull trout redd (spawning beds) counts in two key tributaries increased from 18 in 1989 to 141 in 1999.

During the May course, participants had the chance to hear from and talk with local landowners and land managers who have been involved with both the Blackfoot Challenge and the Big Blackfoot Chapter of Trout Unlimited for many years. These landowners told a fascinating story of how they had formed productive partnerships in the Blackfoot Valley, which benefitted natural resources while allowing them to maintain their rural lifestyle. It was encouraging to hear that in spite of the many obstacles these local groups had faced, they had achieved great successes and enthusiastically supported continued work.

The Service has come to realize that developing partnerships isn't just a good idea; it is crucial to the success of conservation efforts for endangered species on non-federal lands. It can be daunting to figure out the best approach to take to form these partnerships. By involving local landowners and other partners in its courses, and giving participants the chance to observe successful partnerships first-hand, the NCTC is doing its part to support the cause of endangered species conservation.

Sonja Jahrsdoerfer is a Course Leader at the National Conservation Training Center at Shepherdstown, West Virginia.

Partnering with Plants

by Dave Harrelson

This specimen of Pyne's ground-plum* (Astragalus bibullatus) *grown in a greenhouse at the Missouri Botanic Garden represents the first time the species has flowered in cultivation.
Photo by Kimberlie McCue

Once, clouds of a unique wildflower, the decurrent false aster *(Boltonia decurrens)*, lined the banks of the Illinois River, but the construction of a system of locks and dams has nearly eliminated the plant's habitat. Loss of wetlands habitat also was a primary reason for the decline of the swamp pink *(Helonias bullata)*, a plant endemic to freshwater wetlands along the eastern seaboard. In 1992, a single specimen of *Delissea undulata* was discovered in North Kona, Hawaii. Botanists were able to germinate seeds from this plant, which was thought to have been extinct since 1971, and today the species appears to have a chance for recovery. Elsewhere in Hawaii, at least 12 native plant species are represented by only a single known individual.

Faced with the expanding development of natural areas, competition from invasive non-native species, loss of pollinators, and over-collection for ornamental and other uses, many of our native plants face an uncertain future. Hawaii, California, Texas, Florida, and Puerto Rico have the greatest number of rare, imperiled, and federally listed plant species. Some plants, such as the endangered Tennessee coneflower *(Echinacea tennesseensis)*, are known to contain substances that can be used to treat human illness. Two-thirds of the native plants of conservation concern are closely related to cultivated species.

A botanist transplants* Astragalus bibullatus *into the wild
Missouri Botanic Garden photo

As of March 31, 2001, 736 native plant species were listed as endangered or threatened under the Endangered Species Act. According to the Center for Plant Conservation (CPC), over 4,000 species of U.S. plants, roughly 25 percent of our country's entire known native plant species, are at some degree of risk. Of these, many hundreds could vanish in the next few decades.

Since its founding in 1984, the CPC has been working with the Fish and Wildlife Service to conserve and recover America's imperiled plant species. The CPC is one of very few national organizations in the U.S. dedicated solely to the conservation of our native plants. Based at the Missouri Botanical Garden, the CPC's network of 30 botanical gardens, arboreta, and related institutions collectively maintain the best-curated and most secure collection of rare native plants and plant materials anywhere in the world. The CPC also maintains information on thousands of rare and endangered native plants. The status of these species in the wild, and especially those held in conservation collections, is constantly tracked. The CPC then provides this information to scientists, conservationists, land-management agencies, and many others.

The many rare and federally protected plants for which the CPC cares are maintained as security against extinction and as a pool of genetic material for use in restoration, research, recovery, and education. The CPC's participating institutions are currently reintroducing several endangered and threatened plant species to secure habitats in the wild. Just as important, the CPC undertakes efforts to conserve rare plants in their natural habitats. With

Mary Yurlina searches for a tiny threatened plant,* Geocarpon minimum*, in its glade habitat.
Missouri Botanic Garden photo

The swamp pink is an attractive wildflower threatened by the loss of wetland habitats.
Photo by David Snyder

this in mind, the CPC has been recognized by the Service for its technical and leadership qualities in the controlled propagation of rare native plants for recovery purposes. In July 2000, the CPC and the Service signed a memorandum of understanding at the World Botanic Congress in Asheville, North Carolina, establishing a framework for cooperation in plant conservation.

A cornerstone of the CPC's conservation programs is the National Collection of Endangered Plants. Currently at 575 species, it is one of the largest living collections of rare plants in the world. Genetically diverse, live plant material is collected from nature and carefully maintained within the CPC garden network in the form of seeds, cuttings, and mature plants. This material is propagated as needed and closely monitored until it can be restored to natural habitats.

Seed storage is another component of the CPC's conservation strategy for native plants. For example, as a member of the CPC, the Berry Botanic Garden in Portland, Oregon, follows the standards and protocols for seed collection, storage, and maintenance developed by the CPC. The seeds of plants like the western lily *(Lilium occidentale)* are kept in a controlled environment at minus 18 degrees Celsius (0 degrees Fahrenheit). To reduce moisture in the seeds to the proper level, they are first dried with silica gel. They are then cleaned, packaged, and stored in freezers. Seeds preserved this way can remain viable for several decades, possibly for centuries.

Research into the ecology and management of rare species, including many of those on the federal list of endangered and threatened plants, is an integral part of the conservation activities of the CPC network. From seed storage to pollination biology and population genetics, scientists from member institutions engage in all aspects of conservation research. Increasingly, participating institutions are applying their botanical expertise and their extensive collection to restoration efforts across the nation, often working in collaboration with other conservation organizations such as The Nature Conservancy, state Natural Heritage Programs, and the Service.

Education is also a major part of CPC activities. Each year, millions of people visit participating gardens and arboreta where they can view and learn about native plant resources that most will probably never see in the wild. Interpretation and other education-oriented experiences are constantly being developed with the goals of increasing public awareness and promoting the stewardship of these natural treasures.

Both the CPC and the Service anticipate increased mutual participation in the recovery process for endangered plant species. Likewise, we all hope that the new memorandum of understanding will lead to the establishment of new alliances (for example, local partnerships between CPC member institutions and national wildlife refuges) and other conservation efforts.

Over the next decade, there will surely be successes, and probably some failures, but the essential fact is that when we work together to develop coordinated conservation and recovery projects, both in cultivation and in the wild, the load is a little lighter, the work a little easier, and our common goals much more obtainable.

Dave Harrelson is a Biologist with the Office of Partnerships and Outreach in the Service's Arlington, Virginia, headquarters office.

"Working the Sturge"

by Stephen Forsythe

Biologists conducting research on "the Sturge" find that this fish can be quite a handful.
USFWS photos

"Pull nets? Sure!" I said to Gail Carmody, feigning a comprehension of her invitation. I had just arrived for a visit as part of my responsibilities as the Fish and Wildlife Service's Florida State Supervisor when Gail, who supervises our Panama City Field Office, suggested I join one of her fisheries crews that was monitoring the status of the threatened Gulf sturgeon *(Acipenser oxyrinchus desotoi)*.

Soon I found myself floating down the lower Choctawhatchee River, about a mile from where it empties into the bay of the same name on the Gulf of Mexico coast in northwest Florida. I was accompanying Service biologist Frank Parauka and technician Bob Jarvis as they conducted their annual capture and tagging of the sturgeon on this mid-November day. The work was timed to coincide with the species' migration from the river into the bay in response to dropping winter temperatures. Also braving the chill and long hours was Student Conservation Association intern Karen Seiser. We were running a set of four nets several times a day and part of the night to capture and tag new sturgeon and to recapture previously tagged sturgeon. Frank had been studying sturgeons for 15 years.

The gently flowing cypress-lined river was about a half-mile wide where

we were. Our 18-foot (5.4-meter) flat-bottomed aluminum boat contained a holding tank for keeping the fish while we tagged them. It was also equipped with a hanging sling for weighing the large fish.

In late afternoon I saw my first critter, a relatively common-sized individual in the 80-pound (36-kilogram) range. Wait a minute…an 80-pound fish! I began to realize that I was going to have to *work*. Frank and Karen, with my amateur assistance, wrangled these monsters into the boat so we could measure and tag them, while Bob skillfully kept the boat positioned. We had to hoist the fish in and out of the holding tank and then onto the sling before lifting them gently over the gunwales to release them. Obviously, this was going to be no easy "show-me tour."

As we worked on the river that cloudy afternoon and evening, a cold front swept chilly rain and wind upon us. At the last "pull" at about 8:30 p.m., it was pitch dark except for the blinking of the floating lights marking the nets. Still, by the time we extracted all 14 of the sturgeon (one nearly 100 pounds [45 kg] and 6 feet [2 m] long) from the nets, worked them up, and returned them to the river, I found myself nicely warmed, even with the cold rain running down my back.

I was struck by the absolute enthusiasm that Frank and Bob exhibited with the capture of each fish. I supposed they had done this dozens of times with hundreds of fish, but each fish was like the first one to them. I marveled at this fine example of the dedicated, largely unsung work of the Service that was accomplished daily by our employees, but which I rarely saw from behind my office desk.

The next morning we were on the river at 6:00 a.m. to set the nets out again. The front had passed, and the weather was clear and crisp (some Floridians would say cold). After docking for breakfast, we returned to the river and retrieved two more sturgeon.

This time the fish absolutely glistened as their bronze, iridescent scutes flashed in the sunlight. I began to see the beauty of the beast. Rather than a bony, spiny, prehistoric critter, I was seeing them through Frank's eyes: an elegant, highly specialized fish that is fighting for survival. I saw "the Sturge" that so excited Frank each time one roiled the water. Yes, I thought, this is the real work of the Service and so much more meaningful than some of those boring or acrimonious meetings I attend in South Florida. Good work, Frank and Bob and Karen and the Panama City staff and the volunteers. "The Sturge" is fortunate to have you in its corner.

Until his recent retirement, Stephen Forsythe was the State Supervisor of the Service's Ecological Services Field Offices in Florida, located at the South Florida Ecological Services Office in Vero Beach. He began his career with the Service in 1974.

Gulf Sturgeon—Fast Facts

STATUS: Listed as threatened by FWS and NMFS in 1991.

DESCRIPTION: Rows of bony plates (scutes) along body. Averages 6-8 feet (1.8-2.4 m), but can grow longer than 9 feet (2.7 m) and weigh more than 300 pounds (136 kg).

DIET: Bottom dwelling organisms, amphipods, isopods, crustaceans, and marine worms.

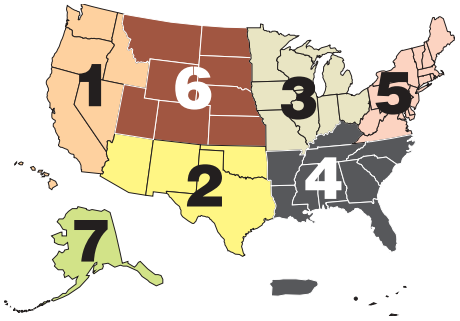
HABITAT: Gulf of Mexico, bays and estuaries in Florida, Alabama, Mississippi, and Louisiana; major freshwater rivers from the Suwannee River (FL) to Mississippi River.

BREEDING: Anadromous. Migrates from salt water into coastal rivers to spawn in spring. Requires 9-12 years to mature.

THREATS TO SURVIVAL: Former—harvested for edible flesh and eggs (caviar). Current—blocked from spawning grounds by dams and other barriers; habitat loss; poor water quality.

FASCINATING FACTS: Can live to 70 years. Fossil record dates back 200 million years. Can jump out of the water like a mullet.

An 18-minute video, "The Gulf Sturgeon," illustrating the life history, biology, and recovery efforts is available by calling 1-800-668-9283 ($15.95). Produced in cooperation with the Service and the U.S. Army Corps of Engineers.



Regional staffers have reported the following news:

Region 1

Northern Idaho Ground Squirrel *(Spermophilus brunneus brunneus)* The Fish and Wildlife Service recently signed a Safe Harbor agreement with landowners Bob and Peggy Mack to enhance habitat on their property for the threatened northern Idaho ground squirrel. This agreement covers approximately 14 acres (5.6 hectares) near New Meadows, Idaho, and includes funding for the Macks through the Endangered Species Private Landowners Incentive Program. This Safe Harbor Agreement is the first for Region 1 of the Service.

Oregon Columbian Sharp-tailed Grouse *(Tympanuchus phasianellus columbianus)* On October 11, 2000, the Service and the Oregon Department of Fish and Wildlife signed a Candidate Conservation Agreement with Assurances to benefit the Columbian sharp-tailed grouse. The goal of this agreement is to restore the grouse to the point that listing under the Endangered Species Act (ESA) will not be necessary. It will be in effect for 20 years and cover approximately 160,000 acres (65,000 ha) in Wallowa County, Oregon. The agreement will support the Oregon Department of Fish and Wildlife's efforts to reintroduce sharp-tailed grouse in Oregon, from which the bird was extirpated by the 1960s.

The Oregon Department of Fish and Wildlife will seek participating private landowners, and will issue a certificate of inclusion authorizing incidental take of sharp-tailed grouse, in exchange for the landowners enhancing grouse habitat on their property. Funding for landowners and implementation of Oregon's reintroduction program is available under the agreement through the Service's Endangered Species Landowner Incentive Program.

Columbia Spotted Frog *(Rana luteiventris)* Service staff met with representatives from the Idaho Department of Lands to discuss protection for Columbia spotted frogs on a grazing lease administered by the state. This frog population in Owyhee County has shown a significant decline for the past 3 years. An agreement was reached to fence portions of the large meadow complex on Idaho Department of Lands property. The Service will provide funding and volunteers for fencing, while the Idaho Department of Lands and the lessee will provide material and labor for a livestock watering system outside of the largest spring complex. In cooperation with other agencies, the Service will continue to monitor this site to evaluate the effectiveness of the fencing on spotted frog numbers, recruitment, and migration.

Salt Marsh Harvest Mouse *(Reithrodontomys raviventris)* A 6-acre (2.4-ha) tidal marsh restoration project was completed on January 19, 2001, at the Don Edwards San Francisco Bay National Wildlife Refuge (NWR). The parcel, called Entry Triangle Marsh, is located at the main entrance to the refuge complex in Fremont, California.

Workers removed a road and excavated swales to allow tidal action on the parcel, and installed a tide gate to permit water control. Decadent pickleweed *(Salicornia)* stands and invasive non-native grasses, effects of the lack of tidal action, supplied poor quality habitat for the salt marsh harvest mouse on the Entry Triangle Marsh. The project was primarily designed to improve habitat for this endangered species. Refuge staff will begin monitoring salt marsh harvest mouse recolonization this spring. The project was accomplished in partnership with Ducks Unlimited, our San Francisco Bay Coastal Estuary Program, the National Fish and Wildlife Foundation, and Wildlife Forever.

Photo © B. Moose Peterson

Photo © B. Moose Peterson

Coachella Valley Fringed-toed Lizard *(Uma inornata)* For an entire week, the refuge manager and maintenance staff at Sonny Bono Salton Sea NWR operated an excavator and bulldozer to rehabilitate sand dune habitat on the refuge. The operation involved pulling tamarisk *(Tamarix* sp.*),* a non-native tree, from over 8 acres (3.2 ha) of the refuge where the trees' presence had prevented sand from freely moving with the wind, thereby threatening the habitat of the threatened Coachella Valley fringed-toed lizard, which resides on dunes in the refuge. Removing the trees and their stumps will restore the sand dune habitat needed by the lizard.

Tule Elk *(Cervus elaphus nannodes)* Tule elk were decimated by hunting during the California gold rush and the subsequent conversion of native habitat to agriculture. In the 1870s, the last survivors, estimated at two dozen, were protected near Buttonwillow by a private landowner. Now there are about 3,600 of these indigenous elk in their natural range in California. They are con-

sidered endangered by the International Union for Conservation of Nature and Natural Resources, although they are not listed as endangered under federal or state law.

On January 30 and 31, 2001, 30 tule elk were captured at San Luis NWR and relocated to augment 3 of the other 21 herds in California. An interagency team of wildlife biologists, veterinarians, land managers, and volunteers captured, processed, and transported the elk to their new homes in Lake, Monterey, and San Luis Obispo counties. The California Department of Fish and Game (CDFG) is in charge of elk management and oversaw the complex but effective and safe operation. A helicopter that routinely works with the CDFG was contracted by the Rocky Mountain Elk Foundation. Nets were used to catch the animals, which were hauled to a processing center to be measured and treated, then taken to their new home. The captive herd at San Luis NWR, which began with 18 animals in 1974, has contributed over 150 animals toward the establishment of other herds over the past quarter-century.

Reported by LaRee Brosseau of the Service's Portland Regional Office.

Region 5

Karner Blue Butterfly *(Lycaeides melissa samuelis)* The Karner Blue Butterfly Recovery Plan gives recognition to the importance of the Concord Pine Barrens, the last outpost for the Karner blue in New England, and identifies the goal of reestablishing a viable population of this endangered insect at the site. To resolve conflicts between habitat conservation and development in the Concord Pine Barrens, the Service's New England Field Office, in cooperation with the New Hampshire Department of Fish and Game, Natural Heritage Inventory, Army National Guard, Federal Aviation Administration, and City of Concord, developed an agreement that sets aside nearly 400 acres (160 ha) of pine barren habitat at the Concord Airport for conservation purposes. The city also agreed to allow for active management of Karner blue butterflies and their habitat at the airport, (e.g., prescribed fire, access for monitoring rare species, and butterfly reintroduction). The National Guard is planning to carry out a number of conservation measures, including butterfly monitoring, management, and recovery work at the airport for a 10-year period. The agreement will allow development to occur in low quality pine barrens at the airport.

Plymouth Redbelly Turtle *(Pseudemys rubriventris bangsi)* For the past 15 years, Massachusetts state naturalists have nurtured thousands of tiny Plymouth redbelly turtles through their first year of life in captivity, then released them into the wild under the state's "head start" program. The naturalists have searched unsuccessfully over the past 5 years for evidence that any of these head-started turtles were reproducing in the wild. Finally, in early June of 2000, a female head-started turtle was found heading back to her pond after just laying her eggs and burying them. This was the first known nesting of a released turtle since the head start program began. So far, the program has resulted in the release of 1,500 to 2,000 Plymouth redbelly turtles over the past 15 years.

Plymouth redbelly turtle
Photo by T.E. Graham

Washington, D.C., Office

Grasslands Meeting Grasslands stretch from Canada to Mexico, and many of the species that inhabit them are declining. Instead of each country tackling each species individually for conservation actions, the governments of Canada, Mexico, and the United States are working together on a continental ecosystem strategy. The Fish and Wildlife Service, the Canadian Wildlife Service, and Mexico's National Institute of Ecology met in Nuevo Casas Grandes, Chihuahua, Mexico in March under the auspices of the Commission for Environmental Cooperation to begin discussions on cooperative conservation strategies. The High Plains Partnership was represented by Region 2 of the Fish and Wildlife Service, and Region 6 was present to discuss with Mexican officials the proposed release of black-footed ferrets *(Mustela nigripes)* into Janos, Chihuahua, this fall. Also present from the three countries were representatives from universities, provinces, states, nongovernmental organizations, and a rancher. The group plans to design a strategy for a grassland initiative by this fall that will include stakeholder involvement.

Reported by Susan Jewell of the Office of Partnerships and Outreach for the endangered species program in the Service's headquarters office.

Meeting participants at potential black-footed ferret release site near the town of Janos in the state of Chihuahua, Mexico.
Photo by Susan D. Jewell

BOX SCORE

Listings and Recovery Plans as of August 31, 2001

GROUP	ENDANGERED U.S.	ENDANGERED FOREIGN	THREATENED U.S.	THREATENED FOREIGN	TOTAL LISTINGS	U.S. SPECIES W/ PLANS**
MAMMALS	63	251	9	17	340	50
BIRDS	78	175	14	6	273	75
REPTILES	14	64	22	15	115	30
AMPHIBIANS	10	8	8	1	27	12
FISHES	70	11	44	0	125	95
SNAILS	20	1	11	0	32	27
CLAMS	61	2	8	0	71	56
CRUSTACEANS	18	0	3	0	21	12
INSECTS	33	4	9	0	46	28
ARACHNIDS	12	0	0	0	12	5
ANIMAL SUBTOTAL	379	516	128	39	1,062	390
FLOWERING PLANTS	565	1	141	0	707	555
CONIFERS	2	0	1	2	5	2
FERNS AND OTHERS	26	0	2	0	28	28
PLANT SUBTOTAL	593	1	144	2	740	585
GRAND TOTAL	972	517	272	41	1,802*	975

TOTAL U.S. ENDANGERED: 972 (379 animals, 593 plants)
TOTAL U.S. THREATENED: 272 (128 animals, 144 plants)
TOTAL U.S. LISTED: 1,244 (507 animals***, 737 plants)

*Separate populations of a species listed both as Endangered and Threatened are tallied once, for the endangered population only. Those species are the argali, chimpanzee, leopard, Stellar sea lion, gray wolf, piping plover, roseate tern, green sea turtle, saltwater crocodile, and olive ridley sea turtle. For the purposes of the Endangered Species Act, the term "species" can mean a species, subspecies, or distinct vertebrate population. Several entries also represent entire genera or even families.

**There are 587 approved recovery plans. Some recovery plans cover more than one species, and a few species have separate plans covering different parts of their ranges. Recovery plans are drawn up only for listed species that occur in the United States.

***Nine animal species have dual status in the U.S.

ENDANGERED Species BULLETIN

U.S. Department of the Interior
Fish and Wildlife Service
Washington, D.C. 20240