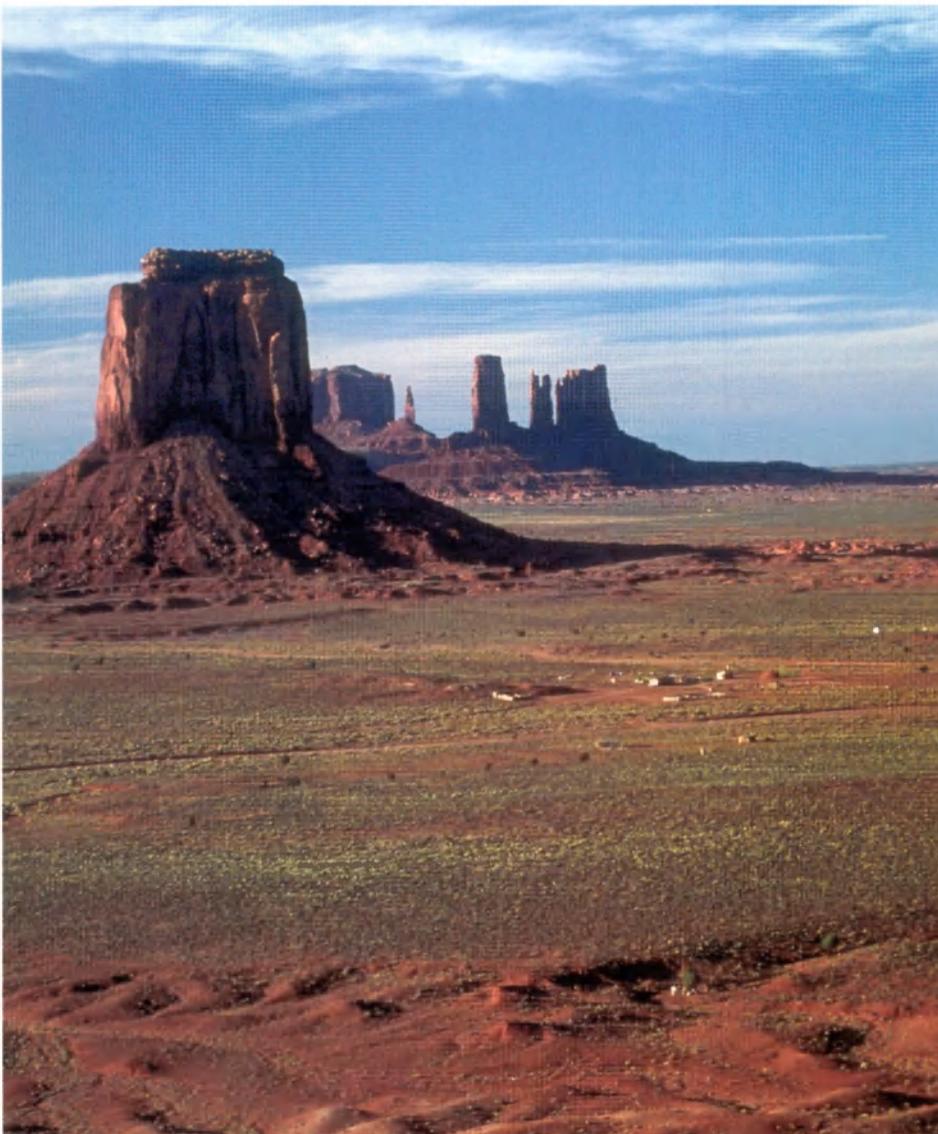


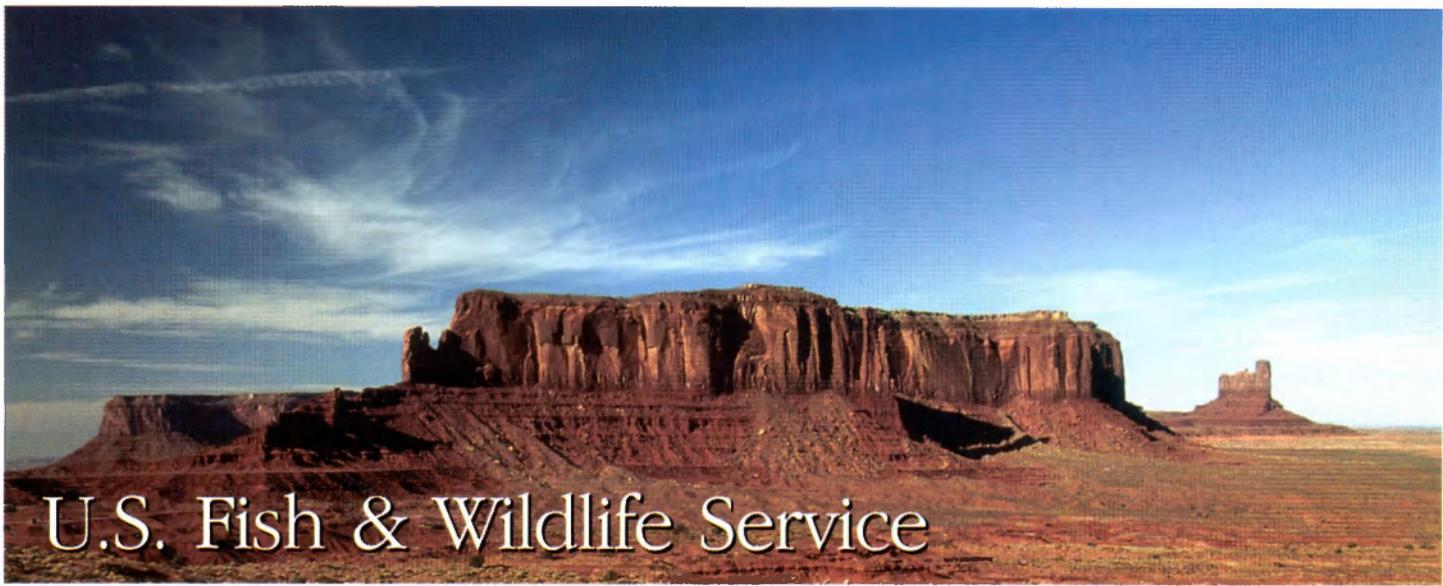
ENDANGERED *Species* BULLETIN

July/August 1999

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American Indian lands in the lower 48 States comprise over 54 million acres, and Alaskan Native lands add approximately 45 million acres. Much of this acreage remains relatively wild and unspoiled. Home to more than 550 tribes, these lands provide the living space, the sacred and cultural sites, and many of the natural resources that tribes need to keep their people and cultures alive. The importance of these lands to the tribes cannot be overstated. They provide spiritual and physical sustenance, and increasingly, the means for economic self-sufficiency. Tribal governments generally place a high priority on preserving these lands and their natural resources, including many vulnerable wildlife species, for future generations.



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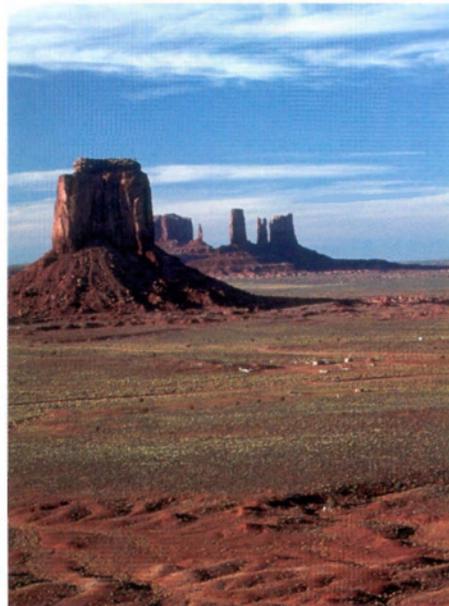
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On the Cover and Opposite Page

The Navajo Nation contains not only spectacular landscapes, such as Monument Valley on the Arizona/Utah border, but also a wealth of rare plant species. (See story on page 18.)

Corel Corp. photo

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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by Valerie C. Guardia

Saving Endangered Species on Indian Lands



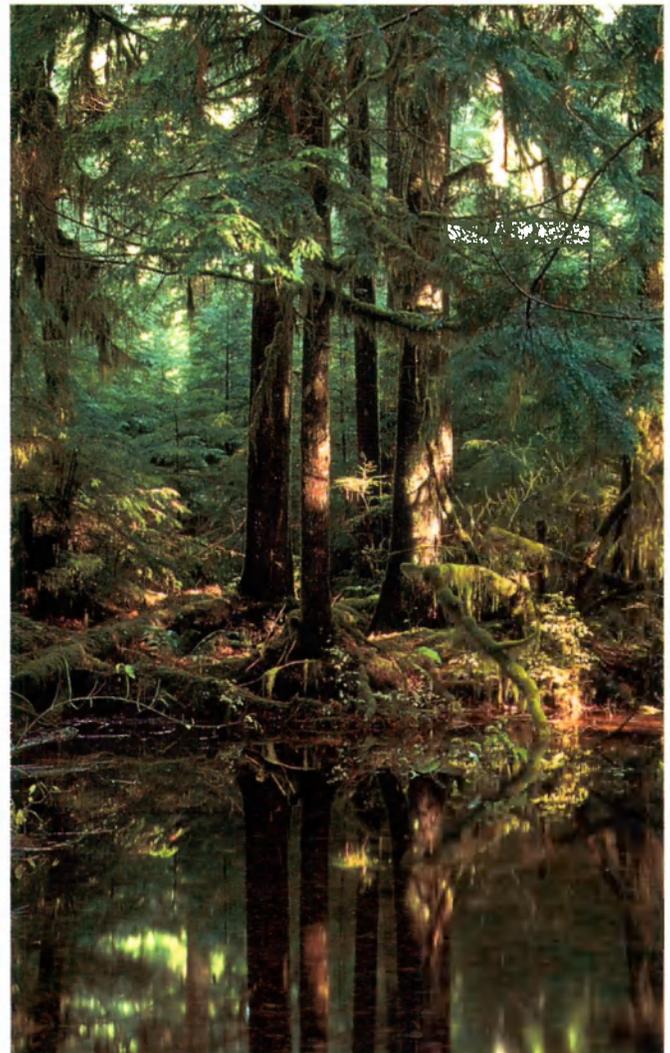
Nez Perce Tribal member Marcie Steiger draws blood from a captured Idaho wolf as part of gray wolf reintroduction efforts there.

Idaho Wolf Recovery Program photo

American Indian tribal lands encompass a vast array of habitat and ecosystems across the conterminous United States and Alaska. Among these lands are the lush lakes and wetlands of reservations in the Great Lakes Region, the prairies of the Ft. Belknap Reservation in Montana, the varied desert habitats of reservations in the southwest and Great Basin, the temperate rain forest of the Quinault Reservation of Washington, and the tundra of Alaskan native lands.

Water is vital as well, from the smallest of streams to the mightiest of rivers. The Trinity River in northern California, where the Yurok, Hoopa, and other tribes formed; the Colorado River, which has nurtured dozens of tribes for thousands of years; the Missouri River, important to over a dozen tribes today; and hundreds of smaller streams and springs with riparian habitats can be found on tribal lands.

These lands provide habitat for a growing number of species listed federally as threatened or endangered. A conservative estimate is that well over 200 such species are located on tribal lands. Many of these species hold particular importance to tribes. Most of us would recognize the importance of



Temperate rain forest in Washington State

Corel Corp. photo

the salmon (*Oncorhynchus* spp.) or the bald eagle (*Haliaeetus leucocephalus*) to American Indians, but the cultural significance of other listed species, such as the cui-ui (*Chasmistes cujus*), Apache trout (*Oncorhynchus apache*), black-footed ferret (*Mustela nigripes*), and gray wolf (*Canis lupus*), is lesser known. The importance of still other species are secrets known only among tribal members, and in some cases they wish it to remain that way forever

Although tribal lands often provide quality habitat, it is important to recognize that these lands are not set aside as national refuges or preserves for listed species, nor are they public lands. They are the lands of tribes that, as sovereign nations, have authority over what occurs on these lands. In many areas, tribal lands provide the best, if not the only, remaining habitat for a listed species. For this reason, tribes sometimes find that they are expected to carry the burden of managing habitat for listed species, which can affect tribal opportunities for economic development and self-sufficiency. Like other landowners, tribes struggle to balance their needs for economic development and self-sufficiency with the needs of wildlife, particularly threatened and endangered species.

The Bureau of Indian Affairs (BIA) is the primary Federal agency charged with administering national Indian policy and discharging the Federal trust responsibility for American Indian tribes, Alaska native villages, and tribal organizations. Threatened and endangered species are trust resources for which the BIA must act as trustee. Increasingly, however, tribes are assuming control over the management of their trust resources, including listed species. The Indian Self-Determination and Education Assistance Act of 1993 (P.L. 93-638) allows tribes to gain control of Federal programs through contract or compact.

There are many challenges and obstacles to the successful development of such programs. Many tribes lack the



Tundra in Alaska's Yukon-Kuskokwim Delta

Photo by Lauren A. Berdow

funds, skilled personnel, training, and basic scientific knowledge necessary to develop management programs for threatened and endangered species. However, some tribes have successfully overcome these obstacles and have launched innovative and exciting projects, as you will see in the stories to follow.

Valerie C. Guardia is the Endangered Species Coordinator for the Bureau of Indian Affairs in Washington, D.C.

by Cynthia I. Westfall

Sensitive Species: Part of the Circle



Mexican spotted owl
Photo by Cynthia Westfall

One Apache story tells of how Coyote went looking for Big Owl's home so that he could trick him and steal his cap. Today, trained Apache youth work as field technicians to find Mexican spotted owl (*Strix occidentalis lucida*) locations, not to trick or steal from Owl, but to learn about his home and protect his habitat. This activity is only a small part of a Sensitive Species Program now in place on the Fort Apache Indian Reservation in Arizona.

The Fort Apache Indian Reservation is located in the beautiful White Mountains of eastern Arizona. It consists of more than 1.6 million acres (0.6 million hectares), ranging from mountainous, forested areas in the northeast at over 11,000 feet (3,350 meters) in elevation to desert scrub in the southwest portion at approximately 2,700 feet (820 m). The great diversity of vegetation, wildlife, water resources, and pristine areas make the reservation one of the premiere recreation regions in the entire Southwest.

The Apache people have always had strong cultural ties with the land and its natural resources. They have been taught to respect and care for the land and living things. This tradition of stewardship continues to guide the natural resource philosophy of the White Mountain Apache Tribe. The tribe strives to protect the land and the life it supports while also meeting the cultural and economic needs of the Apache people. In Apache tradition, the tribe does not manage its lands for the benefit of one particular species. Overall ecosystem health drives resource management decisions, resulting in benefits to all species.

The tribe has begun a series of initiatives to strengthen its natural resources management. In 1994, it developed a "Statement of Relationship" with the U.S. Fish and Wildlife Service (FWS) that established a joint framework for promoting healthy ecosystems while addressing sensitive species issues. This document was the template for Secretarial Order #3206, issued by the secretaries of Commerce and the Interior in 1997. The order acknowledges Federal trust responsibilities to tribes, makes commitments to working with tribes on a government to government basis, and ensures that "tribes do not bear a disproportionate burden for the conservation of listed species."

The White Mountain Apache Tribe is also developing a Tribal Ecosystem Code for the restoration and protection of reservation lands and resources, based on watershed-based ecosystem management. A Tribal Plan and Project Review system provides for full tribal control over natural resources-related project planning and management decisions. Projects are reviewed by an interdisciplinary team representing tribal divisions of Environmental Planning, Forestry, Wildlife and Outdoor Recreation, Watershed Planning, Cultural Resources, and others.

A Tribal Land Restoration Code calls for returning tribal ecosystems to a state that better reflects conditions prior to damage from earlier mismanagement. The tribe has set aside over \$4 million in a permanent restoration fund to meet this need. The fund also supports educational scholarships for tribal members involved in disciplines related to natural resource management.

The tribe is treated as a State by the Environmental Protection Agency, which has facilitated the growth of Tribal Environmental and Watershed Planning Departments. Recent efforts include adoption of water quality standards that protect sensitive fisheries as well as human health, along with several riparian and wetlands restoration and enhancement projects. Various watershed/riparian, wetland, and water quality plans designate streams and riparian zones as sensitive areas and ensure that these zones are productive.

The tribe manages its forests on an ecosystem basis, not on a timber sale by timber sale basis. Tribal and Bureau of Indian Affairs (BIA) foresters practice uneven-aged management and selective cut, and the tribe does not allow clear cutting. Logging has been reduced overall, and no cutting is permitted in areas with steep slopes. Working closely with the BIA forestry and roads departments, the tribe uses timber harvest activities as opportunities to improve or close roads and to improve habitats for species such as the Mexican spotted owl (*Strix occidentalis lucida*).

All recreation is regulated through a permit system, and sensitive areas are closed to recreational use. Tribal range management plans have been implemented and a range management specialist, along with four tribal technicians, have been hired. They determine range conditions, provide data for adjusting livestock numbers, and assist stockmen in preventing the overuse of grazing areas.

Sensitive Species Program

In the tribe's commitment to ecosystem management, it has established a Sensitive Species Program that provides protection for federally listed species and their habitats. The program coordinates various field and education projects with other tribal and BIA departments, linking natural resources protection and sustainability with cultural and economic needs. It enables tribal economic activity, such as timber

sales, to continue while conserving sensitive species and their habitats. This was accomplished by developing and implementing management plans, in cooperation with the EWS, and initiating a comprehensive inventory and monitoring program. In one example, many years of cooperative work have restored the Apache trout (*Oncorhynchus apache*) to the point that it may be proposed before long for removal from the endangered and threatened species list. (See following article.)

Traditional warrior songs and stories tell how Wolf used to live and hunt on the same lands as the Apache. The White Mountain Apache Tribe is the first to officially facilitate Mexican wolf (*Canis lupus baileyi*) recovery efforts. The Tribal Council authorized the development of a Mexican Wolf Management Plan that will provide for wolf recovery on the reservation. An effort is underway to forge an agreement with the FWS.

Eagle, Owl, and Wolf live on in Apache stories and songs and continue to be an important part of Apache culture. The Tribal Sensitive Species Program of the White Mountain Apache Tribe will create a foundation that promotes biodiversity and contributes to ecosystem management. The animals will remain part of the system, part of the stories, and part of the circle that connects the Apache people with the land and all living things.



Mexican wolf
Corel Corp. photo

Cynthia I. Westfall is the Sensitive Species Coordinator with the Wildlife & Outdoor Recreation Division of the White Mountain Apache Tribe in Whiteriver, Arizona.

by Craig L. Springer

Apache Trout: On the Brink of Recovery

Tucked away in the cold, high-elevation streams on White Mountain Apache homelands in Arizona, the threatened Apache trout (*Oncorhynchus apache*) has existed for thousands of years. But trouble has shadowed this handsome fish for the last 100 years or so. Since the European settlement of east-central Arizona, the Apache trout has faced an onslaught of over-harvest, habitat loss, and competition with introduced, non-native trout species. But now this native sport fish is on its way toward recovery.

The Apache trout was quite popular among the early white settlers in east-central Arizona, not just as sport but also as an easy food source. In the 1880's, families trekked to the White Mountains to gather fish, preserving them in salt and keeping them in barrels for the winter. The July 5, 1888, *St. Johns Herald* newspaper attests to this popularity:

"Thomas Carsen took a trip to the head waters of the Black River for the purpose of enjoying a short season of



Apache trout
Photo by Derald DeClay

sport in hooking and delivering some of the speckled beauties that are known to abound in the streams. The flies were so numerous that he could only stop one day, otherwise he was afraid he would have no horse to ride back."

The flies may still be numerous, but the Apache trout numbers have dropped significantly, in part from over-harvesting. That over-harvesting led to the eventual stocking of non-native trout species—rainbow (*Oncorhynchus mykiss*), cutthroat (*O. clarki*), brook (*Salvelinus fontinalis*), and brown (*Salmo trutta*)—in the Apache trout's habitat as early as 1910.

Rainbow and cutthroat trout are so closely related to Apache trout that they interbreed. Their hybrid offspring, also capable of reproducing, continued to dilute the Apache trout population to the point where hybrid fish predomi-

nated and the native fish became rarer with each successive generation. Brook and brown trout, though not able to hybridize with Apache trout, are fierce competitors for food and space. Before long, the non-native trouts displaced the Apache trout.

Historically, the Apache trout occupied some 600 miles (965 kilometers) of streams in the headwaters of the Salt, San Francisco, and Little Colorado rivers, all of which drain the White Mountains. By the 1940's, however, Apache trout occupied fewer than 30 miles (48 km) of just 12 streams. It was then that the White Mountain Apache Tribe interceded; recognizing the inherent value of its native fish, the tribe closed streams to fishing.

"White Mountain Apaches view the native trout as much a part of the land as they do themselves," says Jon

Cooley, Director of the White Mountain Apache Wildlife and Outdoor Recreation Division. "It's just natural for Apaches to appreciate its intrinsic value."

Some would argue that the Apaches also had foresight. "The Apache trout was close to extinction," says Dr. Stuart Leon, the Fish and Wildlife Service's (FWS) Region 2 Recovery Coordinator for Native Fish. "The White Mountain Apaches were very forward-thinking. They stepped in to head off extinction fully 30 years before the Endangered Species Act came to be."

Stewart Jacks, Project Leader of the FWS Arizona Fishery Resources Office, agrees. "Without the leadership of the White Mountain Apache Tribe, the Apache trout could be in serious peril, if not extinct. Instead, the Apache trout offers a viable sport fishery. What's more, it could soon be the first living fish species taken off the endangered species list."

With FWS assistance to the tribe, the Apache trout truly has rebounded. Since 1983, the Alchey-Williams Creek National Fish Hatchery (NFH) complex, located on the Fort Apache Indian Reservation, has produced several million Apache trout specifically for restoring the sport fishery in streams while maintaining the species' genetic integrity. The hatchery also propagates Apache trout for stocking in immensely popular fishing lakes that draw anglers from around the globe. The Arizona Game and Fish Department, via the FWS Sport Fish Restoration Program, uses Apache trout from the hatchery to restore trout streams on national forest lands. The FWS Pinetop Fish Health Center assists in recovery by keeping fish diseases in check. Fish health biologists monitor wild Apache trout populations and frequently inspect Alchey-Williams Creek NFH for disease pathogens.

The FWS Arizona Fishery Resources Office lends technical assistance to the White Mountain Apache Tribe in restoring the Apache trout to its native range. For example, FWS biologists and

tribal members built barriers to protect Apache trout from invading non-native fish. They also have worked together to enhance trout habitat through riparian revegetation, livestock exclosures, and non-native fish removal. Last year, they protected some 75 acres (30 hectares) of riparian vegetation surrounding Apache trout streams and reintroduced fish to



another stream, Ord Creek. The species' recovery plan calls for maintaining 30 self-sustaining, non-hybridized stream populations, and Ord Creek may be number 29.

"After three decades, we're happy to see this fish return to its native habitat," says Daniel Parker, White Mountain Apache tribal member and biologist with the FWS Arizona Fishery Resources Office. "We stocked adult trout, so they've already spawned this year. When we establish one more stream population, we could make history."

According to Stewart Jacks, the FWS and tribe are close to satisfying the recovery plan's requirements for delisting the Apache trout.

Craig L. Springer is a Fishery Biologist with the FWS Division of Fisheries in the Albuquerque, New Mexico, Regional Office.

Introduction of non-native trout species such as the rainbow and brown trout led to competition and hybridization, with a subsequent decline in Apache trout populations.

Corel Corp. photo

Keeping an Eye on Eagles

by Paul Wolterbeek



Director Paul Nosie, Jr., and Matt Hopkins, Jr., of the San Carlos Apache Recreation and Wildlife Department; Jamie Driscoll of Arizona Game & Fish; and Liberty Wildlife Rehabilitation Center Director Megan Mosby look on as a rehabilitated eagle takes wing following hospitalization.

Photo by Paul Wolterbeek

Encompassing nearly 1.8 million acres (0.73 million hectares) that range in elevation from 3,500-8,000 feet (1,060 to 2,440 meters), the San Carlos Apache Reservation is an ecologically diverse area of land in east-central Arizona. Biotic communities found here include Sonoran desert scrub, grassland, oak woodland, piñon-juniper woodland, ponderosa pine forest, mixed conifer forest, and several types of riparian communities. San Carlos Lake, one of Arizona's largest, is located on this reservation, and rivers, creeks, and stock ponds are also scattered throughout this land, approximately 175,250 acres (70,920 ha) of which is forested.

Coaxed from the large crate she had been transported in, the young bald eagle (*Haliaeetus leucocephalus*) hopped out cautiously onto the gravel embankment overlooking the San Carlos River in eastern Arizona. Six weeks earlier, she had been found injured and taken to a rehabilitation center 100 miles (160 kilometers) away, where her broken keel bone was given the care and time needed to mend.

It was a breathtaking moment as the healed bird shuffled, then took wing over the river. Employees of the San Carlos Apache Tribe Recreation and Wildlife Department watched as the bird soared majestically once again. Could a better event exist to illustrate the Eagle Nest Watch partnership that united the tribe, Bureau of Indian Affairs, Arizona's Game and Fish Department and the Liberty Wildlife Rehabilitation Center in Scottsdale, Arizona? "We really give much of the credit to the seasonal Nest Watch Program that was funded by a grant from the Bureau of Indian Affairs," said Recreation and Wildlife Director Paul Nosie, Jr., a member of the San Carlos Apache Tribe. "This program was largely responsible for that eagle's survival. The nest watch program provided Federal money for tribal members Matt Hopkins, Jr., James P. Reede, and other wildlife technicians to observe eagle nests every day during the spring nesting season."

Bald eagles have probably nested on this reservation for decades, but they were first documented in 1985 when the Arizona Game and Fish Department confirmed the presence of a nesting pair on the Gila River during a helicopter survey. Wildlife Technician Matt Hopkins, Jr., knows well the three bald eagle nest sites mapped on the reservation near Coolidge Dam, Talkalai Lake,

and alongside the San Carlos River. Easily the most fecund, the Coolidge pair alone has produced 13 young since its discovery. The San Carlos nest site was found in 1995 and has yielded six young since then, an average of about two each year. "The Talkalai nest was discovered in 1994 and has yet to successfully produce nestlings," said Hopkins. "Peregrine falcons nesting in the same area may have a negative influence on this site's breeding success." Bald eagles nested at several reservation sites in 1998, but only the pair living along the San Carlos River managed to successfully produce chicks. Nest watchers spent about 24 days over the course of 5 months observing both nestlings and recording their parents' arrivals and departures.

Hopkins has studied eagles as part of his job since 1995. He has accompanied Arizona Game and Fish biologists on numerous helicopter flights over the reservation to count birds and survey nestlings, so he was quick to notice when one young eagle disappeared from the riverside aerie. With mounting alarm, Hopkins and other field observers monitored the nest for a day before alerting State biologists. Together, they inspected the area and found the bird on the ground injured, dehydrated, and hungry. They took the fledgling to Liberty Wildlife Rehabilitation, where

she was sheltered and fed a protein-rich diet for several weeks. After her keel bone healed and she was ready to fly, the magnificent bird was released near the riverside nest where she hatched.

A nearly identical story in 1997 did not end as happily. That year, a fledgling eagle was found dead beneath the same nest after apparently falling out. Money was not available in 1997 for the kind of daily observance that probably meant the difference between life and death for the eagle rescued in 1998.

Monitoring bald eagle nests is just one facet of the tribe's approach to conserving sensitive and endangered species. In recent years, San Carlos Apaches have also restored Gila topminnows (*Poeciliopsis occidentalis*) to rehabilitated freshwater springs, searched ponderosa pine forests above 6,000 feet (1,800 meters) for reclusive Mexican spotted owls (*Strix occidentalis lucida*) and northern goshawks (*Accipiter gentilis atricapillus*), and picked their way through dense riverbank thickets of salt cedar to verify the existence of endangered southwestern willow flycatchers (*Empidonax traillii extimus*).

Watching the eagle circle skyward was a gratifying moment for Hopkins, who at that time was in his second year of studies at Eastern Arizona College in Thatcher. A member of the San Carlos Apache Tribe, he is working toward a degree in wildlife management while spending his summers and vacation time receiving on-the-job experience as a wildlife technician employed at the tribe's Recreation and Wildlife Department. Enduring eyestrain, sunburn, windblown sand, and occasional boredom as a Nest Watcher over the years has given him a unique vantage point from which to suggest improvements. "Nest Watchers need a stronger spotting scope for positive prey identifications and to allow us to read leg-bands without disturbing the eagles. It would also be helpful to have portable radios to coordinate the monitoring of forage sites to learn exactly where the

parents are foraging. And I would definitely recommend monitoring nests on weekends and holidays when the eagles are prone to more disturbance. Education of the public is also crucial, and with the continued cooperation between tribal, State, and Federal agencies, this program will continue to protect bald eagles on the San Carlos Apache Reservation."

Paul Wolterbeek is in the Tribal Planning Office for the San Carlos Apache Tribe.

Photo © B. Moose Peterson/WRP



by Curt Mack

Restoring the Gray Wolf in Idaho



Horace Axtel, left, religious leader for the Nez Perce Tribe, blesses wolves to be released in Idaho.
Idaho Gray Wolf Recovery Program photo

In March of 1995, the U.S. Fish and Wildlife Service (FWS) entered into a precedent setting cooperative agreement with the Nez Perce Tribe to restore the gray wolf (*Canis lupus*) to Idaho. This is the first time the Federal government has contracted with a Native American tribe to lead recovery and management responsibilities for a state-wide recovery effort of an endangered species. The partnership has blossomed into working relationships between not only the FWS and the Nez Perce Tribe but many other cooperating Federal agencies, including the Bureau of Indian Affairs, U.S. Forest Service, and Wildlife Services (an animal control agency within the U.S. Department of Agriculture), all working toward the common goal of wolf recovery. This partnership is nationally recognized as a model for defining relationships between Federal and Native American governments.

The wolf plays a prominent role in the culture and history of the Nez Perce people. The Nez Perce recognize many similarities between the wolf and the family-centered hunting lifestyle of their own culture. The wolf has become a symbol for the tribe's struggle to survive since their respective fates mirror each other's through history. Both the wolf and the Nez Perce were seen as obstacles to the settlement of the west, and both were persecuted and removed from most of their homelands. From the Nez Perce perspective, both the tribe and the wolf are struggling to regain their rightful place. Restoring the wolf in Idaho is an opportunity for a significant conservation achievement for the Endangered Species Act, and a chance for the tribe to rekindle its cultural ties to the wolf.

Through the cooperative agreement, the tribe assumed, subject to its limits of jurisdiction, operational responsibilities in support of the FWS program for the reintroduction and recovery of wolves in the Central Idaho Recovery Area. The overall goal of the Nez Perce Tribe's Gray Wolf Recovery and Management Plan is to restore a self-sustaining population of gray wolves to Idaho by maintaining a minimum of 10 breeding packs for 3 consecutive years. The program adopts an innovative partnership approach among the Nez Perce Tribe, Federal and State agencies, regional universities, local governments, private organizations, and individuals. These groups work cooperatively on key program elements: monitoring; management and control; and information, education, and outreach.

Wolf recovery in Idaho is proceeding very successfully. Fifteen wolves were translocated from Canada to Idaho in January 1995. A second translocation added 20 more wolves in January 1996. Wolves quickly recolonized vacant habitats, paired, and established territories. Translocated wolves first reproduced in 1996 when three packs produced 11 pups, the first documented wolves born in the Idaho wilds in over 60 years. Since 1996, the wolf population has grown steadily each year, increasing in both the number of packs and pups produced. During the summer of 1998, Idaho attained the important recovery benchmark of 10 breeding wolf packs just 3 years after the original translocations. There are now an estimated 115 wolves and 12 known wolf packs in Idaho.

From a biological standpoint, wolves are recovering faster than anticipated,

but their foothold in Idaho is not guaranteed. Long-term survival of wolves will depend less on biological considerations and more on social values and the level of tolerance afforded wolves by Idahoans, particularly those people in rural communities whose lives stand to be most affected by wolves. To address social concerns and build tolerance for wolves, the Nez Perce recovery program has brought together proponents and opponents of wolf recovery, including conservation, livestock, and sporting groups, to find creative solutions for potential conflicts. The most recent projects resulting from these collaborations are studies of wolf predation rates on livestock and big game populations. We anticipate that these studies will 1) provide a better understanding of the potential effects wolves have on livestock operations, big game populations, hunter opportunity, and outfitter operations; 2) help develop effective future wolf manage-

ment plans based on science rather than perception and misinformation; and 3) generate increased tolerance for wolves.

We are confident that the collaborative approach to species conservation outlined in the Nez Perce Idaho Wolf Recovery Program is a recipe for success in the long-term coexistence of wolves and people.

Curt Mack is the Nez Perce Tribal Gray Wolf Recovery Coordinator in Lapwai, Idaho.

(top) Radio collars allow biologists to monitor released wolves.

Photo by Milo Burcham

(bottom) A wolf sprints to freedom in the 1996 release

Idaho Wolf Recovery Program photo



by Charles B. Alexander
and Rodney L. Scarpella

Recovering Summit Lake's Lahontan Cutthroat Trout



**Vanessa Garfield, Creel Census
Taker, with the first Lahontan
cutthroat of the 1999 spawning run.**

Photo by Charles B. Alexander

For centuries, the *Numa* (or “People”) have relied upon the land and other resources of the northern Great Basin. *Numa* are better known now as the Northern Paiute (meaning “water over there”) Indians. The *Numa*, *taibo* (“white people”), and *agai* (“trout”) continue to thank *Numanab* (“Father of All People and Creator of All Things”) for Summit Lake, the “water over there” in this desert region. Summit Lake is home to one of the few remaining native populations of lacustrine or lake-dwelling Lahontan cutthroat trout (*Oncorhynchus clarki bensbawi*). This once common fish has not only been a significant food source but also a fundamental part of the Summit Lake *Numa* culture. It wasn't until 1970, after riparian habitat degradation, water diversion, over-fishing, and the introduction of non-native fishes had taken their toll, that two new words for *agai* were introduced into the *Numa* language: “endangered species.”

Northwestern Nevada is Lahontan cutthroat trout country and home of the Summit Lake Paiute Indian Tribe. Of all the historic lake habitat occupied by the Lahontan cutthroat, only 0.4 percent supports self-sustaining populations today. Two small native lacustrine populations remain at Independence Lake, California and Summit Lake, Nevada, on the Summit Lake Paiute Indian Reservation. Summit Lake is a terminal lake (no outlet) of approximately 600 surface acres (243 hectares). In 1998, the Summit Lake spawning run was the largest (1,925 adults) since 1980, almost 30 times larger than the Independence Lake spawning run of 65 fish. However, this strength has not always been the case. As early as 1877,

the *Winnemucca Silver State* reported the “wholesale slaughter” of “mountain and salmon trout” at Summit Lake. These reports followed on the heels of the 1865-1871 military occupation of Summit Lake at Camp McGarry. It wasn't until 1913 that the Summit Lake Indian Reservation was set aside by an executive order of President Taft.

In the 1950's, the Nevada Fish and Game Department used stock from Summit Lake for Lahontan cutthroat trout recovery efforts at Pyramid Lake, which had lost its own native trout population. Later, in the 1960's and 1970's, the Summit Lake Paiute Tribe and the U.S. Fish and Wildlife Service (FWS) worked together to augment and recover Lahontan cutthroat trout populations in need, including the trout at Summit Lake. This three decade period began with the worst of times for the Summit Lake population but finished with strong recovery efforts. Some poor water years in the 1950's and 1960's magnified problems caused by irrigation withdrawals and grazing damage to riparian habitat. The 1970's was a decade of much change. On the negative side, an illegal introduction of two cyprinid fish species occurred around 1970 or 1971. Most of the change, however, was good: the Summit Lake population was supplemented with hatchery fish; riparian habitat along Mahogany Creek, which flows into Summit Lake, was fenced for protection from grazing; the Bureau of Land Management created the Lahontan Cutthroat Trout Natural Area on Mahogany Creek; a permanent fish trap was constructed by the tribe and FWS for monitoring the trout population; and the Nevada Division of Wildlife closed

fishing on the public section of Mahogany Creek. In 1975, the FWS reclassified the Lahontan cutthroat trout from endangered to the less critical category of threatened.

The tribe assumed management of its fishery in 1981. As set forth in the tribe's 1981 hunting and fishing ordinance, "it is the policy of the Summit Lake Paiute Tribe of Indians to restore, preserve, protect, and perpetuate fish and wildlife resources for the benefit of the Tribe and the Public." Some tough times and the tribe's belief in allowing nature to provide for the fish has led to conservative views in managing this Lahontan cutthroat trout population. The tribe has employed fisheries biologists and tribal members that work within a philosophy that emphasizes natural spawning with as little human intrusion as possible.

The tribe implemented more restrictive fishing regulations in 1977 and 1981. The annual spawning runs have varied from highs of 5,000 fish in 1974 and 1975 to a low of 472 in 1992. The largest runs were likely influenced by fish of hatchery origin: up to 100,000 fry were planted in 1968 and 1970. The smallest run followed drought years. Spawning runs never reached 1,000 fish from 1982 through 1992. This period was dominated by drought years, which hampered trout recovery since the system needed water and time to recover from decades of habitat loss, egg takes, and introduced fishes. However, the tribe's efforts toward habitat protection and restrictive harvest regulations paid off as the Lahontan cutthroat trout quickly responded once sufficient amounts of water and quality habitat returned. The 1998 spawning run numbered 1,925 fish and was followed by 2,400 spawners in 1999.

Despite an overall desire to minimize handling of Lahontan cutthroat trout, the Tribal Council believes there is need for good information and has granted approval for its Fisheries Program to use passive integrated transponder (PIT) tags in a study of fish survival, growth, and movement. However, the extent to

which we research and understand Summit Lake's Lahontan cutthroat trout population will be limited somewhat by how much money is available from private sources. Federal funding that has long supported monitoring activities may not keep up with needs of the fishery. While maintaining habitat quality in times of land use development, we need to learn more about the trout's growth, spawning mortality, repeat spawning in successive years, interactions with other fish species, and lake productivity. This information is important if we are to be successful in "restoring, preserving, protecting, and perpetuating" the fisheries resource.

Charles B. Alexander is the Fisheries Director and Rodney L. Scarpella is the Fisheries Management Biologist for the Summit Lake Paiute Tribe.



An upstream view of the Mahogany Creek fish trap.

Photo by Charles B. Alexander

by Steven Albert

The Beaver and the Flycatcher



Where beavers are active, they have created a lush wetland, which attracts southwestern willow flycatchers, yellow-billed cuckoos, and dozens of other species of birds.

Photo by Steve Albert

The North American beaver (*Castor canadensis*) was native to the southwestern United States on most streams having permanent water. Beavers provide many benefits to other species of wildlife in this semi-arid region. By constructing dams, they slow the flow of water, which allows sediment to drop out and water to percolate into the soil. This process helps maintain a high water table. As a result, these sites contribute to a greater abundance and diversity of riparian vegetation and wildlife.

North American beaver populations underwent severe declines in the 18th and 19th centuries because of trapping and massive changes in riparian ecosystems due to (human) dam construction, stream diversions, and the invasion of alien plants, including salt cedar (*Tamarix pentandra*). Given this situation, it's no surprise that a great number of species in the Southwest that depend on these rapidly changing riparian zones are threatened, endangered, or rare species. One such species is the southwestern willow flycatcher (*Empidonax traillii extimus*).

This small passerine is one of four recognized subspecies of the willow flycatcher. It nests along riparian areas and wetlands where there is dense growth of willow (*Salix* spp.), *Baccharis*, boxelder (*Acer negundo*), or other plants, often with a scattered overstory of cottonwood (*Populus*) or willow. Like many flycatchers, it is insectivorous, and it uses high perches from which to forage and advertise its territory.

On the Zuni Reservation, we've taken an aggressive approach to riparian and wetland restoration, including active habitat management using beavers. These efforts have had

surprising and beneficial impacts for endangered species, especially the willow flycatcher.

In the semi-arid high desert of the Colorado Plateau, Zunis have long known the value of healthy riparian areas, lakes, springs, and seeps. On Zuni land, all of the springs are known and named, and many of them are held sacred. Some of the most important plants and animals in Zuni culture and religion are riparian obligate species. Occasionally, pilgrimages are made to sacred springs to collect plants or animals for ceremonial use. A far greater proportion of wildlife uses the riparian corridor than the drier surrounding landscape. In one study we conducted in the upper Rio Nutria watershed, 37 percent of the birds occupied the riparian corridor of the Rio Nutria, an area that encompassed only about 2 percent of the land area surveyed. The number of bird species in the riparian corridor was also far greater than in from other surveyed lands.

Even before the southwestern willow flycatcher was declared endangered in 1995, the Zuni Fish and Wildlife Department had a program of restoring riparian ecosystems and wetlands. Some areas of the reservation had undergone severe erosion in this century, and our approach to wetland and riparian restoration involved the entire watershed. Central to this approach was the use of beavers. Beginning with a small remnant population, we began moving beavers to stream areas where there was abundant food (mostly willows), but where the stream channel was incised and didn't hold water year round. Within a very short time, the beavers began to make a difference. Their dams

slowed the flow of the water, allowing sediment to drop out of suspension and raise the stream bed. Water was spread over a wider area, and pools, small at first, now much larger, began to collect and remain year-round. This treatment has allowed much thicker and lush riparian vegetation to establish itself, and wildlife has begun to use these improved riparian areas.

Benefits for Endangered Species

Before the beaver relocation program, four or five flycatcher territories were regularly used. In the last 3 years, however, singing males or pairs of flycatchers have established territories in at least four additional locations, all of them with active beaver dams. The key ingredient seems to be the availability of open water. Most likely the water serves as an attractant for the flycatcher's insect prey

Not everyone has been a supporter of the beaver program from the start. Many farmers initially complained that the beaver dams were a nuisance and kept water from entering their farm fields. In 1996, we got help from an unexpected source: a drought. That summer was one of the driest in recent decades. Many reaches of the Zuni River dried up, and some farmers had partial or total crop failure. One family, however, had great success by irrigating their fields directly from a series of beaver ponds, with the aid of a small pump. This helped convince many families that beavers could in fact provide benefits to farmers.

Tribes and the Endangered Species Act

A big hurdle in working with some land users on endangered species issues is their unease about the Endangered Species Act. In Indian Country, as in other places, some land users believe that if they report the presence of an endangered species, their land use activities will be curtailed.

At Zuni, we have tried to overcome this distrust by accepting the opening that was provided by Secretarial Order

3206. Signed in June 1997, the order gives tribes flexibility in preparing and implementing their own endangered species recovery plans. It directs the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to work with tribes on a government-to-government basis to promote healthy ecosystems, protect endangered species, and establish cooperative agreements on endangered species and other issues. It also recognizes that tribal lands are not subject to the same controls that exist on Federal lands.

The executive order has been well received by most tribes. In Zuni, we are now more than ever willing to work openly and honestly with the Fish and Wildlife Service because we know that sharing information will not compromise tribal sovereignty and management of our own natural resources.

Steven Albert is Director of the Zuni Fish and Wildlife Department.

Southwestern willow flycatcher.

Photo © B. Moose Peterson/WRP



Plant Conservation on the Navajo Nation



Navajo Natural Heritage Program biologist goes to great lengths in search of Navajo sedge

Navajo Natural Heritage Program photo

The Navajo Nation encompasses 17.5 million acres (28 million hectares) of the Colorado Plateau in northeastern Arizona, northwestern New Mexico, and southeastern Utah. Its dramatic landscape ranges from desert scrub to sub-alpine conifer forests. Two major rivers border the Navajo Nation, the Colorado River to the west and the San Juan River to the north. Other major geographic features include the Little Colorado River, Navajo Mountain, Rainbow Bridge, Black Mesa, Chuska Mountains, Monument Valley, Canyon de Chelly, and Shiprock.

The Navajo Natural Heritage Program (NNHP) was established in 1984, through a cooperative agreement between the Navajo Nation and The Nature Conservancy, to collect, manage, and disseminate biological and ecological information for conservation and land use planning on the Navajo Nation. The NNHP maintains a comprehensive database of information on rare and protected plant and animal species and biological communities on the Navajo Nation.

Little botanical work had been done on the Navajo Nation prior to the NNHP compared to other regions of the United States. However, since the program was formed, its botanists have conducted research to identify and classify the Navajo Nation's plant life and have gathered fundamental data on botanical diversity through plant collections. Over time, botanists have put together a small regional herbarium including nearly 4,000 specimens collected on reservation lands. A recently developed database listing these specimens now makes information on plant locations and collections easily accessible. Many

of the specimens have been collected by staff botanists in remote and difficult to access areas of the Navajo Nation, such as the canyons of the Rainbow Plateau in the northwest corner of the reservation (bordering Lake Powell in Utah) and the Little Colorado River Gorge in Arizona. From April through October, NNHP botanists and other staff members can frequently be seen carrying heavy packs and plant presses into uncharted territories of the Navajo Nation, camping out in the rough terrain, braving inclement weather and water shortages, all to find the last stronghold of little known or seldom seen plants.

Over 1,100 plant species from 90 families are known to exist on Navajo lands. The Navajo Endangered Species List includes 29 species of plants, 6 of which are federally listed as threatened or endangered. Several species of plants are known to occur only on Navajo Nation lands, including the Copper Canyon milkvetch (*Astragalus cutleri*), the rare Marble Canyon milkvetch (*Astragalus cremnophylax* var. *hevronii*), and the federally listed Navajo sedge (*Carex specuicola*).

Once known from only two locations near Inscription House in northern Coconino County, Arizona, the Navajo sedge is now known from 23 sites ranging all the way eastward to Chinle Creek in San Juan County, Utah. Navajo sedge is very localized and is restricted to seep areas or to hanging gardens in the Navajo Sandstone formation along often inaccessible sheer cliff faces. Although these extensive surveys indicate that the Navajo sedge may not be imminently imperiled with extinction, the species continues to be threatened

by water development and overgrazing at its more accessible sites.

The Copper Canyon milkvetch, a very local endemic on the Navajo Nation, is known only from a 4-mile (6.5-km) stretch between Copper Canyon and the adjacent Nokai Canyon in San Juan County, Utah, near Lake Powell. Despite extensive surveys, the range of this plant has not been extended significantly beyond these locations. The remoteness of these areas keeps threats to the species' survival at bay for the time being.

The Marble Canyon sentry milkvetch was described in 1992 after being discovered by former NNHP botanist Bill Hevron. Three varieties are now known, and all are restricted to the limestone rims of the Grand Canyon and Marble Canyon in Coconino County, Arizona. NNHP botanists have spent a considerable amount of time walking the rim of Marble Canyon in hopes of documenting the population beyond its current range, but so far without success. The Marble Canyon milkvetch is currently considered the rarest plant known on reservation lands because of its small range and restricted habitat availability.

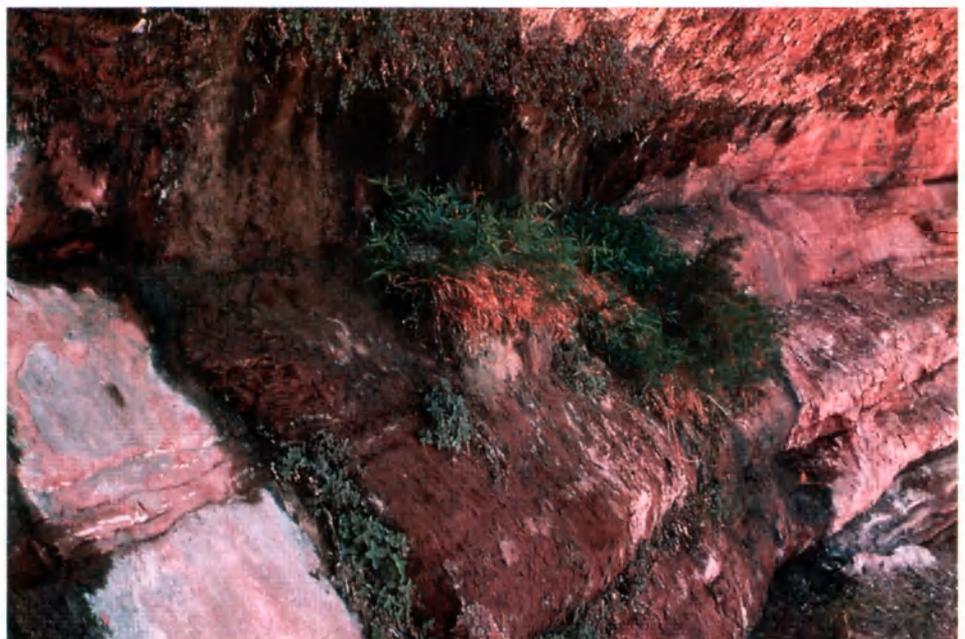
The Mesa Verde cactus (*Sclerocactus mesae-verdae*) was once known from only a few scattered populations in northwestern New Mexico and southwestern Colorado. Extensive field work has indicated that this federally listed cactus is not as restricted in its distribution within this region as previously thought. The NNHP monitors several populations of Mesa Verde cactus in the Four Corners area. One of these populations includes transplanted cacti salvaged from a road construction project. Annual monitoring began in the early 1990's. Population data helps to determine the status of a species, to see whether a population is increasing or decreasing, and to evaluate response to natural and man-made threats such as drought, insect attacks, transplanting, and off-road vehicle use. While the Mesa Verde cactus continues to suffer

habitat destruction, its potential for delisting has increased due to our new knowledge.

The rare plant list of the Navajo Nation is dynamic and continues to change as we gather new information on rare species. As time passes, we hope to be able to shed even more light on the distribution and abundance of native sensitive and rare plants of the Navajo Nation.

Daniela Roth is a Botanist with the Navajo Natural Heritage Program.

(top) Marble Canyon milkvetch
(bottom) Navajo sedge
Navajo Natural Heritage Program photos



Biodiversity on the Yakama* Indian Nation



**Male western sage grouse in
sagebrush habitat**
Photo by Mike Schroeder

Since 1997, the Yakama Indian Nation, U.S. Fish and Wildlife Service (FWS), Department of the Army, Bureau of Land Management, Washington Department of Fish and Wildlife, and six other land management agencies in the State of Washington have worked together to increase the numbers and distribution of the western sage grouse (*Centrocercus urophasianus phaios*). Once distributed throughout much of the western United States and the southern portions of three Canadian provinces, this charismatic bird has been on the decline since before the turn of the century. In Washington, western sage grouse historically ranged from the Columbia River at the Oregon border north to Oroville, west to the foothills of the Cascade Mountains, and east to the Spokane River.

In describing the sage grouse, the Lewis and Clark journals state that "the cock of the plains is found on the plains of the Columbia in great abundance, from the entrance of the south-east fork of the Columbia to that of Clark's River. It is about 3/4 the size of our ordinary turkey." As large portions of Washington's once abundant shrub steppe ecosystem have been converted for agricultural use and urban development or modified by other uses such as grazing, sage grouse have been virtually eliminated from all but 4 of the 16 Washington counties in which they originally existed.

Initially, the Army entered into a conservation agreement with the FWS

and Washington Department of Fish and Wildlife in 1992 for management of western sage grouse on the Army's Yakima Training Center. But by the fall of 1996, biologists agreed that more habitat would be needed to maintain the agreement and manage the birds to ensure their future. Eleven agencies joined to form the Western Sage Grouse Working Group to protect and reestablish the shrub-steppe habitat so important to the grouse.

Just south of the Yakima Training Center, the Yakama Indian Nation owns some 1.3 million acres (0.5 million hectares) of land, one-third of which is shrub-steppe habitat and closed by tribal policy to development of any kind. Studies are underway at the training center, and will be soon on the reservation, to determine the sage grouse's habitat needs and decide if the

*The spelling of this word is *Yakama* in reference to the Indian Nation. It is spelled *Yakima* otherwise.



(Left) Mike Schroeder, biologist with the Washington Department of Fish and Wildlife, with captured western sage grouse

(Below) Chris Warren of the U.S. Fish and Wildlife Service, left, assists Mike Schroeder in telemetry study
Photos by Taylor Pittman

Yakama reservation can provide it. According to Bill Bradley, program manager for the Yakama Wildlife Resource Management Program, the Yakama Nation ties to sage grouse date back thousands of years. These birds have played a very important part in the Yakama Nation's culture. Unfortunately, however, sage grouse disappeared from the reservation in the late 1960's.

Restoration of the sage grouse and other shrub-steppe species is something for which the Yakama Nation is willing to work hard. According to Bill Bradley, the Yakama Nation has an excellent track record working with the Endangered Species Act. He explains that because of the high quality of the Yakama Nation wildlife and timber programs, the tribe has avoided jeopardy rulings through 10 years of northern spotted owl (*Strix occidentalis caurina*) management under the ESA, and their commercial forestry did not suffer economic setbacks from spotted owl regulations. Of the shrub-steppe habitat, Don Larson, tribal biologist, says "Grazing has been cut to a tenth of what it was in the 1970's. We are now eager and ready to do everything we can to recover and manage the shrub-steppe land on the reservation for as much biodiversity as possible."

The western sage grouse figures into every aspect of education and social

inheritance of the tribe, commanding high respect in the intricately connected web of tribal beliefs and natural systems. From cosmological myths to the training of today's youth, the sage grouse represents the fundamental dynamic between all living things in the dance of survival and creation on this planet. As one tribal elder said to me, "There is a mountain. There is a river. This is the way my law is written." With the land as their law, the Yakama Indian Nation continue to work with the Western Sage Grouse Working Group in anticipation of a western sage grouse homecoming. If given the space, the sage, and the chance, perhaps the bird will return to thrive on this part of its homeland.

Taylor Pittman is an Interpretation and Education Specialist with the FWS Olympia, Washington, Office.



Conservation on Seminole Lands in Florida

by Susan D. Jewell

*I*magine being driven hundreds of miles from your home, a land of temperate climate with fertile hills and valleys and bountiful game, into a steamy, subtropical world of water, muck, and mosquitoes that no one else wanted. That is what happened to a small band of southeastern Indians in the 1800's. They had escaped forced relocation by the government and wanted to live quietly without disturbance, so they sought refuge in the Everglades. They are known today as the Seminole Tribe of Florida, officially recognized by the Federal government in 1957. They are descendants of the Creek Indians from northern Florida, Georgia, and Alabama.

The Seminoles had to adapt to a new way of life in the Everglades. They lived in small family groups on tree islands known as "hammocks" in the midst of the vast sawgrass marshes and wet prairies. They hunted and fished from canoes carved from the rot-resistant bald-cypress trees. They harvested cabbage palm hearts and coontie (a native cycad) roots, and, where possible on higher ground, they grew corn that they had brought from their homeland. To live in, they built "chickees" (their word for houses). These were relatively open-sided platforms with thatched roofs that kept them dry, and they were cooled by the same breezes that sometimes kept the insects at bay.

Toward the end of the 1800's, colonists began to settle the coastal uplands of southern Florida. They gouged canals in the rich earth to drain the Everglades, providing flood control and land for farming. Some canals were dug to provide the fill for roads, such as Alligator Alley (now I-75).



Corel Corp. photo

The effects on the Everglades from a century of ditching, diking, farming, and development have been devastating. The Everglades is a water-dependent system, and anything that affects the water affects the entire ecosystem and the people who live there. Water flow has been altered dramatically, and water quality has suffered as well. These changes have interfered with Seminole religious practices, culture, and hunting and fishing.

Several canals now slice the tribe's 52,000-acre (21,000-hectare) Big Cypress Reservation, located about 30 miles (48 kilometers) south of Lake Okeechobee. The canals carry agricultural pesticides, excess nutrients from fertilizing and other farming practices, and such heavy metals as mercury. Scientists don't know the cumulative effects of the pesticides, but the excess phosphorus has been shown to cause a shift in the vegetation communities of the Everglades, most

obviously as dense and expansive cattail stands.

Phosphorus is an essential nutrient for plant and animal life. In some places, like the Everglades, it is found naturally in low concentrations. The amount of phosphorus available in the ecosystem often determines what can grow; that is, phosphorus becomes the limiting factor. Plants and animals in the Everglades are adapted to these low concentrations of phosphorus. When more is added, it throws the ecosystem out of balance. The imbalance starts with the base of the food web: microorganisms such as algae.

The change in algal mats was a subtle clue that went largely unnoticed, but the spread of the cattails alarmed managers of the Everglades. Even though phosphorus naturally occurs in the Everglades, an artificial excess is a form of pollution. The cattails were causing low dissolved oxygen levels,

forming impenetrable monocultures, shading aquatic vegetation, and leading to a series of other problems. The Fish and Wildlife Service and the National Park Service became involved when the polluted water flowed into the A.R.M. Loxahatchee National Wildlife Refuge and Everglades National Park.



Female Everglade snail kite and young
USFWS photo

Where did this polluted water come from? Most can be traced to the agricultural lands south of Lake Okeechobee and some from water pumped into the Everglades from towns near Ft. Lauderdale. The farmland encompasses about 700,000 acres (283,000 ha) of former Everglades that were converted to sugarcane and vegetable farming. The drained muck soil quickly oxidizes and erodes, releasing trapped phosphorus. Nutrient laden water is then pumped into the Everglades.

Water testing in 1989 revealed that mercury contamination was a serious problem throughout the Everglades, leading to health advisories against eating certain fish. The mercury is thought to be the result of hydrological changes from the large-scale artificial plumbing system, agricultural practices in the Everglades Agricultural Area north of the Seminoles' reservation, or atmospheric deposition (such as from

incinerators). Florida panthers (*Felis concolor coryi*) in the area have been documented with high levels of mercury, causing at least one death.

The Seminoles maintain agricultural practices, which became necessary several decades ago when they sought a way to support themselves on a

decreased amount of land. They raise cattle, citrus, and vegetables. Much of the land of the Big Cypress Reservation is bald-cypress swamp, but 500 acres (200 ha) are residential, providing homesites for the tribe.

The Seminoles' culture depends on healthy natural resources for fishing, hunting, and tourism. They are assisting with the large-scale Everglades restoration plans that the Fish and Wildlife Service, National Park Service, and other agencies are preparing. To protect their tribal lands, the Seminoles are developing their own Everglades Initiative. A major component is the Big Cypress Water Conservation Plan, which considers the land uses, hydrology, and cultural issues for that reservation. They are revising their agricultural practices by restructuring drainage ditches to move surface water where needed, storing water on selected lands, rehydrating wetlands by restoring sheet flow,

and cleaning their discharged surface flood waters. They plan to maintain more than 40 percent of their land in native or wetland-related systems. The Department of the Interior is aiding the tribe with this water conservation plan, and the Fish and Wildlife Service is assisting by reviewing the plan.

The Seminole Tribe has completed studies on indicators of nutrient enrichment in forested wetlands, canal water chemistry, and nutrient enrichment or assimilation. In the future, they will study a wide range of other subjects, including the impact of the Big Cypress Water Conservation Plan on the Florida panther, wetland restoration ecology, nutrient dynamics of a natural riparian system, historic changes in hydroperiod (as revealed by tree growth), occurrence of old growth cypress strands and the effects of drainage, impacts of fire on Big Cypress habitats, bioindicators of the effects of agricultural chemicals, and status of aquatic animals.

The Big Cypress Water Conservation Plan will benefit all types of wildlife, including the endangered Everglade snail kite (*Rostrhamus sociabilis plumbeus*), wood stork (*Mycteria americana*), and Florida panther.

Will the Seminole Tribe find itself adapting to new ways again? To living in impenetrable stands of cattails as far as the eye can see? With their characteristic persistence, they won't have to.

Susan D. Jewell is a Biologist with the Fish and Wildlife Service's Division of Endangered Species in Arlington, Virginia. She wishes to thank Craig Tepper, Director of Water Resources Management for the Seminole Tribe, for his assistance with this article.

by staff of the Washington,
D.C., Office of Public Affairs

A Spectacular Summer for Birds

"It's a spectacular summer for America's great birds, the bald eagle, the Aleutian Canada goose and the peregrine falcon," Interior Secretary Bruce Babbitt said in late summer of this year. "And beneath the wings of their recovery stands America's great law: the Endangered Species Act."

Peregrine Falcon

The world's fastest bird soared off of the endangered species list on August 25, 1999, when the U.S. Fish and Wildlife Service (FWS) formally recognized the recovery of the peregrine falcon (*Falco peregrinus*) by removing it from the list of threatened and endangered species. The peregrine's comeback marks one of the most dramatic success stories of the Endangered Species Act (ESA).

The peregrine once ranged throughout much of North America from the subarctic boreal forests of Alaska and Canada south to Mexico. A medium-sized raptor, the falcon nests on tall cliffs or urban skyscrapers and hunts other birds for food, reaching speeds of 200 miles an hour as it dives after its prey. Its remarkable speed and agility, however, could do nothing to prevent its sharp decline after World War II when widespread use of the pesticide DDT and other organochlorine pesticides decimated populations. DDT caused peregrines to lay thin-shelled eggs that broke during incubation.

FWS researchers confirmed the link between DDT and egg shell thinning on peregrines in the United States. Rachel Carson, a former FWS employee, helped alert the public to the hazards of pesticides on wildlife in 1962 when she published her book *Silent Spring*. Ten



Photo by Jo Keller/USFWS

years later, the Environmental Protection Agency made the historic and, at the time, controversial decision to ban the use of DDT in the United States, which was the first step on the road to recovery for the peregrine.

In 1970, the FWS listed the peregrine falcon as endangered under the Endangered Species Conservation Act of 1969, the predecessor of the current law, when the population in the eastern United States had completely disappeared and populations in the west had declined by as much as 80 to 90 percent below historical levels. By 1975, the population reached an all-time low of 324 nesting pairs in North America.

The ban on DDT made recovery of the peregrine falcon possible. But the protections provided by the ESA and the extraordinary partnership efforts involving the FWS and State wildlife agencies, universities, private ornithological groups, and falcon enthusiasts accelerated the pace of recovery through captive breeding programs, reintroduction efforts, and the protection of nest sites during the breeding season.

Similar efforts took place in Canada, where the Canadian Wildlife Service and provincial agencies took the lead in a major captive breeding and reintroduction program. Currently, there are at least 1,650 peregrine breeding pairs in the United States and Canada, well above the recovery goal of 631 pairs.

"The peregrine falcon is a perfect example of the success we can have when we work in partnership to recover endangered species," said Secretary Babbitt. "With the help of the protections provided by the Endangered Species Act, and the visionary work in captive breeding and release efforts by The Peregrine Fund, the University of Minnesota's Raptor Center, and the University of California's Santa Cruz Predatory Bird Research Group, the peregrine flies through the skies of almost every State in the Union."

Overall, government and private raptor experts have reintroduced more than 6,000 falcons into the wild since 1974. Some of the reintroductions took place in urban areas after researchers discovered that the falcons have successfully adapted to nesting on skyscrapers where they can hunt pigeons and starlings. State wildlife agencies also played a fundamental role in the recovery process by protecting nesting habitat, carrying out releases, and monitoring populations.

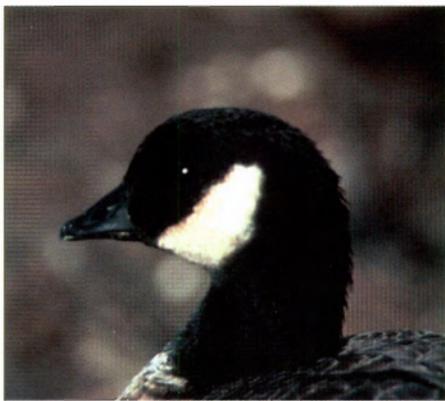
The peregrine will continue to be protected by the Migratory Bird Treaty Act. This law prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests except when specifically authorized by the Interior Department, such as in the case of hunting seasons for game birds.

The ESA requires that a species be monitored for a minimum of 5 years after delisting. The FWS has decided to monitor the peregrine falcon for 13 years, with surveys occurring once every 3 years to provide data that will reflect the status of at least two generations of peregrines. If it becomes evident during this period that the bird again needs ESA protection, it will be relisted.

Aleutian Canada Goose

After a concerted recovery effort spanning more than three decades, the FWS proposed on July 30 to remove the Aleutian Canada goose (*Branta canadensis leucopareia*) from the list of threatened and endangered species.

Populations of this goose, a small subspecies of Canada goose that nests on a few of Alaska's remote, windswept islands and winters in areas of California and Oregon, numbered only in the hundreds in the mid-1970's. Today, biologists estimate there are more than 32,000 birds, and the threat of extinction has been eliminated, thanks in large part to the cooperation of private landowners and conservation organizations such as Ducks Unlimited and the California Waterfowl Association.



USFWS photo

The Aleutian Canada goose, identifiable by a distinctive white neck band, nests on islands within the Alaska Maritime National Wildlife Refuge. Biologists trace the decline of the subspecies back as far as 1750, when fur farmers and trappers introduced foxes on more than 190 islands within the goose's nesting range in Alaska. The

foxes decimated the birds, which had no natural defenses against land predators. Biologists found no Aleutian Canada geese from 1938 until 1962, when an FWS biologist discovered a remnant population on the rugged, remote Buldir Island in the western Aleutian Islands.

For the past 35 years, biologists have worked to remove introduced foxes from former nesting islands and reintroduce geese. Removing foxes also benefitted many other birds, including puffins, murre, and auklets.

Besides removing foxes, FWS and State wildlife biologists closed wintering and migration areas to the hunting of Canada geese, banded birds on the breeding grounds to identify important wintering and migrations areas, and released families of wild geese caught on Buldir Island onto other fox-free islands in the Aleutians. In California, the FWS has worked extensively with local landowners in cooperative partnerships to protect and manage wintering habitat on private land through fee title acquisition, easements, and voluntary programs. Important wintering and migration habitat in California and Oregon also has been acquired as national wildlife refuges.

As a direct result of these recovery activities, the population increased to 6,300 birds by 1990, enough to reclassify the subspecies from endangered to threatened. The recovery continued through the 1990's, with new populations firmly established on Agattu, Alaid, and Nizki islands in the western Aleutians. The overall population of Aleutian Canada geese is now four times greater than the established recovery goal.

Russian scientists are undertaking a program to reestablish the Aleutian Canada goose in the Asian portion of its range. So far, they have released 86 geese on Ekarma Island in the Kuril Islands. Japanese scientists have observed several of these birds on the wintering grounds in Japan.

If the Aleutian Canada goose is delisted, biologists will monitor the population for 5 years, paying close attention to the small number of geese that nest in the Semidi Islands and winter on the north coast of Oregon. Although the goose would no longer be protected under the ESA, the subspecies would still be protected under the Migratory Bird Treaty Act.

Bald Eagle

The bald eagle once ranged throughout every state in the Union except Hawaii. When America adopted the bird as its national symbol in 1782, as many as 100,000 nesting bald eagles lived in the continental United States, excluding Alaska. By 1963, however, after habitat loss, illegal shooting, and contamination by the pesticide DDT, only 417 nesting pairs were found in the lower 48.

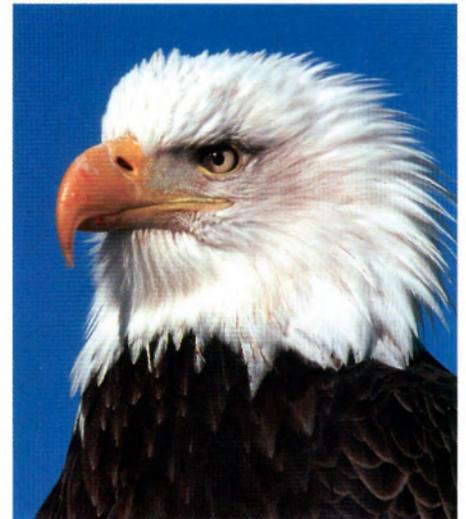


Photo © B. Moose Peterson/WRP

Today, due to the ban on DDT and FWS recovery efforts carried out in partnership with other Federal agencies, tribes, State and local governments, conservation organizations, universities, corporations, and many individuals, this number has risen to an estimated 5,748 nesting pairs. Biologists believe it may no longer require ESA protection. A proposal to delist the bald eagle was celebrated at a recent White House ceremony (see following article.)

by Jim Kraus

Bald Eagle Recovery in the Lower 48 States



Photo © B. Moose Peterson/WRP

From an original wild population perhaps numbering in the hundreds of thousands, the bald eagle (*Haliaeetus leucocephalus*) declined earlier in this century to such low levels that listing our national bird throughout most of the lower 48 states as an endangered species was necessary in 1967. Fortunately, environmental improvements and recovery actions carried out under the Endangered Species Act (ESA) have restored the bald eagle to a secure status. On the strength of the continuing increase in the bald eagle population nationwide, President Clinton announced at a White House ceremony on July 2, 1999, the Fish and Wildlife Service's (FWS) proposal to remove the bald eagle from the list of threatened and endangered species.

The proposal, published in the July 6 *Federal Register*, outlines the achievements of the bald eagle recovery program and explains the preliminary conclusion that the eagle no longer

meets the definition of a threatened or endangered species, and thus is no longer in need of ESA protection.

Bald eagle numbers in the lower 48 states declined precipitously throughout the early 20th century due to direct persecution in the form of shooting and poisoning, indirect threats from gradual habitat loss and degradation, and the deleterious effects of the persistent organochlorine pesticide DDT and other contaminants. The first national survey, sponsored by the National Audubon Society in 1963, documented nesting success at only 417 sites. DDT suppressed reproduction in the wild eagle population by interfering with calcium metabolism and egg shell formation, resulting in egg shell thinning and breakage. This insidious threat was reduced when EPA banned the chemical for domestic use in 1972, but the effects of DDT and related compounds lingered as their persistence in the eagle's (and our own) environment

FWS bald eagle recovery coordinator Jody G. Millar; Al Cecere, President of the Foundation to Save America's Eagles; and the bald eagle "Challenger" join President Clinton on the South Lawn of the White House for the July 2nd announcement of the delisting proposal. Looking on are members of the Earth Conservation Corps, one of many groups that participated in bald eagle recovery projects.

Photo by Jim Kraus



diminished only gradually to levels sublethal to eagles.

After the eagle in the lower 48 States was added to the list of threatened and endangered species, specific recovery actions outlined in five recovery plans covering different geographic areas were undertaken. This included captive rearing of chicks hatched from eggs removed from nest sites, which prompted wild birds to lay additional eggs to raise in replacement of those taken for foster-rearing by humans. Chicks hatched in captivity were successfully introduced to the wild at artificial nest structures where eaglets were screened from their human benefactors and fed until they were able to live on their own.

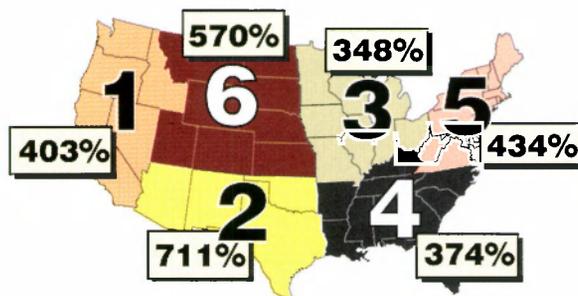
In many States, wild eggs translocated from other States or Canadian Provinces with abundant eagle populations were the basis for reestablishing native populations. Land management agencies, in consultation with the FWS, protected areas around active eagle nest trees and roost sites. Wildlife rehabilitators and veterinarians volunteered countless hours to save individual birds injured by shooting and vehicle collisions, and conducted reintroductions and public education campaigns about the eagle's plight.

The number of known active nesting pairs has increased tenfold since the first comprehensive survey in 1963. By 1998, more than 5,700 occupied breeding areas were documented. (See chart for FWS regional totals.) If the proposed delisting of the bald eagle is made final, it will not be relegated to some forgotten status without any protection. Federal statutes such as the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act will continue to protect eagles from direct take. Other statutes, including the Lacey Act, the National Environmental Protection Act, the Clean Water Act (CWA), and the Federal Insecticide, Fungicide, and Rodenticide Act, will continue to provide protection from illegal trade, transport, and contaminants. Each State

will continue to play a role through population monitoring and their own conservation programs. In addition, the FWS will continue to monitor the eagle's status and can again invoke ESA protection in the event of an unforeseen crisis or rapid decline. Having gained so much in recent years and averted a near biological and cultural calamity, it is clearly in the interest of all Americans to keep their eye on the eagle.

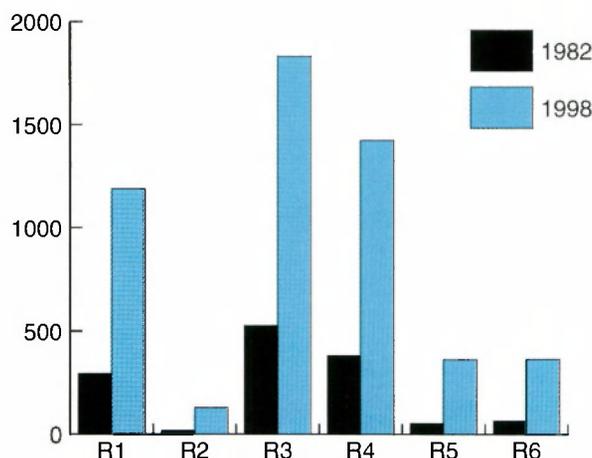
Jim Kraus is a Wildlife Biologist with the FWS Division of Endangered Species in Arlington, Virginia.

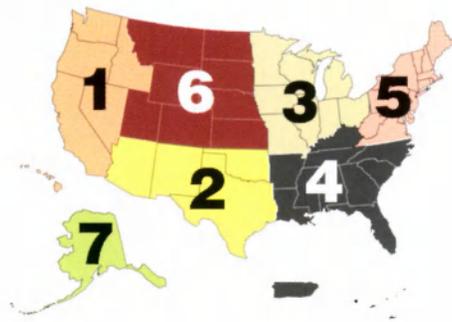
Increase in Nesting Pairs by USFWS Region, 1982-1998



The last two decades have seen dramatic increases in the number of bald eagle nesting pairs, as shown in the figures at left. Numbers are broken down by Fish and Wildlife Service regions, indicated in the map, and cover the lower 48 States.

Number of Nesting Pairs by USFWS Region, 1982-1998





Fish and Wildlife Service (FWS) regional endangered species staffers have reported the following news:

Region 1

Oregon Spotted Frog (*Rana pretiosa*) Conboy Lake National Wildlife Refuge (NWR) biologist Engler (*reviewers, we're checking on this name*) assisted Dr. Marc P. Hayes of Portland State University with the final field work on the Oregon spotted frog breeding project at Conboy NWR. Staff and volunteers conducted surveys through the breeding season for this frog, which is a candidate for listing under the Endangered Species Act. Preliminary data indicated the presence of about 8,300 egg masses. Data were also collected on egg mortality, oviposition depths, oviposition timing, and vegetation structure associated with egg masses. The refuge currently harbors the largest known population of Oregon spotted frogs.

Threatened Fishes On May 26, Oregon Governor John Kitzhaber and Portland General Electric announced plans to remove Marmot Dam on the Sandy River and Little Sandy Dam on the Little Sandy River to restore habitat for threatened salmon and steelhead. This action will also benefit numerous other fish and wildlife species as well as overall watershed health. The dams currently generate 22 megawatts of power and have been in operation for over 90 years. Removal of these dams will restore passage to 10 miles (16 kilometers) of habitat above Little Sandy Dam, and 12 miles (19 km) of mainstem habitat and 100 miles (160 km) of spawning and rearing habitat above Marmot Dam. The Fish and Wildlife Service (FWS) is a participant in the Sandy Basin Agreement, which will guide restoration efforts in the Basin.

Public outreach is also important for salmon recovery. Bonneville Power Administration staff in Portland helped kick off this year's National Fishing Week with a game of miniature golf, thanks to staff from Carson National Fish Hatchery (NFH) and the FWS Columbia Gorge Information & Education Office. Carson and Leavenworth NFHs teamed up to create a new portable golf course incorporating displays that captivate audiences as they learn more about the perils salmon face as they migrate to and from the ocean. Federal Aid and Dworshak NFH provided a banner and photos for a display in the lobby. The miniature golf game returned to Carson NFH for their open house on June 5, moved on to Winthrop NFH on June 12, and goes to Leavenworth NFH for the Wenatchee Salmon Festival in September.

Region 2



Bonytail chub

Photo by Peter J. Carboni

Endangered Fishes Colorado River Indian tribes (Hopi, Navajo, Mojave, and Chemehuevi) are cooperating with Dr. Chuck Minckley of the FWS Arizona Fishery Resources Office in Parker toward refurbishing an old fish hatchery on tribal lands to raise endangered native fish species, such as the bonytail chub (*Gila elegans*) and razorback sucker (*Xyrauchen texanus*). The FWS is evaluating the facility, known as *Achii Han'yo* (Mojave for "fish pond"), to determine its importance for endangered fish restoration. The tribes are also assisting in fishery surveys during annual drawdowns for razorback suckers as well as collecting fish from canal drains for analysis of heavy metal and pesticide contamination. In addition, the tribes have provided assistance in the razorback roundup on Lake Mojave.

Region 5



Roseate terns

Photo by Bud Oliverira/USFWS

Roseate Tern (*Sterna dougallii*) When biologists returned to tern nesting islands in spring 1999, they were encouraged by an excellent 1998 roseate tern season. In 1998, over 4,000 pairs nested in the U.S., a level not seen since the 1970's. In addition, census data have shown a steady increase of nesting pairs at an average rate of about 4 percent per year since at least the mid-1980's. This slow but steady increase was interrupted by only one decrease between 1991 and 1992, when a tropical storm struck the North Atlantic just as roseates were leaving the nesting colonies to prepare for their southward migration. The downside to the generally increasing numbers, however, is that the peripheral colonies like Falkner Island, Connecticut, and all Canadian breeding sites again showed poor productivity levels in 1998, mainly due to predation by black-crowned herons, crows, and gulls. This makes the larger core colonies in Massachusetts and New York even more important.

A new review paper written by recovery team members Ian Nisbet and Jeffrey Spendelow summarizes the results of scientific studies on North American roseates conducted in the 12 years since the species was listed as endangered in 1987. It also looks at the extent to which research has contributed to effective management and recovery of the North American population. This paper and the recovery team's updated Roseate Tern Recovery Plan—Northeast Population (1998) are available from the FWS Region 5 Office (see *Bulletin* page 2 for address).

During April and May of 1999, the Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) published the following Endangered Species Act (ESA) listing actions in the *Federal Register*:

Emergency Listing Rule

California Bighorn Sheep (*Ovis canadensis californiana*) On April 20, the FWS published an emergency listing rule that protects the distinct Sierra Nevada population of California bighorn sheep as an endangered species for a period of 240 days. Protection from possible lion predation was critically important in April and May, when bighorn sheep vulnerability to mountain lion (*Felis concolor*) predation is greatest as they attempt to use low elevation winter ranges at the end of gestation. The purpose of the ESA's emergency rule provision is to prevent species from becoming extinct by affording them immediate protection while the normal listing process is being followed. The FWS also published a proposal on April 20 to give this bighorn population long-term ESA protection.

Sierra Nevada bighorn sheep numbers have declined from about 310 individuals in 1985-86 to 100 individuals currently. The population is found almost entirely on Federal land in portions of Inyo and Mono counties in California. Primary threats to the species are believed to be predation by mountain lions and coyotes (*Canis latrans*), and the direct and indirect effects of bighorn sheep abandoning winter habitat in order to avoid mountain lions. Disease spread from domestic sheep also is a chronic threat.

Until the 1960's, the State had a bounty on mountain lions, which kept the population low enough that predation on bighorn sheep was likely insignificant. When mountain lion hunting ended in the 1970's, there was a subsequent increase in the lion population, and predation on bighorn sheep increased. During the late 1980's, the California Department of Fish and Game removed four mountain lions that were known to have killed bighorn sheep. This management practice contributed, at least in part, to a period of growth in the bighorn sheep population.

California State Proposition 117, enacted in 1990, prohibits the killing of any mountain lion except animals that pose a direct threat to people, pets, or livestock. Since the passage of Proposition 117, State

agencies no longer have the authority to control lions known to prey on bighorn sheep. The emergency listing, however, allows the FWS to work with the California Department of Fish and Game, U.S. Forest Service, Bureau of Land Management, and National Park Service to implement a plan to protect Sierra Nevada bighorn sheep from mountain lions. Removal of mountain lions from critical sites may not necessarily involve lethal techniques.

In addition to threats from predation, disease spread from domestic sheep has also reduced bighorn sheep populations. In 1988, a strain of pneumonia, apparently contracted from domestic sheep, wiped out a reintroduced herd of bighorn sheep in Modoc County.

Currently, domestic sheep are permitted in areas adjacent to bighorn populations. Steps are being taken to modify or retire domestic sheep grazing allotments adjacent to bighorn sheep habitat, but because of conflicting management concerns, progress has been very slow.



Photo © B. Moose Peterson/WRP

Sierra Nevada bighorn sheep are large, impressive animals. They have a coat of short hair that is tawny to dark brown in color, with a white rump patch. Adult males stand approximately 3 feet (0.9 meter) tall and weigh up to 220 pounds (100 kilograms). They have massive coiled horns. Females of the species are slightly smaller with horns that are narrower and only slightly curved.

Listing Proposals

Ventura Marsh Milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) The Ventura marsh milk-vetch, a plant thought to be extinct until its recent rediscovery in Ventura County, was proposed May 25 for listing as an endangered species.

This member of the pea family (Fabaceae) with silvery-haired leaves and clusters of yellowish or cream-colored flowers had not been seen since 1967, when a single plant was taken from the wild in Oxnard. It was presumed extinct until 1997, when an FWS biologist discovered a population of 374 plants on less than one acre (0.4 hectare) of privately owned Ventura County beach dune that was used for disposal of oil field wastes in the past. The imminent threats to the plants are a proposed clean-up of the contaminated soil and a proposed housing development on the site. A 1998 count showed the plants numbered fewer than 200. Due to its small population size, the Ventura marsh milk-vetch is also vulnerable to extinction as a result of disease or prolonged drought, which could destroy the last wild population.

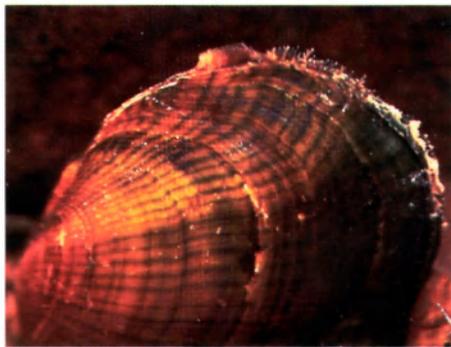
The historic range of the Ventura Marsh milk-vetch included coastal Ventura, Los Angeles, and Orange counties, but many places it was previously found, such as the Ballona wetlands and Santa Monica, have been radically altered, and the plant has not been seen in these areas for nearly a century. The California Department of Fish and Game currently is working with FWS biologists to collect seed from the remaining plants in order to establish new populations.

Sixteen Mussels The FWS proposed on May 27 to join the State of Alabama in an effort to reintroduce 16 endangered mussels and a snail to a portion of Muscle Shoals, a 53-mile (85 kilometer) stretch of the Tennessee River in Colbert and Lauderdale counties that once supported 80 percent of all mussel species native to the river system. This action, along with other conservation measures, is intended to help recover the river's aquatic mollusks to the point where these species no longer require special protection.

The proposal, developed at the request of the director of the Alabama Division of Game and Fish, is part of a broad initiative that also includes habitat improvement and the rebuilding of depleted populations with the eventual goal of removing all of these species from

the Federal endangered species list. The reintroduced mussels will be classified as a “nonessential, experimental population,” a designation intended to promote public acceptance of reintroduction by authorizing a greater measure of management flexibility compared to the rules protecting other endangered and threatened species. Although the reintroduction is intended to aid in the recovery of these mussel species, the term “nonessential” recognizes that the experimental population is not essential to their survival.

The 16 mussel species are Anthony’s riversnail (*Athearnia anthonyi*), Alabama lampmussel (*Lampsilis virescens*), birdwing pearl mussel (*Conradilla caelata*), clubshell (*Pleurobema clava*), cracking pearl mussel (*Hemistena lata*), Cumberland bean pearl mussel (*Villosa trabalis*), Cumberlandian combshell (*Epioblasma brevidens*), Cumberland monkeyface pearl mussel (*Quadrula intermedia*), dromedary pearl mussel (*Dromus dromas*), fine-rayed pigtoe (*Fusconaia cuneolus*), oyster mussel (*Epioblasma capsaeformis*), purple cat’s paw pearl mussel (*Epioblasma obliquata*), shiny pigtoe (*Fusconaia cor*), tubercled-blossom pearl mussel (*Epioblasma torulosa torulosa*), turgid-blossom pearl mussel (*Epioblasma turgidula*), winged mapleleaf mussel (*Quadrula fragosa*), and yellow-blossom pearl mussel (*Epioblasma florentina florentia*).



Oyster mussel

Photo by Dick Biggins/USFWS

Muscle Shoals is part of the Tennessee River in Colbert and Lauderdale Counties, Alabama, an area identified by early naturalists as incomparable in its diversity of freshwater mussels. Over the years, mollusks that originally inhabited Muscle Shoals declined significantly due to water impoundments and deteriorating water quality. Work in the past several years by the Tennessee Valley Authority, the Environmental Protection Agency, and other State and Federal agencies



Clubshell

Photo by Craig Stihler.

has improved water quality. That, coupled with improvements in the technology to propagate mussels in captivity, indicate that a major freshwater mussel reintroduction program is feasible.

The FWS anticipates that reintroduction of mollusks will not conflict with any human activity or hinder public use of the Tennessee River system. Special rules also are being proposed to stipulate there would be no violation of the Endangered Species Act for “unavoidable and unintentional taking” (killing or injuring) of any reintroduced mollusks when the taking is incidental to a legal activity such as boating, commercial navigation, commercial mussel harvesting, or fishing in accordance with State law or regulation.

Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*) After conducting a comprehensive review of coastal cutthroat trout populations in Washington, Oregon, and California, NMFS biologists have identified six Evolutionary Significant Units (ESUs) within this range. On April 5, NMFS and the FWS jointly published a proposal to list one of these ESUs, consisting of coastal cutthroat trout populations in southwestern Washington and the Columbia River, excluding the Willamette River above Willamette Falls, as threatened under the ESA.

The proposal would also delist the Umpqua River coastal cutthroat trout ESU, which is currently listed as endangered. Information gained since its listing indicates that it is part of a larger ESU encompassing the coast of Oregon between the Columbia River and Cape Blanco, Oregon. NMFS and the FWS do not believe the larger ESU is in need of ESA protection at this time. Details on these proposed listing actions are available in the April 5 *Federal Register*.

Final Listing Rules

Lone Buckwheat (*Eriogonum apricum*) and Lone Manzanita (*Arctostaphylos myrtifolia*)

These plant species are native to the sandy clay soils of the lone formation, an ancient mineral deposit found in the western Sierra Nevada foothills. On May 26, the FWS listed the lone buckwheat, a perennial herb in the family Polygonaceae, as endangered and the lone manzanita, an evergreen shrub in the heath family (Ericaceae), as threatened.

The unusual soils of the lone formation are mined heavily for lignite (a wax used for industrial purposes), silica, quartz sands, and gravel. Mining, land clearing for agriculture and fire protection, habitat fragmentation, off-road vehicle use, and residential and commercial development threaten the survival of the two plant species.

Howell’s Spectacular Thelypody (*Thelypodium bouellii* ssp. *spectabilis*)

A herbaceous biennial in the mustard family (Brassicaceae), Howell’s spectacular thelypody is known from only 11 sites in Baker and Union counties of eastern Oregon. Because this plant grows in wet alkaline meadows within valley bottoms, it is threatened by stream channelization, livestock grazing in spring and summer, trampling, urban development, and competition from non-native plants. On May 26, it was listed as threatened.

Flatwoods Salamander (*Ambystoma cingulatum*)

On April 1, the FWS listed this small, black to chocolate brown amphibian as a threatened species. The salamander is native to longleaf pine flatwoods of the lower southeastern coastal plain in Florida, Georgia, and South Carolina. It also occurred historically in Alabama, but it has not been sighted there since 1981. Major threats to the survival of the flatwoods salamander include the destruction or



Flatwoods salamander

USFWS photo

modification of its habitat due to agriculture, urban expansion, certain forestry practices, and fire suppression. Today, the Southeast's pine flatwoods have declined to less than 20 percent of their original distribution. Timber management, however, can be compatible with the survival of the flatwoods salamander, and some silvicultural techniques, such as selective cutting and burning, can duplicate natural ecological processes that benefit the species. The Southeast Amphibian Survey Cooperative of the American Forest and Paper Association has pledged to work with FWS scientists to seek innovative and beneficial resource management strategies.

Bull Trout (*Salvelinus confluentus*) On April 8, the FWS published a final rule listing the Jarbidge River population of bull trout as threatened. This supersedes an emergency rule issued in the summer of 1998 that temporarily listed the population as endangered to protect its habitat from damage caused by unauthorized road work. The final listing action includes a special rule that will allow recreational anglers to continue to fish the Jarbidge River in accordance with State regulations.

The bull trout, a member of the char subgroup of the salmon family, is native to the Pacific Northwest, including Washington, Oregon, California, Idaho, Montana, Nevada, Alaska, and Canadian provinces of Alberta and British Columbia. This fish is now extinct in California.

The Jarbidge River bull trout population currently is restricted to the headwaters of the East Fork and West Fork of the Jarbidge River and four tributary streams in Elko County in northeastern Nevada and Owyhee County in southern Idaho. It is estimated that only 50 to 125 bull trout spawn annually throughout the entire Jarbidge River basin. Specific threats to bull trout in the Jarbidge River include non-native fish, incidental harvest by anglers, and habitat degradation from road construction and maintenance, mining, and grazing. The Jarbidge population is separated from other bull trout populations by a 150-mile (240-km) stretch of river dotted with impassable dams.

The FWS included a special provision related to recreational fishing in the Jarbidge River basin in the final listing rule. Under this provision, anglers will be allowed to continue sport fishing in the river for 24



Bull trout
USFWS photo

months while the FWS and the states of Idaho and Nevada develop a management and conservation plan for the species. The public will have an opportunity to provide input into this process.

Only four other populations of bull trout remain in the West. The Klamath River and Columbia River segments in Oregon were listed as threatened on June 10, 1998. In a separate action on that same day, populations in the Coastal-Puget Sound area in Washington and St. Mary-Belly River in Montana were proposed for listing as threatened. A final decision on this proposal has not yet been made.

Creature Feature

The FWS Endangered Species Program has launched a new web site attraction: the *Creature Feature*. Each month, we will profile a lesser known endangered or threatened plant or animal. The first feature was on the endangered Houston toad. This secretive species has been federally protected since 1970, primarily due to loss of habitat. Despite its name, the Houston toad disappeared from the Houston area in the 1960's, but populations are still found in a few Texas counties. You can learn more about the toad, including information on its life history, habitat, and threats to its survival, as well as check out some links to other amphibian and reptile web sites, by visiting the Houston toad web site at:

<http://ifw2es.fws.gov/HoustonToad/>

Our current *Creature Feature* looks at some of the most misunderstood mammals in the United States: bats. The site provides an introduction to bats, debunks common myths and misconceptions, and details threats to bats. In addition, the web site provides links to information on several endangered and threatened bats, links to bat conservation organizations, and has a great bat page for kids. Check out the new bat web site out at:

<http://endangered.fws.gov/bats/bats.htm>

You can also view the Creature Feature by visiting the Service's Endangered Species Home Page at:

<http://endangered.fws.gov/>

New Look for the Division of Environmental Contaminants National Web Site

The Division of Environmental Contaminants recently unveiled its new national web site at:

<http://contaminants.fws.gov>

The new web site highlights many of the issues that the Contaminants Program is involved in, including pesticides, amphibian declines and deformities, endocrine (hormone) disruptors, water quality, habitat restoration, and "Superfund" site and oil spill clean-ups. The site also has feature items, such as a web page on pollinators and answers to frequently asked questions, as well as news and hot topics from Contaminants Program offices around the country.

BOX SCORE

Listings and Recovery Plans as of August 31, 1999

GROUP	ENDANGERED		THREATENED		TOTAL LISTINGS	U.S. SPECIES W/ PLANS**
	U.S.	FOREIGN	U.S.	FOREIGN		
 MAMMALS	61	250	8	16	335	48
 BIRDS	74	178	15	6	273	76
 REPTILES	14	65	22	14	115	30
 AMPHIBIANS	9	8	8	1	26	12
 FISHES	69	11	42	0	122	90
 SNAILS	18	1	10	0	29	20
 CLAMS	61	2	8	0	71	45
 CRUSTACEANS	17	0	3	0	20	12
 INSECTS	28	4	9	0	41	27
 ARACHNIDS	5	0	0	0	5	5
ANIMAL SUBTOTAL	356	519	125	37	1,037	365
 FLOWERING PLANTS	540	1	135	0	676	524
 CONIFERS	2	0	1	2	5	2
 FERNS AND OTHERS	26	0	2	0	28	28
PLANT SUBTOTAL	568	1	138	2	709	554
GRAND TOTAL	924	520	263	39	1,746*	919

TOTAL U.S. ENDANGERED: 924 (356 animals, 568 plants)

TOTAL U.S. THREATENED: 263 (125 animals, 138 plants)

TOTAL U.S. LISTED: 1187 (481 animals***, 706 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 522 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*

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