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August 2005

Endangered Species Bulletin, August 2005 - Vol. XXX No. 1

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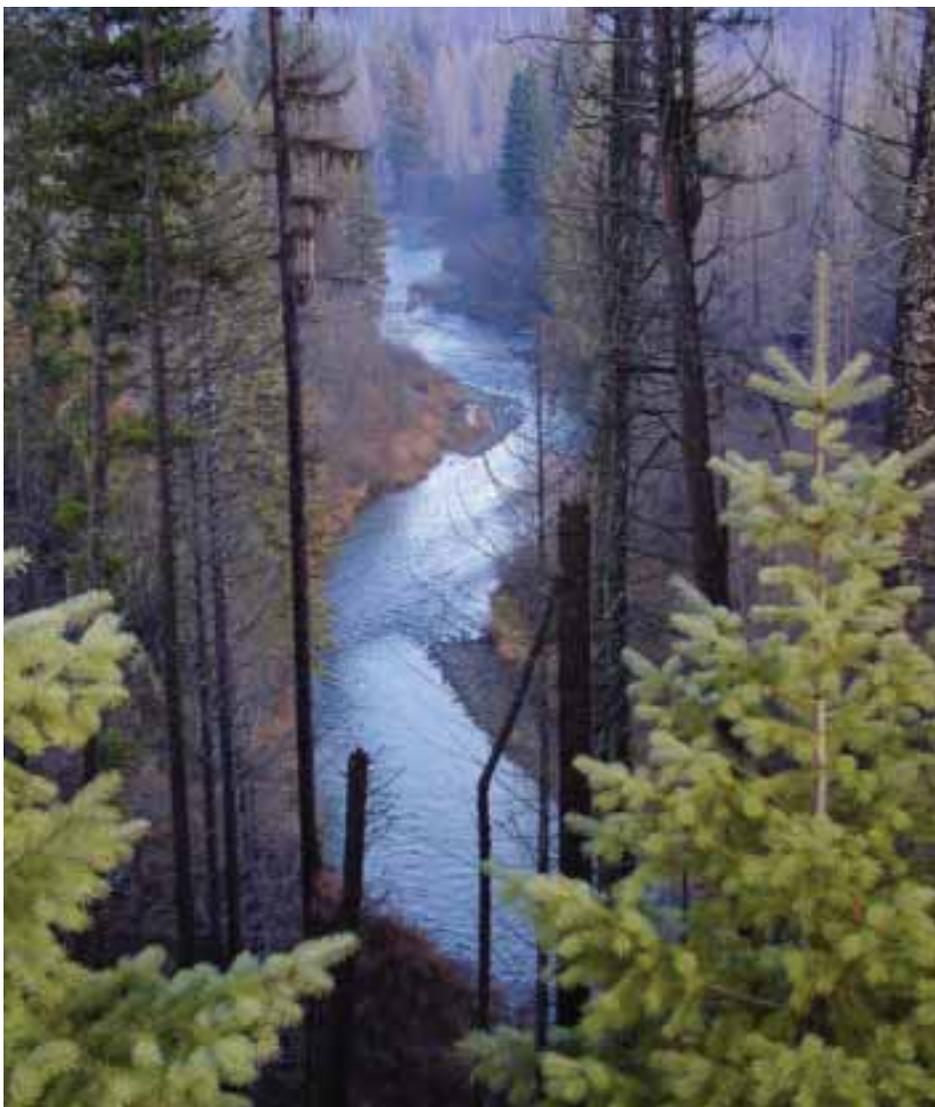
"Endangered Species Bulletin, August 2005 - Vol. XXX No. 1" (2005). *Endangered Species Bulletins and Technical Reports (USFWS)*. 21.
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ENDANGERED *Species* BULLETIN

August 2005

Vol. XXX No. 1



*H*uman endeavors in the conservation of imperiled species are a fairly recent development, scarcely more than a century old. In that brief span, we have witnessed the emergence of new ideas to describe the diversity of species on this planet and ways to conserve them.

In recent years, many of these ways reflect a cooperative conservation approach characterized by emphasis on innovation, incentives, local involvement, and on-the-ground action.

In this Bulletin, we highlight some of the programs designed to give landowners and other concerned citizens greater opportunities for innovation and involvement in wildlife conservation. These approaches are known by a variety of acronyms, but they fall under a venerable term: partnership.

How can we define partnership? Think of it as symbiosis—with awareness, creativity, and passion.



Montana Fish, Wildlife and Parks

U.S. Fish & Wildlife Service

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ENDANGERED Species BULLETIN

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On the Cover
Headwaters of the Bull Run in Montana, where habitat is being protected for the bull trout and other species.

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.

We also welcome your comments and ideas. Please e-mail them to us at esb@fus.gov.

The Fish and Wildlife Service distributes the Bulletin primarily to Federal and State agencies, and official contacts of the Endangered Species Program. It also is reprinted by the University of Michigan as part of its own publication, the Endangered Species UPDATE. To subscribe, write the Endangered Species UPDATE, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI 48109-1115; or call (734) 763-3243.



Printed with vegetable-based ink on recycled and recyclable paper. If you do not keep back issues, please recycle the paper, pass them along to an interested person, or donate them to a local school or library.

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The Crucians are Coming!

by Leopoldo
Miranda-Castro and
Claudia Lombard

The Saint Croix ground lizard (*Ameiva polops*) is a small lizard with adults measuring 1.5–3.5 inches (35–77 millimeters) from snout to vent. It is considered one of the world's most endangered reptiles, with fewer than 500 individuals living in three tiny islands off the coast of St. Croix in the U.S. Virgin Islands. The lizard was believed to be extinct during the early twentieth century, but it was rediscovered in 1937 on Green Cay and Protestant Cay, two of the three islands. Individuals of this endemic Crucian (meaning a resident of St. Croix) were last seen on the main island of Saint Croix in 1968.

The main reasons for their extirpation are habitat loss, habitat fragmentation, and the introduction of the Indian mongoose (*Herpestes auro-punctatus*), a mammalian predator. The lizard is currently restricted to three mongoose-free islands: Green Cay, Protestant Cay, and Ruth Island. Many of the experts agree

that the future of the lizard populations will depend on the fate of the lizards on these cays (islands).

All of these offshore islands fall in the subtropical, dry forest life zone. The literature on this species is scant, and there are no comprehensive works on its biology. Optimal ground lizard sites in Green Cay are characterized by exposed and canopied areas, leaf or tidal litter, loose substrate, and crab burrows. The most heavily used habitats are beaches and upland forests. Typical vegetation of the forest are the trees *Hippomane mancinella* (manchineel), *Tabebuia heterophylla* (pink trumpet tree), *Exostema caribaeum* (Caribbean princewood), and the shrubs *Eupatorium sinuatum*, *Lantana involucrate*, and *Croton betulinus*.

Different-sized lizards use different habitats, with smaller individuals found in more exposed habitat and larger *A. polops* in sites with more cover. Like most *Ameivas*, this species is diurnal, and it can be seen foraging for invertebrates and occasionally resting and sunning itself in the open.

(Left to right) Karen Koltes, Mike Evans, Leopoldo Miranda-Castro, Assistant Interior Secretary Lynn Scarlet, Virginia Tippie, and Joel Tutein visit the resort site to observe improving lizard habitat.



U.S. Park Service photo



Leopoldo Miranda-Castro

Green Cay National Wildlife Refuge

Green Cay is on the north coast of Saint Croix. It was purchased by the Fish and Wildlife Service on December 15, 1977 and designated as the Green Cay National Wildlife Refuge. It contains most of the designated critical habitat for the ground lizard. Outcrops of lava and sedimentary rocks are prominent geological features. The refuge's main objective is to maintain the natural island ecosystem to protect the endangered lizard. This refuge is closed to the public to protect the delicate critical habitat of the ground lizard.

Ruth Island

Ruth Island is a human-made island on the south coast of Saint Croix. It contains the only population occurring on the south coast. This island was created in the mid-1960s as a result of the dredging of Krause Lagoon to construct an industrial port. After a couple of decades, Ruth Island became naturally vegetated. This, together with its mongoose-free status, prompted biologists to introduce

about a dozen lizards, mostly from Protestant Cay. Today, the ground lizard population at Ruth Island is estimated at 30 individuals.

Protestant Cay

Protestant Cay is about a 3-acre (1.2 hectare) island a few hundred yards from the Christianstead Harbor. It is managed by the Hotel on the Cay, which was built in 1968. Approximately two-thirds is covered by this 55-room hotel. The rest of the habitat has been heavily modified and severely disturbed by the introduction of exotic vegetation and landscaping activities. This small island holds the second largest population of St. Croix ground lizards, estimated at 36 individuals.

Although the lizard population at Protestant Cay has been relatively stable since the 1960s, landscaping and hotel activities dramatically affect the lizard's habitat. The extensive development, including the modification to the understory by constant raking, removal of undergrowth, and other landscaping

St. Croix ground lizard

This site on the Protestant Cay resort began to be used by St. Croix ground lizards after the resort managers stopped raking away the ground cover needed by this endangered species.



Leopoldo Miranda-Castro

practices, also have contributed to the decline of the species. Future threats include the danger of accidental invasion of the cays by the mongoose and the lizard's vulnerability to natural catastrophes, such as hurricanes, primarily because of their small size and reduced habitat area. An increase in human disturbance or habitat alteration at important habitats, resulting from recreational activities or hotel expansion, could also be detrimental. As a result, the Hotel on the Cay management approached the Service's Partners for Fish and Wildlife Program to develop a conservation and habitat restoration project to protect the species at Protestant Cay.

The Partners program has had tremendous support from private landowners in the Caribbean. Most of the projects involve sensitive habitats that provide benefits to endangered species, neotropical migrants, and other native and endemic wildlife.

Although Protestant and Green Cays are considered critical habitat for this species, both islands are located relatively close to each other in the north coast of Saint Croix, making them vulnerable to the same natural disturbances such as hurricanes. Looking into the future, and

to reduce the chance of a catastrophic event eliminating the species, Ruth Island should be considered one of the main targets for the management and restoration of the species.

The Hotel on the Cay habitat restoration project aims to restore and connect habitat patches within the cay and to modify the hotel's landscaping maintenance practices to protect and manage this endangered species. Also, this project has an important and strong educational component. First, the hotel is informing its guests about the project and species conservation initiatives taking place at the island. Second, local schools are getting involved in the scientific procedures of population monitoring, habitat restoration, and management activities through coordination with the Virgin Islands Department of Planning and Natural Resources.

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How the Scanlans Got their Range Back

by David A. Ross

Since the late 1800s, western juniper (*Juniperus occidentalis*) has encroached or increased in density on sagebrush and bunchgrass habitats in the intermountain region of the western United States. Such anthropogenic (human-caused) influences as livestock grazing and the suppression of fire are major contributing factors. These juniper woodlands are still in a state of flux, undergoing succession from open shrub steppe communities to closed canopy woodlands. Such a change in plant community structure harms certain species of wildlife and the resources on which ranchers and their livestock depend.

Wildlife species that rely on native grasslands and sagebrush habitat have experienced considerable change. Forest dwelling birds such as Townsend's solitaire (*Myadestes townsendi*) and mountain chickadee (*Parus gambeli*) are replacing grassland obligate species such as sage grouse (*Centrocercus urophasianus*) and western meadowlark (*Sturnella neglecta*) in larger stands. While wildlife associated with these native habitats is declining, so is the quality of range forage that cattle and other livestock require. Addressing the needs of both wildlife and livestock with habitat restoration actions in this situation may sound like a big challenge, but ranchers Jerry and Judy Scanlan from Malin, Oregon, have gone a long way toward achieving this goal.

The Scanlans acquired about 12,000 acres (4,860 hectares) of ranch land on the border of Oregon and California during the 1990s. They realized that, if the ranch was to be productive enough for them to maintain livestock and be a working ranch, they would have to

restore the range and provide adequate water for stock. Such a task would be expensive and involve a number of partnerships.

These partnerships addressed both livestock and wildlife management needs. The Natural Resources Conservation Service developed a ranch management plan establishing 12 management units or

Sagebrush and grasses are recovering where encroaching junipers have been cut.



USFWS

fenced paddocks within the ranch. The Scanlans knew that providing adequate forage for livestock would require removing the juniper overstory that had drastically decreased the densities of native grasses and sagebrush. Juniper stands also can consume large amounts of water, making it unavailable to both livestock and wildlife.

Jerry contracted with a wood chipping firm to chip and haul away 4,000-acres (1,618-ha) worth of juniper to a cogeneration plant for fuel for free. The Oregon Department of Fish and Wildlife provided funds to cut 900 acres (360 ha) of juniper on the Scanlan's land in Oregon, while firewood harvesters removed smaller stands.

Springs and seeps that appeared following juniper removal were fenced to provide wildlife habitat. Juniper stands were left on ridgetops and other sites that would have naturally been in juniper to

provide wildlife movement corridors and habitat. Water was piped from springs to troughs outside the fence for livestock. Ponds were fenced, and solar powered pumps provided water to troughs outside in the adjoining paddocks. Each of the paddocks had water. Two reservoirs have been restored to provide better livestock management among paddocks and permanent sources of water for wildlife.

These efforts provide the ability to rotate stock throughout the ranch. Stock rotation helps to ensure that no overgrazing occurs and wildlife habitat remains intact. Additionally, one paddock is not grazed by livestock and is reserved as wildlife habitat.

As juniper stands were cleared, the disturbed skid trails and landing areas were seeded with native bunchgrass. Livestock grazing does not occur until two years following seeding to ensure adequate establishment.

Sage grouse



Dave Menke, USFWS

The Fish and Wildlife Service's Partners for Fish and Wildlife Program provided funds for fencing, pond enhancements, solar pumps, pipe installation, and native bunchgrass seed. The Scanlans provided the matching labor and equipment to construct the facilities and sow the native bunchgrass seed.

To make the most of their juniper resources, the Scanlans have used juniper for fence posts, a sheep corral, and firewood to heat their home. Their daughter built a home from large juniper logs, and their son builds attractive juniper furniture from wood harvested on the ranch.

Following the juniper removal, the Scanlans observed resprouting of sagebrush and an increase in the density of native bunchgrasses. In 2002, Jerry was surprised to see several sage grouse on the northern part of the ranch. (The nearest sage grouse population was about 6 miles (10 km) to the south on Clear Lake National Wildlife Refuge.) The California Department of Fish and Game flew aerial surveys in 2004 and reported a small herd of pronghorn (*Antilocapra americana*) wintering on their ranch. The Scanlans also have a stable population of mountain quail on the ranch, and mule deer survival is good.

Jerry and Judy are thankful for the partnerships that have developed. Jerry stated that he did not think they could make the ranch successful had it not been for the contributions from the agency partnerships. He added, "I had previous experience with the Partners for Fish and Wildlife Program and contacted the local Service Partners for Fish and Wildlife representative at the time, Jim Hainline, and invited him out to the ranch. Mr. Hainline came out and provided me with the technical assistance to get the Partners project off the ground. The program on our ranch seemed to mushroom, and Jim advised me to contact both the NRCS and Oregon Department of Fish and Wildlife for additional funding."



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Jerry proceeded with Jim's advice. Larry Flourney (Natural Resources Conservation Service) assisted with a Ranch Management Plan, and Tom Collum (Oregon Department of Fish and Wildlife) assisted with their Access in Habitat funding. With relationships like this, it's clearly possible to make strides in addressing fish and wildlife conservation issues while helping private landowners stay economically viable.

Spring habitats on the Scanlan Ranch are improving and have been fenced for protection.

David A. Ross is the Restoration Supervisor at the Service's Klamath Basin Ecosystem Restoration Office in Klamath Falls, Oregon (phone: 541-885-8481; dave_ross@fws.gov)

Banking on Gopher Tortoises

by Mike Groutt

The tortoise beat the hare in a fabled footrace. But the gopher tortoises (*Gopherus polyphemus*) of southwestern Alabama have been slowly losing their race for living space. New homes, roads, and businesses squeeze them out, and the exclusion of fire alters the tortoise's open longleaf pine habitat. Thankfully, a new approach known as "conservation banking" is providing a better future for this species.

The gopher tortoise is a large turtle that lives in deep burrows, often up to 25 feet (7.5 m) in length, in upland habitats usually dominated by stands of longleaf pines. These burrows also provide shelter for more than 360 other species, including the eastern indigo snake (*Drymarchon corais couperi*), which is listed under Endangered Species Act as threatened. Tortoises require well-drained, sandy soil in which to dig their burrows, herbaceous plants for food, a sparse understory, and open areas for basking.

Habitat alteration and land development pose the most serious threat to the tortoise's survival. Habitat loss contributed

significantly to its listing as a threatened species in parts of Alabama and throughout Mississippi and Louisiana. This is particularly true in Mobile County, Alabama, which underwent a 94 percent increase in residential development in the 1990s.

Biologists with the Fish and Wildlife Service's Daphne, Mississippi, Field Office recognized that to protect the species, action was needed to conserve large, contiguous plots of tortoise habitat. Much of the native longleaf pine ecosystem has disappeared across the South. Small restored areas of longleaf pines are not enough to provide for long-term health of the tortoise population.

Service biologists turned to conservation banking as a means of accommodating both habitat conservation and other land uses. Conservation banks are permanently protected, privately or publicly owned lands managed for endangered or threatened species. The Service approves habitat or species "credits" based on the natural resource values on the bank lands. The bank owner is free to sell—or use for itself—credits allotted to the bank for species or their habitats.

The Service found an enthusiastic first partner in the Mobile Area Water and Sewer System (MAWSS). Much of the drinking water for this area comes from Converse Reservoir in western Mobile County. Converse Reservoir sits in an area undergoing rapid development, and MAWSS has been purchasing land within the reservoir's watershed to create a buffer. Using the buffer as a conservation area for tortoises provided the ideal solution for keeping development at a safe distance and providing an economic benefit for the conservation of the site.

In 2001, MAWSS, working with the Daphne Field Office and the organiza-

Below: Before being used for gopher tortoise habitat, much of the land at the conservation bank needed restoration. Since natural processes, like periodic fires, have been suppressed, thick, woody brush had choked out native grasses.

Below right: Once restored, the habitat at the bank closely resembles a natural longleaf pine forest ecosystem, allowing gopher tortoises to burrow in the grassy understory.



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Adult gopher tortoise being held for testing. All tortoises are tested for upper respiratory tract disease syndrome (URTDS) before being relocated to the conservation bank. URTDS destroys the respiratory tract and olfactory senses of gopher tortoises, and can spread throughout a colony.

tion Environmental Defense, opened a 222-acre (90-hectare) conservation bank. The site marked the first time a federally sanctioned conservation bank had been used for the gopher tortoise, and the first time a conservation bank had been established in Alabama.

In addition to helping MAWSS, the bank has benefited individual property owners by allowing them to buy credits that allow them develop property where previously they may have had to make project modifications because of a resident gopher tortoise.

Gopher tortoises also benefit. Rather than individuals living in relative isolation on small parcels of land where their future would be in doubt, tortoises relocated to the bank find a large area of optimal habitat where they can interact with other tortoises to create a stable population.

Before the bank could become operational, much of the area needed to be restored. Since the site had not previously been managed for gopher tortoises, natural processes—such as periodic fires—had been suppressed. Thick, woody brush had grown up, choking out native

grasses. Fortunately, the cost of restoring habitat for gopher tortoises proved manageable. For areas where restoration could be accomplished with prescribed burning, the cost was as little as \$15 per acre (about \$37 per ha). However, where restoration included removal of invasive plants and planting of longleaf pine seedlings, the cost ran from \$50 to \$200 per acre (\$124 to \$495 per ha).

The habitat at the MAWSS site has now been improved to more closely resemble a natural longleaf pine forest ecosystem. Prescribed burns in 2000 and 2002, as well as hardwood timber harvesting in 2001, have opened up the forest to allow for gopher tortoise burrows in the grassy understory. In 2003, herbicides were used to control cogon grass, an invasive species that, if allowed to spread, would render the habitat unusable for the gopher tortoise. Another invasive species, the imported red fire ant, is also a concern since they prey on gopher tortoise hatchlings.

The site was initially home to 14 gopher tortoises. Since 2001, another 70 have been relocated to the bank from

small, scattered parcels. All are tested for diseases and quarantined before release.

Conservation banks are proving to be a useful tool in preserving gopher tortoise habitat and populations in southwest Alabama. The Daphne Field Office has worked closely with the responsible agencies to develop conservation plans addressing the needs of the gopher tortoise, insuring that the habitat would be restored and maintained, and guaranteeing the long-term survival of the site and the species. These sites will be monitored on a continual basis. The goal is to conserve gopher tortoises by managing a conservation site of relocated tortoises and residents as a single viable population.

With the success of the MAWSS conservation bank, the future looks brighter for the gopher tortoises. In 2004, a second site was dedicated as a conservation bank, this time as a joint project between the Service, the Federal Highway Administration, and the Alabama Department of Transportation. This site, near the city of Chunchula in northwestern Mobile County, will provide a relocation site for tortoises displaced by local highway projects. Other banks are planned, such as one with South Alabama Utilities and the City of Citronelle. By late 2006, it is expected that at least 1,500 acres (about 600 hectares) of Mobile County will be dedicated to gopher tortoise conservation banks.

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Rare Species are Welcome on Arizona Ranch

by Kris Randall



S. and D. Maslowski/USFWS

Southwestern willow flycatcher

James W. Crosswhite, a rancher in eastern Arizona, knew that Nutrioso Creek wasn't in the best shape when he bought the 400-acre (162-hectare) EC Bar Ranch in 1996. The stream was a down-cut channel and rabbit brush, an invasive plant not grazed by livestock, was predominant in the pasture. He knew that the stream, its associated riparian area, and the surrounding pastures needed to be improved in order to enhance the land for cattle grazing.

In 2002, Jim approached Marty Jakle, biologist in the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program in Arizona. Jim wanted to plant willows along the creek to stabilize the streambanks. Minimizing sediment and reducing flood flows would improve fish habitat and enhance the riparian area. The idea of helping a small fish, the Little Colorado spinedace (*Lepidomeda vittata*), and possibly attracting migratory birds such as the southwestern willow flycatcher (*Empidonax traillii extimus*) was something Jim wanted.

However, because both of these species are federally listed as threatened and endangered, respectively, he did not want these habitat improvements to limit the use of his land as an economically viable cattle operation. The solution was to develop a Safe Harbor Agreement, which would assure him that the habitat improvements would not restrict his land use practices should flycatchers colonize and spinedace increase on his property.

The EC Bar Ranch includes 2.5 miles (4 kilometers) of Nutrioso Creek, which flows largely from snowmelt and seasonal rains. The ranch contains one of the few reaches of Nutrioso Creek where the flow is perennial and is occupied by spinedace. The creek's headwaters are in high elevation conifer forests and drain into a grassland valley. These grasslands have been used for livestock grazing and farming since the late 1800s, and had deteriorated into poor condition. Nutrioso Creek became a deeply down-cut stream channel with little floodplain.

Nutrioso Creek stream channel showing the eroded stream banks and the formation of flood plain supporting riparian vegetation.



Jim Crosswhite

Jim started making improvements to the ranch in 1996 by changing the grazing management practices and, with assistance from the Natural Resource Conservation Service, installing stream grade control structures in Nutrioso Creek. His hard work began paying off. Riparian and wetland vegetation started to increase along the streambanks and more sediment was retained within the channel, building up the floodplain.

In 2002, Jim received funding from the Fish and Wildlife Service's Partners for Fish and Wildlife Program. Willows would be planted along the floodplain and fencing installed to exclude livestock and elk from Nutrioso Creek. But first, before any on-the-ground work was started, a Safe Harbor Agreement would be written.

The baseline condition for both the flycatcher and the spinedace on the ranch needed to be determined. The baseline for the southwestern willow flycatcher was zero because no habitat existed on the ranch for this species. This migratory bird requires riparian habitat for nesting and breeding, which past overgrazing in the watershed had destroyed. The closest known breeding location for the bird was approximately 15 miles (24 km) west of the ranch near Greer, Arizona.

The baseline for the Little Colorado spinedace did not rely on population surveys because such surveys can vary depending on the monitoring methods and fluctuations in natural stream conditions. Stream discharge was also eliminated as a baseline criterion since water flow here is extremely variable, there are upstream diversions, and the area is experiencing a severe drought. Since these conditions are out of the landowner's control, the available suitable habitat components were used as the measure for the spinedace baseline condition. Woody riparian trees are surrogate indicators of the current riparian habitat conditions supporting the existing population of the spinedace. The baseline became the number of woody riparian trees at least 3 feet (1 m) high present along the

ranch portion of Nutrioso Creek at the time the Safe Harbor Agreement was signed.

On January 16, 2004, Jim was invited to the Fish and Wildlife Service's Regional Office in Albuquerque, New Mexico, where Dom Ciccone, Regional Chief for the National Wildlife Refuge System, signed the Safe Harbor Agreement. That February, Jim planted over 10,000 willows along Nutrioso Creek. This partnership has resulted in good things for wildlife while improving range conditions for cattle. In time, stream conditions should improve for the spinedace, and riparian habitat will develop that may attract migratory birds such as the southwestern willow flycatcher.

As a rancher, Jim pays close attention to the land. "The mechanism for attaining a sustainable water supply is to restore native vegetation in the growing season, to practice dormant season grazing, and other best management practices. This approach benefits my livestock business while improving wildlife resources," he says. "Cattle ranching and endangered species recovery can be compatible and this project is a long-term demonstration of that premise and my commitment."

Many listed species occur partially or exclusively on private lands. This makes working with private landowners essential to protecting and recovering endangered species. Landowners' interests must be balanced with providing incentives to manage those lands in ways that benefit endangered species. The Partners for Fish and Wildlife Program is committed to working with private landowners and protecting threatened and endangered species. Safe Harbor Agreements are a vital tool to reach this goal.

Kris Randall is the State Coordinator of the Partners for Fish and Wildlife Program in the Service's Arizona Ecological Services Field Office (Kris_Randall@fws.gov).



USFWS



Arizona Department of Game and Fish

Top: Rancher Jim Crosswhite (in blue baseball cap) discussing plans for riparian restoration with Bill Zeedyke, restoration expert.

Bottom: Little Colorado spinedace

by Leopoldo
Miranda-Castro and
Silmarie Padron

Cactus Comeback in the Caribbean

When Columbus arrived in the Caribbean, the eastern islands were covered by extraordinary tropical coastal forests. After centuries of European colonization, few of those ecosystems remain intact. The colonization of Culebra began in 1880, commanded by Don Cayetano Escudero. The first settlement was located in an area now managed by the Puerto Rico Department of Natural and Environmental Resources and the Fish and Wildlife Service.

During this period, agriculture, fishing, and logging were the major source of income for the inhabitants of Culebra, who exported wood, turtle oil and shells, salted fish, tobacco, livestock, cheese, vegetables, coconuts, cotton, mangrove bark, charcoal, and domestic turkeys. These activities had a detrimental effect on Culebra's limited natural resources.

The island of Culebra.



Leopoldo Miranda-Castro

The beaches of Culebra are considered some of the most beautiful in the world. Culebra, located 17 miles (27 kilometers) east of Puerto Rico, and its surrounding islands comprise approximately 7,700 acres (3,116 hectares). In 1909, the Service established the area as a bird refuge, making it one of the oldest refuges in the system. Since then, much of the island and the surrounding 23 small islands have been protected by the Service as a national wildlife refuge. The topography is very rugged. Less than a half mile (0.8 km) from the coast, Monte Resaca (Culebra's highest point) rises to 650 feet (215 meters).

Culebra's soils are mostly of volcanic origin. This, together with the climate, provides the perfect environment for the development of the beautiful Culebra island cactus (*Leptocereus grantianus*). This species is a spineless cactus endemic to the island of Culebra. It was discovered in 1932 by Major Chapman Grant and later described by Nathaniel Britton in 1933. The only known natural population of this species has only about 50 individuals. It grows on rocky exposed slopes adjacent to a narrow beach along the southwest coast of Culebra. It is associated with several tropical native dry forest species like the almasigo (*Busera simaruba*), ucar (*Bucida buceras*), and sea-grape (*Coccoloba uvifera*).

The cactus was listed as an endangered species in 1993. It is threatened by agricultural, rural, urban, and tourist development. In addition, it is an attractive and spineless cactus, which increases its potential as an ornamental plant; therefore, collection may become a problem in the future.

In the summer of 2003, the Service's Partners for Fish and Wildlife Program,



Leopoldo Miranda-Castro

Fish and Wildlife Service biologist Cristina Adorno with a Culebra Island cactus recently transplanted from a greenhouse.

together with the Caribbean National Wildlife Refuge and a private landowner, developed a project to establish a second population of this endangered cactus on Culebra.

The project consisted of establishing 40 plants that were produced from cuttings from the wild population. These one- to two-year old individuals were raised in a nursery at the Cabo Rojo National Wildlife Refuge and then transported to Culebra. They were intended to be planted within the Culebra National Wildlife Refuge, a former Navy shooting range, but since there still was unexploded ordnance within refuge boundaries and the only available area (Luis Peña

Island) had a high population of feral goats, the refuge could not plant them on its land.

Through the Partners for Fish and Wildlife Program, a private landowner devoted to the conservation of wildlife was found. He agreed to establish a population of this endangered cactus on his property, which already had a perpetual conservation easement. This property is a 5-acre (2-ha) lot mostly covered with invasive grasses. It was decided to plant the cacti in two areas, a rocky hill and open clearing. The invasive grasses were cleared using hand tools, and the cacti, already 2 to 4 feet (0.5 to 1.2 m) high, were planted in the cleared areas.

All the cacti are doing well, and most are sprouting. Only three individuals needed to be relocated due to high soil moisture that was affecting their survival.

The project would not have been possible without the help of many partners, including the landowner and especially the 2003 Culebra National Wildlife Refuge Youth Conservation Corps, who prepared the area and planted the cacti in just one day!

The landowner and Service biologists monitor the survival of all individuals regularly to ensure that each cactus becomes established and survives. This model of cooperation between private landowners and the Service is proving to be critical for the recovery of this Caribbean native and endangered cactus.

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Meet the Beetles!

by Lee Andrews



USFWS

Greater Adams cave beetle

The greater Adams Cave beetle (*Pseudanophthalmus pholeter*) and the lesser Adams Cave beetle (*P. cataryctos*) are endemic to a single site in Madison County, Kentucky. Adams Cave, located in the middle of a rapidly developing subdivision southwest of Richmond, Kentucky, is the only known habitat for these extremely rare species. The Fish and Wildlife Service has identified both species as candidates for listing under the Endangered Species Act. This spring, however, the Service and a land trust, the Southern Conservation Corporation (SCC), signed a Candidate Conservation Agreement with Assurances (CCAA) to protect both species and perhaps make listing unnecessary.

In 2001, when the Service began working with the property's previous owner, the two Adams Cave beetles had not been observed or collected for years. People had used Adams Cave for camp-

ing and other illegal activities involving trespassing. This resulted in extensive vandalism and degradation of the habitats within and surrounding the cave.

Through the efforts of the Service, Eastern Kentucky University, Kentucky State Nature Preserves Commission, and the National Speleological Society's Blue Grass Grotto, the cave's interior was cleared of debris and a damaged concrete block wall at the entrance was replaced by a specially designed, bat-friendly, steel exclusion gate. The Service also secured a commitment from the landowner to donate the cave property to the SCC, a non-profit land trust that accepted ownership of the property in 2002. Biological inventories of the cave that year documented the presence of both Adams Cave beetle species.

Cave beetles within the genus *Pseudanophthalmus*, including both Adams Cave beetle species, are generally

Roy Powers and Kristen Bobo stand proudly in front of the Adams Cave gate they helped build. The gate will protect the cave animals and their habitat from vandalism, trash dumping, and disturbance.



J. Brent Harre/USFWS



Members of the EKU Student Chapter of the Wildlife Society and the National Speleological Society's Blue Grass Grotto haul in steel for the cave gate.

no longer than the width of a pencil eraser. They are eyeless, reddish brown, and are cave-dependent. They are predators on spiders, mites, millipedes, and other insects.

The CCAA covers a parcel of about one acre (0.4 hectare) that contains the cave entrance. The SCC will keep the Adams Cave property in its natural state and maintain the metal gate at the cave entrance. It will also limit human access to Adams Cave and the rest of the property enrolled in the CCAA. These efforts will conserve habitat, eliminate unauthorized human disturbances inside the cave, and provide important monitoring data that can be used toward improving management strategies for these two beetles and other cave-dependent species.

"The Service is always looking for opportunities to engage willing landowners in the conservation of rare species," says Dr. Michael Floyd, a biologist in the Service's Frankfort (Kentucky) Field Office. "We may not have to list these

cave beetles under the Endangered Species Act because SCC is helping us protect Adams Cave. SCC's efforts will likely mean two less endangered species in Kentucky and less potential regulatory burden for projects in Richmond and Madison County."

If either or both of these cave beetles are later listed by the Service as threatened or endangered, the SCC will receive regulatory assurances through an "enhancement of survival" permit. The permit will authorize the SCC to engage in activities that otherwise would violate the Act's prohibitions on the "take" of listed species, provided they continue to meet the requirements in the CCAA. Through the CCAA agreement, the Service provides assurances to the SCC that no additional conservation measures or land, water, or resource use restrictions beyond those voluntarily agreed to by the SCC at the time of the agreement will be required if either or both of these species are listed in the future.

"We see this as a simple way that we can help conserve these species," says Charles H. Fox, the SCC's executive director. "The Fish and Wildlife Service helped us develop a CCAA and showed us how the agreement would protect us from future liability under the Endangered Species Act. All we have to do is implement several conservation measures on the property, which we were going to do anyway."

Lee Andrews is the state field office supervisor for the Service's Ecological Services Program in Kentucky and formerly the Candidate Conservation Program Coordinator for the Southeast Region at the Frankfort, Kentucky, Field Office (Lee_Andrews@fws.gov).

Bull River: A New Wildlife Haven

by Robert M. Lee, III

*T*hanks to the hard work and dedication of people from several organizations, more than 3 square miles (7.8 sq. kilometers) of outstanding fish and wildlife habitat are now under conservation management in northwestern Montana. Recently, Avista Corporation, The Conservation Fund, Plum Creek Timber Company and Montana Fish, Wildlife and Parks completed a conservation agreement on more than 1,800 acres (728 hectares) of land formerly owned by Plum Creek and Genesis Mining Company. The result was the creation of the Bull River Wildlife Management Area (WMA), which is to be managed by Montana Fish, Wildlife and Parks. The Bull River WMA was formally dedicated in May 2005.

This new management area is located strategically between the East and West Cabinet Mountains in the headwaters of

Bull River and Lake Creek drainages. It encompasses wetlands, bull trout habitat, and an important migration route for big game and large carnivores.

The project preserves the integrity of vitally important stream habitats for native bull trout (*Salvelinus confluentus*) and westslope cutthroat trout (*Oncorhynchus clarki lewisi*); maintains a wilderness linkage that allows grizzly bears, lynxes, bald eagles, gray wolves, fishers, and other wide-ranging wildlife to travel between the two mountain ranges; provides an important winter range for elk, moose, and deer; and provides the public with opportunities for compatible recreational uses such as hunting, fishing, wildlife viewing, hiking, horseback riding, and other non-motorized day uses.

The property is located approximately 20 miles (32 kilometers) south of Troy, Montana, along the watershed divide between the headwaters of the Bull River and the Lake Creek drainages. The area, which includes the confluences of the three forks of the Bull River and Ross Creek, provides a permanent conservation linkage between the East and West Cabinet Mountains.

The major habitat components of the new wildlife management area include a large wetland complex that feeds directly into the Bull River, a mile of the Bull River main stem, three-quarters of a mile of Ross Creek with a wetland near the mouth, a half-mile of shoreline on Bull Lake, as well as productive uplands and a boreal coniferous forest wetland. Avista will continue to manage their adjacent lands consistent with WMA objectives under the conservation easement. The new WMA is bordered on three sides by U.S. Forest Service property. An adjacent 40-acre (16-ha) parcel was acquired

Scenic wetlands of the Bull River WMA.



Montana Fish, Wildlife and Parks

with partial funding through a grant to Avista from the North American Wetland Conservation Act program.

"This is an incredible example of a private timber company, a private utility company, a non-profit conservation organization, and State and Federal agencies working together for the benefit of wildlife," says Jim Williams, Regional Wildlife Program Manager for Montana Fish, Wildlife and Parks.

Tim Swant, Avista Utilities Clark Fork License Manager, echoes that and adds, "Throughout the process the individuals focused on the desired outcome of protecting this important habitat, while being sensitive to each organization's needs."

In 2003 and again in 2004, the Fish and Wildlife Service awarded Habitat Conservation Plan Land Acquisition grants to Montana Fish, Wildlife and Parks to partially fund the project. These grants were available based on the species protection provided by Plum Creek Timber Company's Native Fish Habitat Conservation Plan. Plum Creek sold 1,164 acres (471 ha) of upland forest and wetlands to Montana Fish, Wildlife and Parks.

At the Bull River WMA dedication ceremony, Ruth Watkins (Arista Corp) was presented with a certificate of appreciation for her work in securing conservation lands. At the left is Chris Smith of Montana Fish, Wildlife and Parks, and in the center is Nate Hall of Arista.



Don Morgan/USFWS

According to Jerry Sorenson, Senior Land Asset Manager for Plum Creek's Rocky Mountain region, the company is always happy to participate in any project that makes both conservation sense and business sense. "Plum Creek is very pleased with this conservation outcome."

To meet the HCP land acquisition grant requirement of a minimum 25 percent non-federal funding match, Avista Corporation and The Conservation Fund donated an adjoining 117 acres (47 ha), and the Avista Corporation donated a conservation easement on an additional 559-acre (226-ha) parcel.

"The preservation of more than 1,800 acres along Montana's Bull River represents a landmark achievement for all of the partners working to protect this spectacular landscape," said The Conservation Fund's president, Larry Selzer. "Thanks to the dedication of the U.S. Fish and Wildlife Service and Montana Fish, Wildlife, and Parks, and the commitment of Avista and Plum Creek, we are safeguarding some of the nation's most important wildlife habitat and enhancing recreation areas for future generations."



Roger Peters

Bull trout

The total market value of the project is \$4.61 million. The new Bull River WMA will have minimal impact on property tax revenue to the local counties. For lands owned in fee, Montana Fish, Wildlife and Parks makes annual payments to the counties that equal the property taxes on equivalent private property. For lands subject to a conservation easement held by Montana, the landowner continues to pay the same property taxes as prior to the conservation easement. Already a superb management area in its own right, Montana Fish, Wildlife and Parks sees future expansion opportunities for the Bull River WMA.

Mark Elsbree of The Conservation Fund summed up the project nicely: "When you reach for the stars, you'll never come up with a handful of mud. This time, we got the stars."

Robert Lee is a Fishery Biologist with the Service's Ecological Services office in Kalispell, Montana. He can be contacted at 406-758-6879 and Robert_Lee@fws.gov.

Sneezeweed Conservation Bears Fruit

by Rhonda L. Rimer



Amy D.F. Smith

Student volunteer assists Rhonda Rimer in out planting greenhouse-reared Virginia sneezeweed.

One of the greatest challenges in the twenty-first century is to protect biodiversity in the face of widespread habitat loss. In the central United States, the Ozark Highlands are exceptionally rich in rare natural communities and at-risk species. One vulnerable species, a plant called the Virginia sneezeweed (*Helenium virginicum*), was known only from Virginia until a population was discovered in Missouri in 1960. Located on private land near Pomona, it was the only one thought to exist in Missouri for more than 40 years.

Virginia sneezeweed, which is federally listed as threatened, grows on the moist borders of seasonally wet sinkhole ponds and meadows in the Shenandoah Valley of Virginia and in the Ozark Highlands of Missouri. It is found in natural wetlands associated with dolomite and limestone geology that is subject to fluctu-

ating water levels varying both seasonally and annually. The species requires full sun to flourish. Although the morphology (structure) and habitat were similar for the Missouri and Virginia *H. virginicum* populations, botanists originally regarded the single Missouri population with uncertainty. In 2000, however, DNA evidence demonstrated that there is no significant genetic difference between the Missouri and Virginia populations.

Habitat destruction led to the decline of the species in Virginia, and by the 1990s fewer than 25 populations existed. In 1998, the Virginia sneezeweed was listed as threatened. Since that time, both Virginia and Missouri have been working on recovery of the species in their states, and a federal recovery plan is in preparation.

For Missouri, protection of the one known population in the state was a

Despite its unusual name, the Virginia sneezeweed is an attractive wildflower. Virginia sneezeweed is a small herb with a branching stem above the inflorescence, a simple stem below, and winged by ruffles of tissue that run up and down the stem. Basal leaves form a rosette and are dotted with glands. The basal leaves can be either toothed or untoothed and are widest in the upper half and tapering at both ends.



Rhonda L. Rimer



C.D. Scott

Bill Summers (surveyor) and Rhonda Rimer, recovery biologist, at Virginia sneezeweed site in Missouri.

priority. The Missouri Department of Conservation initiated a partnership with the landowner, the Fish and Wildlife Service, the Missouri Botanical Garden, and the Center for Plant Conservation. In October 2001, biologists from these groups collected seed from the Missouri population with the goal of reintroducing the plant to two appropriate sites nearby on public land. During the process of raising and planting the sneezeweeds in their new homes, they gathered valuable information on the role of maternal genetic composition, water regime, and competing vegetation on survivorship, growth, and flowering of the Virginia sneezeweed. The two introduced populations were monitored yearly and, by August 2004, overall survivorship at both

sites exceeded 90 percent. Reproduction was evidenced by new seedlings growing along the margins of the sinkholes at both sites.

The information obtained from the reintroduction project gave Missouri Conservation Department biologists a new image of the species' preferred habitat. From that, biologists designed a survey in 2003 using the original site as a focal point and county roads as survey grids working outward from that point. Within the first three weeks of the survey, five new Virginia sneezeweed sites were discovered in Missouri. Sneezeweed surveyors traveled thousands of miles of county roads and contacted hundreds of landowners. The work paid off. By November 2004, more than 44

populations of Virginia sneezeweed were known to exist in five counties in the Missouri Ozarks!

The role of private landowners in this success story cannot be overstated. Without the support of the owner of the Pomona site, biologists could never have gained the valuable material for DNA analysis to compare with Virginia plants nor could have collected seed for the reintroduction project. In addition, hundreds of private landowners allowed biologists access to their land to look for a federally threatened species. Many even took biologists to sites on their property that might never have been found without their assistance. This led to the discovery of several new populations.

Conservationists in Missouri are feeling good about the status of Virginia sneezeweed in the state. Neighboring states have taken notice and begun planning surveys of their own for the species. With two successfully introduced populations on public land and the goodwill of many landowner cooperators, the future for Virginia sneezeweed is looking bright.

Rhonda L. Rimer is the Natural History Regional Biologist for the Missouri Department of Conservation's Ozark Region and the State Recovery Leader for Virginia Sneezeweed (Rhonda.Rimer@mdc.mo.gov).

Keeping Family Forests

by William Vogel and
Steve Stinson

*F*amily forest” landowners manage about 60 percent of forests nationwide. Yet this statistic does not reflect the tremendous influence these landowners have over certain key landscapes. For instance, the ownership pattern within the lower-elevation forest lands in western Washington’s Puget Trough is dominated by family forests. The Puget Trough—once predominantly low-lying forests, prairies, wetlands, and farmlands—is rapidly urbanizing, forming a barrier between wildlife in coastal Washington and the Cascade Mountain range.

Family forest landowners (often known as tree farmers) take pride in managing their lands. Many of them desire to manage for wildlife and to mimic natural-disturbance regimes, as well as manage for recreation and the

production of forest products. While the term “tree farm” implies young trees growing in rows like crops, family forests are typically diverse and often contain old forest conditions with large standing dead trees and large downed logs used by many species of wildlife.

Unfortunately, many tree farmers fear that potential regulatory restrictions could keep them from managing their lands economically. These lands represent long-term investments, often for college and retirement funds, and occasionally for yearly family income. As with industrial lands, listing of species under the Endangered Species Act may have unintended consequences when a listing encourages landowners to harvest timber on shorter rotations and to retain less structure within their forests so that the listed species are not attracted to their properties.

In this context, Habitat Conservation Plans, and other conservation tools such as Safe Harbor Agreements (SHAs), can accomplish the conservation of threatened and endangered species merely by removing the uncertainties that may be created by a changing regulatory environment. The largest threat to wildlife habitat in many areas is the conversion of forest lands to residential, commercial, or industrial developments. Developing HCPs can help to retain these lands as habitat for listed species. However, other uncertainties will continue, and the Fish and Wildlife Service recognizes it will have to incorporate additional flexibility to accommodate the management on family forest lands. For example, unexpected medical bills may make it necessary for a landowner to harvest and sell timber that would otherwise have been allowed to grow longer.

Old forest in Pacific Northwest.



John and Karen Hollingsworth/USFWS

The Problem

A number of family forest landowners have contacted the Service wishing to pursue HCPs or similar conservation plans. They were already managing their lands in ways the Service would applaud. However, these landowners generally did not have the ability (as do some industrial companies) to prepare an HCP or SHA and the necessary environmental compliance documents, therefore making it necessary for Service staff to prepare these documents. Because of the workload associated with large HCPs and SHAs, some covering over a million acres each, smaller projects often have ranked lower in Service priority. Another factor influencing priorities was that many of these family forest landowners were not having immediate impacts on listed species. But smaller landowners needed the same opportunities as the larger landowners. There had to be a better way.

A Solution

Family forest landowners in Lewis County, Washington, have been aware of the encroaching growth problems and are represented by a group of progressive and involved leaders. The Service, working with these community leaders, contacted a broad range of people and groups interested in maintaining family forests within Lewis County, including family forest landowners, landowner organizations, state and federal agencies, Native American tribes, environmental organizations, county extension staff, and universities. These stakeholder groups found common interests and desires.

A steering committee began pursuing a programmatic HCP. The original idea was that the programmatic plan, which was expected to contain several options for land management, would form the basis for issuance of numerous individual permits under the Endangered Species Act. Each landowner who chose to participate would receive his own permit and be responsible for compliance. Lewis County has joined the



Fae Marie Beck

Doug and Steve Stinson.
The Stinson family owns the
Cowlitz Ridge Tree Farm.

process and may agree to hold a master permit, if issued, allowing individual landowners to be included through "Certificates of Inclusion."

Additional Benefits

The programmatic HCP is expected to streamline other processes. Upon approval by U.S. Environmental Protection Agency and Washington Department of Ecology, there should be certainty with respect to the federal Clean Water Act. Also, once approved by the Washington Department of Fish and Wildlife and Department of Natural Resources, State Forest Practices Rules could allow for a long-term State Forest Practices permit as well. Participants in the project may also be able to reap other benefits, such as potential tax incentives or increased ranking for cost-share activities. These additional applications of the plan are still being explored.

The plan developers believe that this approach provides landowners with the opportunity to pursue long-term regulatory certainty and "one-stop shopping," as well as a number of options that will fit their desire for site-specific management. At the same time, this programmatic approach will help the agencies achieve their goals for fish and wildlife conservation and clean water

in a manner that was not possible on a case-by-case basis. The agencies and other groups realize that each will have to contribute to the effort. Only a team effort will succeed.

The Steering Committee of the Family Forest Habitat Conservation Plan has formed the Family Forest Foundation, a non-profit 501(c)(3) corporation, to facilitate the funding of this project. Cooperation among several key stakeholders (the Fish and Wildlife Service, National Marine Fisheries Service, Washington Department of Natural Resources, and Lewis County) is increasing. Legal counsel and biological assistance have been established, and progress is encouraging.

William Vogel is a wildlife biologist with Service's Western Washington Office (Bill_Vogel@fws.gov). Steve Stinson is the Executive Director of the Family Forest Foundation and a partner in the Cowlitz Ridge Tree Farm. He is also the primary contact for the Family Forest Conservation Project (stevestinson@familyforestfoundation.org).

BOX SCORE

Listings and Recovery Plans as of August 5, 2005

GROUP	ENDANGERED		THREATENED		TOTAL LISTINGS	U.S. SPECIES W/ PLANS
	U.S.	FOREIGN	U.S.	FOREIGN		
 MAMMALS	68	251	10	20	349	55
 BIRDS	77	175	13	6	271	78
 REPTILES	14	64	22	16	116	33
 AMPHIBIANS	11	8	10	1	30	15
 FISHES	71	11	43	1	126	95
 SNAILS	21	1	11	0	33	22
 CLAMS	62	2	8	0	72	69
 CRUSTACEANS	18	0	3	0	21	13
 INSECTS	35	4	9	0	48	31
 ARACHNIDS	12	0	0	0	12	5
ANIMAL SUBTOTAL	389	516	129	44	1,078	416
 FLOWERING PLANTS	571	1	144	0	716	584
 CONIFERS	2	0	1	2	5	3
 FERNS AND OTHERS	26	0	2	0	28	28
PLANT SUBTOTAL	599	1	147	2	749	615
GRAND TOTAL	988	517	276	46	1,827*	1,031

TOTAL U.S. ENDANGERED: 988 (389 animals, 599 plants)

TOTAL U.S. THREATENED: 276 (129 animals, 147 plants)

TOTAL U.S. LISTED: 1,264 (518 animals**, 746 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.

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

ENDANGERED
Species
BULLETIN

*U.S. Department of the Interior
 Fish and Wildlife Service
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