



Ecology Explorers: Endangered Species of the Southwestern United States



By Luis, Jessica, Kamal, and Alison



Four Endangered Species of the Southwestern United States

Mexican Spotted Owl -



© Photo courtesy F.R. Gehlbach
Note: Special thanks to the photographers for providing images of Texas endangered and threatened animals. All rights to these images are reserved. Educational use permitted.



Credit: U.S. Fish and Wildlife Service

- Mexican Gray Wolf

Colorado Pikeminnow -



Credit: U.S. Fish and Wildlife Service.
Photo by James E. Johnson/U.S. Fish and Wildlife Service



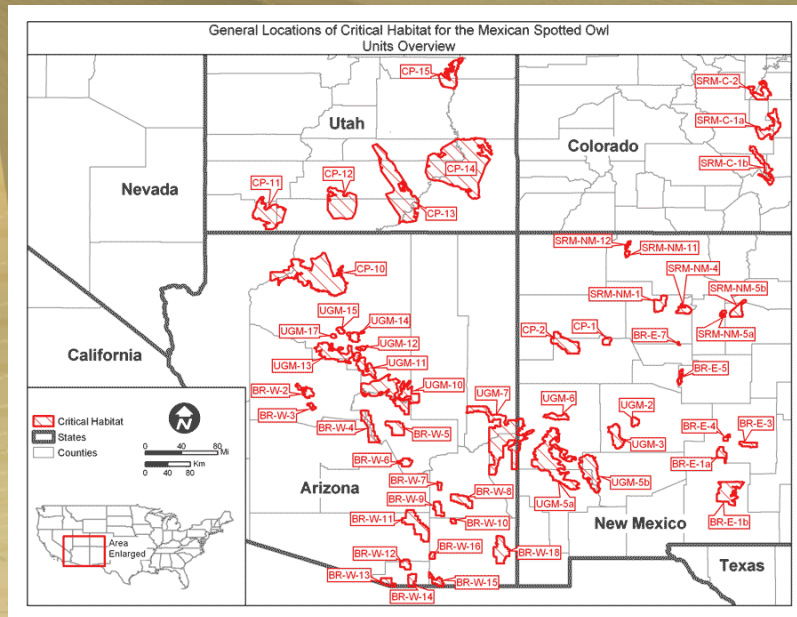
Credit: U.S. Fish and Wildlife Service,
Arizona Ecological Services Field Office

- Mount Graham Red Squirrel

The Mexican Spotted Owl



Credit: U.S. Fish and Wildlife Service, Southwestern Region



Designated areas of critical habitat for the Mexican Spotted Owl
Credit: U.S. Fish and Wildlife Service

- Ashy-chestnut colored animal with white and brown spots
- Lives in forests of old white pine, Douglas fir, and ponderosa pine trees
- Prefers being in an area of steep slopes, rocky cliffs and canyons
- Eats insects, small birds, and other small animals
- An estimated 2,106 are alive in the U.S. (1990)
- Put on the Endangered Species list in 1993

The Mexican Gray Wolf



Credit: U.S. Fish and Wildlife Service



Historic range of the Mexican Gray Wolf

Credit: U.S. Fish and Wildlife Service, Mexican Wolf Recovery Program (Map found on [Fieldtrip Earth](#) Web site)

Recovery area of the Mexican Gray Wolf
Credit: U.S. Fish and Wildlife Service, Mexican Wolf Recovery Program (Map found on [Fieldtrip Earth](#) Web site, North Carolina Zoological Society)

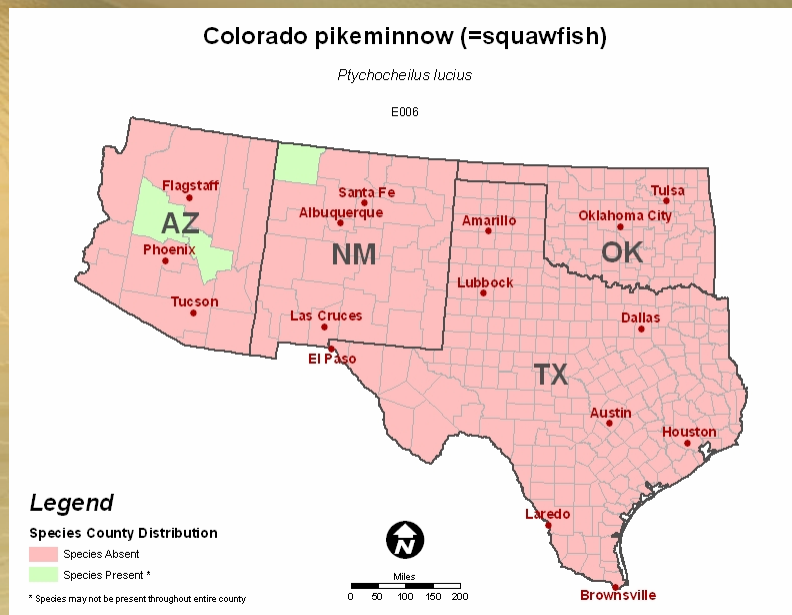
- Also known as “El Lobo”
- Measures about 5 1/2 feet in length (about the size of a German shepherd)
- Subspecies of the Gray Wolf
- Lives in the mountainous regions from central Mexico through southeastern Arizona, southern New Mexico, and southwestern Texas
- Captive-reared Mexican Wolves have been released in the Apache National Forest in eastern Arizona to be reintroduced.
- An estimated 49 wolves are in the wild (2004)
- Put on the Endangered Species list in 1976

Colorado Pikeminnow



Credit: U. S. Fish and Wildlife Service, San Juan River Basin Recovery Implementation Program

- Called "white salmon" and "Colorado salmon" by early settlers; also known as "Colorado squawfish"
- Torpedo-shaped fish with an olive-green and gold back, silver sides and white belly
- The largest minnow in North America and one of the largest in the world
- Before it was endangered, it may have lived 50 or more years, growing to nearly 6 feet long and weighing up to 80 pounds
- Today, it normally grows 18 to 22 inches long, weighing 2 to 4 pounds
- Historically lived in the Colorado River and its major tributaries in Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada, California and Mexico
- Now can only be found in parts of Arizona and New Mexico.
- Estimated 700 adult fish in the Colorado River; 2,300 in the Green River system (2005)
- Put on the Endangered Species list in 1967

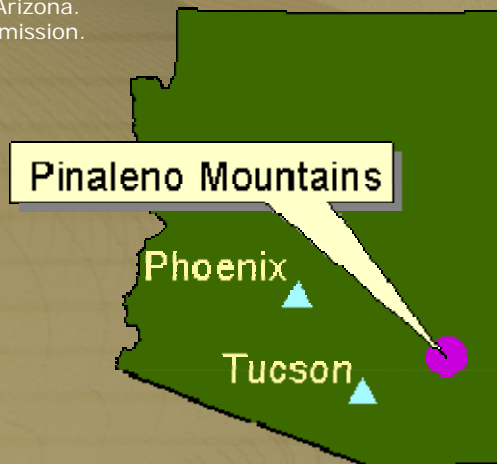


Green areas show the current locations of the Colorado Pikeminnow
Credit: U. S. Fish and Wildlife Service

Mount Graham Red Squirrel



Credit: School of Natural Resources - Mt. Graham Biology Programs
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Only known location of Mount Graham Red Squirrels
Credit: School of Natural Resources - Mt. Graham Biology Programs
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- Grayish-brown tree squirrel, tinged rusty or yellowish along the back
- Lives only on the Pinaleno (Graham) Mountains of southeastern Arizona from elevations of about 7800 feet on the north and east slopes to 10,720 feet
- An estimated 276 Mount Graham Red Squirrels are alive in the wild (2005)
- Put on the Endangered Species list in 1987

How does the ecosystem benefit from these animals?

- **Mexican Spotted Owl**

- Balance in the number of animals that they prey on such as mice, wood rats, pocket gophers, birds, insects, rabbits and reptiles

- **Mexican Gray Wolf**

- Manage elk, deer, coyote, and other prey populations
- Removal of some of the coyotes by the wolves has given other medium predators (such as the red fox) a chance to survive
- Scavenger animals benefit from their kills

- **Colorado Pikeminnow**

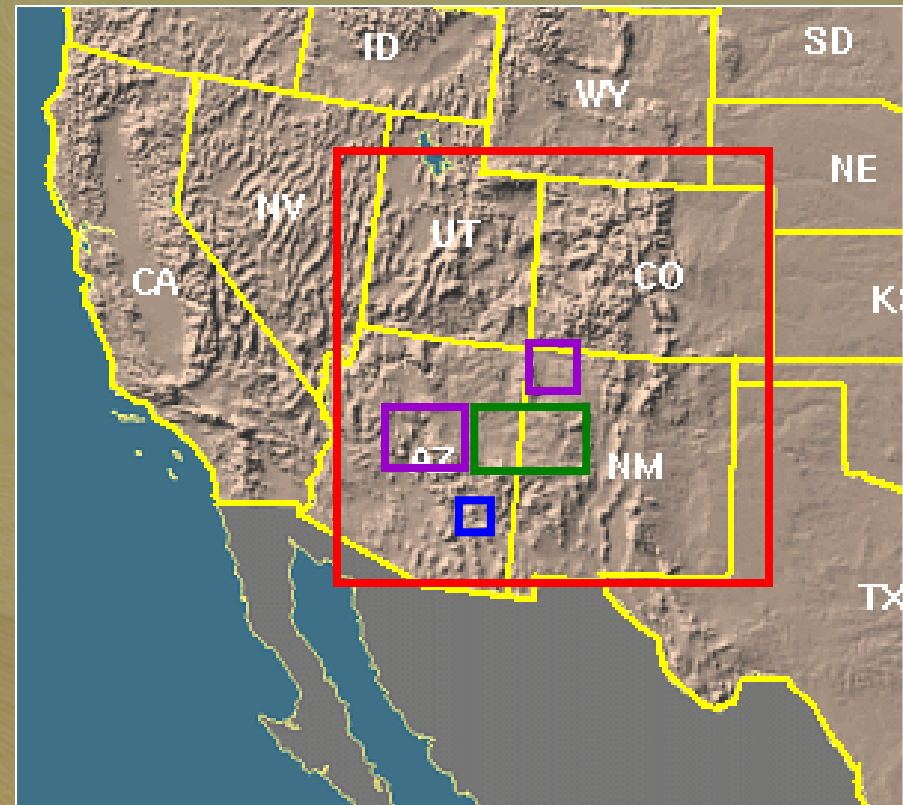
- Balance of other fish populations

- **Mount Graham Red Squirrels**

- Their foraging helps the planting and sprouting of seeds throughout the forest.
- They may also scatter fungi throughout the forest.

Common Issue: Human Development

- Logging, recreational activities, cattle grazing, development, fires reduce the **Mexican Spotted Owl's** habitat
- The **Mexican Gray Wolves** are killed off to save livestock; habitat has been developed
- Dams reduce water flow, block migration, and lower water temperature for the **Colorado Pikeminnows**; over 40 non-native fish have been introduced--which end up being competitors or predators of the pikeminnow
- **Mount Graham Red Squirrels'** habitat has been shrinking because of logging, fire, development, and loss of food resources (because of beetle infestation of trees)



Base map courtesy of CDC United States Climate Page

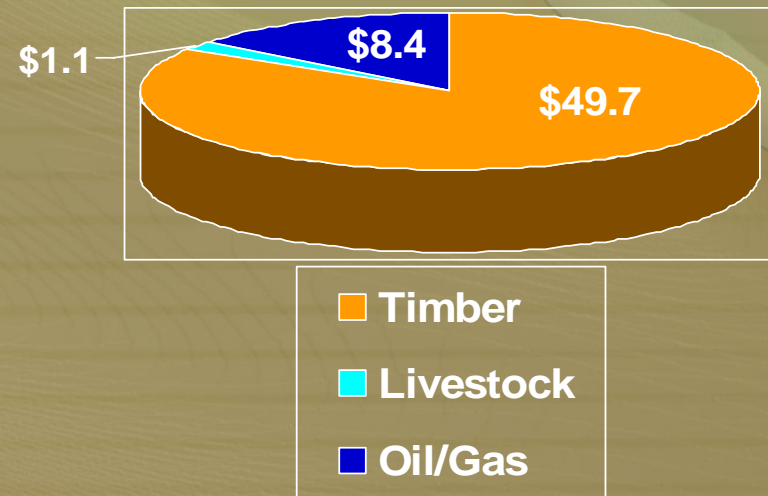
-  Mexican Spotted Owl
-  Mexican Gray Wolf
-  Colorado Pikeminnow
-  Mount Graham Red Squirrel



Mexican Spotted Owl: Protection at a Cost

- Currently protected habitat: **8.6 million acres** in Arizona, Colorado, New Mexico, and Utah
- Financial impacts to the timber industry, Native American tribes, livestock grazing, fire management, small businesses, oil and gas development, and mining activities.

Estimated Losses in Revenue to Businesses Annually: \$59.2 million



- Possible regional economic impacts: **\$59.2 million** and loss of **495 jobs** in timber, livestock, and oil/gas companies
- Total past costs associated with federal land management of rangelands are estimated at **\$6 million to \$20.6 million** since the listing of the Mexican Spotted Owl
- Future estimated costs range from **\$9.5 to \$32.9 million** over the next 10 years (or \$1.0 to \$3.3 million per year) ([2004 economic analysis report](#))

Mexican Gray Wolf: Protection at a Cost

- Currently protected habitat: **5,000 square miles** in Arizona and New Mexico
- Financial impacts to ranchers and costs to the government
- Positive impacts to tourism
- Between 1998 and 2004, ranchers have been reimbursed by the government for livestock losses totaling **\$33,640**
- The estimated loss in 2004 to ranchers that were not reimbursed: somewhere between **\$4,375 and \$126,011** ([Paper presented at the International Wolf Conference, October 2005](#))
- Estimated costs of Mexican wolf conservation by cooperating agencies since initial releases occurred in 1998: **\$7.3 million** [[Five-Year Report](#) by the Mexican Wolf Adaptive Management Oversight Committee]

Colorado Pikeminnow: Protection at a Cost

- Total Agency Contributions for the Upper Colorado River Endangered Fish Recovery Program (1989-2005):

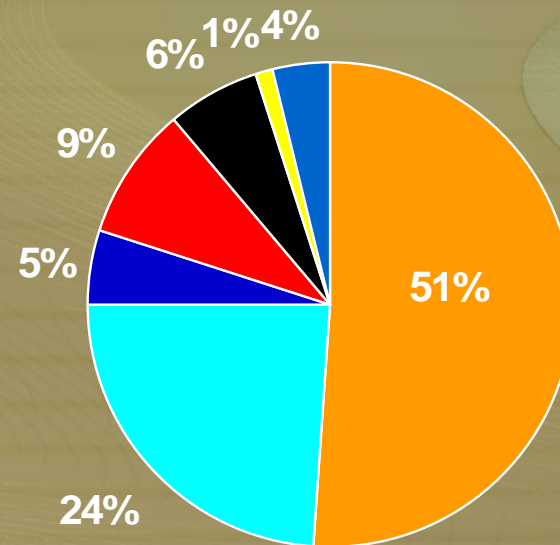
\$150 million

- Total Agency Contributions for the San Juan River Basin Recovery Implementation Program (1989-2005):

\$26.7 million

(Both programs are for all endangered fish on these rivers, not just the Colorado Pikeminnow)

[\(2004-2005 Program Highlights\)](#)



Mount Graham Red Squirrel: Protection at a Cost

- **6.8 acres** of protected Mount Graham Red Squirrel habitat in Arizona is currently at odds with a **\$200 million** Mount Graham International Observatory, which eventually could feature the world's largest optical telescope
- 2 of the 8 telescopes have been built
- The telescope project, if completed, would generate **tens of millions** of dollars of federal research grants each year that could support programs throughout the University of Arizona
- Six biologists are watching red squirrels in a monitoring project that costs the university upwards of **\$200,000** a year.

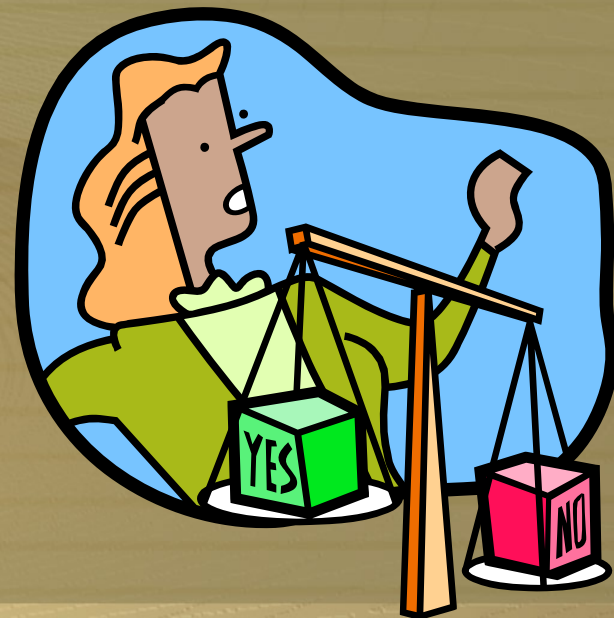


Mount Graham International Observatory

Credit for the pictures above: School of Natural Resources
- Mt. Graham Biology Programs
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Solutions We *Don't* Think are Worth the Cost

- Removal of dams on the Colorado River
- Increasing the acreage of protected land
- Stopping the construction of telescopes on Mount Graham
- Completely cutting off use of public lands
 - Clear-cutting: no
 - Managed use: yes



Our Solutions



- Maintain the current 13.5 million acres of protected habitat under the Forest Practices Act and uphold the Endangered Species Act.
- Continue to re-stock endangered fish and provide means for fish to migrate past dams
- Impose high fines for illegal hunting.
- Reduce livestock grazing in sensitive areas.
- Manage areas to reduce chance of catastrophic fires.
- Educate people on endangered animals and how they can help protect them.
- Monitor population numbers to know if solutions are working--if they're not, then it's not worth the continued cost.

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