



The Endangered Species Act

WHAT GOOD ARE THEY?

THE VALUE OF CONSERVING UNDER-APPRECIATED ENDANGERED SPECIES

For more than 40 years, the Endangered Species Act (ESA) has helped prevent the extinction of our national treasures. Because of the act, iconic species such as the bald eagle, peregrine falcon and American alligator are once again thriving. Hundreds of other species, including the manatee, Mexican gray wolf, black-footed ferret, California condor and whooping crane, are no longer on the brink of extinction. Such astonishing success makes the act a true symbol of our nation's commitment to protecting our natural heritage for future generations. It is also an example of the progress that can be made when people work together to conserve their local wildlife and habitat. With the participation of communities, businesses, conservationists and government, we can preserve wildlife and still have a vibrant economy. But the biggest success is that all parties—both people and our most vulnerable creatures—have benefited from the ESA. With people working together, hundreds of plants and animals have been saved for generations to come and not just the most iconic species. Many lesser known imperiled creatures have also been saved. These species may be overlooked or maligned, but they and their habitats play valuable roles in providing us with clean water, food, medicines and other important products.

The short profiles below feature under-appreciated endangered species that are moving away from the brink of extinction and help answer an important question: What good are they?

Houston Toad (Texas)

Like other toad species, Houston toads use poisonous skin secretions to protect themselves from predators. These toxins are proving to be very important in the development of pharmaceuticals. Many modern medicines contain active ingredients derived from the chemicals produced by several species of toads, providing a boon to our health and the economy.

The Houston toad, for example, secretes serotonin—an essential chemical in our brains—and alkaloids, which are used to treat heart and neurological diseases. The alkaloids are thought to have analgesic properties more powerful than morphine.

Houston toads also help keep insect populations down, provide food for larger animals such as raccoons, snakes and owls, and help move nutrients from the water to land during their metamorphosis from tadpoles to terrestrial adults.



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Unfortunately, rapid development in and around Houston has destroyed much of the toad's habitat. Efforts to restore the species will be critical to realizing the full extent of their medical and ecological benefits for society.

Freshwater Mussels (throughout the United States)

Mussels are known as “filter feeders” because they eat small particles that float in the water, keeping our waterways healthy and clean. They're also reliable indicators of water quality since they're particularly sensitive to toxic chemicals and other pollutants. So



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when mussels perish, that's a sign that other aquatic plants and animals are at risk as well, including humans.

While the pearl button industry initially wreaked havoc on mussel populations before the introduction of plastic button in the 1950s, problems continue for freshwater mussels. Over the last 30 years, mussels have continued to decline as a result of water pollution and excessive sediment from dredging and soil erosion. Fortunately, the important role mussels play is no secret, and many are working on their recovery. For example, the National Park Service has stepped up to help mussels recover, and since 2000, the Tennessee Aquarium Research Institute has propagated more than a 100,000 native freshwater mussels for release in the Conasauga River.

Barton Springs Salamander (Texas)

Nearly one third of all documented amphibians around the world face extinction, and the Barton Springs salamander is no exception. These salamanders rely on the pure, flowing currents of Barton Springs in Austin, Texas, for their survival. But they aren't the only ones dependent upon the springs: keeping the water clean is also a critical issue for people, since the springs provide much of Austin's municipal water supply.

Because of their sensitive skin, salamanders serve as a very important indicator of the health of a water supply. Additionally,



COURTESY OF U.S. GEOLOGICAL SURVEY

the Barton Springs salamander evolved under such unique conditions that they might also provide information valuable to scientists developing new medicines.

Blue-tailed Mole Skink (Florida)

If you're ever in central Florida and see a flash of electric blue dart under a rock, you've probably just encountered the highly elusive blue-tailed mole skink. These small lizards have a voracious appetite for crickets, roaches and spiders, which helps keep insect populations under control. Research suggests there might even be a direct correlation between the skink's decline and insect population explosions that can be detrimental for people and crops—specifically, the state's orange groves.

According to a revised recovery plan issued for this skink by the U.S. Fish and Wildlife Service (FWS) in 1999, sizeable breeding populations occurred in only 34 known locations. Smarter development, however, will help mitigate impacts to species like the blue-tailed skink.

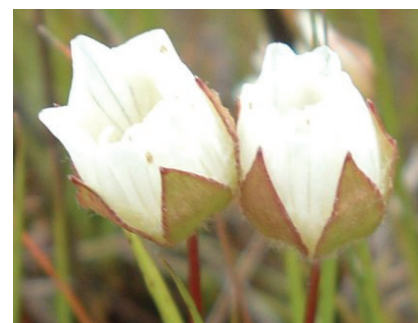
Butte County Meadowfoam (California)

Today, billions of dollars are spent on organic produce and herbal remedies every year—a recent study shows that the U.S. consumer market for natural and organic skincare, hair care and makeup could top \$11 billion by 2016.ⁱⁱⁱ One of the most commonly used ingredients in natural cosmetic products comes from meadowfoam, a small wildflower native to the Pacific Coast. Popular skin care companies like Revlon use oil from meadowfoam seeds to produce “age-defying creams” and body lotions; other industries are looking to use the oil for fuel, lubricant, detergent and even candle wax. In fact, meadowfoam is so critical that it is now farmed and cultivated specifically for such commercial uses.

Unfortunately, one subspecies—Butte County meadowfoam—experienced a significant decline and was listed as endangered in 1992. Without healthy strains in the wild, scientists will have very limited ways to study and combat the effects of viruses or genetic defects on cultivated meadowfoam, which is becoming increasingly important for many industries.

Indiana Bat (eastern United States)

The Indiana bat lives throughout the eastern half of the United States where it provides free pest control for people and our food supply. A bat can consume as much as its own body weight in insects per night, including pests that damage many valuable crops. According to a study published in *Science*, insect-eating bats provide the agricultural industry with pest control services totaling at least \$3.7 billion per year.^{iv}



COURTESY OF RICK KUPPER/U.S. FISH AND WILDLIFE SERVICE



COURTESY OF ANN FROSHAUER/U.S. FISH AND WILDLIFE SERVICE

Unfortunately, the bat became vulnerable to widespread habitat destruction by the commercialization of caves, the blocking of cave entrances and timber practices. It is also threatened by white-nose syndrome, a fungal pathogen sweeping through and destroying populations of many bat species in the eastern United States. Once among the most abundant eastern U.S. mammals, the Indiana bat was one of the first endangered species listed in 1967.

American Burying Beetle (Nebraska, Arkansas, Rhode Island, Oklahoma, South Dakota and Kansas)

At about 1.5-inches-long, the American burying beetle is an expert recycler, taking biological waste underground to make food for its family.



COURTESY OF LINDSAY VIVIAN/U.S. FISH AND WILDLIFE SERVICE

“Thankfully, we’ve come a long way from the day when someone reportedly said during a high-profile ESA case before the Supreme Court, ‘Snail darters—what good are they? Can you eat ‘em?’”

DONALD BARRY
EXECUTIVE VICE PRESIDENT
DEFENDERS OF WILDLIFE

Managing biological waste is essential to maintaining healthy ecosystems. Bugs like the burying beetle break down organic matter from dead animals and recycle it into nutrients that help replenish the soil.

The burying beetle once thrived in every state east of the Rockies, but it has since disappeared from more than 90 percent of its historic range. Today, the U.S. Fish and Wildlife Service has confirmed populations in six states: Nebraska, Arkansas, Rhode Island, Oklahoma, South Dakota and Kansas. Due to this sharp decline, the American burying beetle was added to the list of endangered species in 1989. Through dedicated conservation efforts, burying beetles are starting to make a long awaited comeback. For example, new populations have been established in Rhode Island and other states.

Tulotoma Snail (Alabama)

Tulotoma snails, an Alabama native, were thought extinct until a small group of them was found in 1991 along a river dam and placed on the endangered species list. These two-inch-long snails are filter feeders that remove bacteria and algae from surface waters, providing vital sanitation services on local rivers. Additionally, the snail is an important food source for ducks, turtles, fish and other animals.



COURTESY OF U.S. FISH AND WILDLIFE SERVICE

For years, dams built along Alabama's rivers have prevented water flow necessary for carrying oxygen to underwater organisms. Due in part to these dams, Alabama has experienced a spike in extinctions. According to at least one report, biologists say that at least 28 species of native mussels are now extinct in Alabama.

However, with the help of scientists, industry, the ESA and Clean Water Act, Tulotoma snails have been restored to about 10 percent of their historic range—a dramatic increase from the one percent occupied in 1991. The solution came from partnerships and collaboration: the Alabama Power Company simply began releasing steady flows of water into the Coosa River, which also helped spur the rebounding population. In 2011, FWS downlisted the snail from “endangered” to “threatened”—only the second time this has happened for any mollusk.

Vernal Pool Fairy Shrimp (California, Oregon)

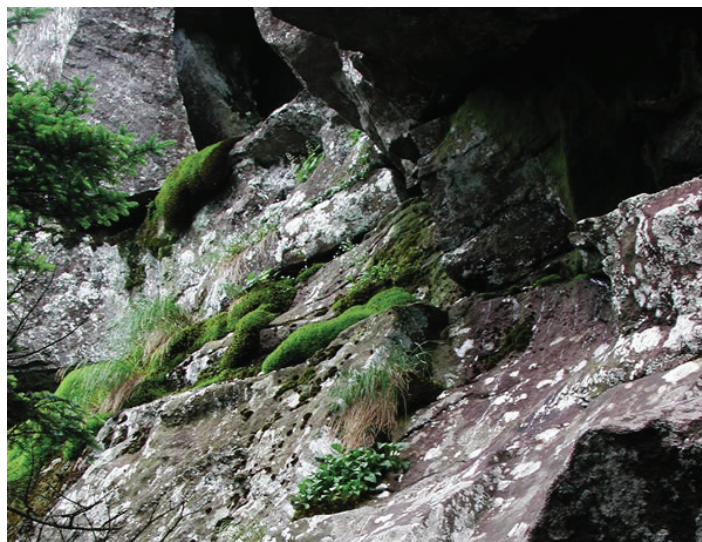
Vernal pool fairy shrimp are named for their diminutive size and translucent bodies, as well as the seasonal ponds they rely on for survival. But the inch-long crustaceans also play a big role in the ecosystem. The fairy shrimp are a vital food source for migratory waterfowl, insects, crustaceans and amphibians. Furthermore, the shrimp collect algae, bacteria and other microorganisms from the surface of the water, keeping the pools clean and healthy so other plants and animals can flourish.

Unfortunately, expansion of cities and suburban development has altered or destroyed many of these habitats, resulting in an ESA listing for the shrimp in 1994. A 1998 study showed that only 16 percent of all the vernal pools tested in 27 counties still contained populations of fairy shrimp. FWS is working to set aside some of these areas for federal protection to ensure that the fairy shrimp will not disappear completely.



COURTESY OF LEO KENNEY/VERNAL POOL ASSOCIATION

www.vernalpool.org



COURTESY OF GARY KAUFFMAN/U.S. FOREST SERVICE

Rock Gnome Lichen (North Carolina, Tennessee)

A lichen is a type of fungus that lives symbiotically with algae on rocks or tree trunks. Since they don't move, lichens directly absorb the elements they need from the air to feed their algae partners. They are small, grow slowly and don't need to be planted in soil like most plants. Instead, lichens survive in some of the most extreme environments on the planet, including in the highest reaches of the Himalayas and the coldest tundras of the Arctic.

Native to the southern Appalachian mountains of North Carolina and Tennessee, the endangered rock gnome lichen inhabits high-elevation rock faces where fog provides moisture or in river gorges that are cool and damp. This hearty fungus also absorbs minerals and pollutants in rain, both acting as a filter and enabling biologists to determine various kinds of pollution.

Excessive pollution and the impacts of an exotic insect have contributed to a dramatic decline in the spruce-fir forests adjacent to the cliffs and rock outcrops occupied by the rock gnome lichen. This loss of habitat and the drying up of otherwise moist areas threaten this little lichen that helps maintain fresh mountain air.

ⁱ http://ecos.fws.gov/tess_public/pub/Boxscore.do

ⁱⁱ http://ecos.fws.gov/tess_public/DelistingReport.do

ⁱⁱⁱ www.packagedfacts.com/Natural-Organic-Personal-6168595/

^{iv} <http://www.sciencemag.org/content/332/6025/41.short>



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