



Photo courtesy: John MacGregor

Endangered Species Act Basics – with a Focus on Kentucky

The endangered Virginia big-eared bat roosts in caves or cliff line habitats year round.

by Michael A. Floyd

On December 28, 1973, President Richard M. Nixon signed the Endangered Species Act (ESA). Preceded by passage of less comprehensive laws — the Endangered Species Preservation Act in 1966 and the Endangered Species Conservation Act in 1969 — the ESA represented a much stronger attempt at conservation of threatened and endangered wildlife and plants, making endangered species protection one of the highest priorities of the government.

Upon signing the ESA, President Nixon remarked, “Nothing is more priceless and more worthy of preservation than the rich array of animal life with which our country has been blessed. It is a many-faceted treasure, of value to scholars, scientists, and nature lovers alike, and it forms a vital part of the heritage we all share as Americans.” He went on to add, “I congratulate the 93rd Congress for taking this important step toward protecting a heritage which we hold in trust to countless future generations of our fellow citizens. Their lives will be richer, and America will be more



Photo courtesy: U.S. Government Archives

President Richard Nixon signing the Endangered Species Act into law in 1973.

beautiful in the years ahead, thanks to the measure that I have the pleasure of signing into law today.”

The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Interior Department’s U.S. Fish and Wildlife Service (FWS) and the Commerce Department’s National Marine Fisheries Service (NMFS). The FWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities

of NMFS are mainly marine wildlife such as whales and anadromous fish (salmon). In Kentucky, the ESA is administered by the Kentucky Ecological Services Field Office in Frankfort, one of 13 field offices in the FWS’s Southeast Region (Region 4).

The Listing Process:

Endangered Versus Threatened

Under the ESA, species may be listed as either endangered or threatened. “Endangered” means a species is in danger of extinction throughout all or a significant portion of its range. “Threatened” means a species is likely to become endangered within the foreseeable future. To help conserve genetic diversity, the ESA defines “species” broadly to include subspecies and distinct populations. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened.

As of March 2014, the FWS and NMFS have listed 2,142 species worldwide as endangered or threatened, including more than 1,500 species in the United States. Kentucky supports populations of 41

Photo courtesy: Tom Ferrari



The endangered American burying beetle has not been seen in Kentucky for more than 40 years. The FWS's Kentucky Field Office is working with federal and state partners on a reintroduction plan.

endangered and threatened species, of which 31 are animals and 10 are plants. Unfortunately, 13 endangered and threatened species have been extirpated from Kentucky. Species such as the gray wolf, red cockaded woodpecker, American burying beetle, and white catspaw no longer live in the Commonwealth.



Photo courtesy: Michael Floyd

The white catspaw mussel once occurred in KY but is now considered to be extinct.

Species are listed as endangered or threatened based on evaluations of their biological status (i.e. are they declining?) and threats to their continued existence. When evaluating a

species for listing, the FWS considers five threat categories or factors:

1. Damage to, or destruction of, a species' habitat
2. Overutilization of the species for commercial, recreational, scientific, or educational purposes
3. Disease or predation
4. Inadequacy of existing regulatory mechanisms
5. Other natural or manmade factors that affect the species' continued existence

When one or more of these factors jeopardizes a species' survival, the FWS takes action to protect it. Some species are evaluated and listed through the FWS' own initiative, while others are listed in response to a formal petition made by an outside party. The FWS publishes its listing proposals in the Federal Register. Once the proposed listing rule is published in the Federal Register, the species is considered to be a "proposed" species. Currently, Kentucky supports populations of two proposed species: northern long-eared bat and Short's bladderpod.



Photo courtesy: Joe Settles

Kentucky glade cress, a Kentucky endemic plant, was proposed for federal listing in 2013. It is now a threatened species.

Critical Habitat

When species are listed as endangered or threatened under the ESA, the FWS is required to consider whether there are geographic areas that are essential to the conservation of the species. If so, the FWS may propose to designate these areas as "critical habitat." These are specific areas within the geographic area occupied by the species at the time it was listed that contain the physical or biological features that are essential to the conservation of the species and that may need special management or protection. Unoccupied critical habitat may also be designated if the FWS considers it to be essential to the conservation of the species. One important fact to remember is that critical habitat designations affect only federal agency actions or federally funded or permitted activities. Critical habitat designations do not affect activities by private landowners. Within Kentucky, the FWS has designated critical habitat for the Indiana



Photo by: John MacGregor

The endangered Kentucky cave shrimp is restricted to nine groundwater basins in the Mammoth Cave region of south-central Kentucky.

bat, two fishes (Cumberland darter and diamond darter), Kentucky cave shrimp, four mussels (Cumberland elktoe, Cumberlandian combshell, fluted kidneyshell, and oyster mussel) and two plants (Braun's rockcress and Kentucky glade cress).



Photo courtesy: Chad Lewis

The Green River supports populations of several endangered and threatened mussel species. It has been designated as critical habitat for the diamond darter and proposed as a critical habitat for the rabbitsfoot mussel.

Candidate Species Conservation

When the majority of species are evaluated for listing, they are not immediately added to the federal list of endangered and threatened species. Instead, they are maintained on a list of "candidate" species. Candidates are species that are warranted for listing under the ESA (they meet the definition of either endangered or threatened), but listing is precluded by higher listing priorities. As higher prior-

Photo courtesy: Michael Floyd

ity listing actions are initiated, the FWS works with other federal agencies, states, conservation organizations, and private landowners to

conserv these species. In some cases, these conservation efforts significantly reduce threats and prevent further species declines, eliminating the need for federal listing.

Kentucky supports populations of eight candidate species: Cumberland arrow darter, Kentucky arrow darter, Clifton Cave beetle, Icebox Cave beetle, Louisville Cave beetle, Tatum Cave beetle,

Rattlesnake-master borer moth, and white fringeless orchid. All eight species are scheduled to be listed by 2017.

Federal Protections under the ESA

The ESA protects endangered and threatened species and their habitats by prohibiting "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products – except under Federal permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulation, the term "harm" was later defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Listed plants are not protected from take, but it is illegal to collect or maliciously harm them on federal land.

Endangered and threatened species are afforded additional protection through Section 7 of the ESA. This section requires federal agencies to use their legal authorities to conserve listed species and consult with the FWS to ensure that effects of actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of listed species. Any action that involves a federal permit, is funded by federal dollars, or takes place on federal land is subject to Section 7. Some examples of these actions include issuance of a Section 404 permit from the U.S. Army Corps of Engineers, construction of a highway using federal funds, or a prescribed burn on a national park.

Kentucky has no equivalent state law to the ESA. The Kentucky State Nature Preserves Commission (KSNPC) monitors the state's biodiversity and maintains a list of state endangered, threatened, and special concern species, but these designations convey no legal protection.

Species Recovery

As mentioned earlier, the ultimate goal of the ESA is to recover species so that they no longer need protection under the ESA. For each species that is listed as endangered or threatened, the FWS prepares a Recovery Plan that outlines a recovery strategy that must be followed, recovery criteria that must be met, and recovery actions that must be completed before a species can be removed from the list of endangered and threatened species. The FWS prepares these plans with the help of species experts; other federal, state, and local agencies; Tribes; nongovernmental organizations; academia; and private citizens.

Since 1973, a total of 28 species have been removed from the list of endangered and threatened species due to recovery actions and successes. Recovered species include: the American alligator, bald eagle, Eggert's sunflower, and peregrine falcon. In 2015, the FWS expects to delist white-haired goldenrod, a rare plant found only in the Red River Gorge region of Eastern Kentucky.

Photo by John MacGregor



White-haired goldenrod, a Kentucky endemic that occurs only within rock shelters of the Red River Gorge, may soon be removed from the federal list of endangered and threatened species.



Photo courtesy: Michael Floyd

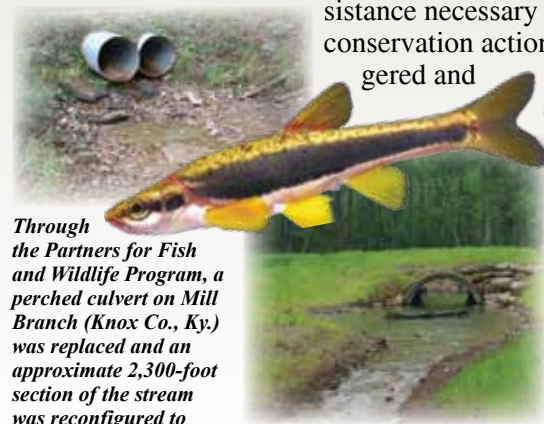
Eggert's sunflower was removed from the Federal list of endangered and threatened species in 2006.

Working with Private Landowners

About 94 percent of Kentucky land is privately owned, so the voluntary cooperation of landowners is essential to our efforts to recover endangered and threatened species and their habitats. The FWS's Partners for Fish and Wildlife Program is a voluntary cost-share program that builds on the strengths and interests of committed individuals and organizations to accomplish shared conservation goals. It provides landowners with the technical and financial assistance necessary to implement

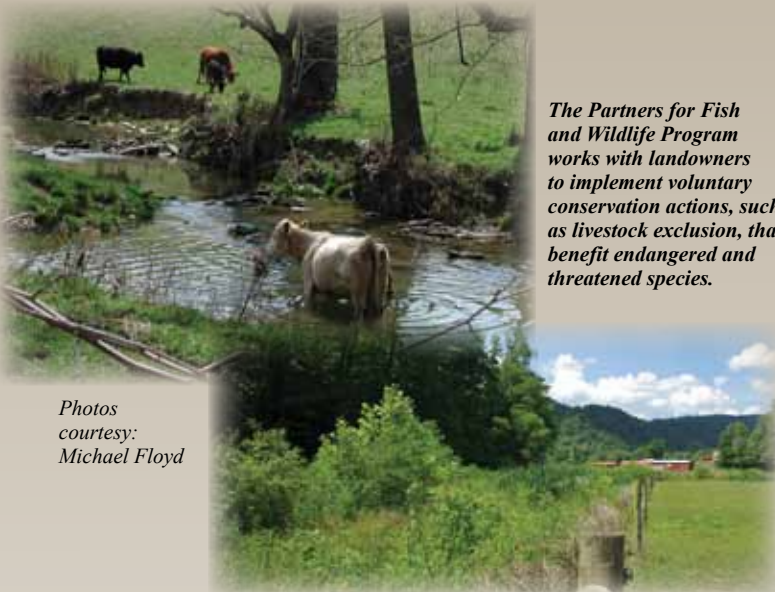
conservation actions for endangered and threatened species and to restore habitats on their property.

The program leverages funds and resources through more efficient state, federal, and



Through the Partners for Fish and Wildlife Program, a perched culvert on Mill Branch (Knox Co., Ky.) was replaced and an approximate 2,300-foot section of the stream was reconfigured to benefit the threatened blackside dace.

Photos courtesy: top and bottom: Brent Harrel
Blackside dace: Matt Thomas



The Partners for Fish and Wildlife Program works with landowners to implement voluntary conservation actions, such as livestock exclusion, that benefit endangered and threatened species.

Photos courtesy: Michael Floyd

private partnerships. In Kentucky, the Partners program has benefited endangered and threatened species through a variety of projects: stream bank and channel restoration, livestock exclusion from streams or other sensitive habitats, prairie restoration, native grass and forest establishment, and cave gating.

The Benefits of Conserving Endangered and Threatened Species

One may ask, “Why should we try to save endangered species?” Well, Congress addressed this question in its preamble to the ESA, recognizing that endangered and threatened species of wildlife and plants “are of aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people.” Congress also stated its intent that the ESA should conserve the ecosystems upon which endangered and threatened species depend.

To answer this basic question, the FWS has prepared a brochure, *Why Save Endangered Species?*, which is available at <http://www.fws.gov/endangered/species/why-save-species.html>. In the brochure, the FWS provides seven reasons why species and their habitats should be conserved:

- Benefits of natural diversity – all species serve a role in the ecosystem
- Contributions to medicine – potential for new medicines
- Biodiversity and agriculture – biological controls, pollinators, edible plants
- Environmental monitors – indicators of environmental quality
- Ecosystem services – clean air and water, soil fertility
- Other economic values – outdoor recreation, bird watching
- Intangible values – aesthetics, natural heritage importance

Kentucky’s Endangered and Threatened Species

As mentioned earlier, Kentucky is home to 41 endangered

and threatened species. These include three bat species, one bird, six fishes, one crustacean (Kentucky cave shrimp), 20 mussels (clams), and nine plants. These species occur in a wide variety of habitats scattered across the Commonwealth. A list of Kentucky’s endangered and threatened species is available at <http://www.fws.gov/frankfort/Endangered-Species.html>.

Kentucky’s three species of endangered bats (gray bat, Indiana bat, and Virginia big-eared bat) hibernate in caves during the winter. During the summer months, gray bats and Virginia big-eared bats (see photo on page 5) use caves or cliff line habitats as roosts, while Indiana bats roost and rear their young under the peeling bark of live, dead, or dying trees. At night these species become active, feeding on flying insects along rivers or lakes and in uplands. They play a significant role in insect control by eating up to half their body weight in insects each night. Unfortunately, all three species are under threat due to a mysterious illness, white-nose syndrome (WNS),

which has killed over a million bats since 2006. The fungus which causes WNS has now been documented from 65 separate sites (caves) in 21 Kentucky counties. The FWS is uncertain about the impact to Kentucky’s Indiana bat population, but so far Kentucky’s gray bat and Virginia big-eared bat colonies appear to be unaffected by WNS.

Each year, Kentucky is visited by several species of endangered or threatened migrating birds (e.g., whooping crane) but only one federally listed species, the endangered interior least tern, nests within Kentucky.



*Photo courtesy: Michael Floyd
Interior least tern chick.*

It spends the summer months in Western Kentucky, where it nests along the Mississippi and lower Ohio rivers. Kentucky continues to support nesting populations of the bald eagle and peregrine falcon, which were delisted in 2007 and 1999, respectively. Both species continue to be protected through the Migratory Bird Treaty Act.

Kentucky’s endangered and threatened fishes tend to be small (generally less than 4 inches), but one exception is the endangered pallid sturgeon, which reaches lengths of up to 6 feet and weights of up to 80 pounds. Within Kentucky, it is found only in the Mississippi River. Kentucky’s other listed fishes include the relict darter



An endangered Indiana bat beneath exfoliating bark. Notice the left forearm band and transmitter wire.

Photo courtesy: John MacGregor

(restricted to the Bayou du Chien watershed in Western Kentucky), duskytail darter (known only from the Big South Fork of the Cumberland River), Cumberland darter (restricted to 13 streams in the upper Cumberland River basin), palezone shiner



The endangered duskytail darter is found only within the Big South Fork Cumberland River.

(restricted to the Little South Fork of the Cumberland River), and blackside dace (known from multiple headwater systems in the upper Cumberland River basin).

The endangered Kentucky cave shrimp is a blind, 1-inch, colorless crustacean that is restricted to nine groundwater basins in the Mammoth Cave region of south-central Kentucky. It is rarely seen by the public and spends its entire life in the cave. Much of its known range occurs in Mammoth Cave National Park.

Kentucky's largest group of endangered and threatened species is freshwater mussels. This highly imperiled group has suffered significant population declines in Kentucky and the rest of North America due to reservoir construction, water pollution, sedimentation, and competition from exotic species. Of Kentucky's 103 native species, 20 species have disappeared from the state, 20 are federally listed as endangered or threatened, and another 16 are considered to be rare or declining.



Freshwater mussels collected during a multi-agency sampling effort on the Green River (Hart Co., Ky.) in 2005.

Photos courtesy: top: Michael Floyd; mussels: Monte McGregor



Mussels spend their entire life partially buried in the substrate, where they filter the water column for bacteria and plankton. By doing so, individual mussels have the potential to filter several gallons of water each day, thereby improving water quality within the stream and benefiting the entire ecosystem. Mussels also function as environmental indicators due to their sensitivity to toxic chemicals.

Kentucky's nine species of endangered and threatened plants include Braun's rockcress, American chaffseed, Cumberland rosemary, Cumberland sandwort, Kentucky glade cress, Price's potato-bean, running buffalo clover, Short's goldenrod, white-haired goldenrod, and Virginia spiraea. Most of these species have restricted distributions in Kentucky, and white-haired

goldenrod is notable in that it is the only Kentucky endemic.

The ESA has provided protection and conservation of imperiled species for over 40 years. Because of it, multiple species have been saved from extinction, and our national symbol, the bald eagle, has fully recovered and been removed from the endangered species list. Going forward, it will be the FWS' continued responsibility to administer the ESA responsibly and work with its many conservation partners to meet its mission of conserving, protecting, and enhancing fish, wildlife, plants and their habitats for the continuing benefit of the American people. For more information on the ESA or Kentucky's endangered and threatened species, visit the FWS' national website, www.fws.gov/endangered, or contact the Kentucky Field Office at 502.695.0468 (www.fws.gov/frankfort).

Can You Explain That?

Endangered Species Act (ESA) - a federal law that was passed in 1973 and was designed to protect critically imperiled species from extinction. It is administered by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

Endangered - a species that is in danger of extinction throughout all or a significant portion of its range.

Threatened - a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Proposed - a species for which a proposed listing rule has been published in the Federal Register.

Candidate - a species for which listing is warranted under the ESA (it meets the definition of either endangered or threatened), but listing is precluded by higher listing priorities.

Critical Habitat - the specific areas within the geographic area occupied by an endangered or threatened species at the time it was listed that contain the physical or biological features that are essential to the conservation of the species and that may need special management or protection.

Take - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect an endangered or threatened species or attempt to engage in any such conduct.

About the Author:

Michael A. Floyd, Ph.D. Michael is a wildlife biologist with the United States Fish and Wildlife Service stationed in the Kentucky Ecological Services Field Office. His focus is on the recovery of threatened and endangered species in Kentucky.

US Fish & Wildlife Service, 330 West Broadway, Suite 265, Frankfort, KY 40601, E-mail: mike_floyd@fws.gov, Phone: 502.695.0468, ext. 102