U.S. Fish and Wildlife Service
Proposal to list two Appalachian crayfishes as endangered
Questions and Answers

Following a review of the best available science, the U.S. Fish and Wildlife Service has proposed to protect the Guyandotte River crayfish and Big Sandy crayfish as endangered under the Endangered Species Act. The proposed rule is available for public review and comment through June 8, 2015.

1. What are the ranges of the Guyandotte River and Big Sandy crayfish? Occurrence data, historical habitat characteristics and information from species experts indicate that the Big Sandy crayfish's historical range may have included streams throughout the upper Big Sandy River basin, which covers 10 counties in Kentucky, Virginia and West Virginia. The species' current range is restricted to a total of four isolated subpopulations in Floyd and Pike counties, Kentucky; Buchanan, Dickenson, and Wise counties, Virginia; and McDowell County, West Virginia.

The historical range of the Guyandotte River crayfish included sites in the Upper Guyandotte River basin in Wyoming County and parts of Logan and Mingo counties in West Virginia. The best available information indicates that this species now exists at a single site in Pinnacle Creek, Wyoming County.

See maps and other information at: http://www.fws.gov/northeast/crayfish.

2. How many of these crayfishes are left? Population estimates are not available for either species. However, the best available information for both species indicates overall decreases in abundance at known sites and the number of suitable habitat sites. Historical records and observations at the few remaining healthy sites indicate that about 20 to 25 individuals can be expected to occupy a suitable site. Surveys conducted between 2007 and 2009 often resulted in fewer than 10 Big Sandy crayfishes at a site.

The Guyandotte River crayfish was last documented in 2011, with five individuals being found at a single site. While surveys later in 2015 will determine if the species still exists at this site, the Service must use the best available information, in this case the existing 2011 information, for making this listing decision.

3. Why is the Service simultaneously proposing protections for both species? The Big Sandy crayfish was among 374 species that the Service determined in 2011 warranted in-depth status reviews. In a subsequent 2013 settlement agreement with the Center for Biological Diversity, the Service committed to completing the review for the Big Sandy crayfish by April 2015.

The best available information about the Big Sandy crayfish, including a December 2014 peer-reviewed publication in the journal Zootaxa, indicates that the previously described species of *Cambarus veteranus* (or Big Sandy crayfish) is actually composed of two separate species, the Guyandotte River crayfish (*C. veteranus*) and the Big Sandy crayfish (*C. callainus*). Information indicated that both species warranted reviews.

4. What has happened to their habitat? Historical and ongoing erosion and sedimentation have made many streams within their historical ranges unsuitable for the crayfishes. Looking forward, activities that cause sedimentation are expected to continue to affect the species' remaining habitat.

Although coal extraction in the region has declined from its peak of the 20th century, effects including non-point source pollutant runoff from closed and abandoned mine lands have the potential to continue.

While the human population has also declined, inadequate sewage treatment may contribute to poor water quality. Increasing natural gas extraction activities, highway construction projects, and ORV use may also increase sedimentation and contribute contaminants to crayfish habitats.

The isolated, small populations of both crayfishes also make them vulnerable to single catastrophic events like coal slurry or oil spills.

As suitable habitat sites have become fragmented, gene flow has been reduced, making natural dispersal between sites highly unlikely or impossible without human intervention.

5. How did we conclude that these two closely occurring crayfishes aren't the same species? While these crayfishes were once thought to be the same species occurring in two disjunct river systems, a 2011 genetic comparison of specimens from the Upper Guyandotte and Big Sandy populations found significant genetic divergence between the two populations, which indicated two distinct species. In addition, a 2014 review of all known museum specimens noted significant morphological (physical) differences between the two species. This genetic information was published in December 2014 in a peer-reviewed scientific journal.

6. Are conservation actions underway? What kinds of activities could help conserve these species? The Big Sandy crayfish is state-listed as endangered in Virginia. It has been a species of concern in Kentucky and is currently under review to determine if state listing as threatened or endangered is warranted. The Guyandotte River crayfish is considered critically imperiled in West Virginia per NatureServe criteria. While the Virginia designation requires projects within known Big Sandy crayfish habitats to include actions that reduce or eliminate effects to the species, the designations in Kentucky and West Virginia do not currently provide legal protection.

The species' habitats are afforded some federal protection under the Clean Water Act and the Surface Mining Control and Reclamation Act, as well as some state protection from the West Virginia Water Pollution Control Act and various state erosion and sedimentation regulations and best management practices.

Here are some ways you can help:

- Drive ORVs and vehicles on designated trails and not through or in streams.
- Don't dump chemicals into streams, and report chemical spills to state environmental protection agencies.
- During timber harvest, construction, or other projects, implement best management practices for sediment and erosion control.
- Start a watershed group or assist in stream and water quality monitoring efforts.
- Plant trees and other native woody vegetation along stream banks to help restore and preserve water quality.
- Replace or remove culverts and low-water bridge crossings that are barriers to fish passage.

7. How can I comment on the proposal to list both crayfish? Visit http://www.regulations.gov and insert docket number FWS-R5-ES-2015-0015 to review and, within the 60-day comment period, provide comments on the proposed rule. The proposed rule describes what information we need, such as other occupied crayfish sites, additional survey and water quality data and climate change projections. Please see the proposed rule for our specific requests for information.

8. What is next? At least three independent scientific reviewers will be asked to review the proposed rule during the comment period. After the comment period closes, the Service will review comments and make a final determination on whether or not to list the crayfish under the ESA. If the species is listed, the Service must consider whether designating critical habitat is appropriate.

Learn more: http://www.fws.gov/northeast/crayfish.