



DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R3–ES–2018–0056; 4500030113]

RIN: 1018–BD26

Endangered and Threatened Wildlife and Plants; 12-Month Petition Finding and Endangered Species Status for the Missouri Distinct Population Segment of Eastern Hellbender

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce a 12-month finding on a petition to list the hellbender (*Cryptobranchus alleganiensis*), a salamander species, as an endangered or threatened species under the Endangered Species Act of 1973 (Act), as amended. Because the Service published a final rule to list the Ozark hellbender subspecies (*Cryptobranchus alleganiensis bishopi*) as endangered on October 6, 2011, this 12-month petition finding addresses the eastern hellbender subspecies (*Cryptobranchus alleganiensis alleganiensis*). After review of the best available scientific and commercial information, we find that listing of the eastern hellbender is not warranted. However, we determined that listing is warranted for a distinct population segment (DPS) of the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*) in Missouri. Accordingly, we propose to list the Missouri DPS of the eastern hellbender (*C. a. alleganiensis*) as an endangered species under the Act. If we finalize this rule as proposed, it would extend the Act's protections to this DPS.

DATES: We will accept comments received or postmarked on or before [INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Comments submitted electronically using the Federal eRulemaking Portal (see ADDRESSES, below) must be received by 11:59 p.m. Eastern Time on the closing date. We must receive requests for public hearings, in writing, at the address shown in FOR FURTHER INFORMATION CONTACT by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal:

<http://www.regulations.gov>. In the Search box, enter FWS-R3-ES-2018-0056, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the Search panel on the left side of the screen, under the Document Type heading, click on the Proposed Rule box to locate this document. You may submit a comment by clicking on “Comment Now!”

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS-R3-ES-2018-0056, U.S. Fish and Wildlife Service, MS: BPHC, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send comments only by the methods described above. We will post all comments on <http://www.regulations.gov>. This generally means that we will post any personal information you provide us (see *Public Comments*, below, for more information).

FOR FURTHER INFORMATION CONTACT: Karen Herrington, Field Supervisor, Missouri Ecological Services Field Office, 101 Park DeVille Drive, Suite A, Columbia,

MO 65203; telephone 573–234–2132. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Information Requested

Public Comments

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other concerned governmental agencies, Native American tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The eastern hellbender’s biology, range, and population trends in Missouri, including:

(a) Biological or ecological requirements of the DPS, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the DPS, its habitat, or both.

(2) Factors that may affect the continued existence of the DPS, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.

(3) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this DPS and existing regulations that may be addressing those threats.

(4) Additional information concerning the historical and current status, range, distribution, and population size of this DPS, including the locations of any additional populations of this DPS.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include. Please note that submissions merely stating support for or opposition to the action under consideration without providing supporting information, although noted, will not be considered in making a determination, as section 4(b)(1)(A) of the Act (16 U.S.C. 1531 *et seq.*) directs that determinations as to whether any species is an endangered or threatened species must be made “solely on the basis of the best scientific and commercial data available.”

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via <http://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <http://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <http://www.regulations.gov>, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Missouri Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received within 45 days after the date of publication of this proposed rule in the *Federal Register* (see **DATES**, above). Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the *Federal Register* and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the *Federal Register* on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we sought the expert opinions of five appropriate specialists regarding the species status assessment (SSA) report that supports this proposed rule; we received responses from two of the five peer reviewers. These peer reviewers have expertise in hellbender biology, ecology, and genetics. The purpose of peer review is to ensure that our listing determinations are based on scientifically sound data, assumptions, and analyses. Comments from the peer

reviewers will be available along with other public comments in this proposed rule's Docket No. FWS-R3-ES-2018-0056 on <http://www.regulations.gov>.

Previous Federal Actions

We identified the hellbender (*Cryptobranchus alleganiensis*) as a Category 2 candidate species in our December 30, 1982, Candidate Notice of Review (CNOR) (47 FR 58454). Category 2 candidates were defined as species for which we had information that proposed listing was possibly appropriate, but conclusive data on biological vulnerability and threats were not available to support a proposed rule at that time. The species remained so designated in subsequent annual CNORs (50 FR 37958, September 18, 1985; 54 FR 554, January 6, 1989; 56 FR 58804, November 21, 1991; 59 FR 58982, November 15, 1994). In the February 28, 1996, CNOR (61 FR 7596), we discontinued the designation of Category 2 candidates; therefore, the hellbender was no longer a candidate species.

In 2001, the Ozark hellbender subspecies (*C. a. bishopi*) was added to the candidate list (66 FR 54808, October 30, 2001). Candidates are those fish, wildlife, and plants for which we have on file sufficient information on biological vulnerability and threats to support preparation of a listing proposal, but for which development of a listing rule is precluded by other higher priority listing activities. The Ozark hellbender was included in seven subsequent annual CNORs (67 FR 40657, June 13, 2002; 69 FR 24876, May 4, 2004; 70 FR 24870, May 11, 2005; 71 FR 53756, September 12, 2006; 72 FR 69034, December 6, 2007; 73 FR 75176, December 10, 2008; and 74 FR 57804, November 9, 2009).

In April of 2010, the Center for Biological Diversity (CBD) petitioned the Service to list 404 aquatic, riparian, and wetland species from the southeastern United States under the Act. The hellbender (*C. alleganiensis*) was among these 404 species. On September 27, 2011, we published a substantial 90-day finding for 374 of the 404 species, including the hellbender, soliciting information about, and initiating status reviews for, those species (76 FR 59836).

Prior to the publication of that 90-day finding, we had already been evaluating the status of Ozark hellbender and had published a proposed rule to list the Ozark hellbender subspecies as endangered (75 FR 54561; September 8, 2010). On October 6, 2011, we published final rules listing the Ozark hellbender as endangered under the Act (76 FR 61956) and listing the hellbender (*C. alleganiensis*), including its two subspecies, the eastern hellbender (*C. a. alleganiensis*) and the Ozark hellbender (*C. a. bishopi*), in Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which addresses native species that need regulation to prevent or restrict exploitation (76 FR 61978).

On June 17, 2014, CBD filed a complaint against the Service for failure to complete a 12-month finding for the hellbender within the statutory timeframe. On September 22, 2014, the Service entered into a settlement agreement with CBD to address the complaint; the court-approved settlement agreement specified that a 12-month finding for the hellbender would be delivered to the *Federal Register* by March 31, 2019. This document serves as our 12-month finding on the April 2010 petition.

Background

The species belongs to the Order Caudata, family Cryptobranchidae. The genus

Cryptobranchus is monotypic (having only one species) and currently contains two recognized subspecies: *C. alleganiensis alleganiensis* (eastern hellbender) and *C. alleganiensis bishopi* (Ozark hellbender).

Because the Ozark hellbender is already listed under the Act, we conducted an SSA for the eastern hellbender. A thorough review of the taxonomy, life history, and ecology of the eastern hellbender (*C. a. alleganiensis*) is presented in the SSA report (U.S. Fish and Wildlife Service 2018, entire). The full SSA report can be found on the Service's Midwest Region website at <https://www.fws.gov/midwest/es/> and at <http://www.regulations.gov> under Docket No. FWS-R3-ES-2018-0056.

The eastern hellbender is a large, entirely aquatic salamander found in perennial streams across 15 States from northeastern Mississippi, northern Alabama, northern Georgia, Tennessee, western North Carolina, western Virginia, West Virginia, Kentucky, southern Illinois, southern Indiana, Ohio, Pennsylvania, western Maryland, and southern New York, with disjunct populations occurring in east-central Missouri.

Eastern hellbender streams are usually fast-flowing, cool, and highly oxygenated (Green 1934, p. 28; Bishop 1941, pp. 50–51; Green and Pauley 1987, p. 46). Eastern hellbenders respire through their skin, aided by prominent, highly vascularized skin folds (Guimond 1970, pp. 287–288; Nickerson and Mays 1973, pp. 26–27), and are not well adapted to low-oxygen conditions (Ultsch and Duke 1990, p. 255). In addition, low water conductivity is an important habitat requirement (Bodinof Jachowski and Hopkins 2018, pp. 220–221).

Boulders provide cover and breeding sites, and are the most important indicator of adult eastern hellbender habitat (Lipps 2009, p. 9; Humphries 2005, p. 10; Bothner and

Gottlieb 1991, p. 45). Hellbender nests are typically excavations beneath partially embedded, large (greater than 30 centimeters), flat rocks with a single opening facing downstream or perpendicular to streamflow (Smith 1907, p. 7). Females deposit eggs under a nest rock, and males externally fertilize the egg clutch (Nickerson and Mays 1973, p. 45), after which a single male defends the nest from other hellbenders (Smith 1907, pp. 24–25). Larvae are typically found within the interstices of cobble and gravel, and occasionally under large rocks (Nickerson *et al.* 2003, p. 624; Keitzer 2007, pp. 16–17; Foster *et al.* 2008, p. 184).

Larvae lose their gills about 1.5 to 2 years after hatching (Bishop 1941, p. 49; Nickerson and Mays 1973, p. 53); juveniles sexually mature at an age of approximately 5 or 6 years (Bishop 1941, p. 50). Maximum age is not known with certainty, but estimates suggest that eastern hellbenders can live at least 25 to 30 years in the wild (Taber *et al.* 1975, p. 635; Peterson *et al.* 1988, p. 298).

Adults are primarily nocturnal and eat crayfish and, to a lesser degree, small fish (Smith 1907, p. 12; Swanson 1948, p. 363; Peterson *et al.* 1989, p. 440). Other occasional food items include insects and larval and adult frogs (Green 1935, p. 36; Pflingsten 1990, p. 49; Foster 2006, p. 74). The diet of larval eastern hellbenders consists mainly of aquatic insects (Pitt and Nickerson 2005, p. 69; Hecht *et al.* 2017, p. 159). Eastern hellbenders occupy relatively small home ranges of approximately 30 square meters (m^2) (322 square feet (ft^2)) to approximately 2,212 m^2 (23,810 ft^2) (Hillis and Bellis 1971, p. 124; Coatney 1982, p. 23; Peterson and Wilkinson 1996, p. 126; Humphries and Pauley 2005, p. 137; Burgmeier *et al.* 2011a, p. 139) but are also capable of long distance movements, which have been documented up to 12.9 kilometers (km) (8 miles (mi))

(Petokas 2011, pers. comm.; Foster 2012, pers. comm.).

Summary of Biological Status and Threats

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species is an “endangered species” or a “threatened species.” The Act defines an endangered species as a species that is “in danger of extinction throughout all or a significant portion of its range,” and a threatened species as a species that is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The Act requires that we determine whether any species is an “endangered species” or a “threatened species” because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence. These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term “threat” to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or

separately—the source of the action or condition or the action or condition itself. However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an “endangered species” or a “threatened species.” In determining whether a species meets either definition, we must evaluate all identified threats by considering the expected response by the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an “endangered species” or a “threatened species” only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

We completed a comprehensive assessment of the biological status of the eastern hellbender, and prepared a report of the assessment (SSA report), which provides a thorough account of the subspecies’ overall viability. In the SSA, we define viability as the ability of a species to persist over the long term and to avoid extinction. To assess the viability of the eastern hellbender, we used the conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310) in our analysis. Briefly, resiliency refers to the ability of the species to withstand stochastic events (arising from random factors), such as fluctuations in birth rates (demographic stochasticity) or variations in rainfall or temperature (environmental stochasticity).

Representation refers to the ability of the species to adapt over time to long-term changes in the environment (natural or human-caused) and is a function of a species' breadth of diversity: genetic diversity within and among populations and the ecological diversity (also called environmental variation or diversity) of populations across the species' range. Redundancy refers to the ability of the species to withstand catastrophic events (for example, droughts or hurricanes). In general, the more redundant and resilient a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. The following is a summary of the key results and conclusions from the SSA report.

Summary of Current Condition

Historically, 570 healthy eastern hellbender populations are known to have existed across 15 States. Currently, 345 (61 percent) are extant, and 225 populations (39 percent) are presumed or functionally extirpated. Of the 345 extant populations across the range, 127 (37 percent) are likely healthy (stable, recruiting), and 218 (63 percent) are declining.

Eastern hellbender abundance has decreased in many parts of the range, with reduced numbers observed as early as 1948 (Swanson 1948, p. 363). Eastern hellbender survey effort has increased substantially over the last 5 to 10 years. Of the extant populations, 125 were discovered since 2012. Most of the new populations discovered since 2000 were observations of a single individual or detection via environmental DNA (genetic material collected from environmental samples). A lack of data regarding abundance or size class structure in these populations precludes assessments of population trends.

We identified four geographical units (referred to in the SSA report as adaptive capacity units (ACUs)), based on Hime *et al.*'s (2016, entire) evaluation of genetic markers, to delineate variation in genetic and ecological traits within the eastern hellbender's historical range (*i.e.*, evolutionary lineages). The units are: (1) Missouri River drainage (MACU), (2) Ohio River-Susquehanna River drainages (OACU), (3) Tennessee River drainage (TACU), and (4) Kanawha River drainage (KACU).

Since 2000, the eastern hellbender has been documented from these four geographic units across 15 States. The number of populations varies among ACUs, with 1 percent of the extant populations occurring in MACU, 39 percent in OACU, 51 percent in TACU, and 9 percent in KACU. Within the ACUs, the number of healthy populations also varies, with 0 in MACU, 42 in OACU, 68 in TACU, and 16 in KACU.

Influences on the Eastern Hellbender

In consultation with species' experts, we identified the past and current negative and beneficial factors that have led to the eastern hellbender's current conditions and which may influence population dynamics into the future. Factors having a negative impact on eastern hellbender individuals are referred to as risk factors (also as stressors), while factors having a beneficial effect are referred to as conservation factors. We referred to risk and conservation factors collectively as "influences." A brief summary of the most influential factors is presented below; for a full description of these factors, refer to chapter 5 of the SSA report (Service 2018, pp. 26–48).

Sedimentation

Across the range, sedimentation was identified as the factor most impacting the status of the eastern hellbender. Sedimentation is the addition of fine soil particles (*e.g.*,

sands, silts, clays) to streams. These sediments bury shelter and nest rocks (Blais 1996, p. 11; Lipps 2009, p. 10; Hopkins and DuRant 2011, p. 112), suffocate eggs (Nickerson and Mays 1973, pp. 55–56), alter habitat for crayfish (the primary food source of adult eastern hellbenders) (Santucci *et al.* 2005, pp. 986–987; Kaunert 2011, p. 23), and degrade habitat for larval and juvenile hellbenders, as well as habitat for macroinvertebrates, which are an important food source for larval hellbenders (Cobb and Flanagan 1990, pp. 35–37; Nickerson *et al.* 2003, p. 624). Because sedimentation affects all life stages of the eastern hellbender, impairs or prevents successful reproduction, and is pervasive throughout the subspecies' range, it has specifically been implicated as a cause of eastern hellbender declines and as a continuing threat throughout much of the species' range.

Water Quality Degradation

Degraded water quality was estimated as having the second highest impact on the eastern hellbender's status in all ACUs because it can cause direct mortality of eastern hellbenders and, at sub-lethal levels, can alter physiological processes and increase vulnerability to other threats (Maitland 1995, p. 260). Major sources of aquatic pollutants include domestic wastes, agricultural runoff, coal mining activities, road construction, and unpermitted industrial discharges. While it is unlikely that a chemical spill could cause catastrophic loss of an entire ACU, it is possible if multiple spills occur in an ACU with low redundancy.

Habitat Destruction and Modification

Destruction of habitat from impoundments, channelization, and instream gravel mining was also ranked relatively high as a factor impacting the eastern hellbender's

status due to the extent of these stressors throughout the subspecies' range.

Impoundments reduce upstream streamflow, increasing sedimentation and subsequently lowering dissolved oxygen. Dams have been constructed in every major stream system in the range of the eastern hellbender and have contributed to population declines and local extirpations, especially in large streams used for navigation (e.g., Ohio, Cumberland, and Tennessee rivers) (Echternacht 2009, pers. comm.; Gentry 1955, p. 169; Graham *et al.* 2011, p. 246; Mount 1975, p. 109; Nickerson and Mays 1973, pp. 58, 63, 66; Pflingsten 1990, p. 49; L. Williams 2012, pers. comm.), and are currently restricting movement among some populations and into some previously occupied habitats. Channelization (typically conducted for drainage improvements) and instream gravel mining remove the coarse substrates (e.g., gravel, cobble, and boulder) and often the associated riparian vegetation, and result in accelerated erosion, decreased habitat diversity, and channel instability (Hartfield 1993, p. 131; Hubbard *et al.* 1993, pp. 136–145).

Direct Mortality or Permanent Removal of Animals

Large numbers of eastern hellbenders have historically been removed from some streams for scientific and educational purposes, for the pet trade, and for eradication efforts. These removals likely contributed to the population declines seen in some streams. The current rate of permanent removal of eastern hellbenders is likely significantly lower than it has been historically. However, collection and sale of eastern hellbenders continues to be a threat, with internet advertisements as recent as 2010 soliciting purchase of wholesale lots of eastern hellbenders (Briggler 2010, pers. comm.). Killing of eastern hellbenders by some anglers and the removal of individuals for personal use and the pet trade also continues in some areas. Even though many eastern

hellbenders targeted by scientists and nature enthusiasts are returned to the stream, the act of searching for eastern hellbenders can result in increased egg and larval mortality. Eastern hellbenders are typically captured by lifting large shelter rocks and catching individuals by hand. Many researchers have speculated that rock lifting to collect eastern hellbenders results in adverse impacts, especially when done during the breeding season (Lindberg and Soule 1991, p. 8; Williams *et al.* 1981b, p. 26; Williams 2012, pers. comm.).

As a long-lived species, removing adult eastern hellbenders from stream populations may be particularly detrimental, as stable populations of long-lived species typically have high adult survival rates, which compensates for correspondingly low rates of recruitment into the adult populations (Miller 1976, p. 2). In eastern hellbender populations with low densities and little evidence of recent recruitment into the adult population, the removal of any individuals from a population may be deleterious (Pfungsten 1988, p. 16). Because many eastern hellbender populations are already stressed by habitat degradation, compensation for high adult mortality through high recruitment of juveniles is even less likely. Although the magnitude of this threat is not known with certainty, its occurrence is commonly noted by field researchers, suggesting that it is a relatively common occurrence in some portions of the subspecies' range. Furthermore, as the number of populations decline and become concentrated on public lands, locations and animals might be easier to find, especially if artificial nest box use increases in the future.

Disease

Disease can act as a stressor on eastern hellbender populations and has the potential to cause catastrophic loss of hellbender populations. Emerging infectious diseases (EIDs), especially fungal EIDs in wildlife, are on the rise, and salamanders are especially susceptible given the high magnitude of legal and illegal trade in herpetofauna.

Batrachochytrium dendrobatidis (*Bd*) is a fungal pathogen that can cause chytridiomycosis, a highly infectious amphibian disease associated with mass die-offs, population declines and extirpations, and potentially species extinctions on multiple continents (Berger *et al.* 1998, pp. 9031–9036; Bosch *et al.* 2001, pp. 331–337; Lips *et al.* 2006, pp. 3165–3166). *Bd* infection of eastern hellbenders has been confirmed in every State where testing has occurred (*i.e.*, New York, Pennsylvania, West Virginia, Ohio, Kentucky, Indiana, North Carolina, Tennessee, Georgia, and Missouri) (Greathouse 2007, p. 42; Briggler *et al.* 2008, p. 444; Burgmeier *et al.* 2011b, p. 845; Gonynor *et al.* 2011, pp. 58–59; Regester *et al.* 2012, p. 20; Roblee 2012, pers. comm.; Souza *et al.* 2012, p. 562; Williams and Groves 2014, p. 457; Wolfe 2012, pers. comm.). The earliest known record of an infected eastern hellbender is from Missouri in 1975; *Bd* infection rates in eastern hellbenders collected in Missouri between 1896 and 1994 was 5.4 percent (Bodinof *et al.* 2011, p. 3). Even mild chronic *Bd* infections may negatively impact eastern hellbenders and may increase susceptibility of eastern hellbenders to other infection. While *Bd* currently does not appear to be causing large-scale mortality events in wild populations of eastern hellbenders, other stressors, such as environmental contaminants or rising water temperatures, can weaken animals' immune systems, leading to outbreaks of clinical disease and cause mortality events in the future (Briggler *et al.* 2007, p. 18; Regester *et al.* 2012, p. 19).

Batrachochytrium salamandrivorans (*Bsal*) is a fungal pathogen that invaded Europe from Asia around 2010 and has caused mass die-offs of fire salamanders (*Salamandra salamandra*) in northern Europe (Martel *et al.* 2014, p. 631; Fisher 2017, pp. 300–301). Given extensive unregulated trade and the discovery of *Bsal* in Europe in 2010, the introduction of this novel pathogen could cause extirpations of naïve salamander populations in North America (Yap *et al.* 2017, entire) were *Bsal* to be introduced here. Regions with a high risk of introduction of *Bsal* include portions of the southeastern and northeastern United States, two regions that comprise a substantial portion of the eastern hellbender's range (Richgels *et al.* 2016, p. 5; Yap *et al.* 2017, pp. 857–858). Given the high risk of *Bsal* invasion, on January 13, 2016, the Service published in the *Federal Register* (81 FR 1534) an interim rule to list 20 amphibian genera known to carry *Bsal* as injurious under the Lacey Act to limit importation into the United States. Despite this protection, it is possible that an unknown carrier or illegal import could introduce this pathogen into eastern hellbender populations.

Habitat Disturbance

Anthropogenic disturbance in the form of rock-moving by people recreating on rivers is becoming an increasing stressor on eastern hellbenders and can cause mortality. Large shelter rocks are removed to reduce obstructions to recreational canoeing or tubing. Additionally, collection of boulders, rocks, and cobble for landscaping has been suspected in some areas in Missouri (Briggler *et al.* 2007, p. 62). Because large rocks serve as shelter and nesting habitat for adults, and smaller rocks and cobble provide larval and juvenile habitat, moving rocks of any size has the potential to lead to mortality of

some life stage. Unger *et al.* (2017, entire) documented direct mortality to eastern hellbenders as a result of shelter rock disturbance.

Small Populations, Population Fragmentation and Isolation

Many eastern hellbender populations are small and isolated from one another by impoundments and large reaches of unsuitable habitat. This isolation restricts movement among populations and precludes natural recolonization from source populations (Dodd 1997, p. 178; Benstead *et al.* 1999, pp. 662–664; Poff and Hart 2002, p. 660).

Increased Abundance of Species of Predators

Some native predators of the eastern hellbender, such as raccoons, have increased in abundance due to anthropogenic influences, while others have recently been reintroduced into hellbender streams (*e.g.*, river otters). Nonnative predators are also present within a large portion of the eastern hellbender's range and include predatory fish stocked for recreation, such as rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) (Mayasich *et al.* 2003, p. 20). Nonnative trout species are thought to directly impact eastern hellbenders by predating on eggs, larvae, sub-adults, and adults, and by impacting hellbenders indirectly through competition for resources.

Climate Change

Average temperatures are expected to rise throughout the range of the eastern hellbender, along with more frequent heat waves and increased periods of drought punctuated by intense rainstorms, likely resulting in elevated stream temperature regimes and lower summer base-flows (Karl *et al.* 2009, pp. 44, 107, 111–112, 117–118), which may affect the subspecies. Migration of eastern hellbenders as an adaptation to climate

change is unlikely, due to their limited mobility, high site fidelity, restriction to defined stream systems, and the extensive network of impoundments throughout their range.

Synergistic Effects

In some instances, effects from one threat may increase effects of another threat, resulting in what is referred to as synergistic effects. Synergistic effects often include an increased susceptibility to predation (Moore and Townsend 1998, pp. 332–333), disease (Kiesecker and Blaustein 1995, pp. 11050–11051; Taylor *et al.* 1999, pp. 539–540), or parasites (Kiesecker 2002, pp. 9902–9903; Gendron *et al.* 2003, pp. 472–473). In addition, chronic, increased levels of stress hormones have been shown to inhibit immune response (Rollins-Smith and Blair 1993, pp. 156–159; Romero and Butler 2007, pp. 93–94). Other stressors present in the eastern hellbender's environment (*e.g.*, habitat modification, degraded water quality) could reduce immune response and thereby increase vulnerability to disease and parasites.

Conservation Efforts

Beneficial efforts, primarily of population augmentation, were also ranked by species' experts as an important influence on the eastern hellbender's status. Captive rearing increases the survival rate of young by raising them in captivity to 2 to 4 years of age. Once reared, young are released into the wild to augment existing populations or reintroduced into areas where the species has been extirpated. However, we currently have no data on whether released individuals have successfully reproduced or can successfully reproduce, or the survival rates of any resulting offspring.

In addition, artificial nest boxes have been successfully used for reproduction by hellbenders in Ohio, West Virginia, Missouri, Virginia, and New York. However, the

survival of fertilized eggs and larvae from these nest boxes is unknown. Because nest boxes may present a curiosity to stream recreationists, hellbenders occupying the nests are susceptible to disturbance, persecution, and collection if the nest boxes are not properly camouflaged.

Summary of Future Conditions

To assess the future number, health, and distribution of eastern hellbender populations, we asked species' experts for their predictions of the changes in the numbers of stable recruiting, declining, functionally extirpated, and presumed extirpated populations at 10-year, 25-year, and 50-year timeframes under three scenarios: reasonable worst plausible, reasonable best plausible, and "most likely" future plausible scenarios. Most experts had little confidence in predictions beyond 25 years. Using these expert-elicited estimates, we forecast the health and distribution of populations at 10- and 25-year increments for the three future scenarios. The reasonable worst plausible and reasonable best plausible scenarios provide the range of plausible outcomes while the "most likely" predictions provide insights to whether the future scenarios are likely to be closer to the upper (reasonable best) or the lower (reasonable worst) predictions.

Projections of the numbers of healthy and extant populations vary between the reasonable worst plausible and reasonable best plausible scenarios, and among the ACUs. For the number of healthy populations, the "most likely" scenario is not skewed toward the reasonable best or reasonable worst plausible scenarios for each ACU, but for the number of extant populations, the "most likely" scenario varies by ACU. First, we summarize these projections by ACU and then provide a summary across the eastern hellbender's range.

In MACU, future projections indicate there may be 3 to 5 extant populations by year 25, with 4 extant populations under the “most likely” scenario. MACU currently has no healthy populations, and this condition would continue under the reasonable worst plausible scenario. Two healthy populations are predicted under the reasonable best plausible scenario. The most important influences affecting eastern hellbender’s future status and trends in MACU are sedimentation, water quality degradation, augmentation, disease and pathogens, and habitat disturbance. MACU has a low to moderate risk of *Bsal* introduction (Richgels *et al.* 2016, p. 5) and other potential EIDs. In the event of a disease outbreak, ACU-wide extirpation is likely under the reasonable worst plausible scenario and is about as likely as not under the reasonable best plausible scenario. ACU-wide extirpation is unlikely due to one or more catastrophic chemical pollution events under both scenarios.

In OACU, future projections indicate that there may be 30 to 108 extant populations by year 25, with 88 extant populations under the “most likely” scenario prediction. Of those extant populations, 15 (65 percent less than current) to 71 (69 percent more than current) healthy populations are predicted to persist across spatially heterogeneous environmental conditions. The most important influences affecting the eastern hellbender’s future status and trends in OACU are sedimentation, water quality degradation, augmentation, small population effects, destruction of habitat, and climate change. Given the predicted future geographic spread of populations within OACU, disease is the only reasonably foreseeable catastrophic event. OACU is at moderate risk of introduction of *Bsal* (Richgels *et al.* 2016, p. 5) and other potential EIDs. In the event of a disease outbreak, the number and spatial extent of populations likely provide

sufficient redundancy to protect against extirpation in OACU over the next 25 years under the reasonable best plausible scenario. However, ACU-wide extirpation due to a catastrophic disease is likely under the reasonable worst plausible scenario.

In TACU, future projections indicate that there may be 112 to 154 extant populations by year 25, with the “most likely” scenario prediction skewed toward the reasonable worst plausible scenario. Of those extant populations, 40 (41 percent less than current) to 91 (34 percent more than current) healthy populations are predicted to persist across spatially heterogeneous environmental conditions. The most important influences affecting eastern hellbender’s future status and trends in TACU are sedimentation, water quality degradation, mortality, overabundance of predators, and augmentation. Given the predicted future geographic extent of populations within TACU, disease is the only reasonably foreseeable catastrophic event. TACU is at moderate risk of introduction of *Bsal* (Richgels *et al.* 2016, p. 5) and other potential EIDs. In the event of a disease introduction, the number and spatial extent of populations likely provide sufficient redundancy to protect against extirpation in TACU over the next 25 years under the reasonable best plausible scenario. However, ACU-wide extirpation due to a catastrophic disease is likely under the reasonable worst plausible scenario.

In KACU, future projections indicate that there may be 4 to 35 extant populations at year 25, with 13 extant populations under the “most likely” scenario prediction. Under the reasonable worst plausible scenario, no healthy populations remain, while under the reasonable best plausible scenario, 13 (19 percent less than current) healthy populations are predicted to persist. The most important influences affecting eastern hellbender future status and trends in KACU are sedimentation, water quality degradation, mortality,

augmentation, and small population effects. KACU has a low to moderate risk of introduction of *Bsal* (Richgels *et al.* 2016, p. 5) and other potential EIDs. ACU-wide extirpation due to a disease outbreak is likely under the reasonable worst plausible scenario, but the risk of catastrophic loss under the reasonable best plausible scenario is lower, as there is a greater number and spatial extent of populations predicted. ACU-wide extirpation is unlikely due to one or more catastrophic chemical pollution events under both scenarios.

Rangewide, the number of extant populations is predicted to decrease by 2 to 52 percent over the next 10 years, and then slightly decrease from year 10 to year 25 under both scenarios (see figure 1, below), with the “most likely” scenario skewed toward the reasonable worst plausible scenario. Despite these overall losses, multiple healthy populations over a broad geographic range are predicted to persist over the next 25 years (55 to 178 healthy populations, representing a 57-percent decrease to a 40-percent increase from current conditions).

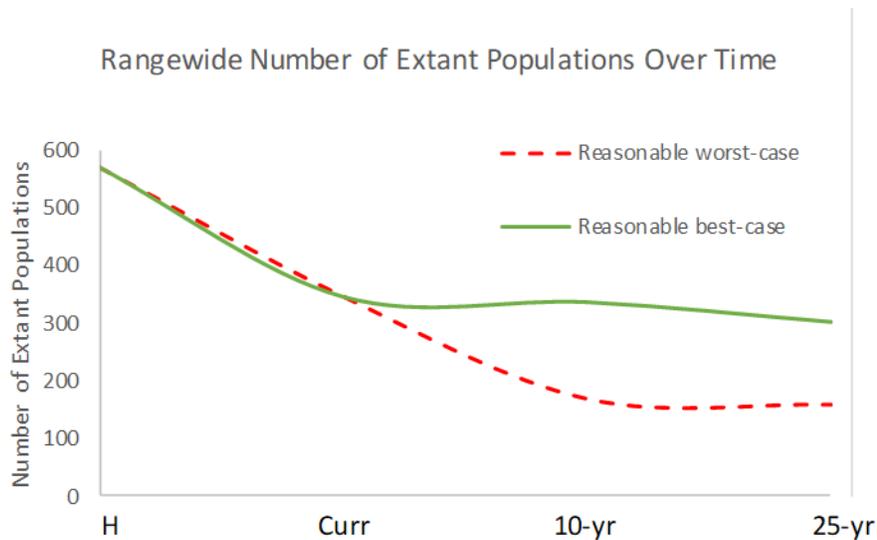


Figure 1. The rangewide number of extant eastern hellbender populations over time.

In summary, stressors are pervasive across the eastern hellbender's range, but the magnitude varies across populations. The primary stressors affecting the eastern hellbender rangewide include sedimentation, water quality degradation, and direct mortality. Although augmentation has the potential to influence the eastern hellbender's status, little data exist as to whether successful sustained reproduction and recruitment can be achieved and whether augmentation is logistically possible at a broad scale. Rangewide, healthy populations are predicted to persist, although with a reduction in geographic range. Across its range, eastern hellbender has a low to moderate risk of exposure to catastrophic events (disease or chemical spills). There is greater vulnerability for ACU-wide extirpation in MACU and KACU due to the low number and reduced distribution of populations. Loss of two ACUs would lead to reductions in genetic and ecological diversity, both of which are potential sources of adaptive diversity. However, the geographically wide distribution of populations in OACU and TACU guard against catastrophic losses rangewide.

Finding

Section 4 of the ESA (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for determining whether a species is an endangered species or threatened species and should be included on the Federal Lists of Endangered and Threatened Wildlife and Plants. The ESA defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species "that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future."

Under section 4(a)(1) of the ESA, we determine whether a species is an endangered species or threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. These same factors apply whether we are analyzing the species' status throughout all of its range or throughout a significant portion of its range.

Determination of Status Throughout All of Its Range

The first step in our analysis of the status of a species is to determine its status throughout all of its range. We subsequently examine whether, in light of the species' status throughout all of its range, it is necessary to determine its status throughout a significant portion of its range.

Stressors are pervasive across the eastern hellbender's range, but the magnitude varies across populations. The primary stressors identified for the eastern hellbender include sedimentation (Factor A), water quality degradation (Factor A), and direct mortality (Factor E). In considering the foreseeable future, we forecast the future viability of the species by predicting the responses of the ACUs to conditions under three future scenarios 10 and 25 years into the future. Predictions of the subspecies' response to threats, based on elicitation of species' experts, are reasonably reliable out to 25 years; therefore, we have concluded that 25 years is the foreseeable future for the eastern hellbender.

Our analysis indicates that numerous healthy (resilient) populations will persist over the next 25 years across a broad geographic range, including multiple representation units (ACUs). Although our analysis predicts a population decline over the next 10 years, populations are predicted to be level from year 10 to year 25 under the future scenarios. The risk of exposure to catastrophic events varies across the eastern hellbender's range. While the subspecies' redundancy is lower than in the past, the geographically wide distribution of populations, as well as the low to moderate risk of a catastrophic event, guards against catastrophic losses rangewide. We find that the predicted persistence of healthy populations across multiple ACUs provides redundancy, resiliency, and representation levels that are likely sufficient to sustain the subspecies now and into the future, and we conclude that the eastern hellbender has a low risk of extirpation.

Based on our review of the best available scientific and commercial information pertaining to the five factors, we find that the stressors acting on the eastern hellbender and its habitat, either singly or in combination, are not of sufficient imminence, intensity, or magnitude to indicate that the subspecies is in danger of extinction (an endangered species), or likely to become endangered within the foreseeable future (a threatened species), throughout all of its range.

Determination of Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range (SPR). Having determined that the eastern hellbender is not in danger of extinction now or likely to become so in the foreseeable future throughout all of its range, we next consider whether it may be in danger of extinction or

likely to become so in the foreseeable future in an SPR. The range of a species can theoretically be divided into portions in an infinite number of ways, so we first screen the potential portions of the species' range to determine if there are any portions that warrant further consideration. To do this we look for portions of the species' range for which there is substantial information indicating that: (1) the portion may be significant, and (2) the species may be in danger of extinction or likely to become so in the foreseeable future in that portion. No portion would warrant further consideration if, for that portion, either one of these initial elements is not present. Therefore, if we determine that either of the initial elements is not present for a particular portion of the species' range, then the species does not warrant listing because of its status in that portion of its range.

We emphasize that the presence of both of the initial elements is not equivalent to a determination that the species should be listed—rather, it is a determination that a portion warrants further consideration. If we identify any portions that meet both of the initial elements, we conduct a more thorough analysis to determine whether the portion does indeed meet both of the SPR standards: (1) the portion is significant and (2) the species is in danger of extinction or likely to become so in the foreseeable future in that portion. Confirmation that a geographic area does indeed meet one of these standards (either the portion is significant or the species is endangered or threatened in that portion of its range) does not create a presumption, prejudice, or other determination as to whether the species is endangered or threatened in a significant portion of its range. Rather, we must then undertake a more detailed analysis of the other standard to make that determination. If the portion does indeed meet both SPR standards, then the species is endangered or threatened in that significant portion of its range.

At both stages in this process—the stage of screening potential portions to identify whether any portions warrant further consideration and the stage of undertaking the more-detailed analysis of any portions that do warrant further consideration—it might be more efficient for us to address first the “significance” question or the “status” question. Our selection of which question to address first for a particular portion depends on the biology of the species, its range, and the threats it faces. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the second question for that portion of the species’ range.

For this species, we chose to evaluate the status question (*i.e.*, identifying portions where the eastern hellbender may be in danger of extinction or likely to become so in the foreseeable future) first. The best available information indicates that eastern hellbender populations in MACU and KACU may have lower viability and greater vulnerability to potential future stressors than the other two ACUs. We therefore evaluated whether these two units could be considered “significant.”

The Service’s most-recent definition of “significant” has been invalidated by the courts (for example, *Desert Survivors v. Dep’t of the Interior*, No. 16-cv-01165-JCS (N.D. Cal. Aug. 24, 2018)). Therefore, we identify portions that may be significant by looking for portions of the species’ range that could be significant under any reasonable definition of “significant.” To do this, we look for any portions that may be biologically important in terms of the resiliency, redundancy, or representation of the species.

Historically and currently, these two units represent a small proportion (10% currently) of the total populations and have a small spatial extent. Because these two

units collectively have few healthy populations, they are not currently contributing in an important way to the subspecies' overall resiliency. If both of these units were extirpated, the subspecies would lose some representation and redundancy, but the loss of this portion of the subspecies' range would still leave sufficient resiliency, redundancy, and representation in the remainder of the subspecies' range such that it would not notably reduce the viability of the subspecies. Therefore, these two ACUs do not represent a significant portion of the subspecies' range, and we conclude that the eastern hellbender is not in danger of extinction or likely to become so in the foreseeable future in a significant portion of its range. Our understanding of "significance" in this finding has been arrived at independently and is not precedential. Further, our approach to analyzing SPR in this determination is consistent with the court's holding in *Desert Survivors*.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the eastern hellbender. Because the subspecies is neither in danger of extinction now nor likely to become so in the foreseeable future throughout all or any significant portion of its range, the subspecies does not meet the definition of an endangered species or threatened species. Therefore, we find that listing the eastern hellbender as an endangered or threatened species under the Act is not warranted at this time. This constitutes the conclusion of the Service's 12-month finding on the 2010 petition to list the hellbender as an endangered or threatened species. A detailed discussion of the basis for this finding can be found in the SSA report and other supporting documents (available on the Internet at <http://www.regulations.gov> under Docket No. FWS-R3-ES-2018-0056).

We ask the public to submit to us any new information that becomes available concerning the taxonomy, biology, ecology, status of, or stressors to the eastern hellbender outside of Missouri whenever it becomes available. Please submit any new information, materials, comments, or questions concerning this finding to Patrice Ashfield, Field Supervisor, U.S. Fish and Wildlife Service, Ohio Ecological Services Field Office, 4625 Morse Road, Suite 104, Columbus, OH 43230; telephone 614-416-8993.

Distinct Population Segment (DPS) Analysis

Under the Act, we have the authority to consider for listing any species, subspecies, or, for vertebrates, any distinct population segment (DPS) of these taxa if there is sufficient information to indicate that such action may be warranted. To guide the implementation of the DPS provisions of the Act, we and the National Marine Fisheries Service (National Oceanic and Atmospheric Administration—Fisheries), published the Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act (DPS Policy) in the *Federal Register* on February 7, 1996 (61 FR 4722). Under our DPS Policy, we use two elements to assess whether a population segment under consideration for listing may be recognized as a DPS: (1) The population segment's discreteness from the remainder of the species to which it belongs, and (2) the significance of the population segment to the species to which it belongs. If we determine that a population segment being considered for listing is a DPS, then the population segment's conservation status is evaluated based on the five listing factors established by the Act to determine if listing it as either endangered or threatened is warranted.

MACU consists of Big Piney River, Gasconade River, Meramec River, Niangua River, and their watersheds (see figure 2, below). Meramec River flows directly to Mississippi River, rather than directly to Missouri River, as do the other three rivers. For the purposes of the SSA, we referred to the grouping as the Missouri River drainage. The entirety of MACU occurs within the State of Missouri, and within this proposed rule, we also refer to MACU as the Missouri portion of the eastern hellbender's range. Below, we evaluate the Missouri portion of the eastern hellbender's range to determine whether it meets the definition of a DPS under our DPS Policy.

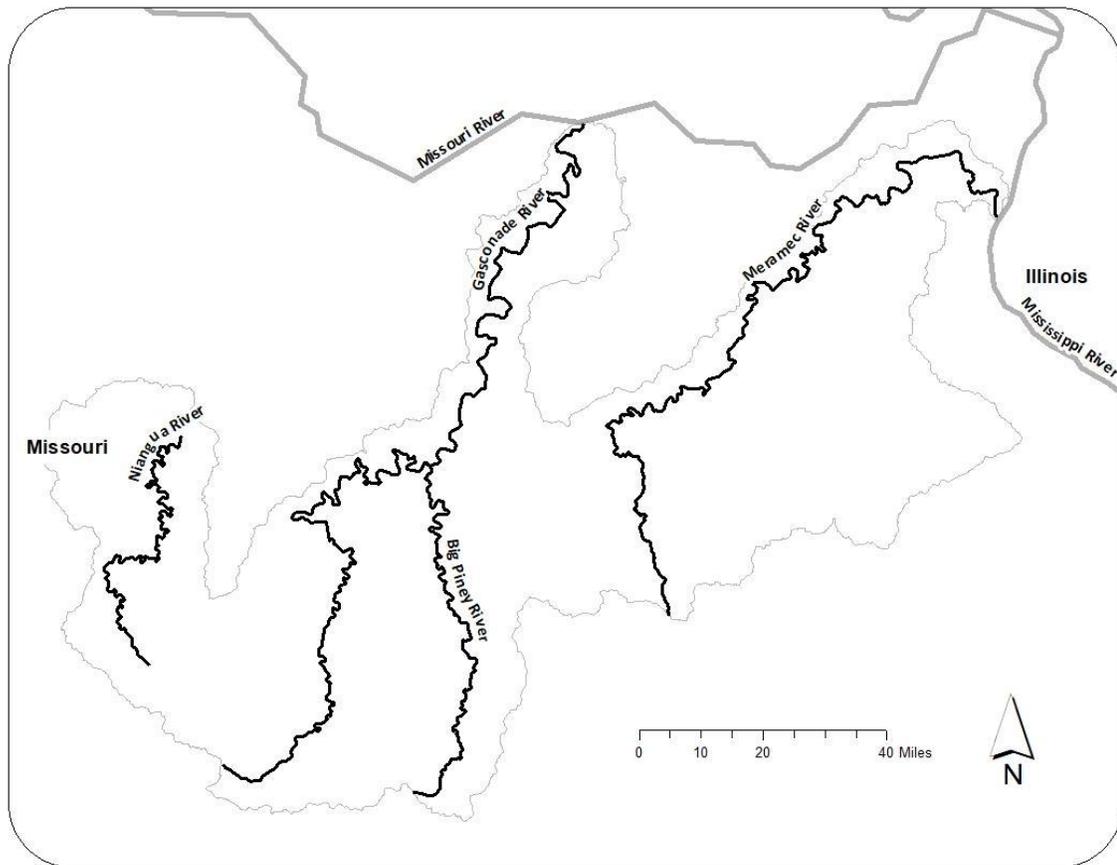


Figure 2. Rivers within the Missouri portion of the eastern hellbender's range or MACU.

Discreteness

Under our DPS Policy, a population segment of a vertebrate taxon may be considered discrete if it satisfies either one of the following conditions: (1) It is markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, or behavioral factors. Quantitative measures of genetic or morphological discontinuity may provide evidence of this separation; or (2) it is delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4(a)(1)(D) of the Act.

The Missouri populations of the eastern hellbender are markedly separate from other populations of the subspecies both genetically and by geographic separation. A recent evaluation of genetic markers spread throughout the *Cryptobranchus* genome indicates that the eastern hellbender subspecies consists of four evolutionary lineages that are distinct from each other (Hime *et al.* 2016, pp. 4–13): the Ohio River drainage, the Kanawha River drainage, the Tennessee River drainage, and the Missouri River drainage. More information on the genetic difference between the Missouri River populations and the remainder of the subspecies is discussed below under “Significance.”

The populations in the Missouri River drainage, referred to here as the Missouri “population,” are disjunct from populations of eastern hellbender in the other three drainages. The distance of the geographic separation from other eastern hellbender populations in the other genetic lineages is about 320 river kilometers (200 river miles). Eastern hellbenders occupy small home ranges, and a long distance movement for an eastern hellbender is 13 km (8 mi); therefore, eastern hellbender populations in Missouri

do not and will never naturally interact with populations in the other three river drainages.

Based on our review of the available information, we conclude that the Missouri population of the eastern hellbender is markedly separate from other populations of the species due to genetic separation and geographic (physical) isolation from eastern hellbender populations in the eastern United States (see figure 3, below). Therefore, we have determined that the Missouri population of the eastern hellbender meets the condition for discreteness under our DPS policy.

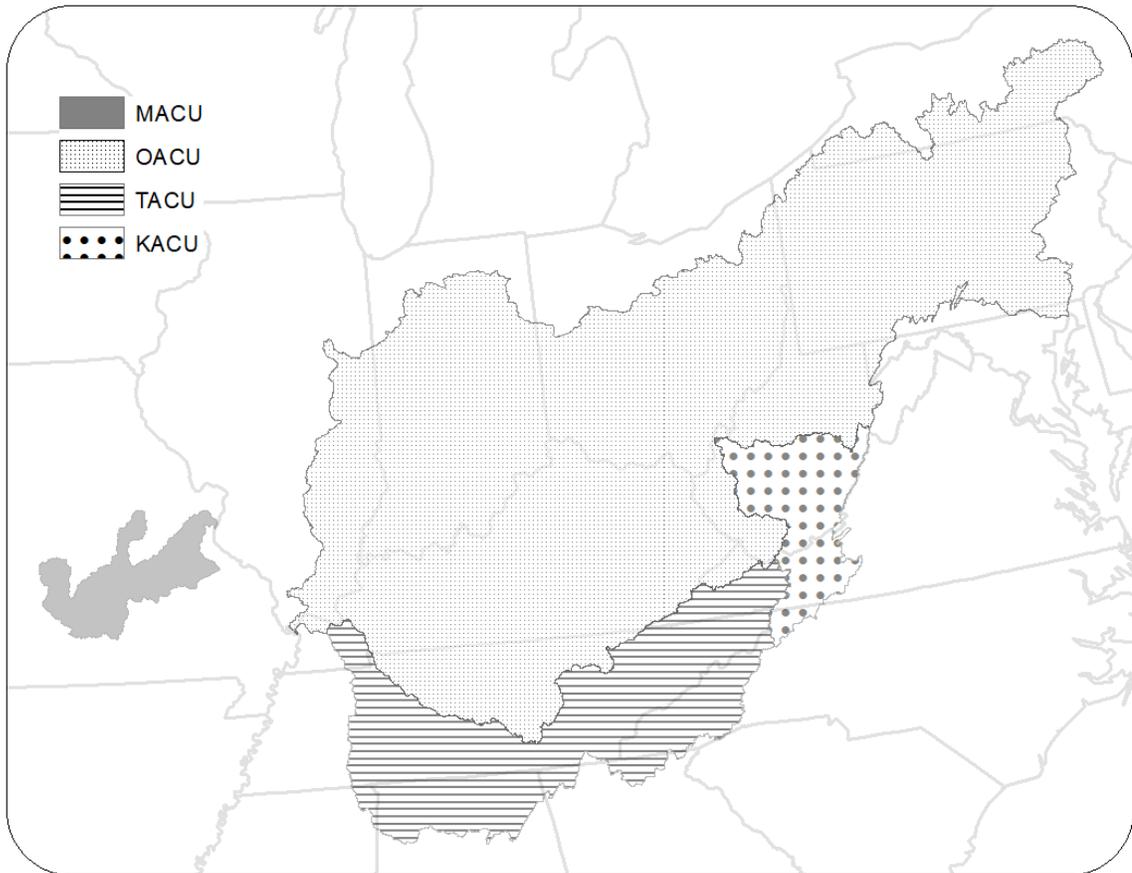


Figure 3. Evolutionary distinct lineages identified within the eastern hellbender subspecies by Hime *et al.* (2016, pp. 4–13).

Significance

Under our DPS Policy, once we have determined that a population segment is discrete, we consider its biological and ecological significance to the larger taxon to which it belongs. This consideration may include, but is not limited to: (1) Evidence of the persistence of the discrete population segment in an ecological setting that is unusual or unique for the taxon, (2) evidence that loss of the population segment would result in a significant gap in the range of the taxon, (3) evidence that the population segment represents the only surviving natural occurrence of a taxon that may be more abundant elsewhere as an introduced population outside its historical range, or (4) evidence that the discrete population segment differs markedly from other populations of the species in its genetic characteristics.

Hime *et al.* (2016, p. 12) found that genetic variation within the separate lineages is up to four orders of magnitude lower than the variation among the lineages. These genetic divergences within eastern hellbender lineages may be millions of years old (Hime *et al.* 2016, p. 12) and are likely the result of ancient geologic and climatic events (Sabatino and Routman 2009, p. 1,242). Each of the evolutionary lineages represents a substantial amount of the subspecies' genetic diversity, as well as diverse ecological and physical conditions, which may provide important sources of adaptive diversity for the subspecies. We have substantial evidence that the Missouri population of the eastern hellbender differs markedly in its genetic characteristics, and loss of this genetic diversity would result in loss of the subspecies' adaptive capacity. Thus, this population meets the criteria for significance under our DPS Policy.

DPS Conclusion for the Missouri Population of the Eastern Hellbender

Our DPS policy directs us to evaluate the significance of a discrete population in the context of its biological and ecological significance to the remainder of the species to which it belongs. Based on an analysis of the best available scientific and commercial data, we conclude that the Missouri population segment of the eastern hellbender is discrete due to genetic separation and geographic (physical) isolation from the remainder of the taxon. Furthermore, we conclude that the Missouri discrete population segment of the eastern hellbender is significant because it meets the following criterion to establish significance in the DPS policy: (1) this population differs markedly from the rest of the species because there are genetic characteristics present in this population that are not observed in the remainder of the taxon. Therefore, we conclude that the Missouri population of the eastern hellbender is both discrete and significant under our DPS policy and is, therefore, a listable entity under the Act.

Based on our DPS policy (61 FR 4722; February 7, 1996), if a population segment of a vertebrate species is both discrete and significant relative to the taxon as a whole (*i.e.*, it is a distinct population segment), its evaluation for endangered or threatened status will be based on the Act's definition of those terms and a review of the factors enumerated in section 4(a) of the Act. Having found that the Missouri population of eastern hellbender meets the definition of a distinct population segment, we now evaluate the status of this population to determine whether it meets the definition of endangered or threatened under the Act.

Determination

Section 4 of the Act (16 U.S.C. 1533), and its implementing regulations at 50 CFR part 424, set forth the procedures for adding species to the Federal Lists of

Endangered and Threatened Wildlife and Plants. Under section 4(a)(1) of the Act, we may list a species based on (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the eastern hellbender in Missouri. Our analysis of this information indicates that the most important risk factors affecting the eastern hellbender's current and future status and trends in Missouri are habitat destruction and modification from sedimentation and water quality degradation (Factor A), disease and pathogens (Factor C), and habitat disturbance (Factor A), and these factors are the primary causes of the decrease in eastern hellbender populations in Missouri now and into the future. The unauthorized collection of eastern hellbenders, especially for the pet trade (Factor B), remains a concern despite regulatory mechanisms, such as listing under CITES (Factor D), to reduce or eliminate overexploitation. Other factors, such as an overabundance of predators (Factor C) or population isolation (Factor E), are also affecting eastern hellbenders in Missouri but to a lesser degree. Although conservation efforts, such as population augmentation and artificial nest boxes, are being implemented in Missouri, we have no evidence that they will improve population viability in the long term.

The threats described above have already resulted in the extirpation of one of only five populations (20 percent) of the eastern hellbender in Missouri and the declining

condition of the remaining four populations (80 percent). The lack of healthy populations and the limited spatial extent of the Missouri DPS greatly reduce the DPS's resiliency and redundancy (the ability of eastern hellbenders to withstand normal environmental variation, periodic disturbances, stressors, and catastrophes currently and into the future).

The Act defines an endangered species as any species that is "in danger of extinction throughout all or a significant portion of its range" and a threatened species as any species that "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." We find that the Missouri DPS of the eastern hellbender is presently in danger of extinction throughout its entire range based on the immediacy of threats currently impacting the species. None of the remaining populations is healthy, and all are threatened by a variety of factors acting in combination to reduce the overall viability of the DPS. The lack of healthy populations and their limited spatial extent, coupled with the current and ongoing threats, put the eastern hellbender in Missouri in danger of extinction. Therefore, on the basis of the best available scientific and commercial information, we propose to list the Missouri DPS of the eastern hellbender as endangered in accordance with sections 3(6) and 4(a)(1) of the Act. We find that a threatened species status is not appropriate for the Missouri DPS of the eastern hellbender because of its contracted range, because the threats are occurring rangewide and are not localized, and because the threats are ongoing and expected to continue into the future.

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. Because we have determined that the Missouri DPS

of the eastern hellbender is in danger of extinction throughout all of its range, we find it unnecessary to proceed to an evaluation of potentially significant portions of the range. Where the best available information allows the Services to determine a status for the species rangewide, that determination should be given conclusive weight because a rangewide determination of status more accurately reflects the species' degree of imperilment and better promotes the purposes of the Act. Under this reading, we should first consider whether the species warrants listing "throughout all" of its range and proceed to conduct a "significant portion of its range" analysis if, and only if, a species does not qualify for listing as either an endangered or a threatened species according to the "throughout all" language. We note that the court in *Desert Survivors v. Department of the Interior*, No. 16-cv-01165-JCS, 2018 WL 4053447 (N.D. Cal. Aug. 24, 2018), did not address this issue, and our conclusion is therefore consistent with the opinion in that case.

Therefore, on the basis of the best available scientific and commercial information, we propose to list the Missouri DPS of the eastern hellbender as an endangered species throughout all of its range in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies; private organizations; and individuals. The Act encourages cooperation with the States

and other countries, and calls for recovery actions to be carried out for listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed and preparation of a draft and final recovery plan. The recovery outline guides the immediate implementation of urgent recovery actions and provides interim guidance for the management and conservation of newly listed species during the time between the final listing and completion of a recovery plan. The recovery plan identifies recovery criteria that indicate when a species may be ready for downlisting (*i.e.*, reclassification from endangered status to threatened status) or delisting (*i.e.*, removal from the Lists of Endangered and Threatened Wildlife and Plants), actions necessary to achieve recovery and their estimated costs, and methods for monitoring recovery progress. The recovery plan may be revised to address continuing or new threats to the species, as new substantive information becomes available. When completed, the

recovery outline, draft recovery plan, and the final recovery plan will be available on our website (<http://www.fws.gov/endangered>), or from our Missouri Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally needs the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.*, restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands. If we list the Missouri DPS of the eastern hellbender, funding for recovery actions would be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Missouri would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Missouri DPS of the eastern hellbender. Information on our grant programs that are available to aid species recovery can be found at: <http://www.fws.gov/grants>.

Although the Missouri DPS of the eastern hellbender is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this DPS. Additionally, we invite you to submit any new information on this DPS whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as an endangered or threatened species and with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. If a species is listed subsequently, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the DPS' habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities, particularly those affecting water quality or instream habitat, on Federal lands administered by the U.S. Forest Service and Department of Defense; issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq.*) permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot,

wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the *Federal Register* on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing.

Based on the best available information, the following actions are unlikely to result in a violation of section 9, if these activities are carried out in accordance with existing regulations and permit requirements; this list is not comprehensive:

(1) Activities authorized, funded, or carried out by Federal agencies, when such activities are conducted in accordance with an incidental take statement issued by us under section 7 of the Act;

(2) Any action carried out for scientific research or to enhance the propagation or survival of the Missouri DPS of the eastern hellbender that is conducted in accordance with the conditions of a permit issued by the Service under 50 CFR 17.22; and

(3) Any incidental take of Missouri eastern hellbenders resulting from an otherwise lawful activity conducted in accordance with the conditions of an incidental take permit issued by the Service under 50 CFR 17.22. Non-Federal applicants may design a habitat conservation plan (HCP) for the DPS and apply for an incidental take permit. HCPs may be developed for listed species and are designed to minimize and mitigate impacts to the species to the maximum extent practicable.

We will review other activities not identified above on a case-by-case basis to determine whether they may be likely to result in a violation of section 9 of the Act. We do not consider these lists to be exhaustive and provide them as information to the public.

Based on the best available information, the following activities may potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Unauthorized killing, collecting, handling, or harassing of individual eastern hellbenders at any life stage in Missouri;

(2) Sale or offer for sale of any Missouri eastern hellbender, as well as delivering, receiving, carrying, transporting, or shipping any Missouri eastern hellbender in interstate or foreign commerce and in the course of a commercial activity;

(3) Unauthorized destruction or alteration of the DPS' habitat (for example, instream dredging, channelizing, impounding of water, streambank clearing, removing large rocks from or flipping large rocks within streams, discharging fill material) that actually kills or injures individual eastern hellbenders in Missouri by significantly impairing their essential behavioral patterns, including breeding, feeding, or sheltering;

(4) Violation of any discharge or water withdrawal permit within the DPS' occupied range that results in the death or injury of individual eastern hellbenders by significantly impairing their essential behavioral patterns, including breeding, feeding, or sheltering; and

(5) Discharge or dumping of toxic chemicals or other pollutants into waters supporting the DPS that actually kills or injures individual eastern hellbenders by significantly impairing their essential behavioral patterns, including breeding, feeding, or sheltering.

Questions regarding whether specific activities might constitute a violation of section 9 of the Act should be directed to the Missouri Ecological Services Field Office, 101 Park DeVill Drive, Suite A, Columbia, MO 65203; telephone 573-234-2132.

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner seeks or requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement

reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the *Federal Register* on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

Prudency Determination

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12), require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that the designation of critical habitat is not prudent when one or both of the following circumstances exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species.

Designation of critical habitat requires the publication of maps and a narrative description of specific critical habitat areas in the *Federal Register*. The degree of detail

in those maps and boundary descriptions is greater than the general location descriptions provided in this proposal to list the Missouri DPS as endangered. We are concerned that designation of critical habitat would more widely announce the exact locations of eastern hellbenders to collectors. We believe that the publication of maps and descriptions outlining the locations of eastern hellbenders will further facilitate unauthorized collection and trade, as collectors will know the exact locations where eastern hellbenders occur.

The unauthorized collection of eastern hellbenders for the pet trade is a factor contributing to hellbender declines and remains a threat today. Eastern hellbenders are easily collected because they are slow moving and have extremely small home ranges. Therefore, publishing specific location information would provide a high level of assurance that any person going to a specific location would be able to successfully locate and collect specimens given the subspecies' site fidelity and ease of capture once located. For a detailed discussion on the threat of commercial collection, refer to the SSA report (Service 2018, pp. 40–42).

In conclusion, we find that the designation of critical habitat is not prudent for the Missouri DPS of the eastern hellbender, in accordance with 50 CFR 424.12(a)(1), because the eastern hellbender faces a threat of unauthorized collection and trade, and designation can reasonably be expected to increase the degree of these threats to the subspecies.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

National Environmental Policy Act

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*), need not be prepared in connection with listing a species as an endangered or threatened species under the Endangered Species Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951),

Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. We have no records of the Missouri DPS of the eastern hellbender occurring on tribal lands.

References Cited

A complete list of references cited in this proposed rule is available on the Internet at <http://www.regulations.gov> and upon request from the Missouri Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Service's Midwest Regional Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361-1407; 1531-1544; and 4201-4245, unless otherwise noted.

2. Amend § 17.11(h) by adding an entry for “Hellbender, eastern [Missouri DPS]” to the List of Endangered and Threatened Wildlife in alphabetical order under AMPHIBIANS to read as set forth below:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * *				
AMPHIBIANS				
* * * * *				
Hellbender, eastern [Missouri DPS]	<i>Cryptobranchus alleganiensis alleganiensis</i>	Missouri	E	[<i>Federal Register</i> citation when published as a final rule]
* * * * *				

Dated: March 27, 2019

Signed:

Margaret E. Everson
Principal Deputy Director,
Exercising the Authority of the Director,
for the U.S. Fish and Wildlife Service.

Billing Code 4333-15

[FR Doc. 2019-06536 Filed: 4/3/2019 8:45 am; Publication Date: 4/4/2019]