

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R3-ES-2023-0058;  
FF09E21000 FXES1111090FEDR 234]

RIN 1018-BG38

**Endangered and Threatened Wildlife and Plants; Endangered Species Status for Salamander Mussel and Designation of Critical Habitat**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Proposed rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), propose to list the salamander mussel (*Simpsonaias ambigua*), a freshwater mussel species from the United States (Arkansas, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, West Virginia, and Wisconsin) and Canada (Ontario), as an endangered species under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month finding on a petition to list the salamander mussel. After a review of the best available scientific and commercial information, we find that listing the species is warranted. Accordingly, we propose to list the salamander mussel as an endangered species under the Act. We also propose to designate critical habitat for the salamander mussel under the Act. In total, approximately 2,012 river miles (3,238 kilometers) in Indiana, Kentucky, Michigan, Minnesota, New York, Ohio, Pennsylvania, Tennessee, West Virginia, and Wisconsin fall within the boundaries of the proposed critical habitat designation. We announce the availability of a draft economic analysis (DEA) of the proposed designation of critical habitat for the salamander mussel. If we finalize this rule as proposed, it would extend the Act's protections to this species and its designated critical habitat.

**DATES:** We will accept comments received or postmarked on or before October 23, 2023. 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 a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by October 6, 2023.

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

(1) *Electronically:* Go to the Federal eRulemaking Portal: <https://www.regulations.gov>. In the Search box, enter FWS-R3-ES-2023-0058, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on "Comment."

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS-R3-ES-2023-0058, U.S. Fish and Wildlife Service, MS: PRB/3W, 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 <https://www.regulations.gov>. This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

*Availability of supporting materials:* Supporting materials, such as the species status assessment report, are available on the Service's website at <https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua>, at <https://www.regulations.gov> at Docket No. FWS-R3-ES-2023-0058, or both. For the proposed critical habitat designation, the coordinates or plot points or both from which the maps are generated are included in the decision file for this critical habitat designation and are available at <https://www.regulations.gov> at Docket No. FWS-R3-ES-2023-0058 and on the Service's website at <https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua>.

**FOR FURTHER INFORMATION CONTACT:** Scott Hicks, Field Supervisor, U.S. Fish and Wildlife Service, Michigan Ecological Services Field Office, 2651 Coolidge Road, East Lansing, MI 48823; telephone 517-351-2555. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

*Why we need to publish a rule.* Under the Act, a species warrants listing if it meets the definition of an endangered species (in danger of extinction

throughout all or a significant portion of its range) or a threatened species (likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the salamander mussel meets the definition of an endangered species; therefore, we are proposing to list it as such and proposing a designation of its critical habitat. Both listing a species as an endangered or threatened species and designating critical habitat can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

*What this document does.* We propose to list the salamander mussel as an endangered species under the Act, and we propose the designation of critical habitat for the species.

*The basis for our action.* Under the Act, we may determine that a species is an endangered or threatened species because of any of five 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. We have determined that the salamander mussel is endangered due to the following threats: contaminants, hydrological alterations to stream habitat, land use changes, loss of connectivity among populations, and host species' vulnerabilities.

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, to designate critical habitat concurrent with listing. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data

available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

#### Information Requested

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 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 species' biology, range, and population trends, including:

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

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns and the locations of any additional populations of this species or its host;

(d) Historical and current population levels, and current and projected trends for this species or its host; and

(e) Past and ongoing conservation measures for the species, its habitat, or its host.

(2) Threats and conservation actions affecting the species, including:

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

(b) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species.

(c) Existing regulations or conservation actions that may be addressing threats to this species.

(3) Additional information concerning the historical and current status of this species or its host.

(4) Specific information on:

(a) The amount and distribution of salamander mussel habitat;

(b) Any additional areas occurring within the range of the species that should be included in the designation because they (i) are occupied at the time of listing and contain the physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection, or (ii) are unoccupied at the time of listing and are essential for the conservation of the species;

(c) Special management considerations or protection that may be needed in critical habitat areas we are proposing, including managing for the potential effects of climate change; and

(d) Whether occupied areas are adequate for the conservation of the species. This information will help us evaluate the potential to include areas not occupied at the time of listing in the critical habitat designation for the species. Please provide specific information regarding whether or not unoccupied areas would, with reasonable certainty, contribute to the conservation of the species and contain at least one physical or biological feature essential to the conservation of the species. We also seek comments or information regarding whether areas not occupied at the time of listing qualify as habitat for the species.

(5) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(6) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation, and the related benefits of including or excluding specific areas.

(7) Information on the extent to which the description of probable economic impacts in the draft economic analysis is a reasonable estimate of the likely economic impacts and any additional information regarding probable economic impacts that we should consider.

(8) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area outweigh the benefits of including that area under section 4(b)(2) of the Act. If you think we should exclude any additional areas, please provide information supporting a benefit of exclusion.

(9) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

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, do not provide

substantial information necessary to support a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made solely on the basis of the best scientific and commercial data available, and section 4(b)(2) of the Act directs that the Secretary shall designate critical habitat on the basis of the best scientific 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 <https://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 <https://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 <https://www.regulations.gov>.

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as any information that may become available after this proposal. Based on the new information we receive (and, if relevant, any comments on that new information), we may conclude that the species is threatened instead of endangered, or we may conclude that the species does not warrant listing as either an endangered species or a threatened species. For critical habitat, our final designation may not include all areas proposed, may include some additional areas that meet the definition of critical habitat, or may exclude some areas if we find the benefits of exclusion outweigh the benefits of inclusion and exclusion will not result in the extinction of the species. In our final rule, we will clearly explain our rationale and the basis for our final decision, including why we made changes, if any, that differ from this proposal.

#### Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. 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. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the **Federal Register**. The use of virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

#### Previous Federal Actions

We identified the salamander mussel as a “Category 2” candidate in our May 22, 1984, Review of Invertebrate Wildlife for Listing as Endangered or Threatened Species (49 FR 21664). Category 2 candidates were defined as taxa 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 the time. The salamander mussel remained a Category 2 candidate in subsequent candidate notices of review (CNORs) (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 species as candidates; therefore, the salamander mussel was no longer a candidate species.

On April 20, 2010, we received a petition from the Center for Biological Diversity (CBD), Alabama Rivers Alliance, Clinch Coalition, Dogwood Alliance, Gulf Restoration Network, Tennessee Forests Council, and West Virginia Highlands Conservancy, to list 404 aquatic, riparian, and wetland species, including the salamander mussel, from the southeastern United States as endangered or threatened species and to designate critical habitat concurrent with listing under the Act. On September 27, 2011, we published a partial 90-day finding in the **Federal Register** (76 FR 59836), concluding that the petition presented substantial information that indicated listing the salamander mussel may be warranted.

#### Peer Review

A species status assessment (SSA) team prepared an SSA report for the salamander mussel. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future

factors (both negative and beneficial) affecting the species.

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 solicited independent scientific review of the information contained in the SSA report for the salamander mussel. We sent the SSA report to three independent peer reviewers, but we did not receive any responses.

#### I. Proposed Listing Determination Background

The salamander mussel is a small, thin-shelled species of freshwater mussel currently found across 14 U.S. States (Arkansas, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, West Virginia, and Wisconsin) and one Canadian province (Ontario) (see figure 1, below). The salamander mussel inhabits rivers and streams with fairly swift velocities but prefers shelter habitat with space under slab rock/bedrock crevice-type structures that are dark, where they are in contact with a solid surface, and where there is stability from swift current.

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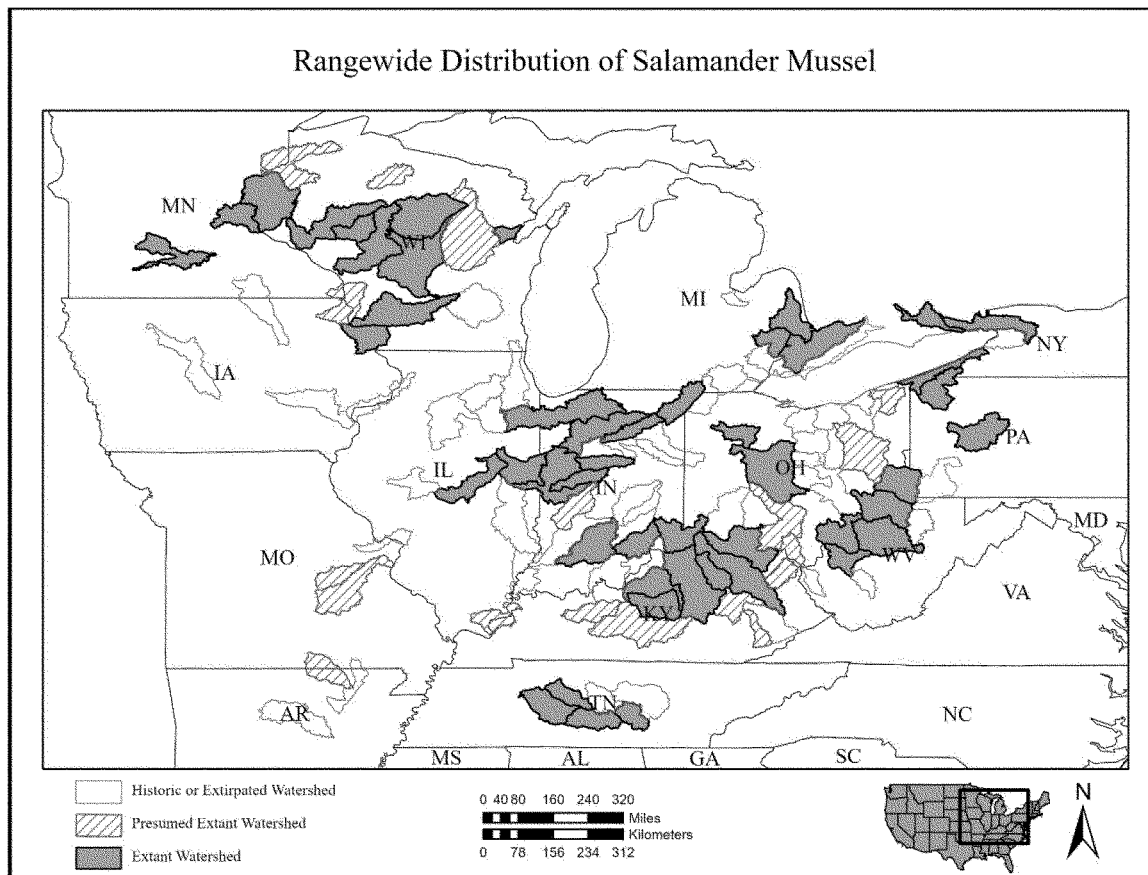


Figure 1. Distribution of all known populations of salamander mussel.

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Similar to other freshwater mussels, the salamander mussel has a unique life cycle that relies on a host for successful reproduction. However, the salamander mussel is the only freshwater mussel in North America to use a non-fish host. The mudpuppy (*Necturus maculosus*), the only host for the salamander mussel, is a fully aquatic salamander species that tends to be present within the same habitat preferred by the salamander mussel during the summer and fall when female mudpuppies are guarding their nests under large flat rocks. The salamander mussel's larvae (called glochidia) develop on the gills of the mudpuppy before falling off into the stream substrate.

Like other freshwater mussels, the salamander mussel feeds on particles, including phytoplankton, zooplankton, rotifers, protozoans, detritus, and dissolved organic matter, in sediments or suspended in the water column. The salamander mussel lives for approximately 10 years. The age of sexual maturity is not known.

A thorough review of the taxonomy, life history, and ecology of the salamander mussel is presented in

detail in the SSA report (Service 2023, pp. 3–10).

**Regulatory and Analytical Framework**

*Regulatory Framework*

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for threatened and endangered species. In 2019, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR part 424 regarding how we add, remove, and reclassify endangered and threatened species and the criteria for designating listed species' critical habitat (84 FR 45020; August 27, 2019). On the same day, the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of

the Act applies to endangered species (84 FR 44753; August 27, 2019).

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 species’ expected response 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.

The Act does not define the term “foreseeable future,” which appears in the statutory definition of “threatened species.” Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term “foreseeable future” extends only so far into the future as we can reasonably determine that both the future threats and the species’ responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. “Reliable” does not mean “certain”; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define the foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species’ likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species’ biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

#### *Analytical Framework*

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be proposed for listing as an endangered or threatened species under the Act. However, it does provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies.

To assess salamander mussel viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation is the ability of the species to adapt to both near-term and long-term changes in its physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species’ ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species’ viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species’ life-history needs. The next stage involved an assessment of the historical and current condition of the species’ demographics and habitat

characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species’ responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at <https://www.regulations.gov> under Docket No. FWS–R3–ES–2023–0058 and at <https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua>.

#### **Summary of Biological Status and Threats**

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species’ current and future condition, in order to assess the species’ overall viability and the risks to that viability.

#### *Species Needs*

We assessed the best available information to identify the physical and biological needs at the individual, population, and species levels for the salamander mussel. Full descriptions of all needs are available in chapter 2 of the SSA report (Service 2023, pp. 3–10). Based upon the best available scientific and commercial information, the resource needs for salamander mussel are characterized as:

- Shelter habitat with flat rocks and bedrock crevices free of excessive silt and fine sediments.
- A hydrologic flow regime (the severity, frequency, duration, and seasonality of discharge over time) that maintains the rock structures and aquatic habitat where the salamander mussel and mudpuppy are found. Adequate flows provide for the exchange of nutrients and sediment; ensure delivery of oxygen; reduce contaminants and fine sediments from interstitial spaces; deliver food to filter-feeding mussels; and enable newly transformed salamander mussel juveniles and young mudpuppies to disperse, settle, and become established. Stream velocity is not static over time, and variations may be attributed to seasonal changes (with higher flows in winter/spring and lower flows in summer/fall), extreme weather events (e.g., drought or floods), or

anthropogenic influence (e.g., flow regulation via impoundments).

- Water and sediment quality, such as (but not limited to) dissolved oxygen above 5 milligrams per liter (mg/L); water temperatures generally below 86 degrees Fahrenheit (°F) (30 degrees Celsius (°C)); concentrations of ammonia, metals, and other pollutants below acute toxicity levels; and an absence of excessive total suspended solids.

- Habitat connectivity (that is, a lack of barriers for passage of mudpuppy hosts and dispersal of mussels).

- The presence and abundance of the mudpuppy host, necessary for recruitment of the salamander mussel.

- Appropriate food sources (phytoplankton, zooplankton, rotifers, protozoans, detritus, and dissolved organic matter) in adequate supply.

#### Threats Analysis

We identified contaminants, hydrological regime, landscape alteration, lack of connectivity, invasive species, and host vulnerability as the primary threats to evaluate for the salamander mussel (Service 2023, pp. 11–17). We also evaluated sedimentation, water temperature, drought, dissolved oxygen, mussel disease, and resource extraction. These threats are summarized below. More detailed information on these threats can be found in appendix B of the SSA report (Service 2023, pp. 81–103).

#### Contaminants

Freshwater mussels are among the most sensitive freshwater species to metals, ammonia, and ion constituents, including copper, sulfate, alachlor, nickel, chloride, sulfate, zinc, and potassium (Wang et al. 2017, pp. 786–796). In particular, freshwater mussels are very sensitive to ammonia (Augspurger et al. 2003, pp. 2569–2575). Ammonia is widespread within the aquatic environment; typical sources include agricultural wastes (animal feedlots and nitrogenous fertilizers), municipal wastewater treatment plants, and industrial waste, as well as precipitation and natural processes, such as decomposition of organic nitrogen (Augspurger et al. 2003, p. 2569; Goudreau et al. 1993, p. 212).

Sources of contaminants can include point (for example, wastewater treatment and industrial effluents, targeted lampricide treatment for management of invasive sea lamprey) and non-point (for example, runoff comprised of fertilizer, pesticide, road salts, grease, and oil) sources resulting from urbanization, agriculture, toxic spills, aquatic invasive species

treatments, and resource extraction and mining (Gillis 2012, pp. 348–356; Gillis et al. 2014, pp. 134–143; Bringolf et al. 2007, pp. 2086–2093; Wang et al. 2017, pp. 786–796; Augspurger et al. 2003, pp. 2569–2575).

All stages of freshwater mussels are directly exposed to contaminants when present in the system. Contaminants have the potential to affect several reproductive early life-history processes, including sperm viability, female fertility or brooding capabilities, and luring or glochidia release behavior (Cope et al. 2008, pp. 451–462). Free glochidia are exposed through surface water (Cope et al. 2008, p. 453). Exposure during encystment may influence the ability of glochidia to successfully transform into juveniles (Cope et al. 2008, pp. 457–458). Adults, however, can be exposed over years through surface water, pore water, sediment, and diet (Cope et al. 2008, pp. 452–453).

#### Sedimentation

Sediment is composed of both organic (biological material) and inorganic (sand, silt, clay) particulate matter formed through various processes including weathering, wind/wave/ice action, and tectonic uplift.

Anthropogenic sources of sediment include agriculture (Peacock et al. 2005, entire), logging (Beschta 1978, entire), mining (Seakem Group et al. 1992, p. 17), urbanization (Guy and Ferguson 1963, entire), and hydrological alteration (Hastie et al. 2001, entire). While all streams carry sediment, alterations in landscape may negatively impact aquatic ecosystems if sediment loads are excessive enough to alter channel formation and/or stream productivity, in turn degrading freshwater biota (USEPA 2007, pp. 2–21; Gammon 1970, entire; Junoy and Viéitez 1990, entire).

Mussel declines have been partially attributed to sedimentation caused by anthropogenic activities (for example, decrease in vegetative and canopy cover and increase in urban and agricultural land) (Peacock et al. 2005, entire; Guy and Ferguson 1963, entire). Increased sedimentation impacts both water quality and quantity, which can have direct and indirect impacts on the survival, reproduction, and growth of freshwater mussel populations (Brim Box and Mossa 1999, entire; Goldsmith et al. 2021, entire; Tuttle-Raycraft and Ackerman 2019, p. 2532; Tokumon et al. 2015, pp. 201–203).

#### Water Temperature and Drought

Alteration to the natural thermal regime of mussels is one of the greatest

threats freshwater ecosystems face today (Caissie 2006, p. 1389). Increased water temperature negatively affects mussel physiological processes (for example, catabolization of protein reserves, fluidity of the cellular membrane, and organ function), disrupting energy balance, growth, and reproduction (Ganser et al. 2015, p. 1706).

#### Dissolved Oxygen

Low dissolved oxygen is a threat to freshwater mussels and is particularly an issue in interstitial waters (waters between sand particles, sediment, and gravel) (Sparks & Strayer 1998, p. 129). Low dissolved oxygen can be caused by excess sedimentation, nutrient loading, organic inputs, changes in flow, and higher temperatures (Sparks & Strayer 1998, p. 129). Alterations to flow directly affect the concentration of dissolved oxygen within a river system (Ganser et al. 2015, p. 17). Adults and juveniles that are buried in the sediment are particularly vulnerable to low dissolved oxygen (Sparks & Strayer 1998, p. 129).

#### Hydrological Regime

Freshwater mussels need flowing water in order to survive. Changes to a river's hydrology and ecological processes can increase or decrease water depths, decrease habitat heterogeneity, decrease substrate stability, block host passage, and isolate mussel populations from hosts, resulting in a reduction or elimination of suitable mussel habitat and interfering with the mussel's reproductive process.

Historical land use change and associated water resource development have altered established patterns of hydrologic variation and associated dynamics of large river systems, resulting in long-term chronic stresses felt decades after their initiation (Zeiringer et al. 2018, p. 70; Pyron et al. 2020, pp. 2, 6). Typical anthropogenic alterations to the naturally occurring hydrology of rivers and streams include construction of dams, water diversions, levees, and other such structures for channelization. Dams directly affect mussels through alterations in flow and habitat (Poff et al. 1997, pp. 772–774). This topic is explored more under “Connectivity,” below.

#### Connectivity

Artificial barriers within streams and rivers (for example, dams, road crossings, water control structures, etc.) pose a great number of threats to freshwater mussels and are considered one of the primary reasons for their decline (Haag 2012, pp. 328–330; Downing et al. 2010, pp. 155–160;

Vaughn and Taylor 1999, p. 915). Artificial barriers affect freshwater mussels through direct effects (such as water temperature and flow changes and habitat alteration) and indirect effects (such as changes to food base and host availability). Hydroelectric dams and similar water control barriers can create additional stressors by fluctuating flows to abnormal levels on a daily basis or at inappropriate times of year (Poff et al. 1997, pp. 772–774). Abnormally high stream flow can displace juvenile mussels and make it difficult for them to attach to the substrate (Holland-Bartels 1990, pp. 331–332; Layzer & Madison 1995, p. 335). Altered flow can destabilize the substrate, which is a critical requirement for mussel bed stability (Di Maio and Corkum 1995, p. 663). Barriers can also exacerbate the effects of drought, resulting in the stranding of mussels and drying of mussel beds (Fisher and LaVoy 1972, pp. 1473–1476).

#### Invasive Species

Invasion of aquatic habitats within the United States by invasive species is one of the leading threats that freshwater ecosystems face, with about 42 percent of endangered and threatened species reported to be significantly affected (NCANSMP 2015, pp. 8–9; Dueñas et al. 2018, p. 3171). When introduced, nonnative species may outcompete (for example, crowd out or replace) native organisms, in turn negatively altering food web and ecosystem dynamics and ultimately severely damaging ecological health (Davis et al. 2000, p. 227). Invasive species can impact native species in a multitude of ways including: (1) native species may become a source of food for invasive species; (2) invasive species may cause or carry diseases; (3) invasive species may prevent native species from reproducing and/or kill the young of native species; and (4) invasive species may outcompete native species for resources (for example, food, space) (Sodhi et al. 2010, p. 318). The invasion of freshwater habitats within the United States has resulted in an imminent threat to mussel fauna within affected regions and is thought to have contributed to the decline of mussel species (Ricciardi et al. 1998, p. 615).

While invasive species do pose a risk to the salamander mussel, given its unique anatomy, habitat it occupies, and its use of a non-fish host, we did not find a plausible situation in which invasive species alone would pose a risk that would affect salamander mussels at the population level. See the SSA report (Service 2023, p. 24, appendices B and C) for more information on each

identified invasive species and the risk posed to the salamander mussel.

#### Host Species Vulnerability

Mudpuppies are susceptible to many of the same threats that affect mussels, including contaminants, habitat degradation and fragmentation, lack of water quality and quantity, known disease issues or die-offs, and potential overharvest and collection. These threats negatively impact the abundance, distribution, and survival of mudpuppies. The conservation status of the mudpuppy varies across the 14 U.S. States where the mudpuppy's range overlaps with the salamander mussel's range. Therefore, it is difficult to determine what effect these activities are having at the population level for the mudpuppy. Regardless, the magnitude of these factors has the potential to have a significant localized impact on the abundance and distribution of mudpuppies, thereby directly impacting the health and status of the salamander mussel.

#### Mussel Disease

Enigmatic declines and large-scale die-offs of mussel assemblages within otherwise healthy streams across large geographic regions have emerged as a very concerning risk factor (Haag and Williams 2014, pp. 45–60; Haag 2019, pp. 43–60; Waller and Cope 2019, pp. 26–42). Little is known about mussel health, including the role of microbiota and pathogens in mussel health, which makes it very difficult to understand how these factors may be impacting freshwater mussel populations. We are not aware of any diseases that are causing die-offs or declines of salamander mussel populations.

#### Resource Extraction

We identified the effects of coal mining and oil and gas exploration and extraction as potential catastrophic events that could negatively affect a large portion of the species' range at any given point in time.

Coal mining has the potential to result in accidental spills and contaminant runoff. Acid mine and saline drainage (AMD) is a major threat to aquatic ecosystems although the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 *et seq.*) has played a significant role in reducing AMD during mining operations. Catastrophic events, such as black water release events and fly-ash spills, have occurred in some river systems (for example, upper Tennessee River), resulting in the extirpation of mussel populations within the watershed (Ahlstedt et al. 2016, p. 8). Impacts from coal mining

may result in direct mortality due to acute toxicity of introduced contaminants and may reduce growth and reproduction, leading to population-level changes in the form of local extirpations or significant population declines.

Oil and gas exploration and extraction can result in accidental spills, discharges, and increased sedimentation. Discharge of untreated or poorly treated brine wastewater and inadvertent release during drilling of frack fluids high in chlorides and other chemicals can result in conditions that are acutely toxic to mussels (Patnode et al. 2015, p. 62). Excess sedimentation results when there is bank slippage and mudslides during pipeline construction, open trenching operations, construction of access roads, and construction of well pads (Ellis 1936, p. 29; Anderson & Kreeger 2010, p. 2). Excessive suspended sediments and contaminants resulting from inadvertent releases or runoff can be acutely toxic, result in sublethal effects (such as impaired feeding processes), and degrade and destroy suitable habitat for mussels.

#### Cumulative and Synergistic Effects

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed the cumulative effects of identified threats and conservation actions on the species. To assess the current and future condition of the species, we evaluate the effects of all the relevant factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative effects analysis.

#### Current Condition

Survey data were provided by State agencies and researchers across the range of the salamander mussel. The occurrence data provided varied across States, depending on level of survey effort (Service 2023, p. 21).

We delineated populations based on the hydrologic unit code (HUC) (Seaber et al. 1987, entire; U.S. Geological Survey 2018, entire) at the fourth of six levels (that is, the HUC–8 watershed). We defined a population as extant if it contains live, fresh dead, or weathered individuals observed in surveys from 2000 to the present (Service 2023, p. 20). We classified weathered dead collections as an indicator of extant



populations because the salamander mussel is a thin-shelled species and weathered dead shells are not expected to persist in a system for an extended time. We defined a population as presumed extant if it contained live, fresh dead, or weathered individuals observed in surveys from 1970 to 1999 (Service 2023, p. 20). We note that for some of these records a single observation of an individual in any condition can be considered an extant or presumed extant population depending on the observation year (Service 2023, p. 20).

Current conditions are described using categories that estimate the overall condition (resiliency) of the salamander mussel populations. We assessed demographic population condition for the small number of populations for which we have demographic data (Service 2023, pp. 22–23). We categorized the demographic condition of each population as high, moderate, low, or functionally extirpated based on demographic criteria. Functionally extirpated populations were defined as populations that are still extant but have fewer than 10 live individuals observed within the last 20 years. For most populations, we have data only from incidental observations that would not allow us to evaluate population health. We categorized these populations as unknown demographic condition.

To calibrate the meanings of the demographic condition categories in terms of a population's ability to withstand demographic stochastic events, we assigned an estimate of the probability of persistence over 20 years for each category (Service 2023, pp. 22–23). Similarly, we also assigned a probability of persistence over 20 years to each of the three risk categories, described below. This allowed us to project a population's condition in 20 years, based on its current demographic population condition and risk category.

We also evaluated the six primary risk factors affecting the salamander mussel (contaminants, hydrological regime, landscape, connectivity, invasive species, and host species vulnerability) to assist in evaluating the current condition of each extant population. We assigned these risk factors to three categories of high, moderate, and low risk (Service 2023, p. 23). In addition, we assigned the potential catastrophic events (described above under Resource Extraction) as low if no known activities were present in the HUC8 or high if activities were known to be present in the HUC8.

Historically, the species occurred in 110 populations. Of those, 66 populations are considered extant or

presumed extant. Of these 66 populations, 48 (73 percent) are in unknown demographic condition. Of the 18 populations for which we have demographic information, 9 are considered functionally extirpated, 6 are in low condition, and 3 are in moderate or high condition. In addition, more than 80 percent of the 66 populations are at high risk from one or more of the primary risk factors, and approximately 14 percent of the populations are at moderate risk. None of the populations across the range are experiencing low risk. We did not have information to complete the risk factor analysis for three populations that cross the border with Canada.

To evaluate the species' genetic and ecological diversity (representation) in the absence of species-specific genetic information, we considered the extent and variability of environmental conditions within the species' geographic range. Based on the best available data, we identified five representation units at the HUC-2 watershed level: Upper Mississippi, Ohio, Tennessee, Great Lakes, and Arkansas-White-Red basins. The species currently ranges across all five representation units, but the Ohio, Upper Mississippi, and Great Lakes basins make up the core area for the salamander mussel.

The number of populations in the Ohio and Upper Mississippi basins has declined by almost 40 percent, while the number of Great Lakes basin populations has declined by 45 percent. The Ohio River basin has 35 extant or presumed extant populations; of these, 27 are at high risk from one or more of the primary risk factors, including contaminants (26 populations) and landscape alterations (7 populations). The Upper Mississippi basin has 17 extant or presumed extant populations, all of which are at high risk from contaminants. Nine are also at high risk from host vulnerability, and five are at high risk from lack of connectivity. The Great Lakes basin has eight extant or presumed extant populations with risk analyses completed. Seven populations are at high risk from contaminants, four are at high risk from landscape alterations, and four are at high risk from host vulnerability. We did not have information to complete the analyses for three extant populations that cross the border with Canada. The Arkansas-White-Red basin historically had only three populations, one of which is presumed extant and is at high risk from lack of connectivity. Salamander mussels have not been observed in the Arkansas-White-Red basin in the last two decades. Both of

the known populations in the Tennessee basin are extant, one of which has had salamander mussels introduced in the last two decades. Both populations are at high risk from lack of connectivity and host vulnerability, and one is also at high risk from contaminants.

We evaluated the effect of the risk factors on each population, given its current condition. Of the 18 populations for which we have demographic condition, we were able to evaluate 16 of those. (We could not evaluate risk condition for the two populations with demographic data that are within Canada.) Of those 16 populations, 11 (approximately 70 percent) would be extirpated within 20 years due to current risks, 3 would be functionally extirpated (approximately 18 percent), and 2 would be in low condition (approximately 12 percent). Of the 48 populations with unknown demographic condition, 43 are experiencing high risk. At best, these populations would be in low condition in 20 years if they all were in high demographic condition currently, which is unlikely. If we assume these unknown populations follow the pattern of the populations for which we have data, 9 (18 percent) would be functionally extirpated and 34 (70 percent) would be extirpated.

With few populations that are all at high risk, the Great Lakes, Tennessee, and Arkansas-White-Red representation units are all at risk of extirpation. Although the Upper Mississippi representation unit has 17 populations, all of them are at high risk, putting the unit at risk of extirpation. The Ohio basin is the only representation unit with populations experiencing moderate risk.

In addition, 98.5 percent of the 66 extant and presumed extant populations are at high risk of a potential catastrophic event from oil and gas or coal activities. Further, 23 extant and presumed extant populations are known from a single record or couple of records of occupied river extent, making these populations more susceptible to extirpation from catastrophic events.

#### *Future Conditions*

As part of the SSA, we also developed two future condition scenarios to capture the range of uncertainties regarding future threats and the projected responses by the salamander mussel. Our scenarios project an upper and lower bound to plausible changes to contaminant levels, landscape cover, hydrological regime, connectivity, invasive species, and host species vulnerability. Because we determined that the salamander mussel is currently



in danger of extinction (see Determination of Salamander Mussel's Status, below), we are not presenting the results of the future scenarios in this proposed rule. Please refer to the SSA report (Service 2023, pp. 44–51, 145–187) for the full analysis of future scenarios.

#### *Conservation Efforts and Regulatory Mechanisms*

Captive propagation is an important tool that is being used to augment and reintroduce salamander mussel populations in Pennsylvania, West Virginia, Wisconsin, and Kentucky. Two of the Service's National Fish Hatcheries (Genoa and White Sulfur Springs) are actively propagating salamander mussel as well as other mussel species for conservation and recovery. In addition, several State wildlife agencies have developed mollusk conservation propagation programs, including the Kentucky Department of Fish and Wildlife Resources that established the Center for Mollusk Conservation in 2002 and have been propagating salamander mussel and other mollusks to aid conservation. These conservation propagation efforts have been critical in contributing significant conservation benefits to imperiled salamander mussel populations as well as enhancing our understanding of salamander mussel and mudpuppy reproduction and life history. These programs will continue to be an important conservation tool into the future for salamander mussel and mudpuppy conservation.

Efforts to construct artificial mudpuppy habitats have been undertaken in several waterbodies, including in the Allegheny River in Pennsylvania (Welte 2020, entire); in the Detroit and St. Clair rivers, Lake St. Clair, and Lake Erie in Michigan (Stapleton et al. 2018, entire); and at Guttenberg, Iowa (Hanson 2021, pers. comm.). Mudpuppies have been observed using the constructed habitat within the first 6 months of installation (Hanson 2021, pers. comm.). In Pennsylvania, one live salamander mussel was observed under an artificial structure. No mudpuppies were observed, but silt may have obscured escaping mudpuppies during monitoring (Welte 2020, entire). In Michigan, mudpuppies were observed at two recent restoration sites where mudpuppies had not previously been detected, indicating that efforts to create mudpuppy artificial habitat have been successful (Stapleton et al. 2018, entire).

The salamander mussel is listed as endangered under State laws in Illinois, Michigan, Minnesota, and Pennsylvania and as threatened under State laws in

Ohio and Wisconsin. The salamander mussel is also listed as endangered in Canada under the Federal Species at Risk Act. In addition, the mudpuppy is listed as threatened under State laws in Illinois and Iowa.

Section 404 of the Clean Water Act (CWA) prohibits the discharge of dredged or fill material in jurisdictional waters of the United States unless permitted by the U.S. Army Corps of Engineers (USACE) or unless the discharge is exempt from regulation as designated in section 404(f). Section 402 of the CWA regulates activities affecting water quality. Under the National Pollutant Discharge Elimination System (NPDES), discharge of pollutants into navigable waters requires a permit from the U.S. Environmental Protection Agency (USEPA) or a State-authorized program.

The USEPA also oversees the CWA triennial review (Section 303(c)(1)), water quality standards (section 303(c)(3)), impaired waters (section 303(d)), and the NPDES programs (section 402). The USEPA's responsibility under the triennial review is to encourage the States to hold public hearings for the purpose of reviewing applicable water quality standards, and, as appropriate, modifying or adopting the State water quality standards (*i.e.*, water body uses, numeric criteria, narrative criteria, and anti-degradation policy). The USEPA's responsibility under the water quality standards program is to determine if any water quality standards submitted by the State as a new or revised standard meets the requirements of the CWA.

Freshwater mussels are among the most sensitive freshwater species to metals, ammonia, and ion constituents, including copper, sulfate, alachlor, nickel, chloride, sulfate, zinc, and potassium (Wang et al. 2017, pp. 786–796). The USEPA has water quality criteria for six of the 10 chemicals tested in Wang et al. (2017, pp. 186–796). If the minimum data requirement for deriving water quality criteria required the inclusion of freshwater mussels, then water quality criteria would capture the high sensitivity of freshwater mussels to many chemicals and different exposure pathways (Wang et al. 2017, p. 795).

#### **Determination of Salamander Mussel's Status**

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 meets the definition of an endangered species or a threatened species. The Act defines an "endangered species" as a species in danger of extinction throughout all or a

significant portion of its range, and a "threatened species" as a species 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 a species meets the definition of 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.

#### *Status Throughout All of Its Range*

After evaluating threats to the species and assessing the cumulative effect of the threats under the Act's section 4(a)(1) factors, we determined that the salamander mussel has experienced a 40 percent reduction in the number of populations from historical conditions. Historically, the species occurred within 110 populations and currently occurs in 66 populations.

Of the 18 populations for which we have demographic information, 9 are considered functionally extirpated, 6 are in low condition, 2 are in moderate condition, and 1 is in high condition. Of these 18 populations, 11 (approximately 70 percent) would be extirpated within 20 years due to current risks, 3 would be functionally extirpated (approximately 18 percent), and 2 would be in low condition (approximately 12 percent). (We could not evaluate risk condition for the two populations with demographic data that are within Canada.) Of the 48 populations with unknown demographic condition, 43 are experiencing high risk. At best, these populations would be in low condition in 20 years if they all were in high demographic condition currently, which is unlikely. In addition, 23 of these populations are known from a single record or couple of records and may be at higher risk than presumed. Based on survey data, it is unlikely that meaningful numbers of individuals or populations have not been identified. Further, more than 80 percent of all populations are at high risk from contaminants, hydrological alteration, land use changes, loss of connectivity (Factor A), or host species' vulnerabilities (Factor E). These current and ongoing threats put the majority of the remaining populations at risk of reduced resiliency and potential extirpation, and the existing regulatory

mechanisms (Factor D) are not adequately reducing the impact of these threats on the species. Although all five representation units are still extant, the populations are concentrated in three units (Ohio, Upper Mississippi, and Great Lakes), and of these, the Ohio basin is the only representation unit with populations at moderate risk. With few populations that are all at high risk, three of the representation units are at risk of extirpation. Redundancy is reduced from historical conditions, and a high percentage (98.5 percent) of the remaining populations are at high risk of experiencing a potential catastrophic event. The biological status of the salamander mussel is exacerbated by having only one host, which also has habitat limitations and is vulnerable to risk factors.

Overall, most of the remaining populations are subject to high risk from current and ongoing threats, including contaminants, landscape alterations, lack of connectivity, and host vulnerability; and are likely unable to withstand potential catastrophic events from accidental spills, discharges, and increased sedimentation related to oil and gas exploration and extraction; and are projected to be in low condition or functionally extirpated within 20 years due to these current and ongoing threats. Thus, after assessing the best available information, we determine that the salamander mussel is in danger of extinction throughout all of its range.

Our analysis of the species' current condition and ongoing threats of contaminants, landscape alterations, lack of connectivity, and host vulnerability, as well as the conservation efforts and regulatory mechanisms discussed above, shows that the salamander mussel is in danger of extinction throughout all of its range due to the severity and immediacy of threats currently impacting the species. We find that a threatened species status is not appropriate for the salamander mussel because the threats that the species is experiencing are already occurring across the species' range. Therefore, the species is currently in danger of extinction throughout its range.

#### *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 within the foreseeable future throughout all or a significant portion of its range. We have determined that the salamander mussel is in danger of extinction throughout all of its range and accordingly did not

undertake an analysis of any significant portion of its range. Because the salamander mussel warrants listing as endangered throughout all of its range, our determination does not conflict with the decision in *Center for Biological Diversity v. Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), which vacated the provision of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578; July 1, 2014) providing that if the Service determines that a species is threatened throughout all of its range, the Service will not analyze whether the species is endangered in a significant portion of its range.

#### *Determination of Status*

Our review of the best available scientific and commercial information indicates that the salamander mussel meets the Act's definition of an endangered species. Therefore, we propose to list the salamander mussel as an endangered species in accordance with sections 3(6) 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 as a listed species, planning and implementation of 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, including the Service, 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. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. 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.

The recovery planning process begins with development of a recovery outline made available to the public soon after a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions while a recovery plan is being developed. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) may be established to develop and implement recovery plans. The recovery planning process involves the identification of actions that are necessary to halt and reverse the species' decline by addressing the threats to its survival and recovery. The recovery plan identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened ("downlisting") or removal from protected status ("delisting"), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery outline, draft recovery plan, final recovery plan, and any revisions will be available on our website as they are completed (<https://www.fws.gov/program/endangered-species>), or from our Michigan Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires 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 this species is listed, funding for recovery actions will 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 States of Arkansas, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, New York, Ohio,

Pennsylvania, Tennessee, West Virginia, and Wisconsin would be eligible for Federal funds to implement management actions that promote the protection or recovery of the salamander mussel. Information on our grant programs that are available to aid species recovery can be found at: <https://www.fws.gov/service/financial-assistance>.

Although the salamander mussel 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 species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7 of the Act is titled Interagency Cooperation and mandates all Federal action agencies to use their existing authorities to further the conservation purposes of the Act and to ensure that their actions are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat. Regulations implementing section 7 are codified at 50 CFR part 402.

Section 7(a)(2) states that each Federal action agency shall, in consultation with the Secretary, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Each Federal agency shall review its action at the earliest possible time to determine whether it may affect listed species or critical habitat. If a determination is made that the action may affect listed species or critical habitat, formal consultation is required (50 CFR 402.14(a)), unless the Service concurs in writing that the action is not likely to adversely affect listed species or critical habitat. At the end of a formal consultation, the Service issues a biological opinion, containing its determination of whether the Federal action is likely to result in jeopardy or adverse modification.

In contrast, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Although the conference procedures are required only when an action is likely to result in jeopardy or adverse modification, action agencies may voluntarily confer with the Service

on actions that may affect species proposed for listing or critical habitat proposed to be designated. In the event that the subject species is listed or the relevant critical habitat is designated, a conference opinion may be adopted as a biological opinion and serve as compliance with section 7(a)(2).

Examples of discretionary actions for the salamander mussel that may be subject to conference and consultation procedures under section 7 are land management or other landscape-altering activities on Federal lands administered by U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, U.S. Army Corps of Engineers, and Federal Energy Regulatory Commission, and as well as actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Federal agencies should coordinate with the local Service Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

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 commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following: (1) import endangered wildlife to, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) endangered wildlife within the United States or on the high seas; (3) possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. Certain exceptions to these prohibitions apply to employees or agents 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 for endangered wildlife are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued: for scientific purposes, for enhancing the propagation or survival of the species, or for take incidental to otherwise lawful activities. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is the policy of the Services, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify, to the extent known at the time a species is listed, specific activities that will not be considered likely to result in violation of section 9 of the Act. To the extent possible, activities that will be considered likely to result in violation will also be identified in as specific a manner as possible. 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.

As discussed above, certain activities that are prohibited under section 9 may be permitted under section 10 of the Act. In addition, to the extent currently known, the following activities would not be considered likely to result in violation of section 9 of the Act:

- (1) Normal agricultural and silvicultural practices that utilize best management practices to minimize runoff and erosion;
- (2) Normal livestock grazing and other standard ranching activities within riparian zones that do not destroy or significantly degrade salamander mussel habitat;
- (3) Routine implementation and maintenance of agricultural conservation practices specifically designed to minimize erosion of cropland (e.g., terraces, dikes, grassed waterways, and conservation tillage);
- (4) Existing discharges into waters supporting the salamander mussel, provided these activities are carried out in accordance with existing regulations and permit requirements (e.g., activities subject to sections 402, 404, and 405 of the Clean Water Act);
- (5) Improvements to existing irrigation, livestock, and domestic well structures, such as renovations, repairs, or replacement; and
- (6) Normal residential landscaping activities.

This list is intended to be illustrative and not exhaustive; additional activities that would not be considered likely to result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (e.g., with new information), the Service may conclude that one or more activities identified here would be considered likely to result in violation of section 9.

To the extent currently known, the following is a list of examples of activities that would be considered likely to result in violation of section 9 of the Act in addition to what is already clear from the descriptions of the prohibitions found at 50 CFR 17.21:

(1) Modification of the river channel or water flow of any stream that supports salamander mussel;

(2) Unauthorized discharges (including violation of discharge permits), spills, or dumping of chemicals, fill material, or other pollutants (e.g., sewage, oil and gasoline, heavy metals) into any waters or their adjoining riparian areas that support or sustain salamander mussel;

(3) Livestock grazing that results in direct or indirect destruction of stream habitat that supports salamander mussel;

(4) Applications of pesticides, herbicides, fungicides, and other chemicals, including fertilizers, in violation of label restrictions;

(5) Withdrawal of surface or ground waters to the point at which baseflows in water courses occupied by the salamander mussel diminish and habitat becomes unsuitable for the species;

(6) Unauthorized collecting of mudpuppies in waters occupied by the salamander mussel; and

(7) Introduction of nonnative species of salamanders that may be vectors of diseases that affect mudpuppies in waters occupied by the salamander mussel.

This list is intended to be illustrative and not exhaustive; additional activities that would be considered likely to result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (e.g., with new or site-specific information), the Service may conclude that one or more activities identified here would not be considered likely to result in violation of section 9. Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Michigan Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

## II. 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.

Our regulations at 50 CFR 424.02 define the geographical area occupied by the species as an area that may generally be delineated around species' occurrences, as determined by the Secretary (i.e., range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals).

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 also 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. Rather, designation requires that, where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the Federal agency consult with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal agency would have already been required to consult with the Service even absent the designation because of the requirement to ensure that the action is not likely to jeopardize the continued existence of the species. Even if the Service were to conclude after consultation that the proposed activity is likely to result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement "reasonable and prudent alternatives" to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in 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.

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.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information from the SSA report and information developed during the listing process for the species. Additional information sources may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of the species.

Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of those planning efforts calls for a different outcome.

**Physical or Biological Features Essential to the Conservation of the Species**

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas we will designate as critical habitat from within the geographical area occupied by the species at the time of listing, we consider the physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection. The regulations at 50 CFR 424.02 define “physical or biological features essential to the conservation of the species” as the features that occur in specific areas and that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features essential to the conservation of the species might include gravel of a particular size required for spawning, alkaline soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or absence of a particular level of nonnative species consistent with conservation needs of

the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

In considering whether features are essential to the conservation of the species, we may consider an appropriate quality, quantity, and spatial and temporal arrangement of habitat characteristics in the context of the life-history needs, condition, and status of the species. These characteristics include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing (or development) of offspring; and habitats that are protected from disturbance.

As described above under Summary of Biological Status and Threats, the salamander mussel occurs in rivers and streams with flat rocks or bedrock crevices. Once released from their mudpuppy host, salamander mussels are benthic (bottom-dwelling) organisms closely associated with appropriate habitat patches within a river or stream. Among mussel species, salamander mussel is a highly mobile and active mussel species with the capability to move to more suitable habitat; however, interaction among individuals in different river reaches is strongly influenced by the presence of barriers, habitat fragmentation, and the distance between occupied river or stream reaches.

The primary habitat elements that influence resiliency of the salamander mussel include substrate/shelter habitat, water quantity/flow, water quality, habitat connectivity, and the presence of the mudpuppy host to ensure recruitment. These features are also described above as species needs under Summary of Biological Status and Threats, and a full description is available in the SSA report. The individuals' needs are summarized below in table 1.

TABLE 1—REQUIREMENTS FOR LIFE STAGES OF THE SALAMANDER MUSSEL

Life stage	Resources needed to complete life stage	Source
Fertilized eggs ..... —late spring to summer	<ul style="list-style-type: none"> <li>• Clear, flowing water .....</li> <li>• Sexually mature males in proximity to sexually mature females</li> <li>• Appropriate spawning temperatures.</li> </ul>	Berg et al. 2008, p. 397; Haag 2012, pp. 38–39.

TABLE 1—REQUIREMENTS FOR LIFE STAGES OF THE SALAMANDER MUSSEL—Continued

Life stage	Resources needed to complete life stage	Source
Glochidia —late summer released from female marsupial gills —develop on host fall to early spring .....	<ul style="list-style-type: none"> <li>• Clear, flowing water .....</li> <li>• Presence of mudpuppy (host) for attachment.</li> <li>• Flow to ensure glochidia encounter host</li> </ul>	Strayer 2008, p. 65; Haag 2012, pp. 41–42; Clarke 1985, pp. 60–68.
Juveniles —excystment (juveniles drop off from host)	<ul style="list-style-type: none"> <li>• Clear, flowing water.</li> <li>• Host dispersal.</li> <li>• Appropriate interstitial chemistry: low salinity; high dissolved oxygen; absence of or non-toxic levels of contaminants, including ammonia, copper, chloride, and sulfate.</li> <li>• Flat rocks and bedrock that provide crevices for shelter.</li> </ul>	Dimock and Wright 1993, pp. 188–190; Sparks and Strayer 1998, p. 132; Augspurger et al. 2003, p. 2574; Augspurger et al. 2007, p. 2025; Strayer and Malcom 2012, pp. 1787–1788.
Adults ..... —greater than 0.8 in (20 mm) shell length ....	<ul style="list-style-type: none"> <li>• Clear, flowing water .....</li> <li>• Flat rocks and bedrock that provide crevices for shelter.</li> <li>• Adequate food availability (phytoplankton and detritus).</li> <li>• High dissolved oxygen.</li> <li>• Appropriate water temperature.</li> </ul>	Yeager et al. 1994, p. 221; Nichols and Garling 2000, p. 881; Chen et al. 2001, p. 214; Spooner and Vaughn 2008, p. 308.

*Summary of Essential Physical or Biological Features*

We derive the specific physical or biological features essential to the conservation of the salamander mussel from studies of the species’ habitat, ecology, and life history as described below. Additional information can be found in the SSA report (Service 2023, pp. 3–10; available on <https://www.regulations.gov> under Docket No FWS–R3–ES–2023–0058). We have determined that the following physical or biological features are essential to the conservation of salamander mussel:

(1) Adequate flows, or a hydrologic flow regime (magnitude, timing, frequency, duration, rate of change, and overall seasonality of discharge over time), necessary to maintain benthic habitats where the salamander mussel and its host, the mudpuppy, are found and to maintain stream connectivity.

(2) Suitable substrates and connected instream habitats, characterized by geomorphologically stable stream channels and banks (*i.e.*, channels that maintain lateral dimensions, longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support the salamander mussel and mudpuppy (*e.g.*, large rock shelters, woody debris, and bedrock crevices within stable zones of swift current with low amounts of fine sediment silt).

(3) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages, including (but not limited to) dissolved oxygen (generally above 2 to 3 parts per million (ppm)), salinity (generally below 2 to 4 ppm), and

temperature (generally below 86 °F (°F) (30° Celsius (°C))). Additionally, concentrations of contaminants, including (but not limited to) ammonia, nitrate, copper, and chloride, are below acute toxicity levels for mussels.

(4) The presence and abundance of the mudpuppy host.

**Special Management Considerations or Protection**

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the salamander mussel may require special management considerations or protections to reduce the following threats: (1) Alteration of the natural flow regime (modifying the natural hydrograph and seasonal flows), including water withdrawals, resulting in flow reduction and available water quantity; (2) urbanization of the landscape, including (but not limited to) land conversion for urban and commercial use, infrastructure (pipelines, roads, bridges, utilities), and urban water uses (resource extraction activities, water supply reservoirs, wastewater treatment, etc.); (3) significant alteration of water quality and nutrient pollution from a variety of activities, such as industrial and municipal effluents, mining, and agricultural activities; (4) land use activities that remove large areas of forested wetlands and riparian systems; (5) dam construction and culvert and

pipe installation that create barriers to movement for the salamander mussel or its mudpuppy host; and (6) other watershed and floodplain disturbances that release sediments, pollutants, or nutrients into the water.

Management activities that could ameliorate these threats include, but are not limited to: Use of best management practices designed to reduce sedimentation, erosion, and bank destruction; protection of riparian corridors and woody vegetation; moderation of surface and ground water withdrawals to maintain natural flow regimes; improved stormwater management; and reduction of other watershed and floodplain disturbances that release sediments, pollutants, or nutrients into the water.

In summary, we find that the occupied areas we are proposing to designate as critical habitat contain the physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection. Special management considerations or protection may be required of the Federal action agency to eliminate, or to reduce to negligible levels, the threats affecting the physical and biological features of each unit.

**Criteria Used To Identify Critical Habitat**

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical

area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat. We are not currently proposing to designate any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that meet the definition of critical habitat and we have determined that occupied areas are sufficient to conserve the species.

#### *Methodology Used for Selection of Proposed Units*

First, we included all extant populations with records of live or fresh dead individuals. These populations could be used for recovery actions to re-establish populations within basins through propagation activities or augment other populations through direct translocations within their basins. We defined a population as extant if it contains individuals observed in surveys from 2000 to the present (Service 2023, p. 20). We did not include presumed extant populations (those with individuals observed in surveys from 1970 to 1999 (Service 2023, p. 20)) or extant populations represented only by weathered or sub-fossil shells due to the level of uncertainty regarding the biological status of those populations and their contribution to recovery of the species. Then, we evaluated the river systems in which the extant populations occur and consulted with local experts to identify those areas that provide suitable salamander mussel habitat.

Sources of data for this proposed critical habitat designation include information from State agencies throughout the species' range and numerous survey reports on streams throughout the species' range (Service 2023, entire). We have also reviewed available information that pertains to the habitat requirements of the species. Sources of information on habitat requirements include studies conducted at occupied sites and published in peer-reviewed articles, agency reports, and data collected during monitoring efforts (Service 2023, entire).

In summary, for areas within the geographic area occupied by the species at the time of listing, we delineated critical habitat unit boundaries using the following criteria:

(1) We identified river and stream reaches with observations from 2000 to the present. We determined it is reasonable to find these areas occupied, given the incomplete survey data for the salamander mussel across its range. Available State heritage databases and information support the likelihood of

the species' continued presence in these areas within this timeframe.

(2) We delineated specific habitat areas, based on Natural Heritage Element Occurrences, published reports, and unpublished survey data provided by States. These areas provide habitat for salamander mussel populations and are large enough to be self-sustaining over time, despite fluctuations in local conditions. The areas within the proposed units represent continuous river and stream reaches of free-flowing habitat patches capable of sustaining mudpuppy hosts and allowing for seasonal transport of glochidia, which are essential for reproduction and dispersal of salamander mussel.

We consider portions of the following rivers and streams to be occupied by the salamander mussel at the time of proposed listing, and appropriate for critical habitat designation: Allegheny River, Beech Fork River, Black River, Blanchard River, Big Pine Creek, Chippewa River, Clinton River, Conneaut Creek, Drennon Creek, Duck River, East Fork White River, Eau Claire River, Fish Creek (Indiana), Fish Creek (West Virginia), Fishing Creek, French Creek, Graham Creek, Harpeth River, Kinniconick Creek, Laughery Creek, Lemonweir River, Licking River, Little Kanawha River, Middle Fork Wildcat Creek, Middle Island Creek, Mill Creek, North Branch Pensaukee River, North Fork Licking River, Otter Creek, Rolling Fork River, South Fork Hughes River, South Fork Licking River, St. Croix River, Tippecanoe River, Tonawanda Creek, and Wisconsin River.

When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the salamander mussel. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We propose to designate as critical habitat lands that we have determined are occupied at the time of listing (*i.e.*, currently occupied) and that contain one or more of the physical or biological features that are essential to support life-history processes of the species.

Thirty-seven units are proposed for designation based on one or more of the physical or biological features being present to support the salamander mussel's life-history processes. All units contain one or more of the physical or biological features necessary to support the salamander mussel's particular use of that habitat.

The proposed critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on <https://www.regulations.gov> at Docket No. FWS-R3-ES-2023-0058 and on our internet site <https://www.fws.gov/species/salamander-mussel-simpsonias-ambigua>.

#### **Proposed Critical Habitat Designation**

We are proposing approximately 2,012 river miles (3,238 kilometers (km)) in 37 units as critical habitat for the salamander mussel. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for salamander mussel. The 37 areas we propose as critical habitat are: (1) St. Croix River, (2) Chippewa River, (3) Eau Claire River, (4) Black River, (5) Wisconsin River North, (6) North Branch Pensaukee River, (7) Lemonweir River, (8) Wisconsin River South, (9) Big Pine Creek, (10) Middle Fork Wildcat Creek, (11) Tippecanoe River, (12) Fish Creek (Indiana), (13) Blanchard River, (14) Clinton River, (15) Mill Creek, (16) Tonawanda Creek, (17) Conneaut Creek, (18) French Creek, (19) Allegheny River, (20) Fish Creek (West Virginia), (21) Fishing Creek, (22) Middle Island Creek, (23) Little Kanawha River, (24) South Fork Hughes River, (25) Kinniconick Creek, (26) North Fork Licking River, (27) Licking River, (28) South Fork Licking River, (29) Drennon Creek, (30) Laughery Creek, (31) Otter Creek, (32) Graham Creek, (33) East Fork White River, (34) Beech Fork River, (35) Rolling Fork River, (36) Harpeth River, and (37) Duck River. Table 2 shows the proposed critical habitat units, the



approximate area of each unit, and the State(s) where each unit is located. All units are occupied by the species.

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR THE SALAMANDER MUSSEL  
[Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Adjacent riparian land ownership by type	Size of unit in river miles (kilometers)	State(s)
1. St. Croix River	Public (Federal, State)	28.85 (46.43)	MN, WI
	Private	24.08 (38.76)	
2. Chippewa River	Public (Federal, State, local)	34.04 (54.77)	WI
	Private	25.20 (40.56)	
3. Eau Claire River	Public (local)	4.23 (6.81)	WI
	Private	3.17 (5.10)	
4. Black River	Public (Federal, State, local)	35.71 (57.47)	WI
	Private	39.67 (63.84)	
5. Wisconsin River North	Public (State, local)	4.11 (6.62)	WI
	Private	17.08 (27.48)	
6. North Branch Pensauee River	Public (State, local)	1.24 (2.00)	WI
	Private	18.69 (30.08)	
7. Lemonweir River	Public (local)	2.11 (3.40)	WI
	Private	35.39 (56.96)	
8. Wisconsin River South	Public (Federal, State, local)	102.78 (165.40)	WI
	Private	50.10 (80.63)	
9. Big Pine Creek	Public (State)	1.30 (2.09)	IN
	Private	49.93 (80.35)	
10. Middle Fork Wildcat Creek	Private	35.70 (57.46)	IN
11. Tippecanoe River	Public (State)	7.43 (11.95)	IN
	Private	116.83 (188.01)	
12. Fish Creek (IN)	Public (State)	1.02 (1.65)	IN, OH
	Private	36.34 (58.49)	
13. Blanchard River	Public (local)	0.94 (1.51)	OH
	Private	24.08 (38.75)	
14. Clinton River	Public (local)	0.28 (0.44)	MI
	Private	6.74 (10.85)	
15. Mill Creek	Public (State)	1.54 (2.47)	MI
	Private	22.11 (35.59)	
16. Tonawanda Creek	Public (State, local)	8.70 (14.00)	NY
	Private	93.91 (151.14)	
	Tribal	10.60 (17.06)	
17. Conneaut Creek	Public (State, local)	2.31 (3.72)	OH, PA
	Private	59.69 (96.06)	
18. French Creek	Public (Federal, State, local)	5.83 (9.39)	PA
	Private	68.54 (110.30)	
19. Allegheny River	Public (State, local)	4.60 (7.40)	PA
	Private	34.85 (56.08)	
20. Fish Creek (WV)	Private	26.58 (42.78)	WV
21. Fishing Creek	Public (local)	0.13 (0.21)	WV
	Private	23.19 (37.33)	
22. Middle Island Creek	Public (State)	0.15 (0.25)	WV
	Private	62.10 (99.94)	
23. Little Kanawha River	Private	49.82 (80.18)	WV
24. South Fork Hughes River	Private	57.44 (92.43)	WV
25. Kinniconick Creek	Private	51.01 (82.10)	KY
26. North Fork Licking River	Public (Federal)	13.13 (21.14)	KY
	Private	7.54 (12.13)	
27. Licking River	Public (Federal, State, local)	20.82 (33.51)	KY
	Private	158.74 (255.47)	
28. South Fork Licking River	Private	18.26 (29.39)	KY
29. Drennon Creek	Private	22.36 (35.99)	KY
30. Laughery Creek	Public (State)	3.01 (4.85)	IN
	Private	41.51 (66.80)	
31. Otter Creek	Private	17.96 (28.91)	IN
32. Graham Creek	Private	41.50 (66.79)	IN
33. East Fork White River	Public (Federal, State)	6.12 (9.85)	IN
	Private	72.45 (116.60)	
34. Beech Fork River	Public (State)	1.99 (3.21)	KY
	Private	48.40 (77.89)	
35. Rolling Fork River	Private	87.90 (141.47)	KY
36. Harpeth River	Public (Federal)	6.07 (9.77)	TN
	Private	37.25 (59.95)	
37. Duck River	Public (Federal)	0.52 (0.83)	TN
	Private	115.90 (186.53)	
Totals	Public	298.97 (481.14)	

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR THE SALAMANDER MUSSEL—Continued  
 [Area estimates reflect all land within critical habitat unit boundaries]

Critical habitat unit	Adjacent riparian land ownership by type	Size of unit in river miles (kilometers)	State(s)
	Private .....	1,702.04 (2,739.17)	
	Tribal .....	10.60 (17.06)	
	Total .....	2,011.61 (3,237.37)	

**Note:** Area sizes may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for salamander mussel, below.

*Unit 1: St. Croix River*

Unit 1 consists of 52.93 miles (85.19 km) of St. Croix River in Polk, St. Croix, and Pierce Counties, Wisconsin, and Chisago and Washington Counties, Minnesota. This unit extends from the base of the dam at St. Croix Falls (Polk County, Wisconsin) and Taylors Falls (Chisago County, Minnesota) downstream to the confluences with the Mississippi River at Prescott (Pierce County, Wisconsin) and Point Douglas (Washington County, Minnesota). The unit includes the river channel up to the ordinary high water mark. Unit 1 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 54.5 percent (28.85 miles (46.43 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 45.5 percent (24.08 miles (38.76 km)) are in private ownership. Approximately 12.63 miles (20.32 km) of the lands in public ownership are Federal lands associated with the National Park Service's (NPS) Lower St. Croix National Scenic Riverway. Approximately 4.25 miles (6.84 km) of the lands in public ownership are Federal lands associated with the NPS's Lower St. Croix National Scenic Riverway on one side of the bank and State lands associated with the Wisconsin Department of Natural Resources' (WDNR) St. Croix Islands Wildlife Area on the other side. Approximately 5.0 miles (8.04 km) of the lands in public ownership are Federal lands associated with the NPS's Lower St. Croix National Scenic Riverway on one side of the bank and State lands associated with the Minnesota Department of Natural Resources' William O'Brien State Park on the other side. Approximately 5.2 miles (8.37 km) of the lands in public ownership are State lands associated with the WDNR's Kinnickinnic State Park and Interstate Park on one side of

the bank and State lands associated with the Minnesota Department of Natural Resources' Interstate Park on the other side. Approximately 1.78 miles (2.86 km) of the lands in public ownership are State lands associated with the Minnesota Department of Natural Resources' Afton State Park. In addition to the Federal and State lands, general land use within St. Croix River Unit includes agriculture and urban areas, including the cities of St. Croix Falls, Osceola, Marine on St. Croix, Stillwater, Houlton, Bayport, Hudson, Lakeland, Lake St. Croix Beach, and Prescott. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of the salamander mussel may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer.

*Unit 2: Chippewa River*

Unit 2 consists of 59.24 miles (95.33 km) of Chippewa River in Buffalo, Dunn, Eau Claire, and Pepin Counties, Wisconsin. The unit extends from the mouth of the Eau Claire River at Eau Claire (Eau Claire County, Wisconsin) downstream to the confluence with the Mississippi River south of Trevino (Buffalo and Pepin Counties, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Unit 2 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 57.5 percent (34.04 miles (54.77 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 42.5 percent (25.20 miles (40.56) km)) are in private ownership. Approximately 1.3 miles (2.09 km) of the lands in public ownership are city or county lands associated with city of Eau Claire's Owen Park and Jefferson County's

Public Hunting Ground. Approximately 4.2 miles (6.76 km) of the lands in public ownership are Federal lands associated with the Bureau of Land Management's (BLM) stewardship of islands within the river channel. Approximately 1.6 miles (2.57 km) of the lands in public ownership are Federal lands associated with the Service's Upper Mississippi River National Wildlife and Fish Refuge on one side of the bank and State lands associated with the WDNR's Tiffany Wildlife Area on the opposite bank. Approximately 27 miles (43.45 km) of the lands in public ownership are State lands associated with the WDNR's Lower Chippewa River State Natural Area, Dunnville Wildlife Area, and Nine Mile Island State Natural Area. General land use includes agriculture and urban areas, including the cities of Eau Claire, Shawtown, and Durand. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host vulnerability from the lack of regulation of collection of mudpuppies; lack of connectivity due to barriers; presence of invasive species; impacts to the hydrologic regime; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer.

*Unit 3: Eau Claire River*

Unit 3 consists of 7.40 miles (11.91 km) of Eau Claire River in Eau Claire County, Wisconsin. The unit extends from the confluence of the North Fork and South Fork Eau Claire River (Eau Claire County, Wisconsin) downstream to Lake Eau Claire (Eau Claire County, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Unit 3 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 57.2 percent (4.23 miles (6.81 km)) of the riparian lands adjacent to, but not included in, this

unit are in public ownership, and 42.8 percent (3.17 miles (5.10 km)) are in private ownership. The lands in public ownership in this unit are associated with the Eau Claire County Forest. General land use includes agriculture and urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host species vulnerability from the lack of regulation of collection of mudpuppies; lack of connectivity due to barriers; presence of invasive species; impacts to the hydrologic regime; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer.

#### *Unit 4: Black River*

Unit 4 consists of 75.38 miles (121.31 km) of Black River in Jackson, La Crosse, Monroe, and Trempealeau Counties, Wisconsin. This unit extends from the bottom of Lake Arbutus dam southeast of Hatfield (Jackson County, Wisconsin) downstream to the confluence with the Mississippi River west of Brice Prairie (La Crosse County, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Unit 4 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 47.4 percent (35.71 miles (57.47 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 52.6 percent (39.67 miles (63.84 km)) are in private ownership. Approximately 0.15 mile (0.24 km) of the land in public ownership is county land associated with Jackson County Forest. Approximately 0.86 mile (1.38 km) of the land in public ownership is Federal land associated with the BLM's stewardship of islands within the river channel. Approximately 6.6 miles (10.62 km) of the lands in public ownership are Federal lands associated with the Service's Upper Mississippi River National Wildlife and Fish Refuge on one bank and State lands associated with the WDNR's Van Loon Wildlife Area on the opposite bank.

Approximately 28 miles (45.06 km) of the lands in public ownership are State lands associated with the WDNR's North Bend Bottoms Wildlife Area, Statewide Habitat Areas, Half Moon Lake Fishery Area, and Black River State Forest. General land use within the unit includes agriculture and forest

and the city of Black River Falls. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host vulnerability from the lack of regulation of collection of mudpuppies; lack of connectivity due to barriers; presence of invasive species; impacts to the hydrologic regime; and habitat degradation and loss due to agriculture and the lack of canopy cover in the riparian buffer.

#### *Unit 5: Wisconsin River North*

Unit 5 consists of 21.19 miles (34.1 km) of Wisconsin River in Lincoln and Marathon Counties, Wisconsin. This unit extends from the base of the dam at Merrill (Marathon County, Wisconsin) downstream to the top of the dam at Wausau (Lincoln County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Unit 5 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 19.4 percent (4.11 miles (6.62 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 80.6 percent (17.08 miles (27.48 km)) are in private ownership. Approximately 3.78 miles (6.08 km) of the lands in public ownership are city or county lands associated with the city of Merrill's Riverside Park, Marathon County's Marathon County Forest, city of Wausau's Gilbert Park, Scholfield Park, Baker Stewart Island Park, Big Bull Falls Park, White Water Park, and Woodson Park. Approximately 0.34 mile (0.55 km) of the land in public ownership is State land associated with the WDNR's State-Owned Islands. General land use within the unit includes agriculture and urban areas, such as the cities of Merrill, Granite Heights, and Wausau. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host species vulnerability from the lack of regulation of collection of mudpuppies; and lack of connectivity.

#### *Unit 6: North Branch Pensaukee River*

Unit 6 consists of 19.93 miles (32.08 km) of North Branch Pensaukee River in Shawano and Oconto Counties,

Wisconsin. This unit extends from the Pensaukee Lakes at Cecil (Shawano County, Wisconsin) downstream to the confluence with the Pensaukee River at Abrams (Oconto County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Unit 6 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 6.2 percent (1.24 miles (2.0 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 93.8 percent (18.69 miles (30.08 km)) are in private ownership. Approximately 1.22 miles (1.96 km) of the lands in public ownership are county lands associated with the Oconto County Forest. Approximately 0.02 mile (0.03 km) of the land in public ownership is State land associated with the WDNR's Wiouwash State Trail. General land use within the unit includes agriculture, forest, and urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: host species vulnerability from the lack of regulation of collection of mudpuppies; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer; and presence of invasive species.

#### *Unit 7: Lemonweir River*

Unit 7 consists of 37.5 miles (60.36 km) of Lemonweir River in Juneau County, Wisconsin. This unit extends from approximately a quarter mile north of Kennedy County Park north of New Lisbon (Juneau County, Wisconsin) downstream to the confluence with the Wisconsin River northeast of Lyndon Station (Juneau County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Unit 7 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 5.6 percent (2.11 miles (3.4 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 94.4 percent (35.39 miles (56.96 km)) are in private ownership. The lands in public ownership are city or county lands associated with the Juneau County Forest owned by Juneau County, Riverside Park owned by the city of Mauston, and an unnamed natural area owned by the county. General land use within the unit includes agriculture and

urban areas such as the cities of New Lisbon and Mauston. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host species vulnerability from the lack of regulation of collection of mudpuppies; lack of connectivity due to barriers; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer.

#### *Unit 8: Wisconsin River South*

Unit 8 consists of 152.88 miles (246.03 km) of Wisconsin River in Iowa, Grant, Dane, Crawford, Richland, Sauk, Columbia, Juneau, and Adams Counties, Wisconsin. This unit extends from the confluence with the Lemonweir River south of White Creek (Adams County, Wisconsin) downstream to the confluence with the Mississippi River south of Prairie du Chien (Crawford County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Unit 8 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 67.2 percent (102.78 miles (165.40 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 32.8 percent (50.10 miles (80.63 km)) are in private ownership. Approximately 0.09 mile (0.14 km) of the land in public ownership is city land associated with the Village of Lake Delton's Newport Park. Approximately 9 miles (14.48 km) of the lands in public ownership are Federal lands associated with the BLM's land stewardship of islands within the river channel and the Service's Upper Mississippi River National Wildlife and Fish Refuge. Approximately 93.7 miles (150.8 km) of the lands in public ownership are State lands associated with the WDNR's Pine Island Wildlife Area, Sauk Prairie Recreation Area, and Lower Wisconsin State Riverway. General land use within the unit includes agriculture and urban areas, including numerous cities and municipalities, as well as several county parks and forests. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host species

vulnerability from the lack of regulation of collection of mudpuppies; lack of connectivity due to barriers; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer.

#### *Unit 9: Big Pine Creek*

Unit 9 consists of 51.23 miles (82.44 km) of Big Pine Creek in White, Benton, and Warren Counties, Indiana. This unit extends from the headwaters of Big Pine Creek northeast of Round Grove (White County, Indiana) downstream to the confluence with the Wabash River at Attica (Fountain County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 9 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 2.5 percent (1.3 miles (2.09 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 97.5 percent (49.93 miles (80.35 km)) are in private ownership. The lands in public ownership are State lands associated with the Indiana Department of Natural Resources' (IDNR) Pine Creek Bottoms Gamebird Habitat Area. General land use within the unit includes agriculture and urban areas, including the city of Rainsville and town of Pine Village. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; host species vulnerability from the lack of regulation of collection of mudpuppies; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 10: Middle Fork Wildcat Creek*

Unit 10 consists of 35.7 miles (57.46 km) of Middle Fork Wildcat Creek in Carroll, Clinton, and Tippecanoe Counties, Indiana. This unit extends from the headwaters of Middle Fork Wildcat Creek northwest of Forest (Clinton County, Indiana) downstream to the confluence with South Fork Wildcat Creek northwest of Monitor (Tippecanoe County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 10 is occupied by the species and contains one or more of the physical or biological

features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit includes agriculture and numerous cities and municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; host species vulnerability from lack of regulation of collection of mudpuppies; and impacts to the hydrologic regime.

#### *Unit 11: Tippecanoe River*

Unit 11 consists of 124.26 miles (199.96 km) of Tippecanoe River in Marshall, Fulton, Pulaski, Starke, Kosciusko, and White Counties, Indiana. This unit extends from below Oswego Lake at Oswego (Kosciusko County, Indiana) downstream to the top of Lake Shaffer west of Sitka (White County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 11 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 6 percent (7.43 miles (11.95 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 94 percent (116.83 miles (188.01 km)) are in private ownership. The lands in public ownership are State lands associated with the IDNR's Tippecanoe River State Park and Menominee Public Fishing Area, Talma Public Access, and Old Tip Town Public Access Site. General land use within the unit includes agriculture and urban areas, including numerous cities and municipalities, as well as several county parks and natural areas. There is overlap of 28.14 miles (45.29 km) of this unit with designated critical habitat for the rabbitsfoot (*Quadrula cylindrica cylindrica*) (see 80 FR 24692, April 30, 2015, and 50 CFR 17.95(f)) and 74.38 miles (119.7 km) with designated critical habitat for the round hickorynut (*Obovaria subrotunda*) (see 88 FR 14794, March 9, 2023, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due

to contaminants; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; lack of connectivity due to barriers; presence of invasive species; host species vulnerability from the lack of regulation of collection of mudpuppies; and impacts to the hydrologic regime.

#### *Unit 12: Fish Creek (IN)*

Unit 12 consists of 37.36 miles (60.14 km) of Fish Creek in Williams County, Ohio, and DeKalb and Steuben Counties, Indiana. This unit extends from the headwaters of Fish Creek at Billingstown (Williams County, Ohio) downstream to the confluence with the St. Joseph River at Edgerton (Williams County, Ohio). The unit includes the river channel up to the ordinary high water mark. Unit 12 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 2.7 percent (1.02 miles (1.65 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 97.3 percent (36.34 miles (58.49 km)) are in private ownership. The land in public ownership is State land associated with the Ohio Department of Natural Resources' (ODNR) Fish Creek Wildlife Area. General land use within the unit is urban. There is overlap of 5.53 miles (8.9 km) of this unit with designated critical habitat for the rabbitsfoot (see 80 FR 24692, April 30, 2015, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; and habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 13: Blanchard River*

Unit 13 consists of 25.02 miles (40.26 km) of Blanchard River in Putnam and Hancock Counties, Ohio. This unit extends from the west side of Findley (Hancock County, Ohio) downstream to the confluence with Riley Creek east of Ottawa (Putnam County, Ohio). The unit includes the river channel up to the ordinary high water mark. Unit 13 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 3.75 percent (0.94 mile (1.51 km)) of the riparian lands

adjacent to, but not included in, this unit are in public ownership, and 96.25 percent (24.08 miles (38.75 km)) are in private ownership. The land in public ownership is city or county land associated with Hancock Park District's Indian Green Preserve. General land use within the unit includes agriculture, forest, and urban areas as well as several county parks and natural areas, a State-managed hatchery, and State-managed recreation and wildlife areas and nature preserves. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; presence of invasive species; and host species vulnerability from the lack of regulation of collection of mudpuppies.

#### *Unit 14: Clinton River*

Unit 14 consists of 7.02 miles (11.29 km) of Clinton River in Oakland County, Michigan. This unit extends from downstream of the fish hatchery at Waterford Township (Oakland County, Michigan) downstream to Cass Lake east of Four Towns (Oakland County, Michigan). The unit includes the river channel up to the ordinary high water mark. Unit 14 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 4 percent (0.28 mile (0.44 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 96 percent (6.74 miles (10.85 km)) are in private ownership. The land in public ownership is city or county land associated with Waterford Township's Clinton River Canoe Site. General land use within the unit includes agriculture, forest, and urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminant; habitat degradation and loss due to the amount of impervious surface, urbanization, and the lack of canopy cover and vegetative cover in the riparian buffer; host species vulnerability from the lack of regulation of collection of mudpuppies; lack of

connectivity due to barriers; and presence of invasive species.

#### *Unit 15: Mill Creek*

Unit 15 consists of 23.65 miles (38.06 km) of Mill Creek in St. Clair County, Michigan. This unit extends from the confluence with Thompson Drain northwest of Brockway Township (St. Clair County, Michigan) downstream to the confluence with the Black River at Ruby (St. Clair County, Michigan). The unit includes the river channel up to the ordinary high water mark. Unit 15 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 6.5 percent (1.54 miles (2.47 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 93.5 percent (22.11 miles (35.59 km)) are in private ownership. The lands in public ownership are State lands associated with the Michigan Department of Natural Resources' (MDNR) Port Huron State Game Area. General land use within the unit includes agriculture and urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; habitat degradation and loss due to the amount of impervious surface, urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; presence of invasive species; and host species vulnerability from the lack of regulation of collection of mudpuppies.

#### *Unit 16: Tonawanda Creek*

Unit 16 consists of 113.21 miles (182.20 km) of Tonawanda Creek in Erie, Genesee, Niagara, and Wyoming Counties, New York. This unit extends from the headwaters of Tonawanda Creek at Java Center (Wyoming County, New York) downstream to the confluence with the Niagara River at Tonawanda (Erie County, New York). The unit includes the river channel up to the ordinary high water mark. Unit 16 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 7.7 percent (8.70 miles (14.00 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership; 82.9 percent (93.91 miles (151.14 km)) are in private ownership; and 9.4 percent (10.6

miles (17.06 km)) are on Tribal lands associated with the Tonawanda Reservation. Approximately 2.08 miles (3.35 km) of the lands in public ownership are city or county lands associated with the town of Sheldon's Vincent Almeter Memorial Park Lands, city of Attica's city lands, city of Batavia's local parks and Kiwanis mini park, and Erie County's Erie County Lands. Approximately 6.62 miles (10.65 km) of the lands in public ownership are State lands associated with New York's Erie Canal Waterway Trail. General land use within the unit includes urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity.

We have reason to consider excluding 10.6 miles (17.06 km) of proposed Unit 16 under section 4(b)(2) of the Act from the final critical habitat designation for the salamander mussel, based on other relevant impacts. This portion of the unit occurs within the Tonawanda Reservation.

#### *Unit 17: Conneaut Creek*

Unit 17 consists of 62 miles (99.78 km) of Conneaut Creek in Ashtabula County, Ohio, and Erie and Crawford Counties, Pennsylvania. This unit extends from the start of Conneaut Creek at Dicksonburg (Crawford County, Pennsylvania) downstream to the mouth with Lake Erie at Conneaut (Ashtabula County, Ohio). The unit includes the river channel up to the ordinary high water mark. Unit 17 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 3.7 percent (2.31 miles (3.72 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 96.3 percent (59.69 miles (96.06 km)) are in private ownership. Approximately 0.34 mile (0.55 km) of land in public ownership is city land associated with Conneaut Local Youth Organization Park. Approximately 1.97 miles (3.17 km) of the lands in public ownership are State lands associated with the ODNR's Conneaut Creek Scenic River. General land use within the unit includes agriculture, forest, and urban areas. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; host species vulnerability from the lack of regulation of collection of mudpuppies; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover in the riparian buffer; lack of connectivity due to barriers; and presence of invasive species.

#### *Unit 18: French Creek*

Unit 18 consists of 74.37 miles (119.69 km) of French Creek in Mercer, Erie, Crawford, and Venango Counties, Pennsylvania. This unit extends from downstream of Union City Dam northwest of Union City (Erie County, Pennsylvania) downstream to the confluence of the Allegheny River at Franklin (Venango County, Pennsylvania). The unit includes the river channel up to the ordinary high water mark. Unit 18 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 7.8 percent (5.83 miles (9.39 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 92.2 percent (68.54 miles (110.3 km)) are in private ownership. Approximately 1.1 miles (1.77 km) of the lands in public ownership are city or county lands associated with the Borough of Cambridge Springs' Cambridge Springs Recreation Area, the Township of Hayfield's Bertram Park, the Township of Vernon's Vernon Township Ball Fields and Vernon Township Recreation Association, and the city of Meadville's Kenneth A. Beers Jr. Bicentennial Park. Approximately 1.1 miles (1.77 km) of the lands in public ownership are Federal lands associated with the Service's Erie National Wildlife Refuge. Approximately 3.6 miles (5.79 km) of the lands in public ownership are State lands associated with the Pennsylvania Game Commission's State Game Land #85 and State Game Land #277 and the Pennsylvania Fish and Boat Commission's Meadville Access and Shaw's Landing. General land use within the unit includes agriculture and urban areas. Unit 18 entirely overlaps with designated critical habitat for the rabbitsfoot (see 80 FR 24692, April 30, 2015, and 50 CFR 17.95(f)) and with designated critical habitat for the longsolid (*Fusconaia subrotunda*) (see 88 FR 14794, March 9, 2023, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require

special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 19: Allegheny River*

Unit 19 consists of 39.45 miles (63.48 km) of Allegheny River in Armstrong County, Pennsylvania. This unit extends from the Pennsylvania Route 68 bridge at East Brady (Armstrong County, Pennsylvania) downstream to the confluence of Kiskiminetas River northeast of Freeport (Armstrong County, Pennsylvania). The unit includes the river channel up to the ordinary high water mark. Unit 19 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 11.7 percent (4.6 miles (7.4 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 88.3 percent (34.85 miles (56.08 km)) are in private ownership. Approximately 1.86 miles (2.99 km) of the lands in public ownership are city or county lands associated with the Armstrong County's West Ford City Park and Riverfront Park. Approximately 2.74 miles (4.41 km) of the lands in public ownership are State lands associated with the Pennsylvania Game Commission's State Game Land #287 and State Game Land #105. General land use within the unit includes urban areas, such as the cities of East Brady and Kittanning. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 20: Fish Creek (WV)*

Unit 20 consists of 26.58 miles (42.78 km) of Fish Creek in Marshall County, West Virginia. This unit extends from the confluence of Pennsylvania Fork Fish Creek and West Virginia Fork Fish Creek at Kausooth (Marshall County, West Virginia) downstream to the confluence with the Ohio River southwest of Graysville (Marshall County, West Virginia). The unit

includes the river channel up to the ordinary high water mark. Unit 20 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The lands in this unit are in private ownership. General land use within the unit is urban, including numerous towns and municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; and habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 21: Fishing Creek*

Unit 21 consists of 23.32 miles (37.54 km) of Fishing Creek in Wetzel County, West Virginia. This unit extends from the confluence of the North Fork Fishing Creek and South Fork Fishing Creek at Pine Grove (Wetzel County, West Virginia) downstream to the confluence with the Ohio River at Brooklyn (Wetzel County, West Virginia). The unit includes the river channel up to the ordinary high water mark. Unit 21 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 0.5 percent (0.13 mile (0.21 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 99.5 percent (23.19 miles (37.33 km)) are in private ownership. The land in public ownership is land associated with the city of New Martinsville. General land use within the unit is urban, including numerous cities and municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 22: Middle Island Creek*

Unit 22 consists of 62.25 miles (100.19 km) of Middle Island Creek in Doddridge, Tyler, and Pleasants

Counties, West Virginia. This unit extends from downstream of Keys Bend south of Camp (Doddridge County, West Virginia) downstream to the confluence with the Ohio River at Delong (Pleasants County, West Virginia). The unit includes the river channel up to the ordinary high water mark. Unit 22 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 0.24 percent (0.15 mile (0.25 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 99.76 percent (62.10 miles (99.94 km)) are in private ownership. The land in public ownership is State land associated with the West Virginia Division of Natural Resources' (WVDNR) Buffalo Run Wildlife Management Area. General land use within the unit is urban, including numerous cities and municipalities. Unit 22 entirely overlaps with designated critical habitat for the round hickorynut (see 88 FR 14794, March 9, 2023, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 23: Little Kanawha River*

Unit 23 consists of 49.82 miles (80.18 km) of Little Kanawha River in Wood and Wirt Counties, West Virginia. This unit extends from the confluence with the West Fork Little Kanawha River west of Creston (Wirt County, West Virginia) downstream to the confluence with the Ohio River at Parkersburg (Wood County, West Virginia). The unit includes the river channel up to the ordinary high water mark. Unit 23 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit is urban, including numerous cities and municipalities. Unit 23 entirely overlaps with designated critical habitat for the longsolid and round hickorynut (see 88 FR 14794, March 9, 2023, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or protection to reduce the following

threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 24: South Fork Hughes River*

Unit 24 consists of 57.44 miles (92.43 km) of South Fork Hughes River in Doddridge, Wirt, and Ritchie Counties, West Virginia. This unit extends from the headwaters of the South Fork Hughes River at Porto Rico (Doddridge County, West Virginia) downstream to the confluence with the Hughes River south of Cisco (Ritchie County, West Virginia). The unit includes the river channel up to the ordinary high water mark. Unit 24 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit is urban, including numerous cities and municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; presence of invasive species; habitat degradation and loss due to urbanization and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 25: Kinniconick Creek*

Unit 25 consists of 51.01 miles (82.10 km) of Kinniconick Creek in Lewis County, Kentucky. This unit extends from the headwaters of Kinniconick Creek southwest of Petersville (Lewis County, Kentucky) downstream to the confluence with the Ohio River at Rexton (Lewis County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 25 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit includes agriculture and urban areas, including the town of Garrison. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or



protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; host species vulnerability from the lack of regulation of collection of mudpuppies; presence of invasive species; impacts to the hydrologic regime; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 26: North Fork Licking River*

Unit 26 consists of 20.67 miles (33.27 miles) of North Fork Licking River in Morgan and Rowan Counties, Kentucky. This unit extends from the headwaters of North Fork Licking River at Redwine (Morgan County, Kentucky) downstream to the confluence of the Licking River at Bangor (Rowan County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 26 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 63.5 percent (13.13 miles (21.14 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 36.5 percent (7.54 miles (12.13 km)) are in private ownership. The lands in public ownership are Federal lands associated with the USACE's Cave Run Recreation Area and U.S. Forest Service's (USFS) Daniel Boone National Forest. General land use within the unit includes agriculture, forest, and urban areas, including the cities of Wrigley, Leisure, Craney, and Paragon. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: water quality degradation due to contaminants; host species vulnerability from lack of regulation of collection of mudpuppies; presence of invasive species; impacts to the hydrologic regime; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 27: Licking River*

Unit 27 consists of 179.56 miles (288.98 km) of Licking River in Harrison, Robertson, Kenton, Bracken, Campbell, Rowan, Pendleton, Fleming, Bath, and Nicholas Counties, Kentucky. This unit extends from below the dam at Cave Rune Lake south of Farmers (Rowan County, Kentucky) downstream to the confluence with the Ohio River at

Newport (Campbell County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 27 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 11.6 percent (20.82 miles (33.51 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 88.4 percent (158.74 miles (255.47 km)) are in private ownership. Approximately 3.58 miles (5.76 km) of the lands in public ownership are city or county lands associated with the city of Newport's General James Taylor Park; city of Covington's 19th St. Hollow Park, Meinken Park, and Eva G. Farris Complex; Kenton County's Locust Pike Park; Campbell County Conservation District's Hawthorne Crossing Conservation Area; and Kenton County Conservation District's Morning View Natural Area. Approximately 0.4 mile (0.64 km) of the land in public ownership is Federal land associated with the USACE's Cave Run Recreation Area. Approximately 0.5 mile (0.8 km) of the land in public ownership is Federal land associated with the USACE's Cave Run Recreation Area or USFS's Daniel Boone National Forest on one bank and State lands associated with the Kentucky Department of Fish and Wildlife Resources' (KDFWR) Minor Clark Fish Hatchery on the opposite bank. Approximately 16.36 miles (26.33 km) of the lands in public ownership are State lands associated with the Kentucky State Nature Preserves Commission's Quiet Trails State Nature Preserve, Kentucky Department of Parks' Blue Licks Battlefield State Recreational Park, and KDFWR's Clay Wildlife Management Area and Minor Clark Fish Hatchery. General land use within the unit includes agriculture, forest, and urban areas, including numerous cities and municipalities. Unit 27 entirely overlaps with designated critical habitat for the longsolid (see 88 FR 14794, March 9, 2023, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: water quality degradation due to contaminants; host species vulnerability from lack of regulation of collection of mudpuppies; presence of invasive species; changes in the hydrologic regime; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; and lack of connectivity due to barriers.

#### *Unit 28: South Fork Licking River*

Unit 28 consists of 18.26 miles (29.39 km) of South Fork Licking River in Pendleton and Harrison Counties, Kentucky. This unit extends from 1 mile upstream from the confluence with Crooked Creek north of Boyd (Harrison County, Kentucky) downstream to the confluence with the Licking River at Falmouth (Pendleton County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 28 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit is urban, including the cities of Falmouth and Morgan. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: water quality degradation due to contaminants; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; host species vulnerability from lack of regulation of collection of mudpuppies; changes in the hydrologic regime; and presence of invasive species.

#### *Unit 29: Drennon Creek*

Unit 29 consists of 22.36 miles (35.99 km) of Drennon Creek in Henry County, Kentucky. This unit extends from the headwaters of Drennon Creek south of Bethlehem (Henry County, Kentucky) downstream to the confluence with the Kentucky River southeast of Drennon Springs (Henry County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 29 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit is agriculture and urban areas, including the cities of Drennon Springs and Delville. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; host species vulnerability from the lack of regulation

of collection of mudpuppies; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 30: Laughery Creek*

Unit 30 consists of 44.52 miles (71.65 km) of Laughery Creek in Ripley, Dearborn, and Ohio Counties, Indiana. This unit extends from below the dam at Versailles Lake at Versailles (Ripley County, Indiana) downstream to the confluence with the Ohio River at Buffalo (Ohio County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 30 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 6.76 percent (3.01 miles (4.85 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 93.24 percent (41.51 miles (66.8 km)) are in private ownership. The lands in public ownership are State lands associated with the IDNR's Versailles State Park. General land use within the unit is agriculture and urban areas, including the cities of Friendship and Versailles. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; lack of connectivity due to barriers; presence of invasive species; host species vulnerability from the lack of regulation of collection of mudpuppies; and impacts to the hydrologic regime.

#### *Unit 31: Otter Creek*

Unit 31 consists of 17.96 miles (28.91 km) of Otter Creek in Jennings and Ripley Counties, Indiana. This unit extends from the U.S. Highway 50 bridge west of Holton (Ripley County, Indiana) downstream to the confluence with the Vernon Fork Muscatatuck River at Vernon (Jennings County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 31 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private

ownership. General land use within the unit includes agriculture and urban areas, including the city of Vernon. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; host species vulnerability from the lack of regulation of collection of mudpuppies; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 32: Graham Creek*

Unit 32 consists of 41.5 miles (66.79 km) of Graham Creek in Jefferson, Jennings, and Ripley Counties, Indiana. This unit extends from west of South Old Michigan Road at New Marion (Ripley County, Indiana) downstream to the confluence with the Muscatatuck River north of Deputy (Jefferson County, Indiana). The unit includes the river channel up to the ordinary high water mark. Unit 32 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit includes agriculture and numerous municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; host species vulnerability from the lack of regulation of collection of mudpuppies; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 33: East Fork White River*

Unit 33 consists of 78.57 miles (126.45 km) of East Fork White River in Dubois, Daviess, Pike, Martin, and Lawrence Counties, Indiana. This unit extends from below the Williams dam south of Williams (Lawrence County, Indiana) downstream to approximately 0.25 mile west of North State Road 57 at Rogers (Pike County, Indiana). This unit includes the river channel up to the

ordinary high water mark. Unit 33 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 7.8 percent (6.12 miles (9.85 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 92.2 percent (72.45 miles (116.6 km)) are in private ownership. Approximately 0.12 mile (0.19 km) of the land in public ownership is Federal land associated with the USFS's Hoosier National Forest. Approximately 6 miles (9.66 km) of the lands in public ownership are State lands associated with the IDNR's Williams Dam Public Fishing Area, Hindostan Falls Public Fishing Area, Glendale Fish and Wildlife Area, Henshaw Bend Nature Preserve, and Bluffs on Beaver Pond. General land use within the unit includes forest, agriculture, dams, and urban areas, including the city of Shoals. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: water quality degradation due to contaminants; host species vulnerability from lack of regulation of collection of mudpuppies; presence of invasive species; changes in the hydrologic regime; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 34: Beech Fork River*

Unit 34 consists of 50.39 miles (81.10 km) of Beech Fork River in Washington and Nelson Counties, Kentucky. This unit extends from the confluence of Beech Fork and Chaplin River north of Mooresville (Washington County, Kentucky) extending downstream to the confluence of Beech Fork River and the Rolling Fork River northeast of Elizabethtown (Hardin County, Kentucky). This unit includes the river channel up to the ordinary high water mark. Unit 34 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 3.9 percent (1.99 miles (3.21 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 96.1 percent (48.40 miles (77.89 km)) are in private ownership. The lands in public ownership are State lands associated with the KDFWR's John C. Williams Wildlife Management Area. General land use within the unit includes agriculture and numerous cities and

municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; host species vulnerability from the lack of regulation of collection of mudpuppies; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 35: Rolling Fork River*

Unit 35 consists of 87.9 miles (141.47 km) of Rolling Fork River in LaRue, Hardin, Marion, and Nelson Counties, Kentucky. This unit extends from the confluence of the North Rolling Fork River and Big South Fork River west of Bradfordsville (Marion County, Kentucky) downstream to the confluence with Beech Fork River east of Younger Creek (Hardin County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Unit 35 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

The riparian lands adjacent to, but not included in, this unit are in private ownership. General land use within the unit includes agriculture and numerous cities and municipalities. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; host species vulnerability from the lack of regulation of collection of mudpuppies; presence of invasive species; and habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer.

#### *Unit 36: Harpeth River*

Unit 36 consists of 43.32 miles (69.72 km) of Harpeth River in Cheatham and Dickson Counties, Tennessee. This unit extends from the confluence of the South Harpeth River southeast of Kingston Springs (Cheatham County, Tennessee) downstream to the confluence with the Cumberland River northeast of Bellsburg (Dickson County, Tennessee). The unit includes the river channel up to the ordinary high water

mark. Unit 36 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 14 percent (6.07 miles (9.77 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 86 percent (37.25 miles (59.95 km)) are in private ownership. The lands in public ownership are Federal lands associated with the USACE's Cheatham Lake Reservoir. General land use within the unit includes agriculture and urban areas, including the town of Kingston Springs. This unit does not overlap with any designated critical habitat for other listed species.

The features essential to the conservation of this species may require special management considerations or protection to reduce the following threats: degradation of water quality due to contaminants; lack of connectivity due to barriers; presence of invasive species; host species vulnerability from the lack of regulation of collection of mudpuppies; habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; and impacts to the hydrological regime.

#### *Unit 37: Duck River*

Unit 37 consists of 116.42 miles (187.36 km) of Duck River in Hickman, Humphreys, Perry, and Maury Counties, Tennessee. This unit extends from the confluence of the Little Bigby Creek northwest of Columbia (Maury County, Tennessee) downstream to the confluence of the Duck River and the Tennessee River, which creates a backwater effect at Elysian Grove (Humphreys County, Tennessee). The unit includes the river channel up to the ordinary high water mark. Unit 37 is occupied by the species and contains one or more of the physical or biological features essential to the species' conservation.

Approximately 0.4 percent (0.52 mile (0.83 km)) of the riparian lands adjacent to, but not included in, this unit are in public ownership, and 99.6 percent (115.9 miles (186.53 km)) are in private ownership. The land in public ownership is Federal land associated with the NPS's Natchez Trace Parkway. General land use within the unit includes agriculture and numerous cities and municipalities. Unit 37 entirely overlaps with designated critical habitat for rabbitsfoot (see 80 FR 24692, April 30, 2015, and 50 CFR 17.95(f)).

The features essential to the conservation of this species may require special management considerations or

protection to reduce the following threats: habitat degradation and loss due to urbanization, agriculture, and the lack of canopy cover and vegetative cover in the riparian buffer; lack of connectivity due to barriers; host species vulnerability from the lack of regulation of collection of mudpuppies; degradation of water quality due to contaminants; presence of invasive species; and impacts to the hydrologic regime.

### **Effects of Critical Habitat Designation**

#### *Section 7 Consultation*

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action which is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

We published a final rule revising the definition of destruction or adverse modification on August 27, 2019 (84 FR 44976). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

Compliance with the requirements of section 7(a)(2) is documented through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define "reasonable and prudent alternatives" (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Service Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinstate consultation if any of the following four conditions occur: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. The reinstatement requirement applies only to actions that remain subject to some discretionary Federal involvement or control. As provided in 50 CFR 402.16, the requirement to reinstate consultations for new species listings or critical habitat designation does not apply to certain agency actions (e.g., land management plans issued by the Bureau of Land Management in certain circumstances).

#### *Destruction or Adverse Modification of Critical Habitat*

The key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat for the conservation of the listed species. As discussed above, the role of critical habitat is to support physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may

violate section 7(a)(2) of the Act by destroying or adversely modifying such habitat, or that may be affected by such designation.

Activities that we may, during a consultation under section 7(a)(2) of the Act, consider likely to destroy or adversely modify critical habitat include, but are not limited to:

(1) Actions that would:

(a) Alter the geomorphology of the salamander mussel's stream and river habitats;

(b) Significantly alter the existing flow regime where this species occurs;

(c) Significantly alter water chemistry or water quality; or

(d) Significantly alter stream bed material composition and quality by increasing sediment deposition or filamentous algal growth; and

(2) Major habitat alterations that impact mudpuppy persistence.

Such activities could include, but are not limited to:

(1) Instream excavation or dredging, impoundment, channelization, clearing riparian vegetation, and discharge of fill materials;

(2) Impoundment, urban development, water diversion, water withdrawal, water draw-down, and hydropower generation;

(3) Hydropower discharges, or the release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater at a point source or by dispersed release (nonpoint source); and

(4) Construction projects, sand and gravel mining, oil and gas development, coal mining, livestock grazing, timber harvest, and other watershed and floodplain disturbances that release sediments or nutrients into the water.

These activities could eliminate or reduce the habitat quantity or quality necessary for growth and reproduction of the salamander mussel or its mudpuppy host.

#### **Exemptions**

##### *Application of Section 4(a)(3) of the Act*

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DoD), or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. No DoD

lands with a completed INRMP are within the proposed critical habitat designation.

#### **Consideration of Impacts Under Section 4(b)(2) of the Act**

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. Exclusion decisions are governed by the regulations at 50 CFR 424.19 and the Policy Regarding Implementation of Section 4(b)(2) of the Endangered Species Act (2016 Policy; 81 FR 7226, February 11, 2016), both of which were developed jointly with the National Marine Fisheries Service (NMFS). We also refer to a 2008 Department of the Interior Solicitor's opinion entitled, "The Secretary's Authority to Exclude Areas from a Critical Habitat Designation under Section 4(b)(2) of the Endangered Species Act" (M-37016).

In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise discretion to exclude the area only if such exclusion would not result in the extinction of the species. In making the determination to exclude a particular area, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor. In our final rules, we explain any decision to exclude areas, as well as decisions not to exclude, to make clear the rational basis for our decision. We describe below the process that we use for taking into consideration each category of impacts and any initial analyses of the relevant impacts.

##### *Consideration of Economic Impacts*

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in

the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a proposed critical habitat designation is analyzed by comparing scenarios both “with critical habitat” and “without critical habitat.”

The “without critical habitat” scenario represents the baseline for the analysis, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (*e.g.*, under the Federal listing as well as other Federal, State, and local regulations). Therefore, the baseline represents the costs of all efforts attributable to the listing of the species under the Act (*i.e.*, conservation of the species and its habitat incurred regardless of whether critical habitat is designated). The “with critical habitat” scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts would not be expected without the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat, above and beyond the baseline costs. These are the costs we use when evaluating the benefits of inclusion and exclusion of particular areas from the final designation of critical habitat should we choose to conduct a discretionary 4(b)(2) exclusion analysis.

Executive Orders (E.O.s) 12866 and 13563 direct Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with the E.O. regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. Section 3(f) of E.O. 12866 identifies four criteria when a regulation is considered a “significant regulatory action” and requires additional analysis, review, and approval if met. The criterion relevant

here is whether the designation of critical habitat may have an economic effect of \$200 million or more in any given year (section 3(f)(1)). Therefore, our consideration of economic impacts uses a screening analysis to assess whether a designation of critical habitat for the salamander mussel is likely to exceed the economically significant threshold.

For this particular designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the salamander mussel (Industrial Economics, Inc. 2022, entire). We began by conducting a screening analysis of the proposed designation of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographical areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (*i.e.*, absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. The presence of the listed species in occupied areas of critical habitat means that any destruction or adverse modification of those areas is also likely to jeopardize the continued existence of the species. Therefore, designating occupied areas as critical habitat typically causes little if any incremental impacts above and beyond the impacts of listing the species. As a result, we generally focus the screening analysis on areas of unoccupied critical habitat (unoccupied units or unoccupied areas within occupied units). Overall, the screening analysis assesses whether designation of critical habitat is likely to result in any additional management or conservation efforts that may incur incremental economic impacts. This screening analysis combined with the information

contained in our IEM constitute what we consider to be our draft economic analysis (DEA) of the proposed critical habitat designation for the salamander mussel; our DEA is summarized in the narrative below.

As part of our screening analysis, we considered the types of economic activities that are likely to occur within the areas likely affected by the critical habitat designation. In our evaluation of the probable incremental economic impacts that may result from the proposed designation of critical habitat for the salamander mussel, first we identified, in the IEM dated September 27, 2022, probable incremental economic impacts associated with the following categories of activities: (1) instream excavation or dredging; (2) impoundment; (3) channelization; (4) sand and gravel mining; (5) clearing riparian vegetation; (6) discharge of fill materials; (7) urban development; (8) water diversion; (9) water withdrawal; (10) water draw-down; (11) hydropower generation; (12) hydropower discharges; (13) release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater at a point source or by dispersed release (nonpoint source); (14) construction projects; (15) oil and gas development; (16) coal mining; (17) livestock grazing; (18) timber harvest; and (19) other watershed and floodplain disturbances that release sediments or nutrients into the water.

We considered each industry or category individually. Additionally, we considered whether their activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat affects only activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the salamander mussel is present, Federal agencies would be required to consult with the Service under section 7 of the Act on activities they authorize, fund, or carry out that may affect the species. If, when we list the species, we also finalize this proposed critical habitat designation, Federal agencies would be required to consider the effects of their actions on the designated habitat, and if the Federal action may affect critical habitat, our consultations would include an evaluation of measures to avoid the destruction or adverse modification of critical habitat.

In our IEM, we attempted to clarify the distinction between the effects that would result from the species being listed and those attributable to the critical habitat designation (*i.e.*,

difference between the jeopardy and adverse modification standards) for the salamander mussel's critical habitat. Because the designation of critical habitat for the salamander mussel is being proposed concurrently with the listing, it has been our experience that it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would likely adversely affect the essential physical or biological features of occupied critical habitat are also likely to adversely affect the species itself. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the salamander mussel includes 37 units, totaling approximately 2,012 river miles (3,238 km), all of which are occupied by the species. Ownership of riparian lands adjacent to the proposed units includes 1,702.04 miles (2,739.17 km; 84.61 percent) in private ownership, 298.97 miles (481.14 km; 14.86 percent) in public (Federal, State, or local) ownership, and 10.60 miles (17.06 km; 0.53 percent) in Tribal ownership.

Total incremental costs of critical habitat designation for the salamander mussel are not expected to exceed \$120,000 (2022 dollars) per year. The costs are reflective of: (1) All proposed units are considered occupied by the salamander mussel, (2) all projects with a Federal nexus would be subject to section 7 consultation regardless of the designation of critical habitat due to the presence of the listed species, (3) critical habitat designation is not likely to change the Service's recommendations for project modifications as part of future consultations considering the salamander mussel, and (4) the salamander mussel receives additional baseline protection from co-occurring listed species and a species with overlapping critical habitat and similar resource needs. Because consultation would be required as a result of the listing of the salamander mussel and is already required in some of these areas

as a result of the presence of other listed species and critical habitats, the economic costs of the critical habitat designation would likely be primarily limited to additional administrative efforts to consider adverse modification for this species in section 7 consultations.

Based on the consultation history regarding historical projects and the forecast of future activity in the proposed critical habitat units, the number of future consultations, including technical assistance efforts, is likely to be no more than 94 per year across all 37 units. This figure accounts for potential increases in highway and infrastructure projects. The geographic distribution of future section 7 consultations and associated costs are likely to be most heavily concentrated in West Virginia, Pennsylvania, and Kentucky. However, even assuming consultation activity increases substantially, incremental administrative costs are still likely to remain well under \$200 million per year.

We are soliciting data and comments from the public on the DEA discussed above. During the development of a final designation, we will consider the information presented in the DEA and any additional information on economic impacts we receive during the public comment period to determine whether any specific areas should be excluded from the final critical habitat designation under the authority of section 4(b)(2) of the Act, our implementing regulations at 50 CFR 424.19, and the 2016 Policy. We may exclude an area from critical habitat if we determine that the benefits of excluding the area outweigh the benefits of including the area, provided the exclusion will not result in the extinction of this species.

#### *Consideration of National Security Impacts*

Section 4(a)(3)(B)(i) of the Act may not cover all DoD lands or areas that pose potential national-security concerns (e.g., a DoD installation that is in the process of revising its INRMP for a newly listed species or a species previously not covered). If a particular area is not covered under section 4(a)(3)(B)(i), then national-security or homeland-security concerns are not a factor in the process of determining what areas meet the definition of "critical habitat." However, the Service must still consider impacts on national security, including homeland security, on those lands or areas not covered by section 4(a)(3)(B)(i) because section 4(b)(2) requires the Service to consider

those impacts whenever it designates critical habitat. Accordingly, if DoD, Department of Homeland Security (DHS), or another Federal agency has requested exclusion based on an assertion of national-security or homeland-security concerns, or we have otherwise identified national-security or homeland-security impacts from designating particular areas as critical habitat, we generally have reason to consider excluding those areas.

However, we cannot automatically exclude requested areas. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland-security impacts, we must conduct an exclusion analysis if the Federal requester provides information, including a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border-security patrols and surveillance activities, or a delay in training or facility construction, as a result of compliance with section 7(a)(2) of the Act. If the agency requesting the exclusion does not provide us with a reasonably specific justification, we will contact the agency to recommend that it provide a specific justification or clarification of its concerns relative to the probable incremental impact that could result from the designation. If we conduct an exclusion analysis because the agency provides a reasonably specific justification or because we decide to exercise the discretion to conduct an exclusion analysis, we will defer to the expert judgment of DoD, DHS, or another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or waters, have national-security or homeland-security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary section 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

In preparing this proposal, we have determined that the lands within the proposed designation of critical habitat for the salamander mussel are not owned or managed by the DoD or DHS, and, therefore, we anticipate no impact on national security or homeland security.

### *Consideration of Other Relevant Impacts*

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security discussed above. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are permitted conservation plans covering the species in the area—such as HCPs, safe harbor agreements (SHAs), or candidate conservation agreements with assurances (CCAAs)—or whether there are non-permitted conservation agreements and partnerships that may be impaired by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designation. We also consider any State, local, social, or other impacts that might occur because of the designation.

When analyzing other relevant impacts of including a particular area in a designation of critical habitat, we weigh those impacts relative to the conservation value of the particular area. To determine the conservation value of designating a particular area, we consider a number of factors, including, but not limited to, the additional regulatory benefits that the area would receive due to the protection from destruction or adverse modification as a result of actions with a Federal nexus, the educational benefits of mapping essential habitat for recovery of the listed species, and any benefits that may result from a designation due to State or Federal laws that may apply to critical habitat.

In the case of the salamander mussel, the benefits of critical habitat include public awareness of the presence of the salamander mussel and the importance of habitat protection, and, where a Federal nexus exists, increased habitat protection for the salamander mussel due to protection from destruction or adverse modification of critical habitat. Continued implementation of an ongoing management plan that provides conservation equal to or more than the protections that result from a critical habitat designation would reduce those benefits of including that specific area in the critical habitat designation.

After identifying the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to evaluate whether the benefits of exclusion outweigh those of inclusion.

If our analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, we then determine whether exclusion would result in extinction of the species. If exclusion of an area from critical habitat will result in extinction, we will not exclude it from the designation.

### *Tribal Lands*

Several Executive Orders, Secretary's Orders, and policies concern working with Tribes. These guidance documents generally confirm our trust responsibilities to Tribes, recognize that Tribes have sovereign authority to control Tribal lands, emphasize the importance of developing partnerships with Tribal governments, and direct the Service to consult with Tribes on a government-to-government basis.

A joint Secretary's Order that applies to both the Service and the National Marine Fisheries Service (NMFS)—Secretary's Order 3206, *American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act* (June 5, 1997) (S.O. 3206)—is the most comprehensive of the various guidance documents related to Tribal relationships and Act implementation, and it provides the most detail directly relevant to the designation of critical habitat. In addition to the general direction discussed above, the appendix to S.O. 3206 explicitly recognizes the right of Tribes to participate fully in any listing process that may affect Tribal rights or Tribal trust resources; this includes the designation of critical habitat. Section 3(B)(4) of the appendix requires the Service to consult with affected Tribes “when considering the designation of critical habitat in an area that may impact tribal trust resources, tribally-owned fee lands, or the exercise of tribal rights.” That provision also instructs the Service to avoid including Tribal lands within a critical habitat designation unless the area is essential to conserve a listed species, and it requires the Service to “evaluate and document the extent to which the conservation needs of the listed species can be achieved by limiting the designation to other lands.”

Our implementing regulations at 50 CFR 424.19 and the 2016 Policy are consistent with S.O. 3206. When we undertake a discretionary exclusion analysis under section 4(b)(2) of the Act, in accordance with S.O. 3206, we consult with any Tribe whose Tribal trust resources, Tribally-owned fee lands, or Tribal rights may be affected by including any particular areas in the designation. We evaluate the extent to which the conservation needs of the species can be achieved by limiting the

designation to other areas and give great weight to Tribal concerns in analyzing the benefits of exclusion.

However, S.O. 3206 does not override the Act's statutory requirement of designation of critical habitat. As stated above, we must consult with any Tribe when a designation of critical habitat may affect Tribal lands or resources. The Act requires us to identify areas that meet the definition of “critical habitat” (*i.e.*, areas occupied at the time of listing that contain the essential physical or biological features that may require special management considerations or protection and unoccupied areas that are essential to the conservation of a species), without regard to land ownership. While S.O. 3206 provides important direction, it expressly states that it does not modify the Secretary's statutory authority under the Act or other statutes.

The proposed critical habitat designation includes the following Tribal lands or resources:

### *Tonawanda Reservation*

A portion of proposed Unit 16 (Tonawanda Creek) occurs within the Tonawanda Reservation. The Tonawanda Seneca Nation has a conservation department that was established in 1977 by the Seneca Nation of Indians Council resolution. The department is responsible for the enforcement of Seneca Nation of Indian laws, ordinances, and codes that address sand and gravel mining; solid waste management; hunting and fishing; and conservation activities.

### **Summary of Exclusions Considered Under 4(b)(2) of the Act**

We have reason to consider excluding 10.6 miles (17.06 km) of proposed Unit 16 (Tonawanda Creek) under section 4(b)(2) of the Act from the final critical habitat designation for the salamander mussel, based on other relevant impacts. We specifically solicit comments on the inclusion or exclusion of this area. We also solicit comments on whether there are potential economic, national security, or other relevant impacts from designating any other particular areas as critical habitat. As part of developing the final designation of critical habitat, we will evaluate the information we receive regarding potential impacts from designating the areas described above or any other particular areas, and we may conduct a discretionary exclusion analysis to determine whether to exclude those areas under the authority of section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19. If we receive a request for exclusion of a particular area and after



evaluation of supporting information we do not exclude, we will fully describe our decision in the final rule for this action.

### Required Determinations

#### *Clarity of the Rule*

We are required by E.O.s 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.

#### *Regulatory Planning and Review—Executive Orders 12866, 13563, and 14094*

Executive Order 14094 reaffirms the principles of E.O. 12866 and E.O. 13563 and states that regulatory analysis should facilitate agency efforts to develop regulations that serve the public interest, advance statutory objectives, and are consistent with E.O. 12866, E.O. 13563, and the Presidential Memorandum of January 20, 2021 (Modernizing Regulatory Review). Regulatory analysis, as practicable and appropriate, shall recognize distributive impacts and equity, to the extent permitted by law. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this final rule in a manner consistent with these requirements.

E.O. 12866, as reaffirmed by E.O. 13563 and E.O. 14094, provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) will review all significant rules. OIRA has determined that this rule is not significant.

#### *Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 *et seq.*), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.*, small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine whether potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term “significant economic impact” is meant to apply to a typical small business firm’s business operations.

Under the RFA, as amended, and as understood in light of recent court decisions, Federal agencies are required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself; in other words, the RFA does not require agencies to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat

protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried out by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies would be directly regulated if we adopt the proposed critical habitat designation. The RFA does not require evaluation of the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities would be directly regulated by this rulemaking, the Service certifies that, if made final as proposed, the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the proposed designation would result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we certify that, if made final, the proposed critical habitat designation would not have a significant economic impact on a substantial number of small business entities. Therefore, an initial regulatory flexibility analysis is not required.

#### *Energy Supply, Distribution, or Use—Executive Order 13211*

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare statements of energy effects when undertaking certain actions. Facilities that provide energy supply, distribution, or use occur within some units of the proposed critical habitat designations (for example, dams, pipelines) and may potentially be affected. We determined that consultations, technical assistance, and requests for species lists may be necessary in some instances. In our economic analysis, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use because all projects with a Federal nexus would be subject to section 7 consultation regardless of the designation of critical habitat due to the presence of the listed species and the critical habitat designation is not likely

to change the Service's recommendations for project modifications as part of future consultations considering the salamander mussel. Therefore, this action is not a significant energy action, and no statement of energy effects is required.

*Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following finding:

(1) This proposed rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both "Federal intergovernmental mandates" and "Federal private sector mandates." These terms are defined in 2 U.S.C. 658(5)–(7). "Federal intergovernmental mandate" includes a regulation that "would impose an enforceable duty upon State, local, or Tribal governments" with two exceptions. It excludes "a condition of Federal assistance." It also excludes "a duty arising from participation in a voluntary Federal program," unless the regulation "relates to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority," if the provision would "increase the stringency of conditions of assistance" or "place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding," and the State, local, or Tribal governments "lack authority" to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. "Federal private sector mandate" includes a regulation that "would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program."

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions are not likely to destroy or adversely modify critical habitat under section 7. While

non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule would significantly or uniquely affect small governments because it will not produce a Federal mandate of \$200 million or greater in any year, that is, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments. Therefore, a small government agency plan is not required.

*Takings—Executive Order 12630*

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for salamander mussel in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed for the proposed designation of critical habitat for the salamander mussel, and it concludes that, if adopted, this designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

*Federalism—Executive Order 13132*

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have substantial direct effects either on the States, or on the relationship between the Federal government and the States, or on the distribution of powers and responsibilities among the various levels of government. The proposed designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

*Civil Justice Reform—Executive Order 12988*

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule would not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat in accordance with the provisions of the

Act. To assist the public in understanding the habitat needs of the species, this proposed rule identifies the physical or biological features essential to the conservation of the species. The proposed areas of critical habitat are presented on maps, and the proposed rule provides several options for the interested public to obtain more detailed location information, if desired.

*Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This rule does not contain information collection requirements, and a submission to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) is not required. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

*National Environmental Policy Act (42 U.S.C. 4321 et seq.)*

Regulations adopted pursuant to section 4(a) of the Act are exempt from the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) and do not require an environmental analysis under NEPA. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This includes listing, delisting, and reclassification rules, as well as critical habitat designations. In a line of cases starting with *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), the courts have upheld this position.

*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), E.O. 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 federally recognized Tribes on a government-to-government basis. In accordance with Secretary’s 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 reached out to the Tonawanda Seneca Nation regarding the portion of proposed critical habitat Unit 16 (Tonawanda Creek) that flows through the Tonawanda Reservation, and we will continue to work with Tribal entities during the development of a final rule for the designation of critical habitat for the salamander mussel.

**References Cited**

A complete list of references cited in this rulemaking is available on the internet at <https://www.regulations.gov>

and upon request from the Michigan Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Authors**

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service’s Species Assessment Team and the Michigan Ecological Services Field Office.

**List of Subjects in 50 CFR Part 17**

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

**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. In § 17.11, amend paragraph (h) by adding an entry for “Mussel, salamander” to the List of Endangered and Threatened Wildlife in alphabetical order under CLAMS to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

\* \* \* \* \*  
(h) \* \* \*

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
*	*	*	*	* *
CLAMS				
Mussel, salamander .....	<i>Simpsonaias ambigua</i> ..	Wherever found .....	E	[FEDERAL REGISTER citation when published as a final rule]; 50 CFR 17.95(f). <sup>CH</sup>
*	*	*	*	* *

■ 3. In § 17.95, amend paragraph (f) by adding an entry for “Salamander Mussel (*Simpsonaias ambigua*)” following the entry for “Longsolid (*Fusconaia subrotunda*)”, to read as follows:

**§ 17.95 Critical habitat—fish and wildlife.**

\* \* \* \* \*  
(f) *Clams and Snails*.  
\* \* \* \* \*

Salamander Mussel (*Simpsonaias ambigua*)

(1) Critical habitat units are depicted for Benton, Carroll, Clinton, Daviess, Dearborn, DeKalb, Dubois, Fulton, Jefferson, Jennings, Kosciusko, Lawrence, Marshall, Martin, Ohio, Pike, Pulaski, Ripley, Starke, Steuben, Tippecanoe, Warren, and White Counties, Indiana; Bath, Bracken, Campbell, Fleming, Hardin, Harrison,

Henry, Kenton, LaRue, Lewis, Marion, Morgan, Nelson, Nicholas, Pendleton, Robertson, Rowan, and Washington Counties, Kentucky; Oakland and St. Clair Counties, Michigan; Chisago and Washington Counties, Minnesota; Erie, Genesee, Niagara, and Wyoming Counties, New York; Ashtabula, Hancock, Putnam, and Williams Counties, Ohio; Armstrong, Crawford,

Erie, Mercer, and Venango Counties, Pennsylvania; Cheatham, Dickson, Hickman, Humphreys, Maury, and Perry Counties, Tennessee; Doddridge, Marshall, Pleasants, Ritchie, Tyler, Wetzell, Wirt, and Wood Counties, West Virginia; and Adams, Buffalo, Columbia, Crawford, Dane, Dunn, Eau Claire, Grant, Iowa, Jackson, Juneau, La Crosse, Lincoln, Marathon, Monroe, Oconto, Pepin, Pierce, Polk, Richland, Sauk, Shawano, St. Croix, and Trempealeau Counties, Wisconsin, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the salamander mussel consist of the following components:

(i) Adequate flows, or a hydrologic flow regime (magnitude, timing, frequency, duration, rate of change, and overall seasonality of discharge over time), necessary to maintain benthic habitats where the salamander mussel and its host, the mudpuppy, are found and to maintain stream connectivity.

(ii) Suitable substrates and connected instream habitats, characterized by geomorphologically stable stream channels and banks (*i.e.*, channels that maintain lateral dimensions,

longitudinal profiles, and sinuosity patterns over time without an aggrading or degrading bed elevation) with habitats that support the salamander mussel and mudpuppy (*e.g.*, large rock shelters, woody debris, and bedrock crevices within stable zones of swift current with low amounts of fine sediment silt).

(iii) Water and sediment quality necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages, including (but not limited to) dissolved oxygen (generally above 2 to 3 parts per million (ppm)), salinity (generally below 2 to 4 ppm), and temperature (generally below 86 °F) (30 °C)). Additionally, concentrations of contaminants, including (but not limited to) ammonia, nitrate, copper, and chloride, are below acute toxicity levels for mussels.

(iv) The presence and abundance of the mudpuppy host.

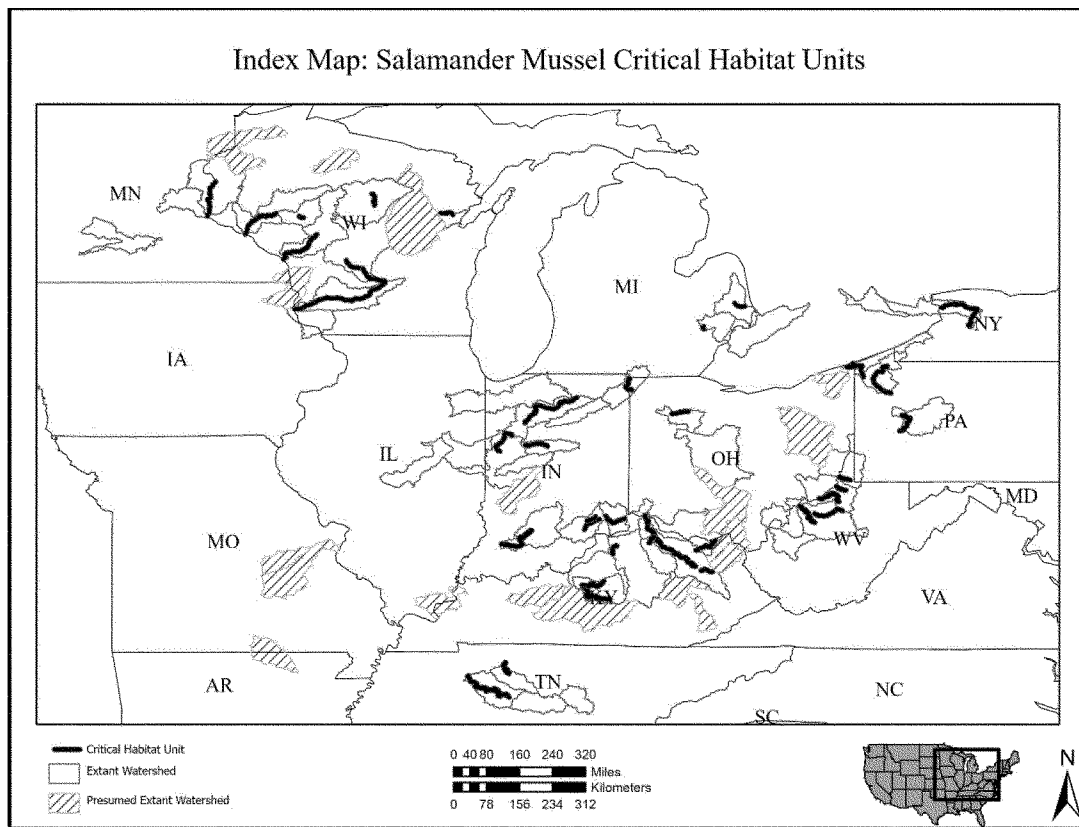
(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal

boundaries on the effective date of final rule.

(4) Data layers defining map units were created using the 1984 World Geodetic System ellipsoid, and 1983 North American datum, and geographic coordinate system. The National Hydrography Dataset was used to create the critical habitat units. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site at <https://www.fws.gov/species/salamander-mussel-simpsonaias-ambigua>, at <https://www.regulations.gov> at Docket No. FWS-R3-ES-2023-0058, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Index map follows:  
Figure 1 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (5)

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(6) Unit 1: St. Croix River; Polk, St. Croix, and Pierce Counties, Wisconsin,

and Chisago and Washington Counties, Minnesota.

(i) Unit 1 consists of 52.93 miles (85.19 kilometers (km)) of St. Croix

River from the base of the dam at St. Croix Falls (Polk County, Wisconsin) and Taylors Falls (Chisago County, Minnesota) downstream to the confluences with the Mississippi River at Prescott (Pierce County, Wisconsin) and Point Douglas (Washington County, Minnesota). The unit includes the river channel up to the ordinary high water mark. Approximately 28.85 miles (46.43 km) of the riparian lands adjacent to this unit are in public ownership, and 24.08 miles (38.76 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 12.63 miles (20.32 km) are Federal lands associated with

the National Park Service's (NPS) Lower St. Croix National Scenic Riverway;

(B) Approximately 4.25 miles (6.84 km) are Federal lands associated with the NPS's Lower St. Croix National Scenic Riverway on one side of the bank and State lands associated with the Wisconsin Department of Natural Resources' (WDNR) St. Croix Islands Wildlife Area on the other side;

(C) Approximately 5.0 miles (8.04 km) are Federal lands associated with the NPS's Lower St. Croix National Scenic Riverway on one side of the bank and State lands associated with the Minnesota Department of Natural Resources' William O'Brien State Park on the other side;

(D) Approximately 5.2 miles (8.37 km) are State lands associated with the WDNR's Kinnickinnic State Park and Interstate Park on one side of the bank and State lands associated with the Minnesota Department of Natural Resources' Interstate Park on the other side; and

(E) Approximately 1.78 miles (2.86 km) are State lands associated with the Minnesota Department of Natural Resources' Afton State Park.

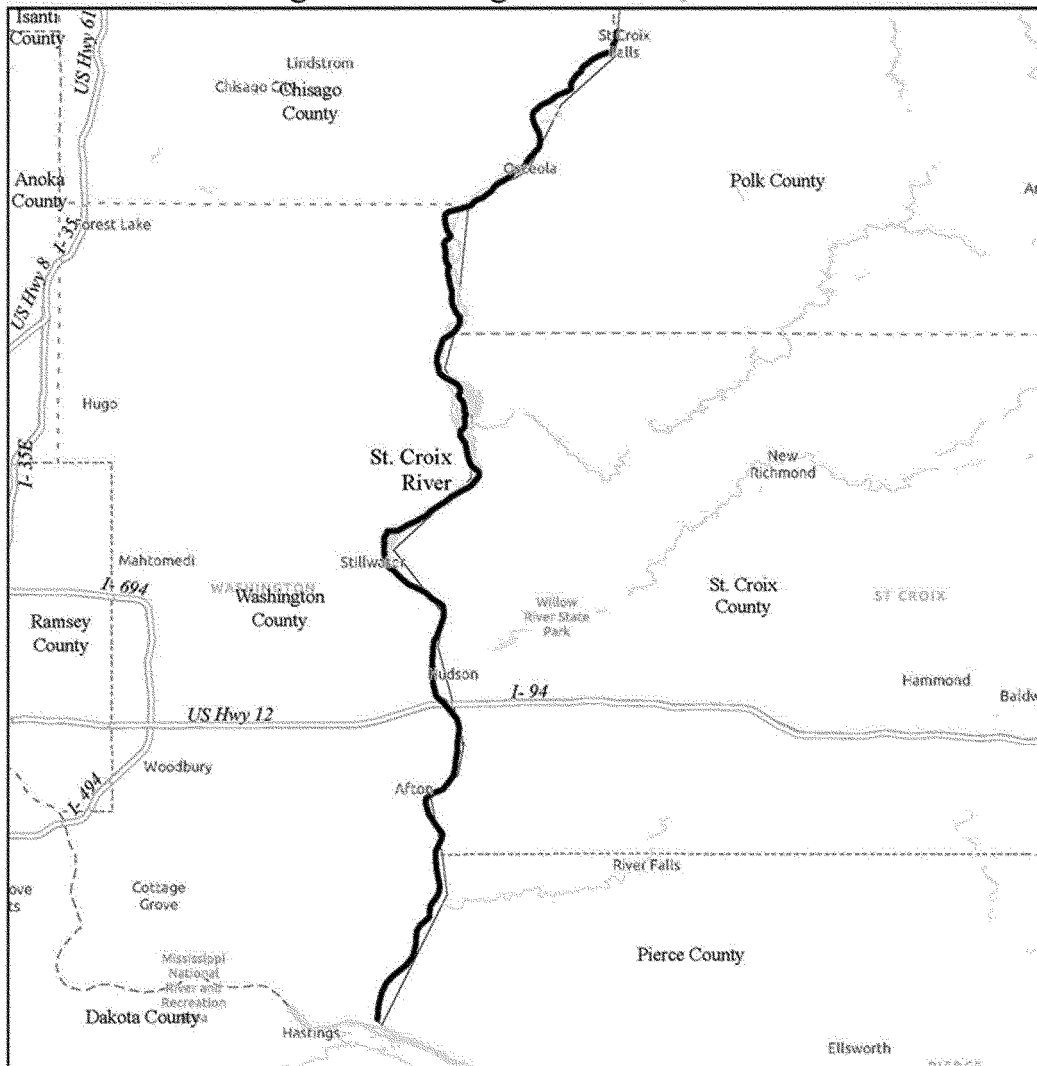
(ii) Map of Unit 1 follows:

Figure 2 to Salamander Mussel

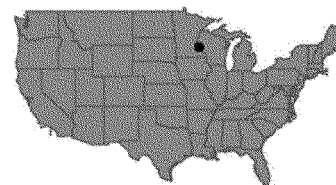
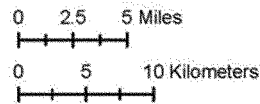
(*Simpsonaias ambigua*) paragraph

(6)(ii)

### Critical Habitat for Salamander Mussel Unit 1 - St. Croix River; Polk, St. Croix, and Pierce Counties, Wisconsin & Chisago and Washington Counties, Minnesota



- Critical Habitat
- Waterbody
- County Boundary
- Major Road
- State Boundary



(7) Unit 2: Chippewa River; Buffalo, Dunn, Eau Claire, and Pepin Counties, Wisconsin.

(i) Unit 2 consists of 59.24 miles (95.33 km) of Chippewa River from the mouth of the Eau Claire River at Eau Claire (Eau Claire County, Wisconsin) downstream to the confluence with the Mississippi River south of Trevino (Buffalo and Pepin Counties, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Approximately 34.04 miles (54.77 km) of the riparian lands adjacent to this

unit are in public ownership, and 25.2 miles (40.56 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 1.3 miles (2.09 km) are lands associated with the city of Eau Claire's Owen Park and Jefferson County's Public Hunting Ground;

(B) Approximately 4.2 miles (6.76 km) are Federal lands associated with the Bureau of Land Management's (BLM) stewardship of islands within the river channel;

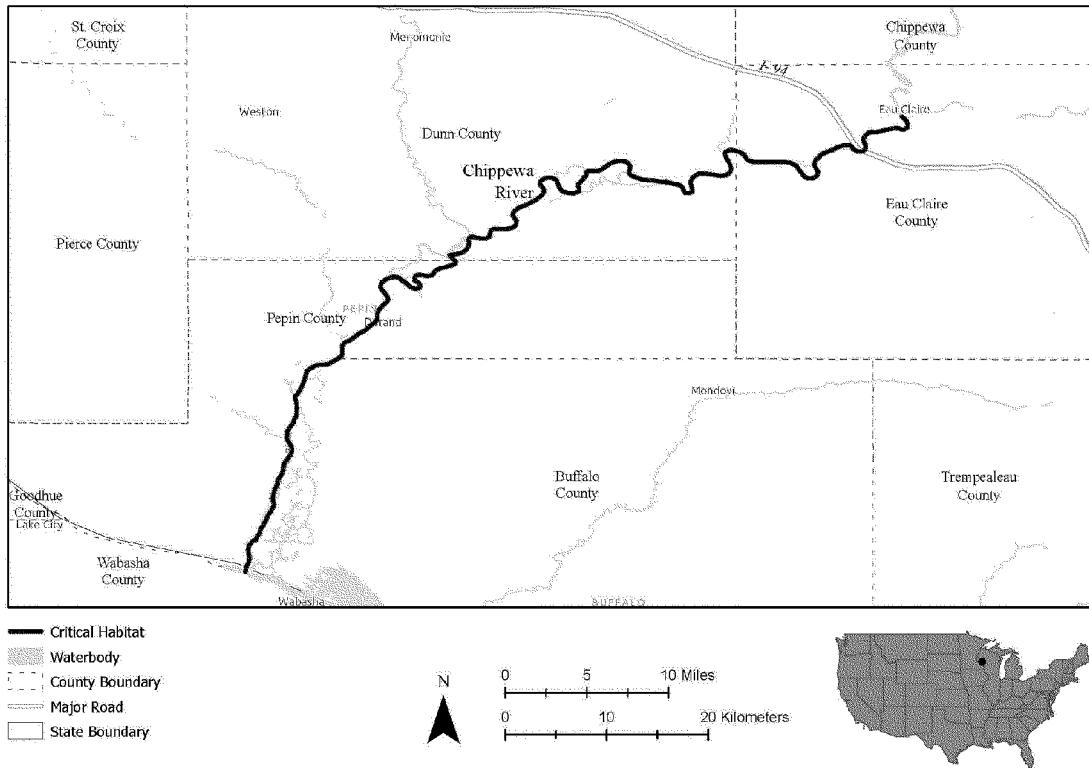
(C) Approximately 1.6 miles (2.57 km) are Federal lands associated with the Service's Upper Mississippi River National Wildlife and Fish Refuge on one bank and State lands associated with the WDNR's Tiffany Wildlife Area on the opposite bank; and

(D) Approximately 27 miles (43.45 km) are State lands associated with the WDNR's Lower Chippewa River State Natural Area, Dunnville Wildlife Area, and Nine Mile Island State Natural Area.

(ii) Map of Unit 2 follows:

Figure 3 to Salamander Mussel  
 (*Simpsonaias ambigua*) paragraph  
 (7)(ii)

Critical Habitat for Salamander Mussel  
 Unit 2 - Chippewa River; Buffalo, Dunn, Eau Claire, and Pepin Counties, Wisconsin



(8) Unit 3: Eau Claire River; Eau Claire County, Wisconsin.

(i) Unit 3 consists of 7.40 miles (11.91 km) of Eau Claire River from the confluence of the North Fork and South Fork Eau Claire River (Eau Claire County, Wisconsin) downstream to Lake

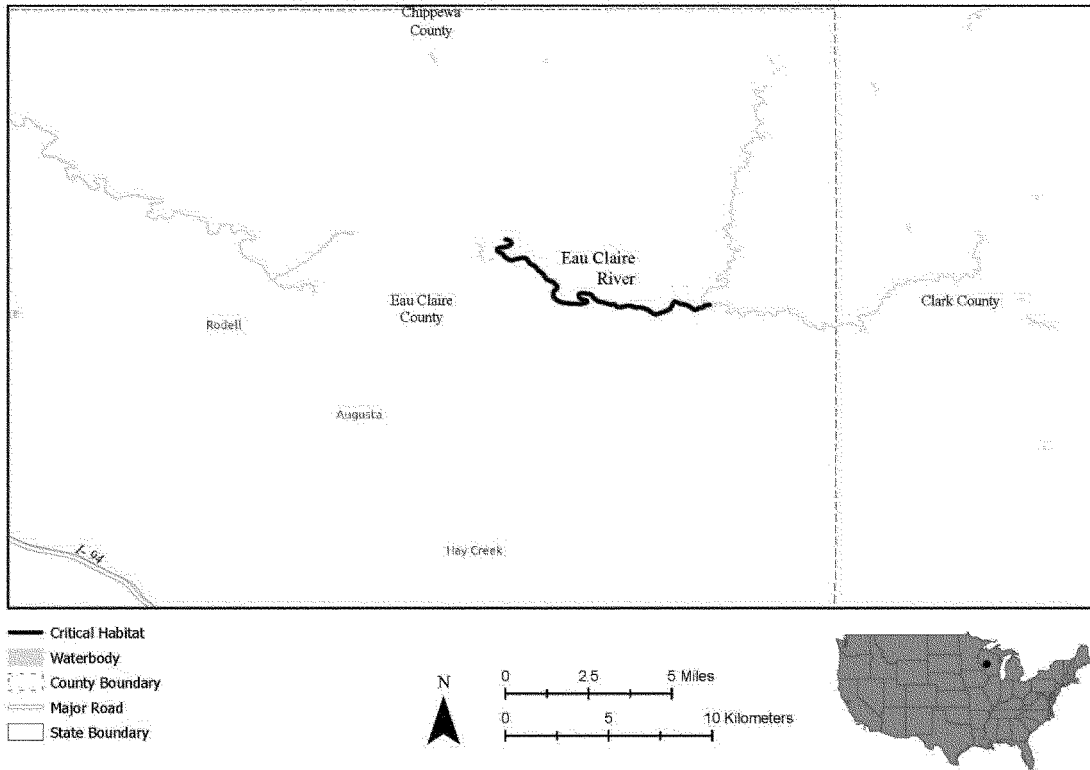
Eau Claire (Eau Claire County, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Approximately 4.23 miles (6.81 km) of the riparian lands adjacent to this unit are in public ownership, and 3.17 miles (5.1 km) are in private ownership.

The land in public ownership in this unit is associated with the Eau Claire County Forest.

(ii) Map of Unit 3 follows:  
 Figure 4 to Salamander Mussel  
 (*Simpsonaias ambigua*) paragraph  
 (8)(ii)



**Critical Habitat for Salamander Mussel  
Unit 3 - Eau Claire River, Eau Claire County, Wisconsin**



(9) Unit 4: Black River; Jackson, La Crosse, Monroe, and Trempealeau Counties, Wisconsin.

(i) Unit 4 consists of 75.38 miles (121.31 km) of Black River from the bottom of Lake Arbutus dam southeast of Hatfield (Jackson County, Wisconsin) downstream to the confluence with the Mississippi River west of Brice Prairie (La Crosse County, Wisconsin). This unit includes the river channel up to the ordinary high water mark. Approximately 35.71 miles (57.47 km) of the riparian lands adjacent to this

unit are in public ownership, and 39.67 miles (63.84 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 0.15 mile (0.24 km) is land associated with Jackson County Forest;

(B) Approximately 0.86 mile (1.38 km) is Federal land associated with the BLM's stewardship of islands within the river channel;

(C) Approximately 6.6 miles (10.62 km) are Federal lands associated with the Service's Upper Mississippi River

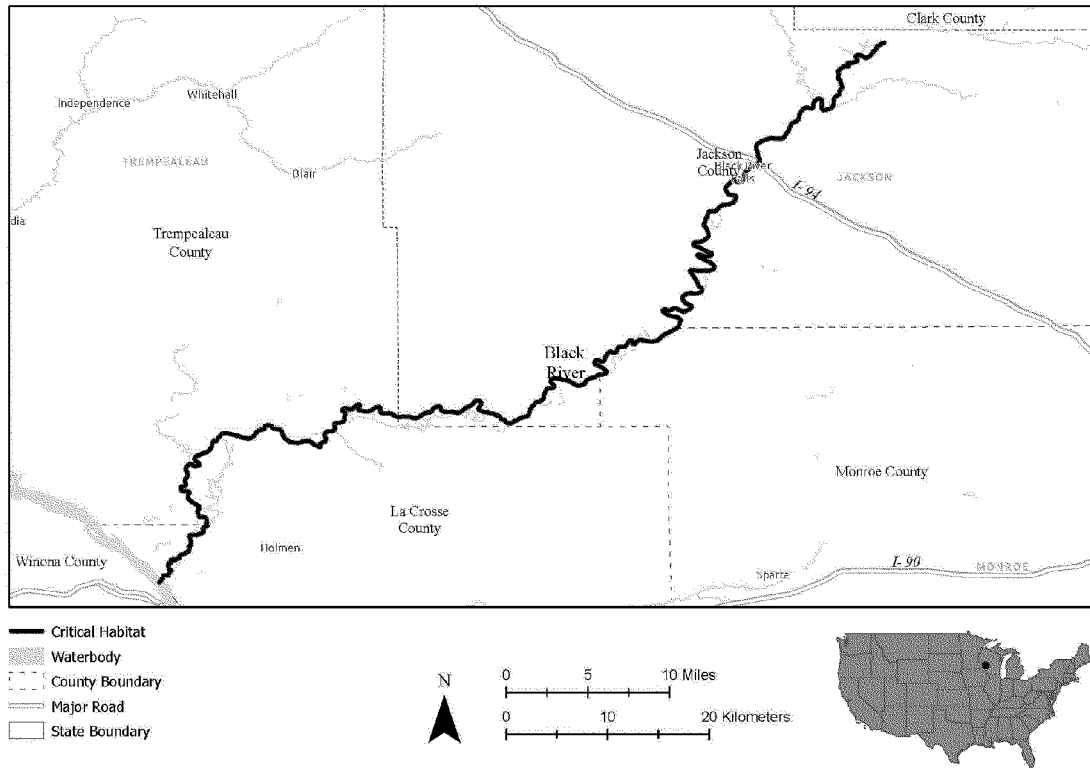
National Wildlife and Fish Refuge on one bank and State lands associated with the WDNR's Van Loon Wildlife Area on the opposite bank; and

(D) Approximately 28 miles (45.06 km) are State lands associated with the WDNR's North Bend Bottoms Wildlife Area, Statewide Habitat Areas, Half Moon Lake Fishery Area, and Black River State Forest.

(ii) Map of Unit 4 follows:

Figure 5 to Salamander Mussel (*Simpsonia ambigua*) paragraph (9)(ii)

Critical Habitat for Salamander Mussel  
 Unit 4 - Black River; Jackson, La Crosse, Monroe, and Trempealeau Counties, Wisconsin



(10) Unit 5: Wisconsin River North; Lincoln and Marathon Counties, Wisconsin.

(i) Unit 5 consists of 21.19 miles (34.1 km) of Wisconsin River from the base of the dam at Merrill (Marathon County, Wisconsin) downstream to the top of the dam at Wausau (Lincoln County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Approximately 4.11 miles (6.62

km) of the riparian lands adjacent to this unit are in public ownership, and 17.08 miles (27.48 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 3.78 miles (6.08 km) are city or county lands associated with the city of Merrill's Riverside Park, Marathon County's Marathon County Forest, city of Wausau's Gilbert Park, Scholfield Park, Baker Stewart Island

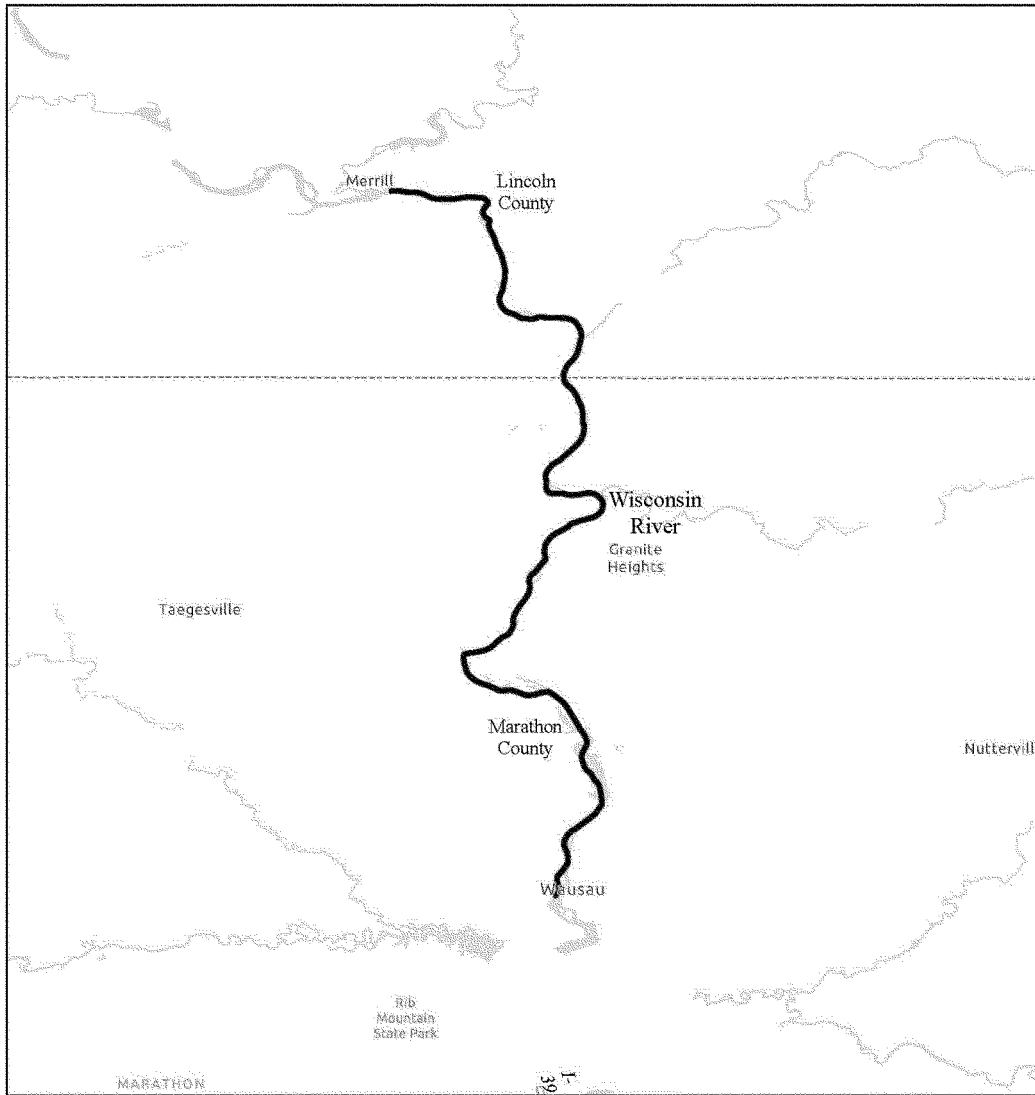
Park, Big Bull Falls Park, White Water Park, and Woodson Park; and

(B) Approximately 0.34 mile (0.55 km) is State land associated with the WDNR's State-Owned Islands.

(ii) Map of Unit 5 follows:

Figure 6 to Salamander Mussel (*Simpsonia ambigua*) paragraph (10)(ii)

**Critical Habitat for Salamander Mussel  
Unit 5 - Wisconsin River North; Lincoln and Marathon Counties, Wisconsin**



- Critical Habitat
- Waterbody
- County Boundary
- Major Road
- State Boundary



0 2.5 5 Miles

0 5 10 Kilometers



(11) Unit 6: North Branch Pensaukee River; Shawano and Oconto Counties, Wisconsin.

(i) Unit 6 consists of 19.93 miles (32.08 km) of North Branch Pensaukee River from the Pensaukee Lakes at Cecil (Shawano County, Wisconsin) downstream to the confluence with the Pensaukee River at Abrams (Oconto County, Wisconsin). The unit includes

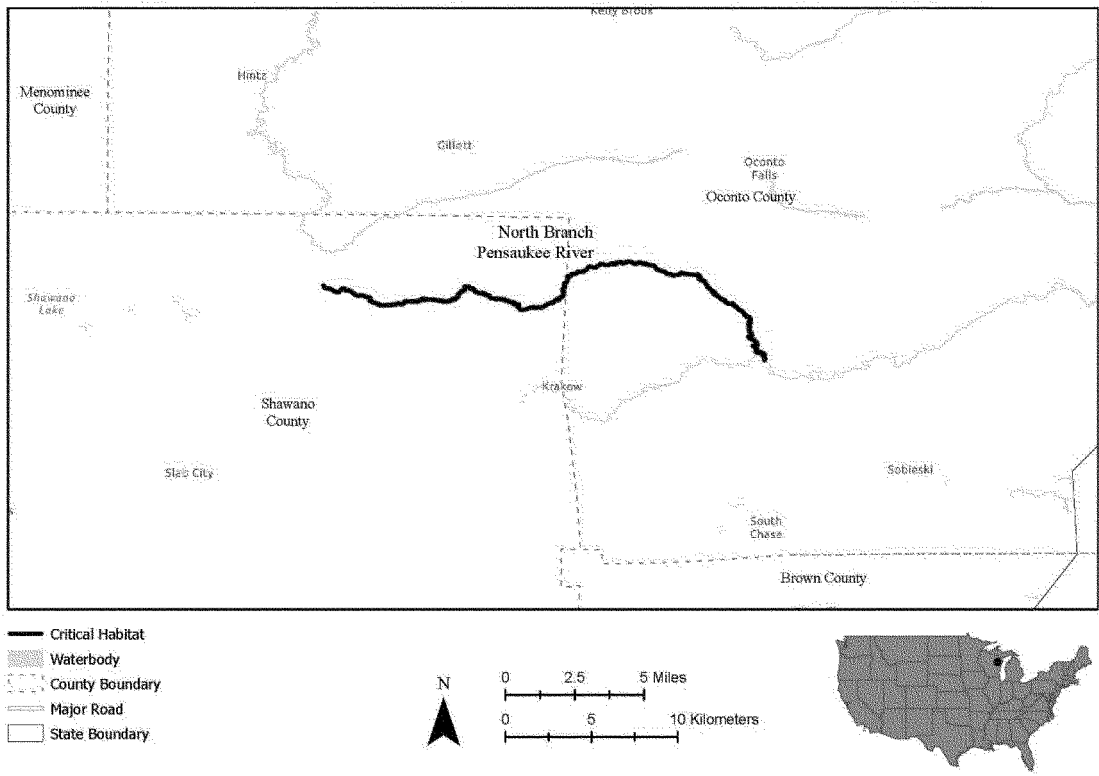
the river channel up to the ordinary high water mark. Approximately 1.24 miles (2.0 km) of the riparian lands adjacent to this unit are in public ownership, and 18.69 miles (30.08 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 1.22 miles (1.96 km) are county lands associated with the Oconto County Forest; and

(B) Approximately 0.02 mile (0.03 km) is State land associated with the WDNR's Wiouwash State Trail.

(ii) Map of Unit 6 follows: Figure 7 to Salamander Mussel (*Simpsonia ambigua*) paragraph (11)(ii)

**Critical Habitat for Salamander Mussel  
Unit 6 - North Branch Pensaukee River; Shawano and Oconto Counties, Wisconsin**



(12) Unit 7: Lemonweir River; Juneau County, Wisconsin.

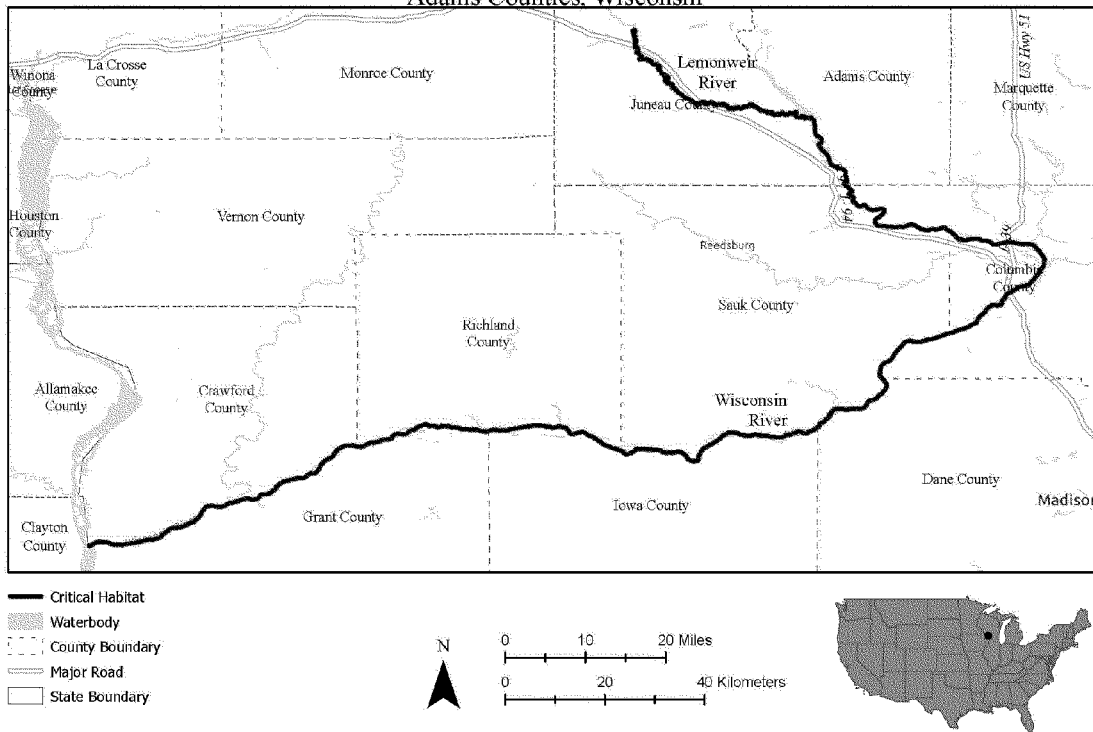
(i) Unit 7 consists of 37.5 miles (60.36 km) of Lemonweir River from approximately 0.25-mile north of Kennedy County Park north of New Lisbon (Juneau County, Wisconsin) downstream to the confluence with the Wisconsin River northeast of Lyndon

Station (Juneau County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Approximately 2.11 miles (3.4 km) of the riparian lands adjacent to this unit are in public ownership, and 35.39 miles (56.96 km) are in private ownership. The lands in public ownership are city or county lands

associated with the Juneau County Forest owned by Juneau County, Riverside Park owned by the city of Mauston, and an unnamed natural area owned by the county.

(ii) Map of Units 7 and 8 follows: Figure 8 to Salamander Mussel (*Simpsonias ambigua*) paragraph (12)(ii)

Critical Habitat for Salamander Mussel  
 Unit 7 - Lemonweir River; Juneau County, Wisconsin  
 Unit 8 - Wisconsin River South; Iowa, Grant, Dane, Crawford, Richland, Sauk, Columbia, Juneau, and  
 Adams Counties, Wisconsin



(13) Unit 8: Wisconsin River South; Iowa, Grant, Dane, Crawford, Richland, Sauk, Columbia, Juneau, and Adams Counties, Wisconsin.

(i) Unit 8 consists of 152.88 miles (246.03 km) of Wisconsin River from the confluence with the Lemonweir River south of White Creek (Adams County, Wisconsin) downstream to the confluence with the Mississippi River south of Prairie du Chien (Crawford County, Wisconsin). The unit includes the river channel up to the ordinary high water mark. Approximately 102.78 miles (165.40 km) of the riparian lands adjacent to this unit are in public ownership, and 50.10 miles (80.63 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 0.09 mile (0.14 km) is city land associated with the Village of Lake Delton's Newport Park;

(B) Approximately 9 miles (14.48 km) are Federal lands associated with the BLM's land stewardship of islands within the river channel and the Service's Upper Mississippi River National Wildlife and Fish Refuge; and

(C) Approximately 93.7 miles (150.8 km) are State lands associated with the WDNR's Pine Island Wildlife Area, Sauk Prairie Recreation Area, and Lower Wisconsin State Riverway.

(ii) Map of Unit 8 is provided at paragraph (12)(ii) of this entry.

(14) Unit 9: Big Pine Creek; White, Benton, and Warren Counties, Indiana.

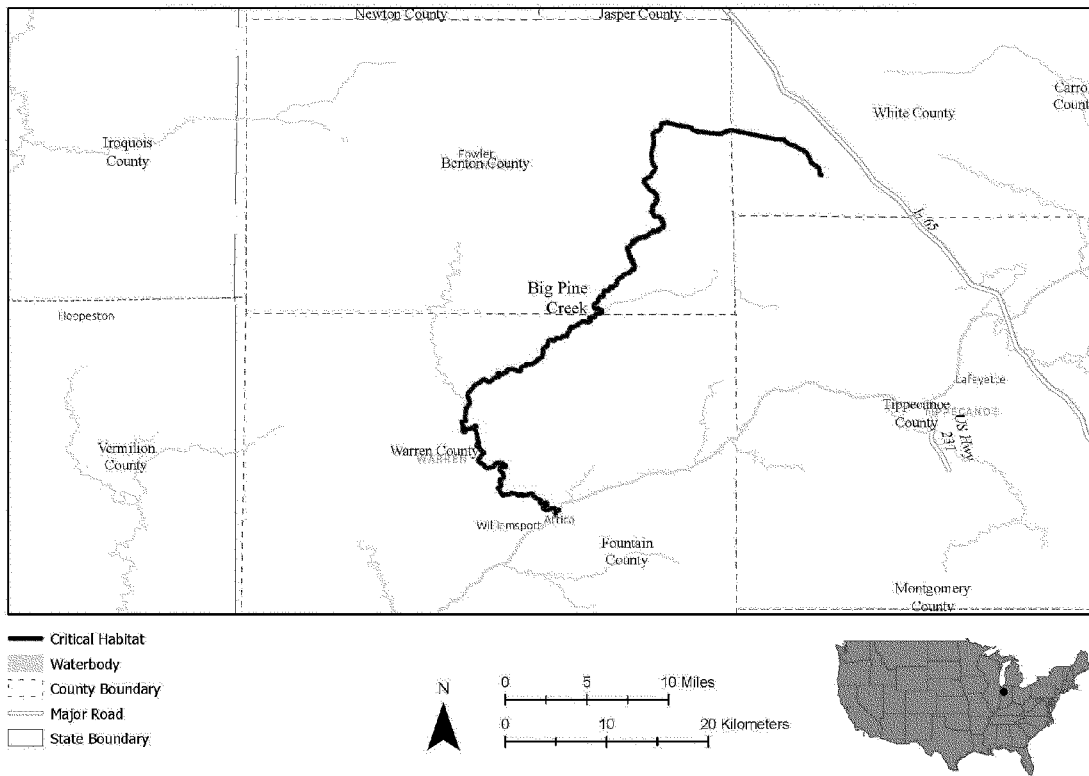
(i) Unit 9 consists of 51.23 miles (82.44 km) of Big Pine Creek from the

headwaters of Big Pine Creek northeast of Round Grove (White County, Indiana) downstream to the confluence with the Wabash River at Attica (Fountain County, Indiana). The unit includes the river channel up to the ordinary high water mark. Approximately 1.3 miles (2.09 km) of the riparian lands adjacent to this unit are in public ownership, and 49.93 miles (80.35 km) are in private ownership. The lands in public ownership are State lands associated with the Indiana Department of Natural Resources' (IDNR) Pine Creek Bottoms Gamebird Habitat Area.

(ii) Map of Unit 9 follows:

Figure 9 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (14)(ii)

Critical Habitat for Salamander Mussel  
 Unit 9 - Big Pine Creek; White, Benton, and Warren Counties, Indiana



(15) Unit 10: Middle Fork Wildcat Creek; Carroll, Clinton, and Tippecanoe Counties, Indiana.

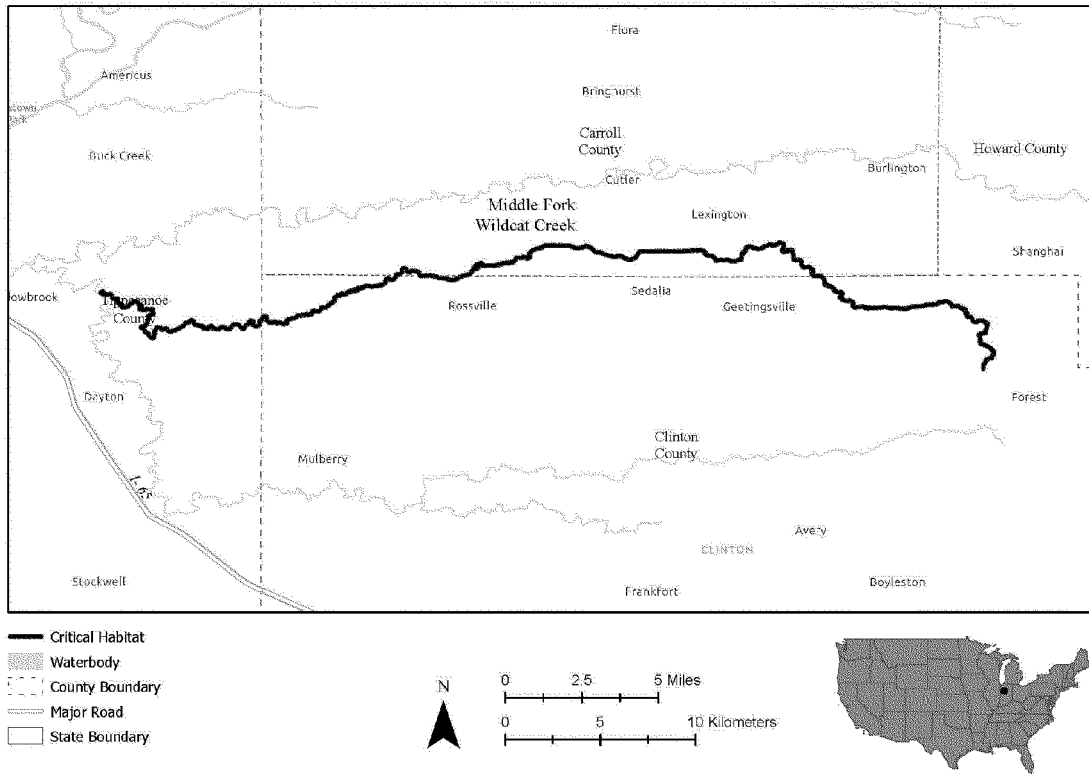
(i) Unit 10 consists of 35.7 miles (57.46 km) of Middle Fork Wildcat Creek from the headwaters of Middle Fork Wildcat Creek northwest of Forest

(Clinton County, Indiana) downstream to the confluence with South Fork Wildcat Creek northwest of Monitor (Tippecanoe County, Indiana). The unit includes the river channel up to the ordinary high water mark. The riparian

lands adjacent to this unit are in private ownership.

(ii) Map of Unit 10 follows: Figure 10 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (15)(ii)

Critical Habitat for Salamander Mussel  
 Unit 10 - Middle Fork Wildcat Creek; Carroll, Clinton, and Tippecanoe Counties, Indiana



(16) Unit 11: Tippecanoe River; Marshall, Fulton, Pulaski, Starke, Kosciusko, and White Counties, Indiana.

(i) Unit 11 consists of 124.26 miles (199.96 km) of Tippecanoe River from below Oswego Lake at Oswego (Kosciusko County, Indiana) downstream to the top of Lake Shaffer

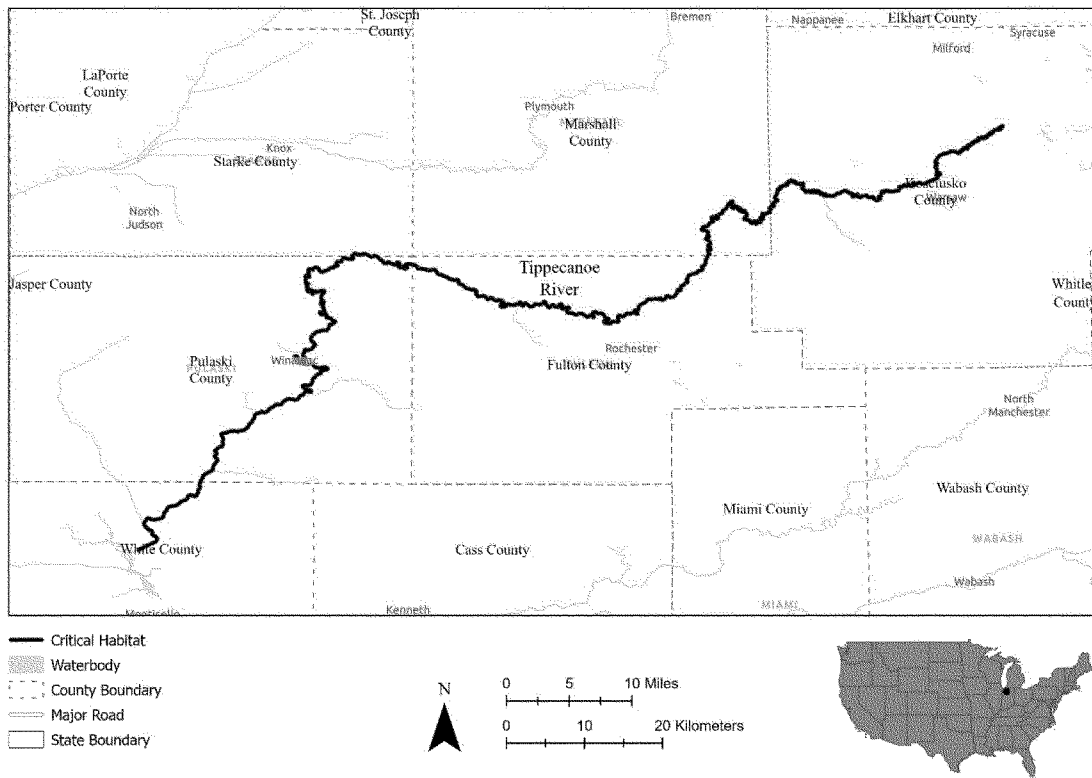
west of Sitka (White County, Indiana). The unit includes the river channel up to the ordinary high water mark. Approximately 7.43 miles (11.95 km) of the riparian lands adjacent to this unit are in public ownership, and 116.83 miles (188.01 km) are in private ownership. The lands in public ownership are State lands associated

with the IDNR’s Tippecanoe River State Park and Menominee Public Fishing Area, Talma Public Access, and Old Tip Town Public Access Site.

(ii) Map of Unit 11 follows:

Figure 11 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (16)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 11 - Tippecanoe River; Marshall, Fulton, Pulaski, Starke, Kosciusko, and White Counties, Indiana**



(17) Unit 12: Fish Creek (IN); Williams County, Ohio, and DeKalb and Steuben Counties, Indiana.

(i) Unit 12 consists of 37.36 miles (60.14 km) of Fish Creek from the headwaters of Fish Creek at Billingstown (Williams County, Ohio) downstream to the confluence with the

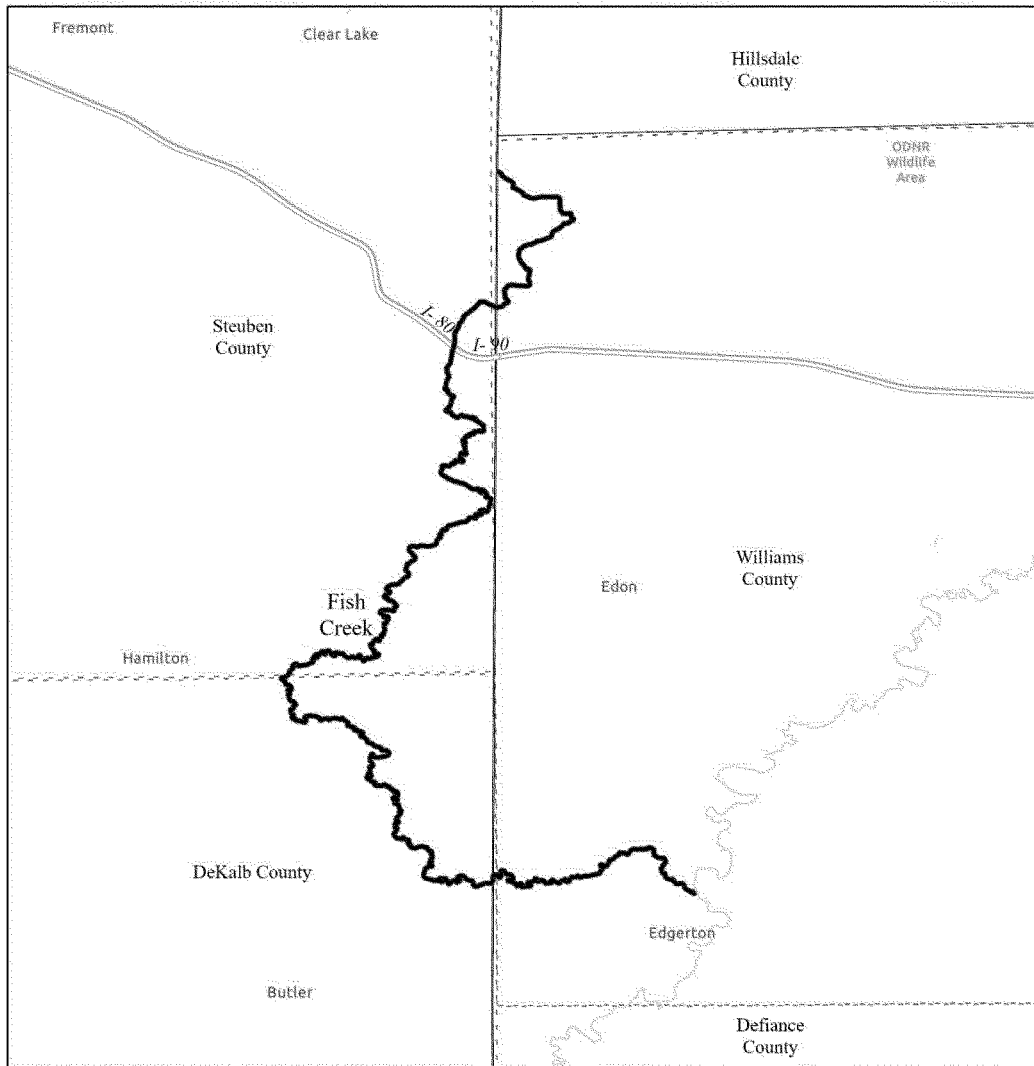
St. Joseph River at Edgerton (Williams County, Ohio). The unit includes the river channel up to the ordinary high water mark. Approximately 1.02 miles (1.65 km) of the riparian lands adjacent to this unit are in public ownership, and 36.34 miles (58.49 km) are in private ownership. The land in public

ownership is State land associated with the Ohio Department of Natural Resources' (ODNR) Fish Creek Wildlife Area.

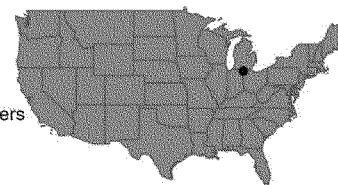
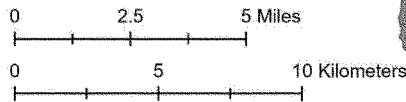
(ii) Map of Unit 12 follows: Figure 12 to Salamander Mussel (*Simpsonias ambigua*) paragraph (17)(ii)



### Critical Habitat for Salamander Mussel Unit 12 - Fish Creek; Williams County, Ohio & DeKalb and Steuben Counties, Indiana



- Critical Habitat
- Waterbody
- County Boundary
- Major Road
- State Boundary



(18) Unit 13: Blanchard River; Putnam and Hancock Counties, Ohio.

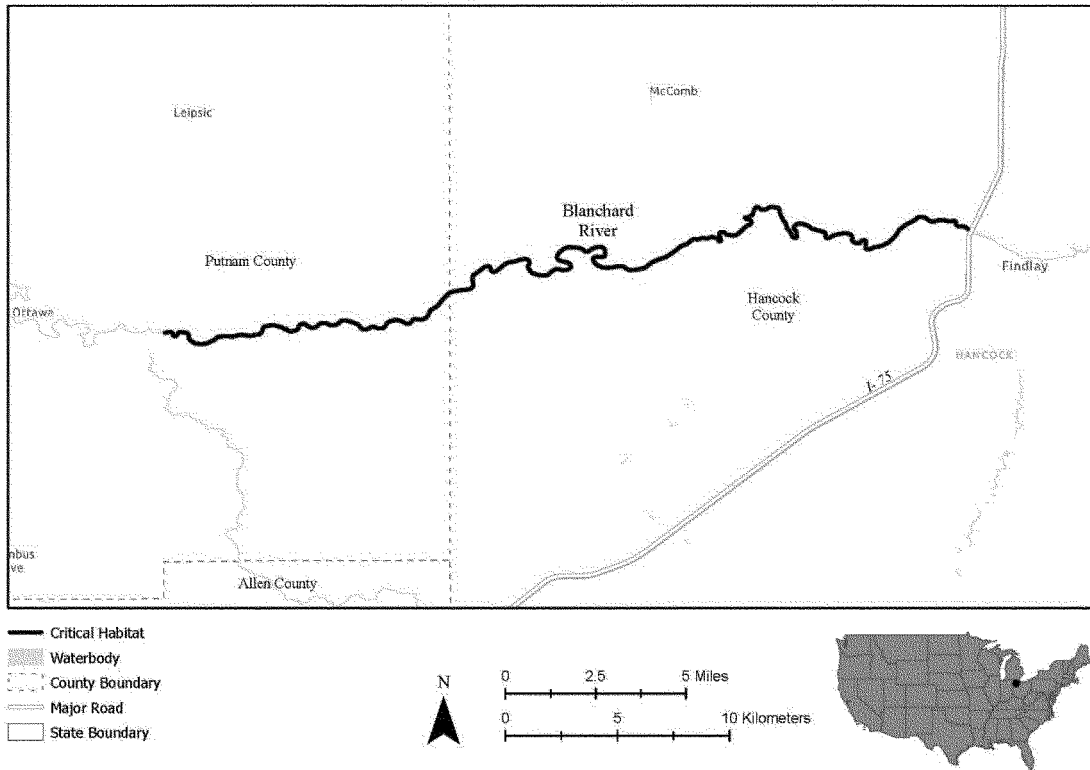
(i) Unit 13 consists of 25.02 miles (40.26 km) of Blanchard River from the west side of Findley (Hancock County, Ohio) downstream to the confluence with Riley Creek east of Ottawa (Putnam

County, Ohio). The unit includes the river channel up to the ordinary high water mark. Approximately 0.94 mile (1.51 km) of the riparian lands adjacent to this unit are in public ownership, and 24.08 miles (38.75 km) are in private ownership. The land in public

ownership is city or county land associated with Hancock Park District's Indian Green Preserve.

(ii) Map of Unit 13 follows: Figure 13 to Salamander Mussel (*Simpsonia ambigua*) paragraph (18)(ii)

Critical Habitat for Salamander Mussel  
 Unit 13 - Blanchard River; Putnam and Hancock Counties, Ohio



(19) Unit 14: Clinton River; Oakland County, Michigan.

(i) Unit 14 consists of 7.02 miles (11.29 km) of Clinton River from downstream of the fish hatchery at Waterford Township (Oakland County, Michigan) downstream to Cass Lake east of Four Towns (Oakland County,

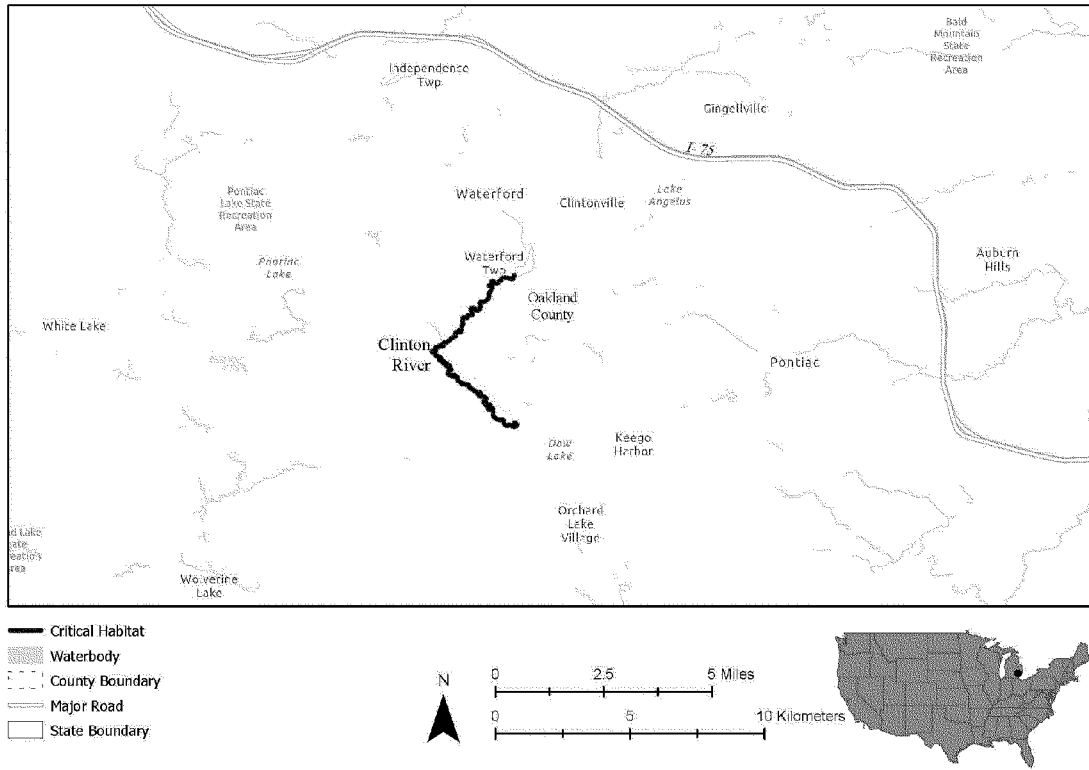
Michigan). The unit includes the river channel up to the ordinary high water mark. Approximately 0.28 mile (0.44 km) of the riparian lands adjacent to this unit are in public ownership, and 6.74 miles (10.85 km) are in private ownership. The land in public

ownership is city or county land associated with Waterford Township's Clinton River Canoe Site.

(ii) Map of Unit 14 follows:

Figure 14 to Salamander Mussel (*Simpsonias ambigua*) paragraph (19)(ii)

Critical Habitat for Salamander Mussel  
Unit 14 - Clinton River, Oakland County, Michigan



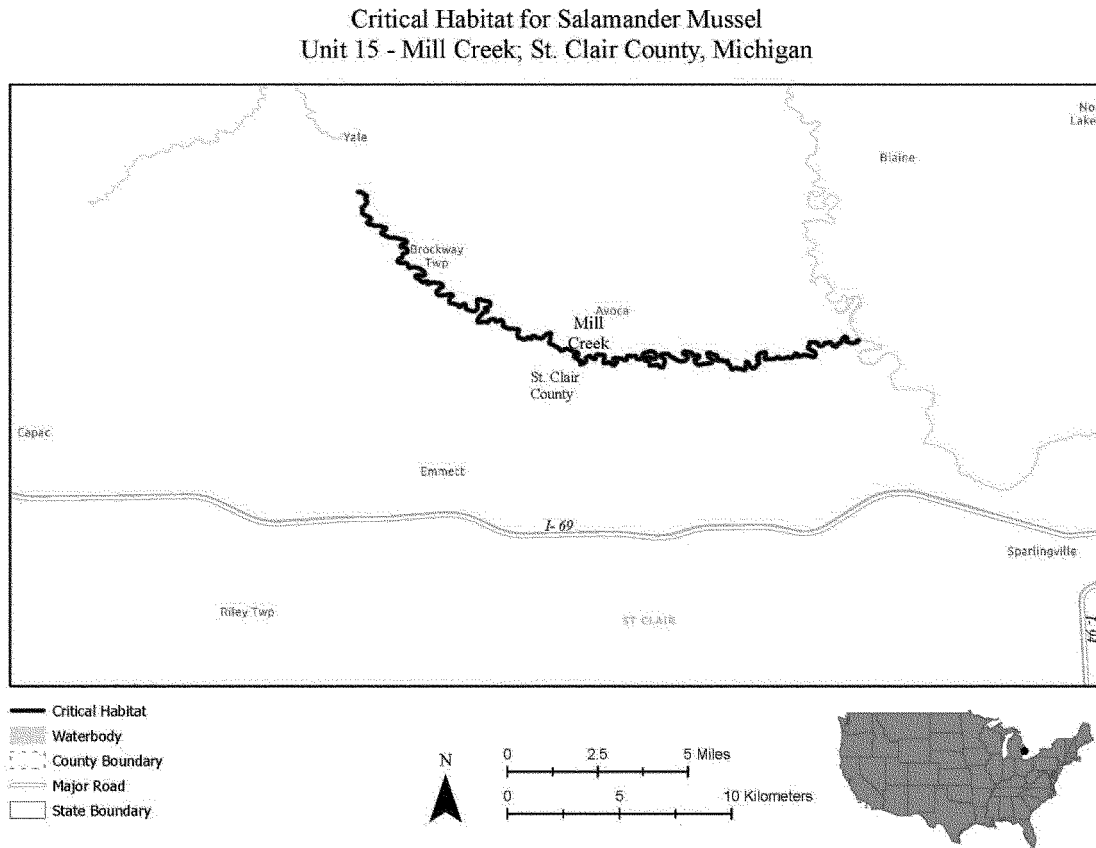
(20) Unit 15: Mill Creek; St. Clair County, Michigan.

(i) Unit 15 consists of 23.65 miles (38.06 km) of Mill Creek from the confluence with Thompson Drain northwest of Brockway Township (St. Clair County, Michigan) downstream to the confluence with the Black River at

Ruby (St. Clair County, Michigan). The unit includes the river channel up to the ordinary high water mark. Approximately 1.54 miles (2.47 km) of the riparian lands adjacent to this unit are in public ownership, and 22.11 miles (35.59 km) are in private ownership. The lands in public

ownership are State lands associated with the Michigan Department of Natural Resources' (MDNR) Port Huron State Game Area.

(ii) Map of Unit 15 follows: Figure 15 to Salamander Mussel (*Simpsonias ambigua*) paragraph (20)(ii)

Figure 15 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (20)(ii)

(21) Unit 16: Tonawanda Creek; Erie, Genesee, Niagara, and Wyoming Counties, New York.

(i) Unit 16 consists of 113.21 miles (182.20 km) of Tonawanda Creek from the headwaters of Tonawanda Creek at Java Center (Wyoming County, New York) downstream to the confluence with the Niagara River at Tonawanda (Erie County, New York). The unit includes the river channel up to the ordinary high water mark.

Approximately 8.70 miles (14.00 km) of the riparian lands adjacent to this unit are in public ownership, 93.91 miles (151.14 km) are in private ownership, and 10.6 miles (17.06 km) are Tribal lands. The Tribal lands in this unit are associated with the Tonawanda Reservation. Of the lands in public ownership:

(A) Approximately 2.08 miles (3.35 km) are city or county lands associated with the town of Sheldon's Vincent

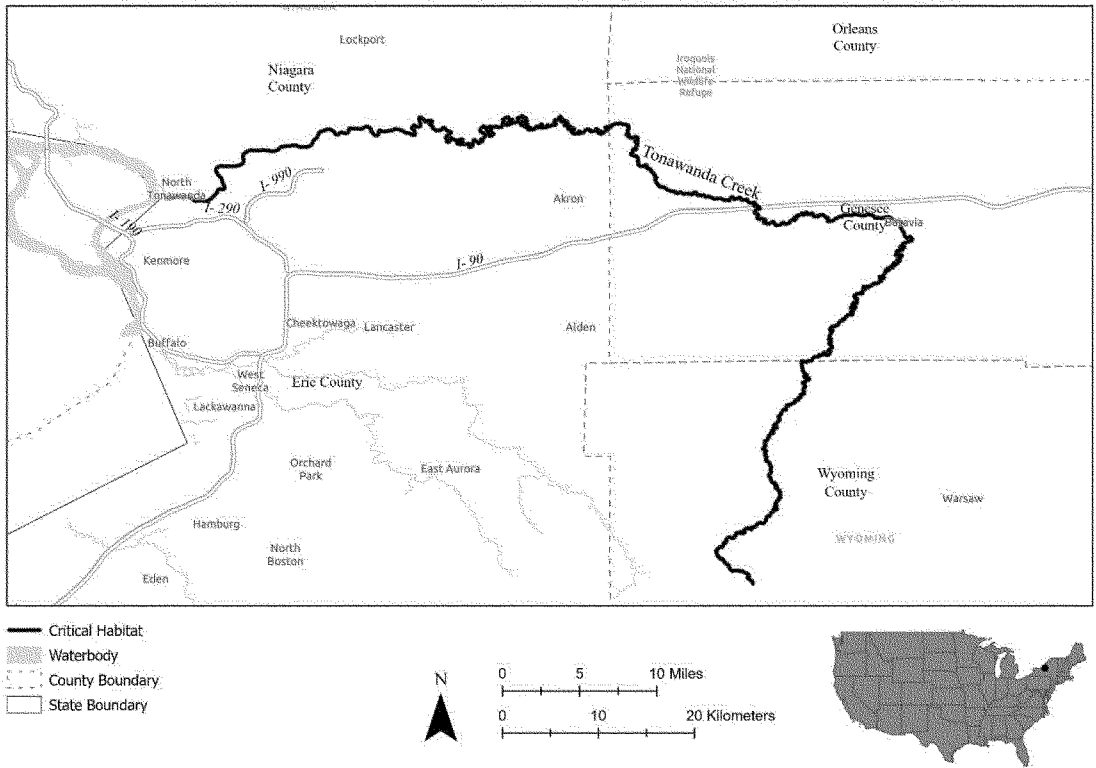
Almeter Memorial Park Lands, city of Attica's city lands, city of Batavia's local parks and Kiwanis mini park, and Erie County's Erie County Lands; and

(B) Approximately 6.62 miles (10.65 km) are State lands associated with New York's Erie Canal Waterway Trail.

(ii) Map of Unit 16 follows:

Figure 16 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (21)(i)

Critical Habitat for Salamander Mussel  
 Unit 16 - Tonawanda Creek; Niagara, Erie, Genesee, Wyoming Counties, New York



(22) Unit 17: Conneaut Creek; Ashtabula County, Ohio, and Erie and Crawford Counties, Pennsylvania.

(i) Unit 17 consists of 62 miles (99.78 km) of Conneaut Creek from the start of Conneaut Creek at Dicksonburg (Crawford County, Pennsylvania) downstream to the mouth with Lake Erie at Conneaut (Ashtabula County, Ohio). The unit includes the river

channel up to the ordinary high water mark. Approximately 2.31 miles (3.72 km) of the riparian lands adjacent to this unit are in public ownership, and 59.69 miles (96.06 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 0.34 mile (0.55 km) is city land associated with

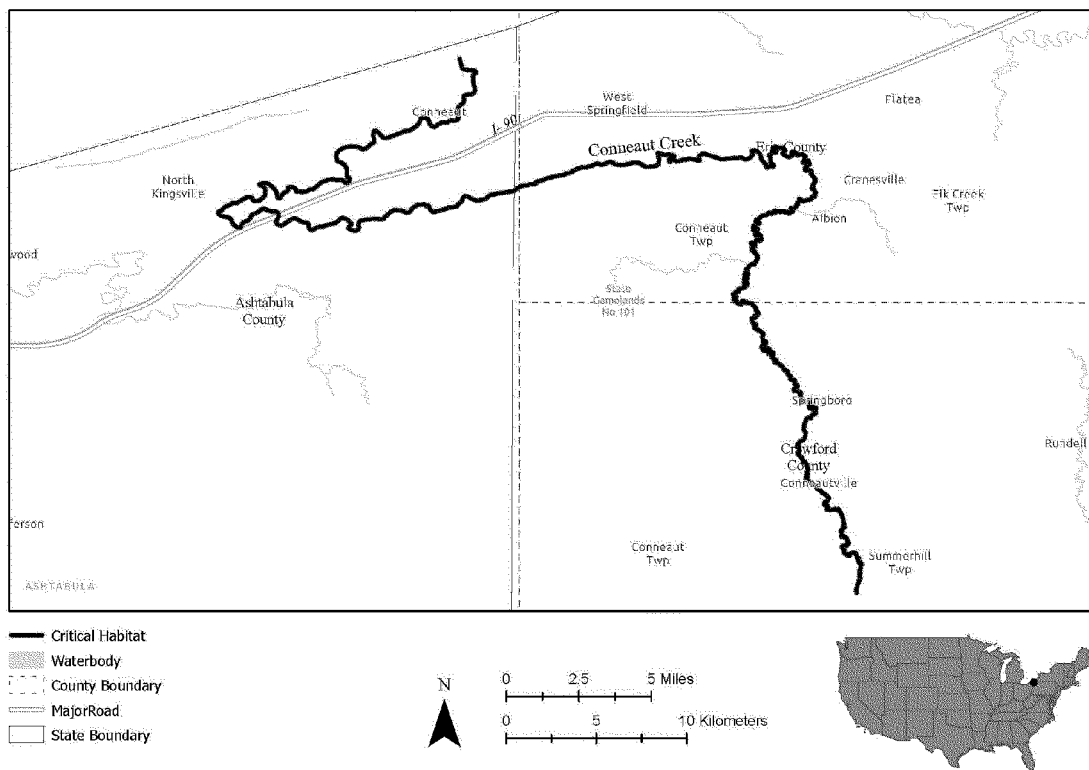
Conneaut Local Youth Organization Park; and

(B) Approximately 1.97 miles (3.17 km) are State lands associated with the ODNR's Conneaut Creek Scenic River.

(ii) Map of Unit 17 follows:

Figure 17 to Salamander Mussel (*Simpsonias ambigua*) paragraph (22)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 17 - Conneaut Creek; Ashtabula County, Ohio & Erie and Crawford Counties, Pennsylvania**



(23) Unit 18: French Creek; Mercer, Erie, Crawford, and Venango Counties, Pennsylvania.

(i) Unit 18 consists of 74.37 miles (119.69 km) of French Creek from downstream of Union City Dam northwest of Union City (Erie County, Pennsylvania) downstream to the confluence of the Allegheny River at Franklin (Venango County, Pennsylvania). The unit includes the river channel up to the ordinary high water mark. Approximately 5.83 miles (9.39km) of the riparian lands adjacent to this unit are in public ownership, and

68.54 miles (110.3 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 1.1 miles (1.77 km) are city or county lands associated with the Borough of Cambridge Springs' Cambridge Springs Recreation Area, the Township of Hayfield's Bertram Park, the Township of Vernon's Vernon Township Ball Fields and Vernon Township Recreation Association, and the city of Meadville's Kenneth A. Beers Jr. Bicentennial Park;

(B) Approximately 1.1 miles (1.77 km) are Federal lands associated with the

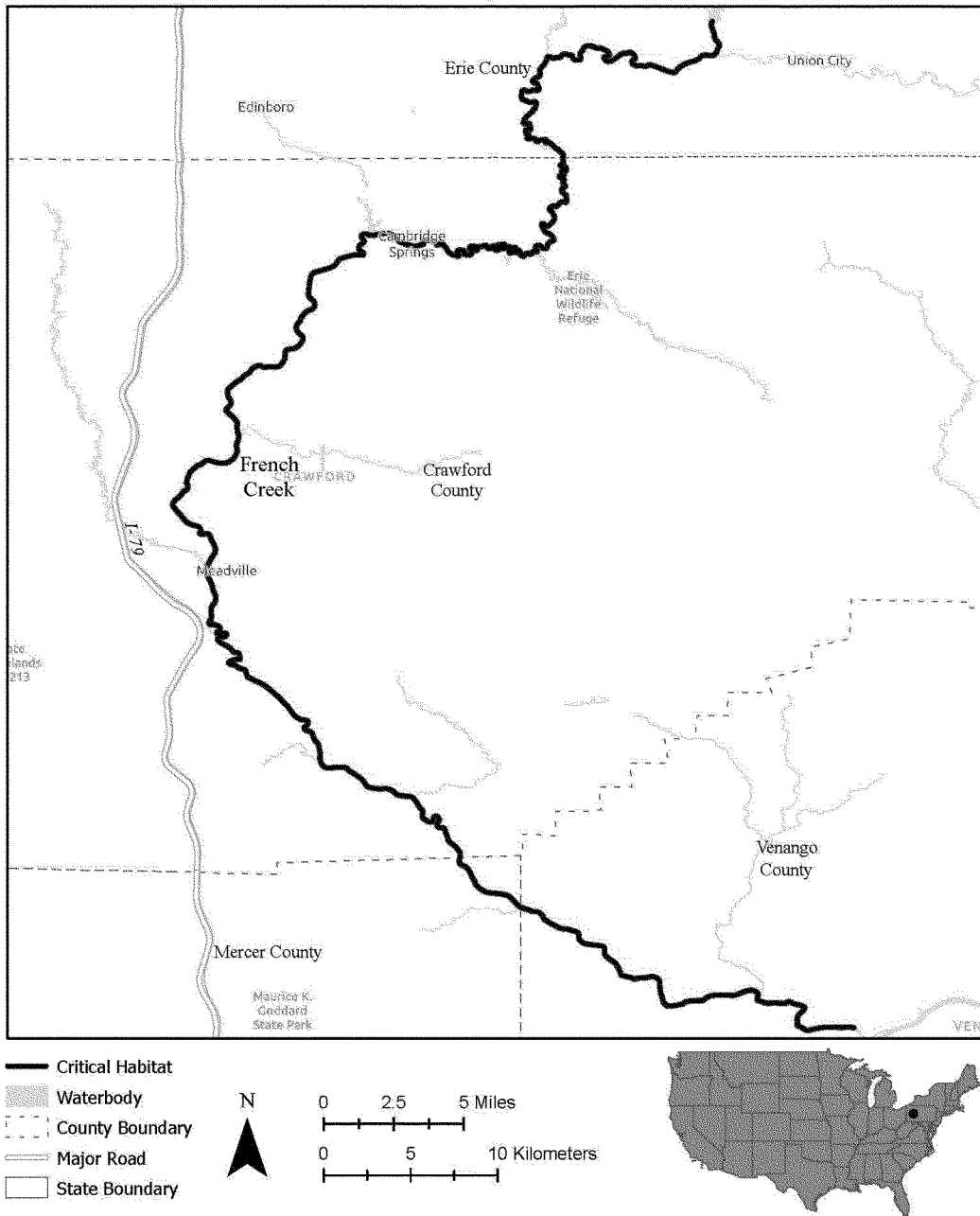
Service's Erie National Wildlife Refuge; and

(C) Approximately 3.6 miles (5.79 km) are State lands associated with the Pennsylvania Game Commission's State Game Land #85 and State Game Land #277 and the Pennsylvania Fish and Boat Commission's Meadville Access and Shaw's Landing.

(ii) Map of Unit 18 follows:

Figure 18 to Salamander Mussel (*Simpsonias ambigua*) paragraph (23)(ii)

**Critical Habitat for Salamander Mussel  
Unit 18 - French Creek; Mercer, Erie, Crawford, and Venango Counties,  
Pennsylvania**



(24) Unit 19: Allegheny River; Armstrong County, Pennsylvania.

(i) Unit 19 consists of 39.45 miles (63.48 km) of Allegheny River from the Pennsylvania Route 68 bridge at East Brady (Armstrong County, Pennsylvania) downstream to the confluence of Kiskiminetas River northeast of Freeport (Armstrong County, Pennsylvania). The unit includes the river channel up to the

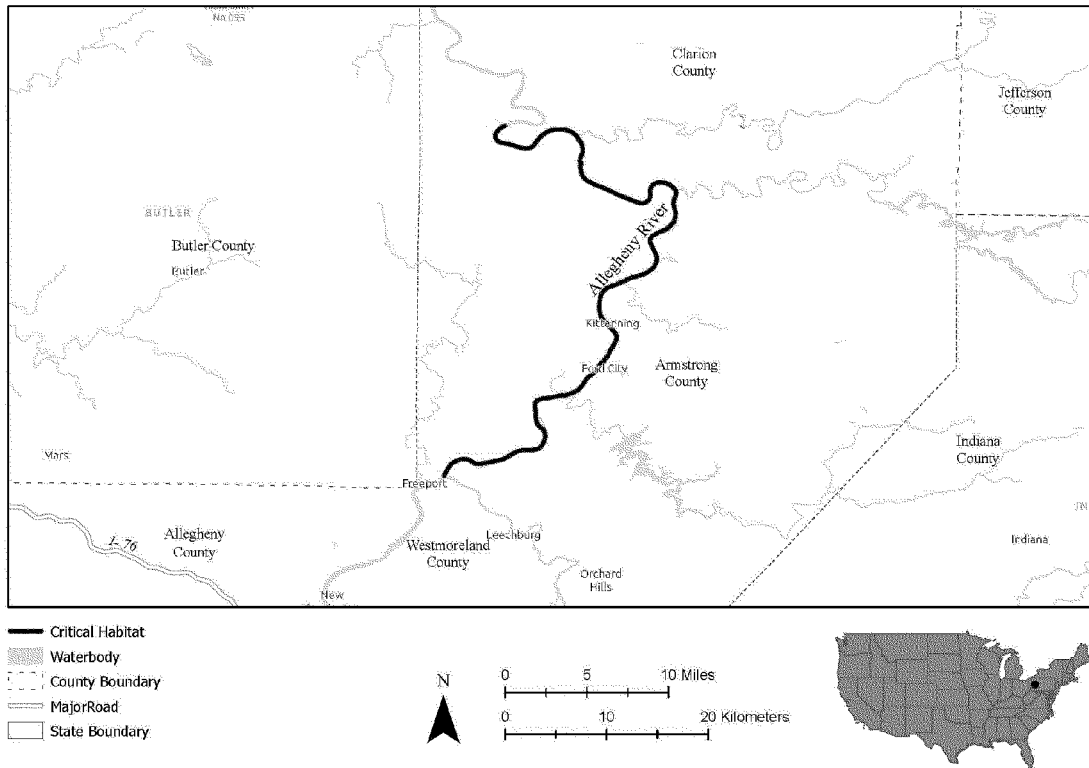
ordinary high water mark. Approximately 4.6 miles (7.4 km) of the riparian lands adjacent to this unit are in public ownership, and 34.85 miles (56.08 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 1.86 miles (2.99 km) are city or county lands associated with the Armstrong County's West Ford City Park and Riverfront Park; and

(B) Approximately 2.74 miles (4.41 km) are State lands associated with the Pennsylvania Game Commission's State Game Land #287 and State Game Land #105.

(ii) Map of Unit 19 follows: Figure 19 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (24)(ii)

Critical Habitat for Salamander Mussel  
 Unit 19 - Allegheny River, Armstrong County, Pennsylvania



(25) Unit 20: Fish Creek (WV); Marshall County, West Virginia.

(i) Unit 20 consists of 26.58 miles (42.78 km) of Fish Creek from the confluence of Pennsylvania Fork Fish Creek and West Virginia Fork Fish

Creek at Kausooth (Marshall County, West Virginia) downstream to the confluence with the Ohio River southwest of Graysville (Marshall County, West Virginia). The unit includes the river channel up to the

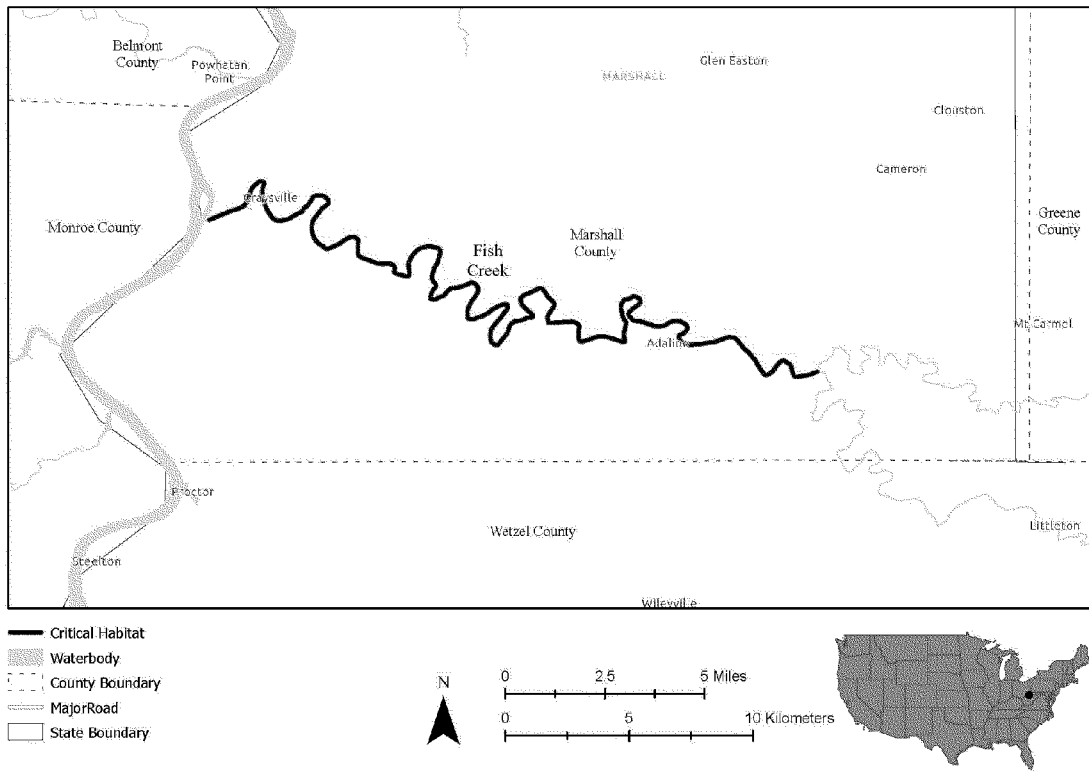
ordinary high water mark. The lands in this unit are in private ownership.

(ii) Map of Unit 20 follows:

Figure 20 to Salamander Mussel (*Simpsonia ambigua*) paragraph (25)(ii)



Critical Habitat for Salamander Mussel  
Unit 20 - Fish Creek; Marshall County, West Virginia



(26) Unit 21: Fishing Creek; Wetzel County, West Virginia.

(i) Unit 21 consists of 23.32 miles (37.54 km) of Fishing Creek from the confluence of the North Fork Fishing Creek and South Fork Fishing Creek at Pine Grove (Wetzel County, West Virginia) downstream to the confluence

with the Ohio River at Brooklyn (Wetzel County, West Virginia). The unit includes the river channel up to the ordinary high water mark.

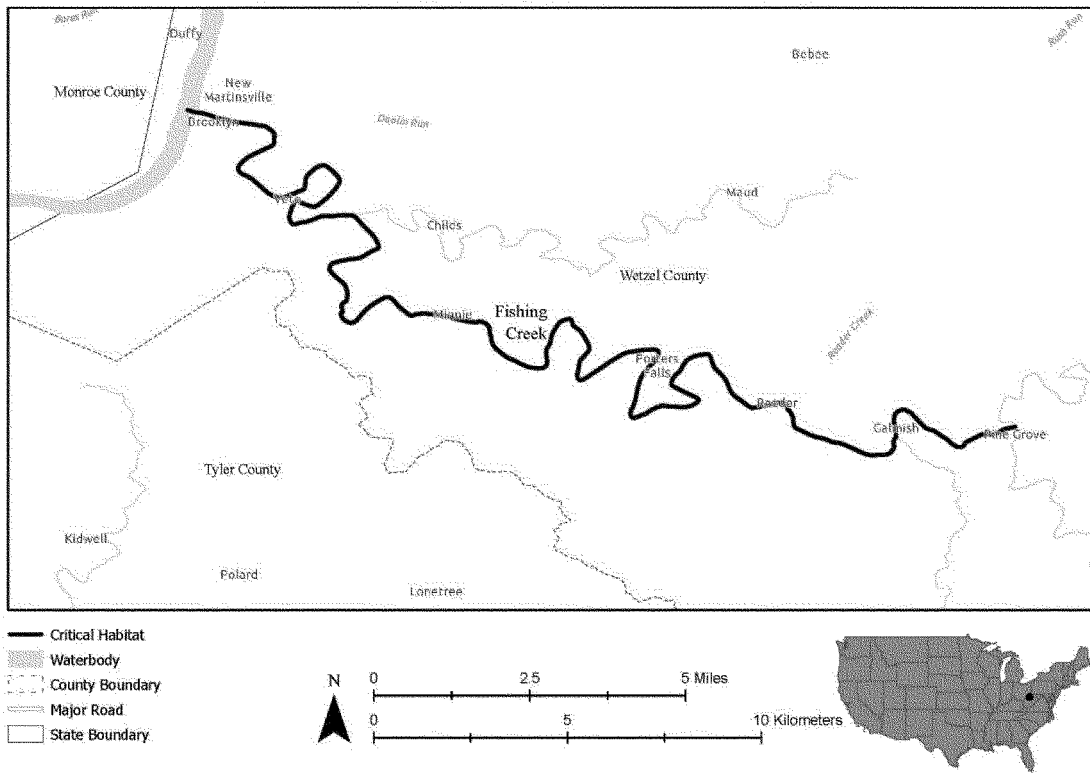
Approximately 0.13 mile (0.21 km) of the riparian lands adjacent to this unit are in public ownership, and 23.19 miles (37.33 km) are in private

ownership. The land in public ownership is land associated with the city of New Martinsville.

(ii) Map of Unit 21 follows:

Figure 21 to Salamander Mussel (*Simpsonia ambigua*) paragraph (26)(ii)

Critical Habitat for Salamander Mussel  
Unit 21 - Fishing Creek, Wetzel County, West Virginia



(27) Unit 22: Middle Island Creek; Doddridge, Tyler, and Pleasants Counties, West Virginia.

(i) Unit 22 consists of 62.25 miles (100.19 km) of Middle Island Creek from downstream of Keys Bend south of Camp (Doddridge County, West Virginia) downstream to the confluence with the Ohio River at Delong (Pleasants

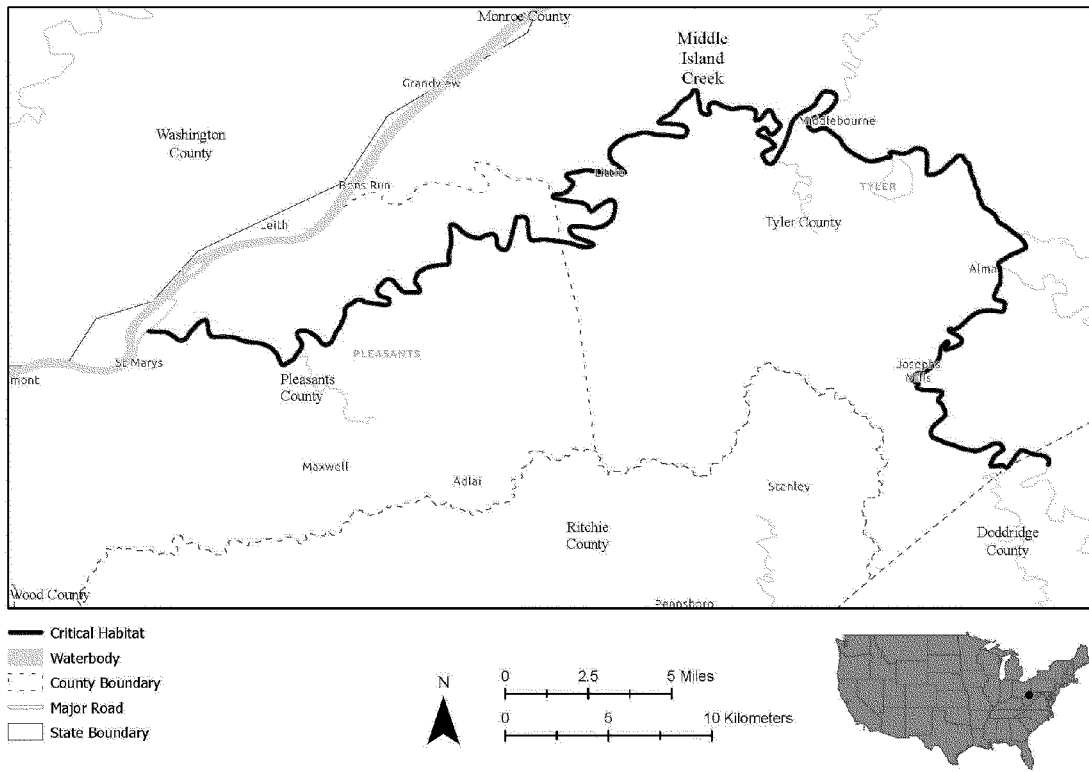
County, West Virginia). The unit includes the river channel up to the ordinary high water mark. Approximately 0.15 mile (0.25 km) of the riparian lands adjacent to this unit are in public ownership, and 62.10 miles (99.94 km) are in private ownership. The land in public

ownership is State land associated with the West Virginia Division of Natural Resources' (WVDNR) Buffalo Run Wildlife Management Area.

(ii) Map of Unit 22 follows:

Figure 22 to Salamander Mussel (*Simpsonias ambigua*) paragraph (27)(ii)

Critical Habitat for Salamander Mussel  
 Unit 22 - Middle Island Creek; Doddridge, Tyler, and Pleasants Counties, West Virginia



(28) Unit 23: Little Kanawha River; Wood and Wirt Counties, West Virginia.

(i) Unit 23 consists of 49.82 miles (80.18 km) of Little Kanawha River from the confluence with the West Fork Little Kanawha River west of Creston (Wirt

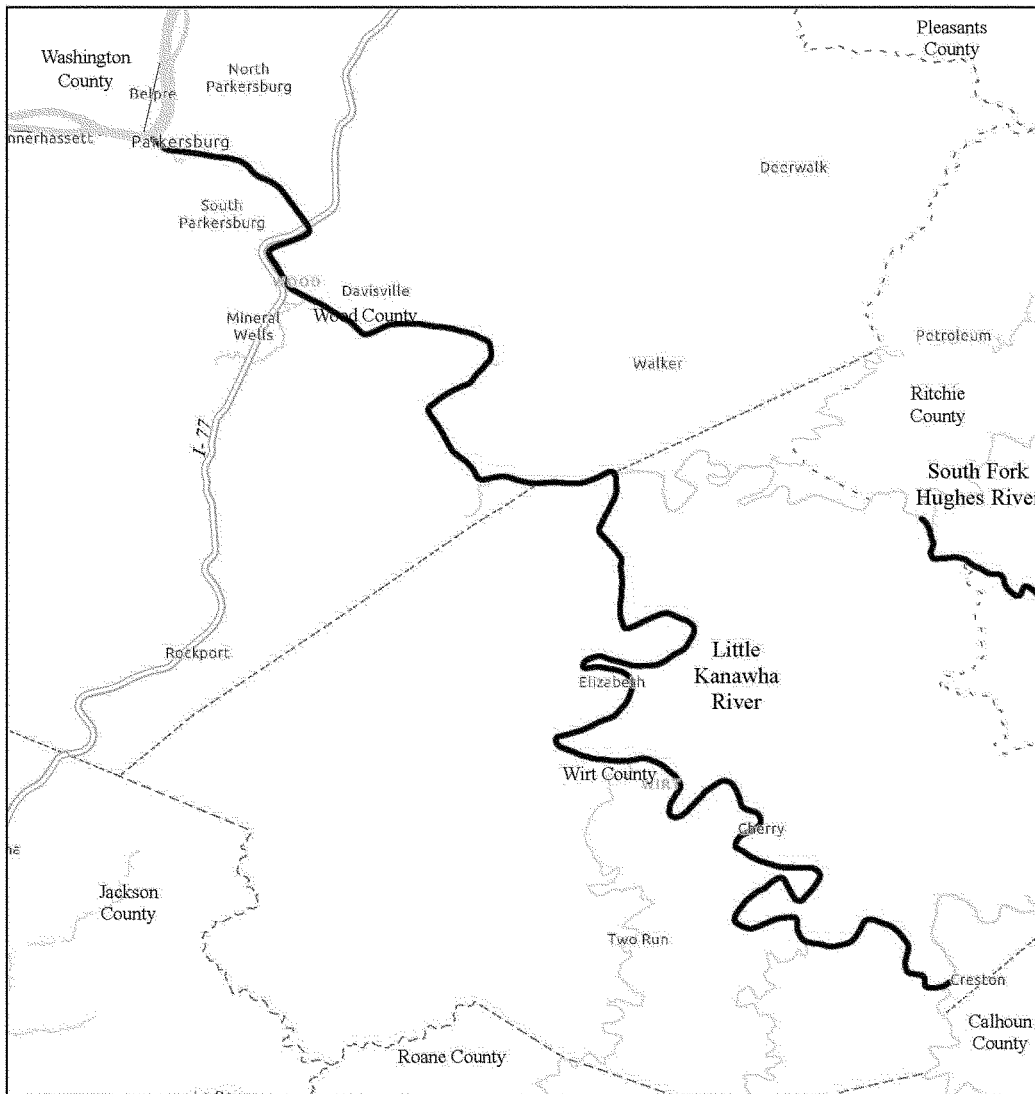
County, West Virginia) downstream to Parkersburg (Wood County, West Virginia). The unit includes the river channel up to the ordinary high water

mark. The riparian lands adjacent to this unit are in private ownership.

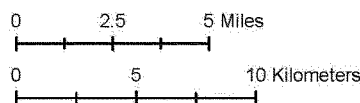
(ii) Map of Unit 23 follows:

Figure 23 to Salamander Mussel (*Simpsonias ambigua*) paragraph (28)(ii)

**Critical Habitat for Salamander Mussel  
Unit 23 - Little Kanawha River; Wood and Wirt Counties, West Virginia**



- Critical Habitat
- Waterbody
- County Boundary
- Major Road
- State Boundary



(29) Unit 24: South Fork Hughes River; Doddridge, Wirt, and Ritchie Counties, West Virginia.

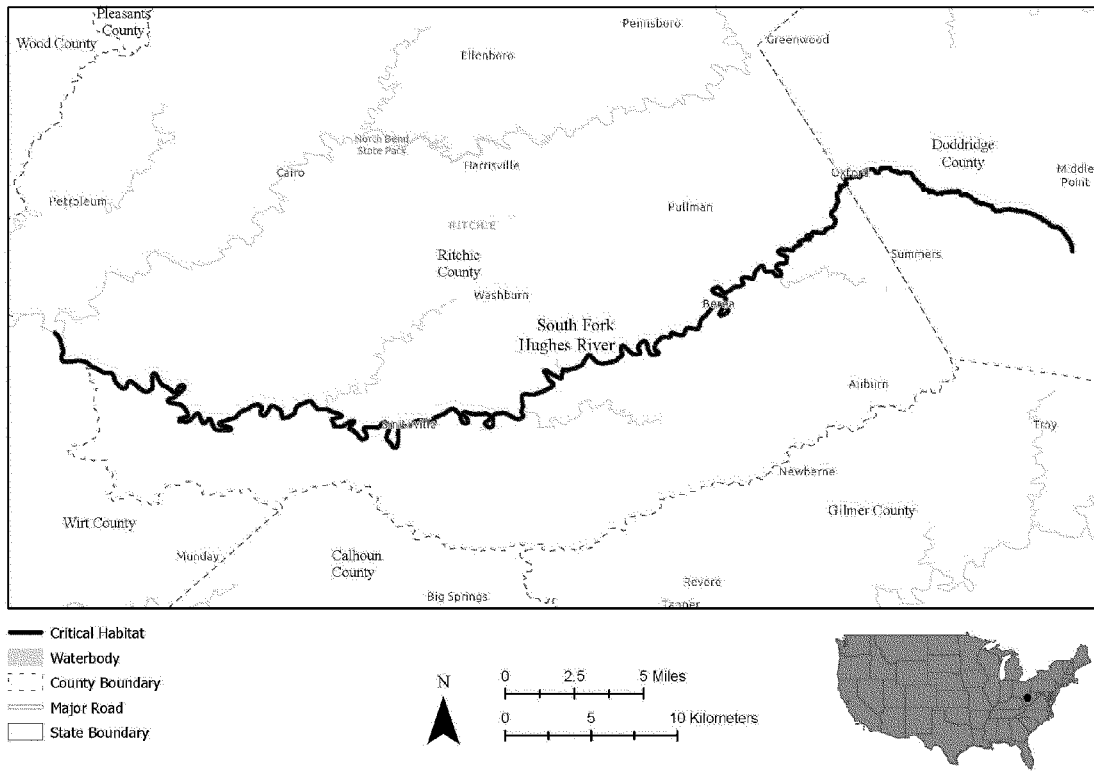
(i) Unit 24 consists of 57.44 miles (92.43 km) of South Fork Hughes River from the headwaters of the South Fork

Hughes River at Porto Rico (Doddridge County, West Virginia) downstream to the confluence with the Hughes River south of Cisco (Ritchie County, West Virginia). The unit includes the river channel up to the ordinary high water

mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Unit 24 follows: Figure 24 to Salamander Mussel (*Simpsonia ambigua*) paragraph (29)(ii)

Critical Habitat for Salamander Mussel  
 Unit 24 - South Fork Hughes River; Doddridge, Wirt, and Ritchie Counties, West Virginia



(30) Unit 25: Kinniconick Creek; Lewis County, Kentucky.

(i) Unit 25 consists of 51.01 miles (82.10 km) of Kinniconick Creek from the headwaters of Kinniconick Creek southwest of Petersville (Lewis County,

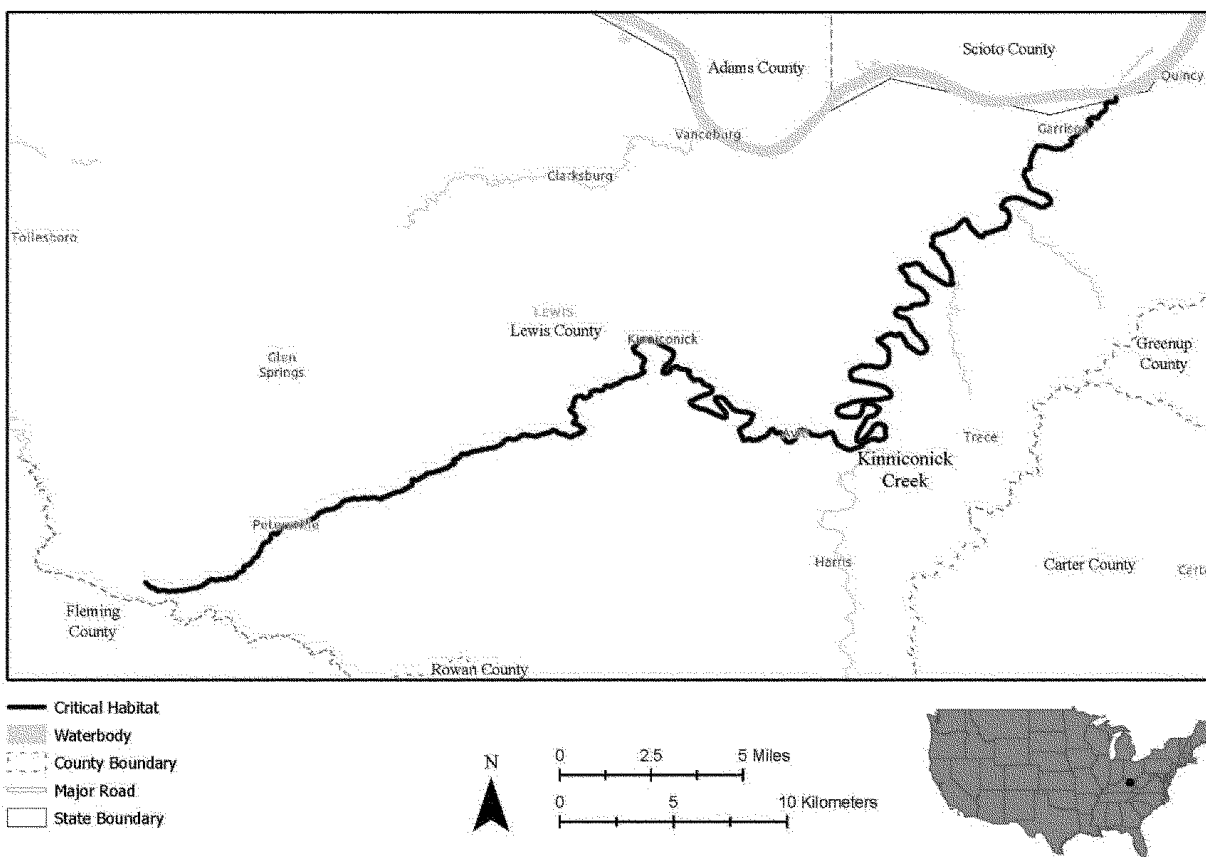
Kentucky) downstream to the confluence with the Ohio River at Rexton (Lewis County, Kentucky). The unit includes the river channel up to the ordinary high water mark. The riparian

lands adjacent to this unit are in private ownership.

(ii) Map of Unit 25 follows:

Figure 25 to Salamander Mussel (*Simpsonias ambigua*) paragraph (30)(ii)

**Critical Habitat for Salamander Mussel  
Unit 25 - Kinniconick Creek; Lewis County, Kentucky**



(31) Unit 26: North Fork Licking River; Morgan and Rowan Counties, Kentucky.

(i) Unit 26 consists of 20.67 miles (33.27 km) of North Fork Licking River from the headwaters of North Fork Licking River at Redwine (Morgan County, Kentucky) downstream to the confluence of the Licking River at

Bangor (Rowan County, Kentucky). The unit includes the river channel up to the ordinary high water mark.

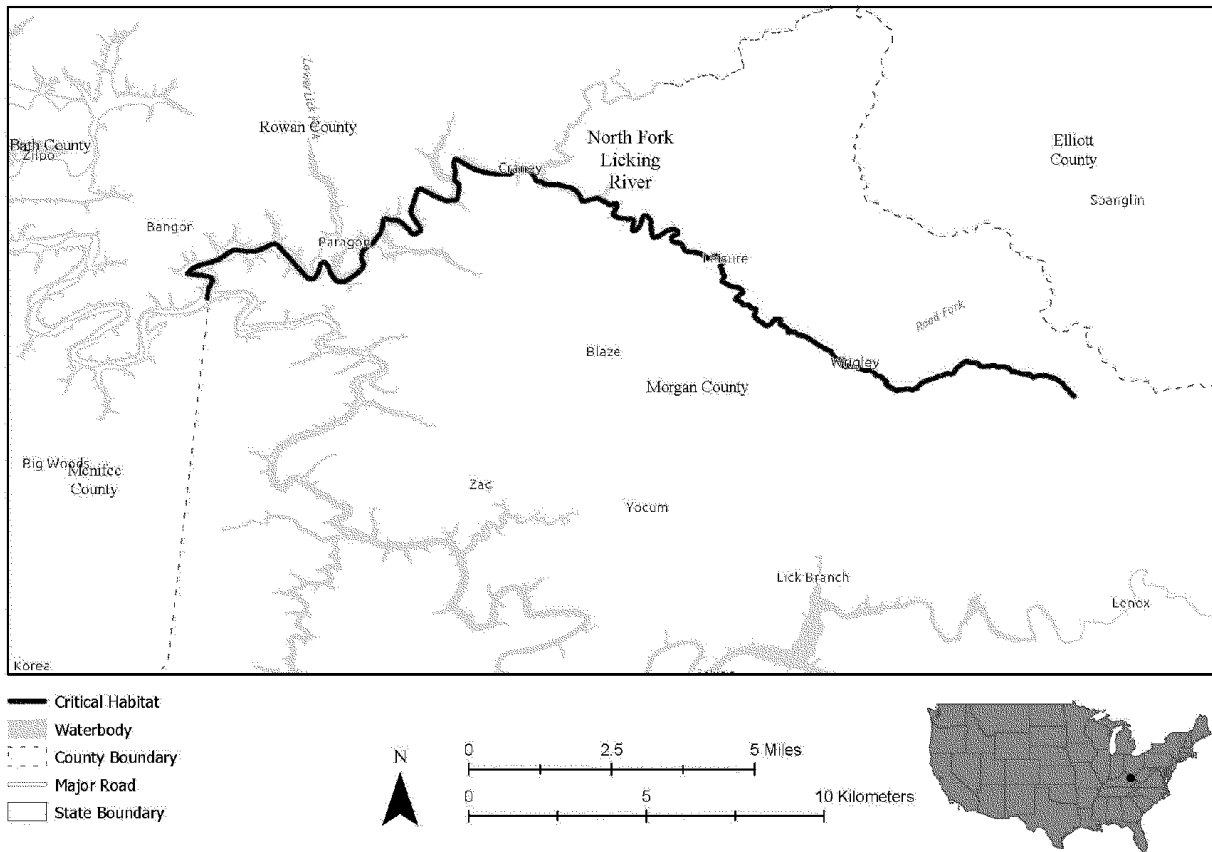
Approximately 13.13 miles (21.14 km) of the riparian lands adjacent to this unit are in public ownership, and 7.54 miles (12.13 km) are in private ownership. The lands in public ownership are Federal lands associated

with the U.S. Army Corps of Engineers' (USACE) Cave Run Recreation Area and U.S. Forest Service's (USFS) Daniel Boone National Forest.

(ii) Map of Unit 26 follows:

Figure 26 to Salamander Mussel (*Simpsonia ambigua*) paragraph (31)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 26 - North Fork Licking River; Morgan and Rowan Counties, Kentucky**



(32) Unit 27: Licking River; Harrison, Robertson, Kenton, Bracken, Campbell, Rowan, Pendleton, Fleming, Bath, and Nicholas Counties, Kentucky.

(i) Unit 27 consists of 179.56 miles (288.98 km) of Licking River from below the dam at Cave Rune Lake south of Farmers (Rowan County, Kentucky) downstream to the confluence with the Ohio River at Newport (Campbell County, Kentucky). The unit includes the river channel up to the ordinary high water mark. Approximately 20.82 miles (33.51 km) of the riparian lands adjacent to this unit are in public ownership, and 158.74 miles (255.47 km) are in private ownership. Of the lands in public ownership:

(A) Approximately 3.58 miles (5.76 km) are city or county lands associated with the city of Newport's General James Taylor Park; city of Covington's 19th St. Hollow Park, Meinken Park, and Eva G. Farris Complex; Kenton County's Locust Pike Park; Campbell County Conservation District's Hawthorne Crossing Conservation Area; and Kenton County Conservation District's Morning View Natural Area;

(B) Approximately 0.4 mile (0.64 km) is Federal land associated with the USACE's Cave Run Recreation Area;

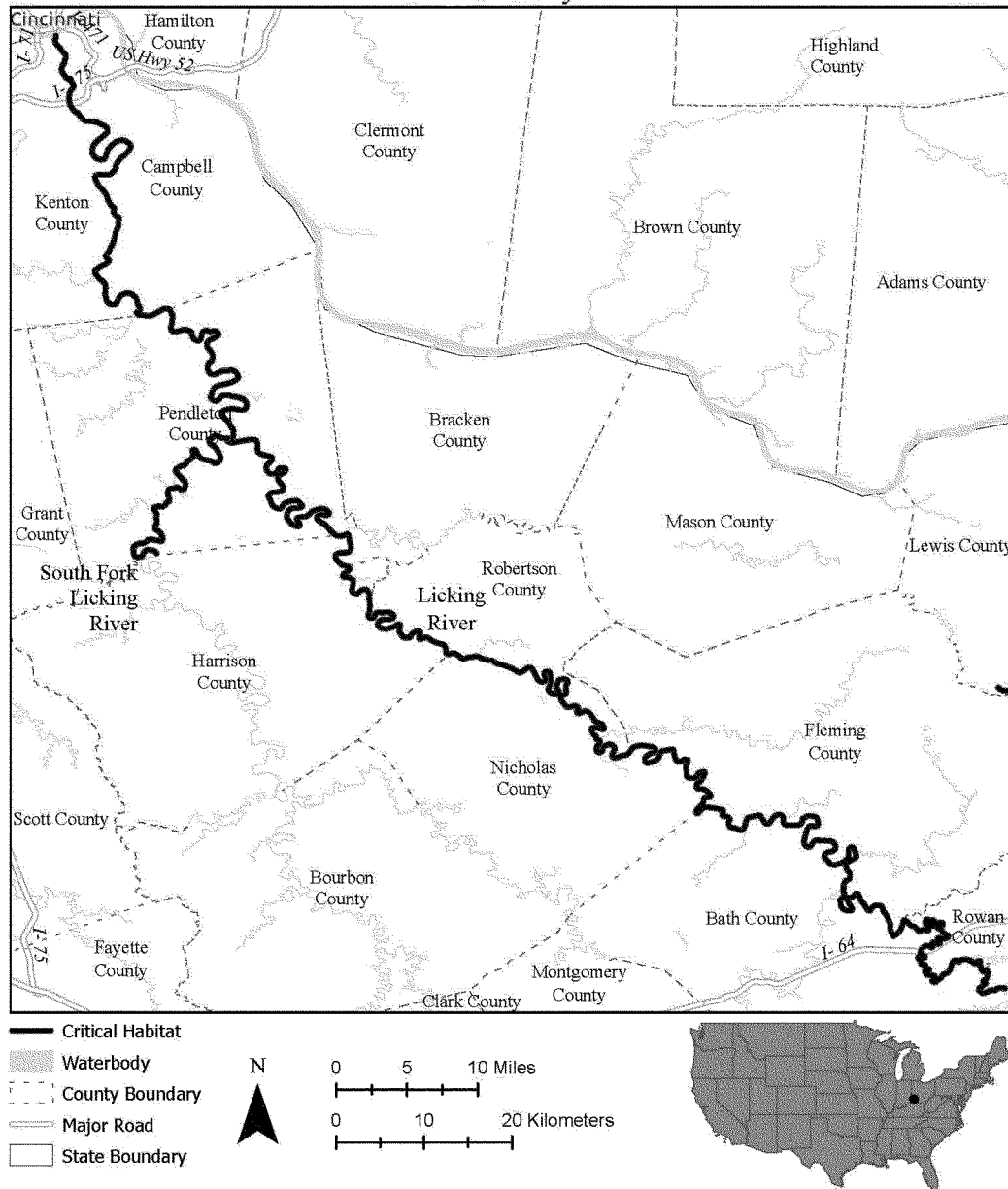
(C) Approximately 0.5 mile (0.8 km) is Federal land associated with the USACE's Cave Run Recreation Area or USFS's Daniel Boone National Forest on

one bank and State lands associated with the Kentucky Department of Fish and Wildlife Resources' (KDFWR) Minor Clark Fish Hatchery on the opposite bank; and

(D) Approximately 16.36 miles (26.33 km) are State lands associated with the Kentucky State Nature Preserves Commission's Quiet Trails State Nature Preserve, Kentucky Department of Parks' Blue Licks Battlefield State Recreational Park, and KDFWR's Clay Wildlife Management Area and Minor Clark Fish Hatchery.

(ii) Map of Units 27 and 28 follows: Figure 27 to Salamander Mussel (*Simpsonias ambigua*) paragraph (32)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 27 - Licking River; Harrison, Robertson, Kenton, Bracken, Campbell,**  
**Rowan, Pendleton, Fleming, Bath, and Nicholas Counties, Kentucky**  
**Unit 28 - South Fork Licking River; Pendleton and Harrison Counties,**  
**Kentucky**



(33) Unit 28: South Fork Licking River; Pendleton and Harrison Counties, Kentucky.

(i) Unit 28 consists of 18.26 miles (29.39 km) of South Fork Licking River from 1 mile upstream from the confluence with Crooked Creek north of Boyd (Harrison County, Kentucky) downstream to the confluence with the Licking River at Falmouth (Pendleton County, Kentucky). The unit includes

the river channel up to the ordinary high water mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Unit 28 is provided at paragraph (32)(ii) of this entry.

(34) Unit 29: Drennon Creek; Henry County, Kentucky.

(i) Unit 29 consists of 22.36 miles (35.99 km) of Drennon Creek from the headwaters of Drennon Creek south of Bethlehem (Henry County, Kentucky)

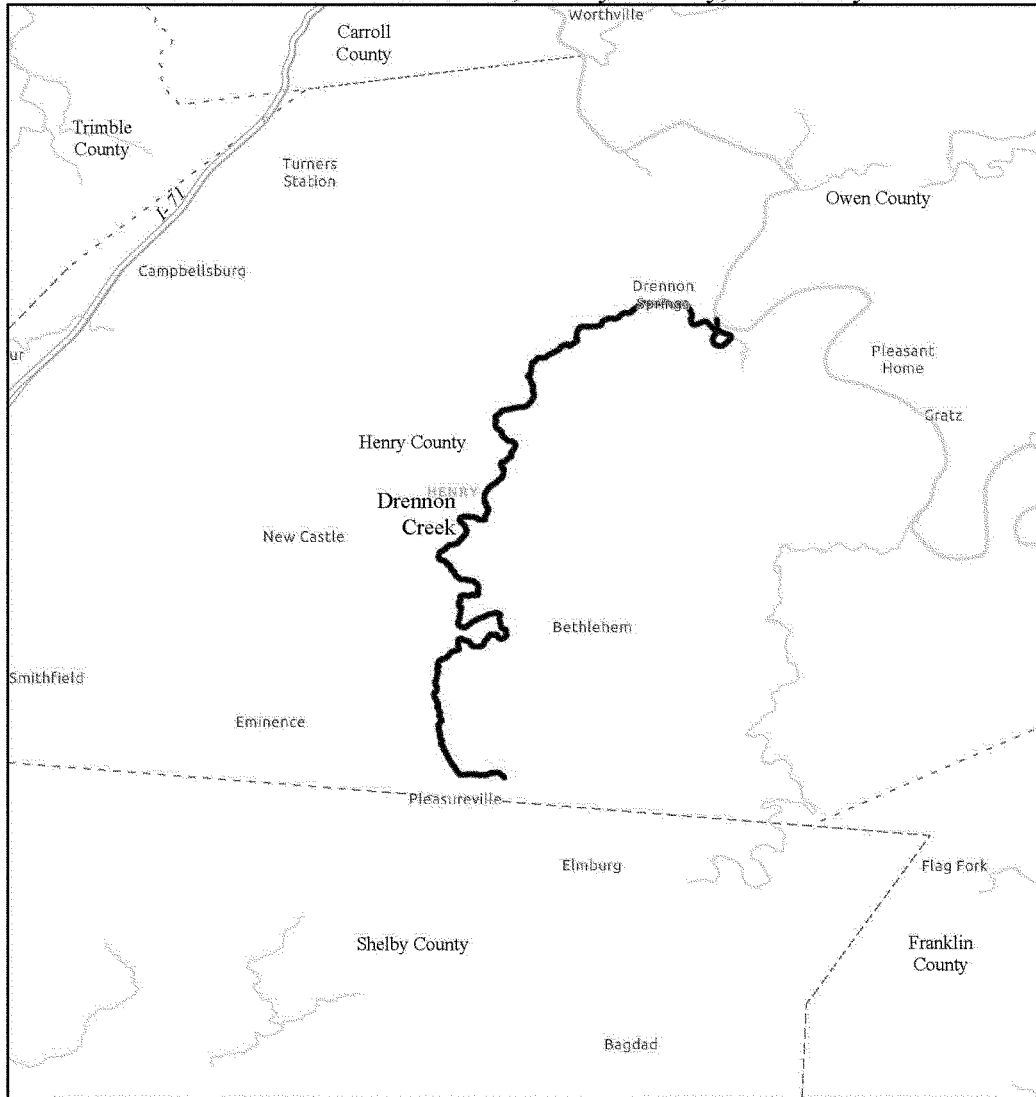
downstream to the confluence with the Kentucky River southeast of Drennon Springs (Henry County, Kentucky). The unit includes the river channel up to the ordinary high water mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Unit 29 follows:

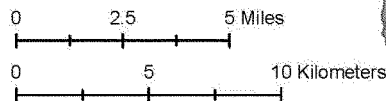
Figure 28 to Salamander Mussel (*Simpsonia ambigua*) paragraph (34)(ii)



Critical Habitat for Salamander Mussel  
Unit 29 - Drennon Creek; Henry County, Kentucky



- Critical Habitat
- Waterbody
- County Boundary
- Major Road
- State Boundary



(35) Unit 30: Laughery Creek; Ripley, Dearborn, and Ohio Counties, Indiana.

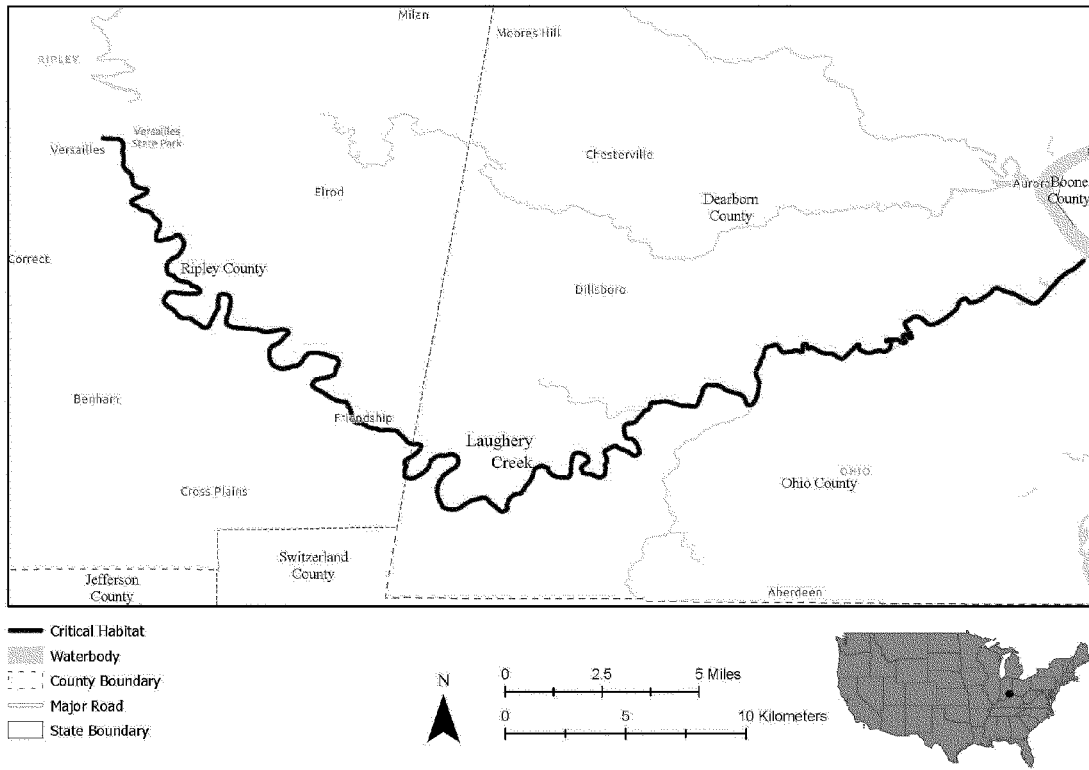
(i) Unit 30 consists of 44.52 miles (71.65 km) of Laughery Creek from below the dam at Versailles Lake at Versailles (Ripley County, Indiana) downstream to the confluence with the

Ohio River at Buffalo (Ohio County, Indiana). The unit includes the river channel up to the ordinary high water mark. Approximately 3.01 miles (4.85 km) of the riparian lands adjacent to this unit are in public ownership, and 41.51 miles (66.8 km) are in private

ownership. The lands in public ownership are State lands associated with the IDNR's Versailles State Park.

(ii) Map of Unit 30 follows:  
Figure 29 to Salamander Mussel (*Simpsonia ambigua*) paragraph (35)(ii)

Critical Habitat for Salamander Mussel  
 Unit 30 - Laughery Creek; Ripley, Dearborn, and Ohio Counties, Indiana



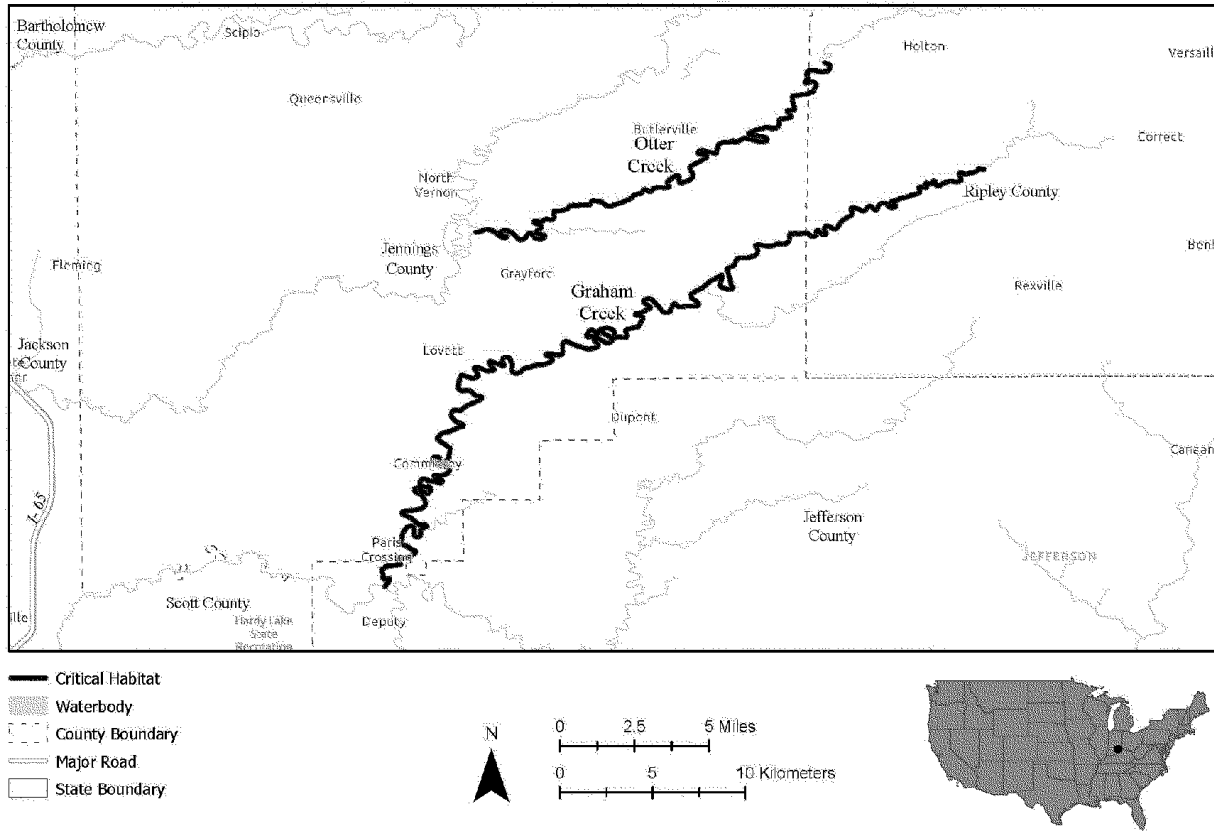
(36) Unit 31: Otter Creek; Jennings and Ripley Counties, Indiana.

(i) Unit 31 consists of 17.96 miles (28.91 km) of Otter Creek from the U.S. Highway 50 bridge west of Holton (Ripley County, Indiana) downstream to

the confluence with the Vernon Fork Muscatatuck River at Vernon (Jennings County, Indiana). The unit includes the river channel up to the ordinary high water mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Units 31 and 32 follows: Figure 30 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (36)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 31 - Otter Creek; Jennings and Ripley Counties, Indiana**  
**Unit 32 - Graham Creek; Jefferson, Jennings, and Ripley Counties, Indiana**



(37) Unit 32: Graham Creek; Jefferson, Jennings, and Ripley Counties, Indiana.

(i) Unit 32 consists of 41.5 miles (66.79 km) of Graham Creek from west of South Old Michigan Road at New Marion (Ripley County, Indiana) downstream to the confluence with the Muscatatuck River north of Deputy (Jefferson County, Indiana). The unit includes the river channel up to the ordinary high water mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Unit 32 is provided at paragraph (36)(ii) of this entry.

(38) Unit 33: East Fork White River; Dubois, Daviess, Pike, Martin, and Lawrence Counties, Indiana.

(i) Unit 33 consists of 78.57 miles (126.45 km) of East Fork White River from below the Williams dam south of Williams (Lawrence County, Indiana) downstream to approximately 0.25 mile west of North State Road 57 at Rogers (Pike County, Indiana). This unit includes the river channel up to the ordinary high water mark. Approximately 6.12 miles (9.85 km) of the riparian lands adjacent to this unit are in public ownership, and 72.45 miles (116.6 km) are in private

ownership. Of the lands in public ownership:

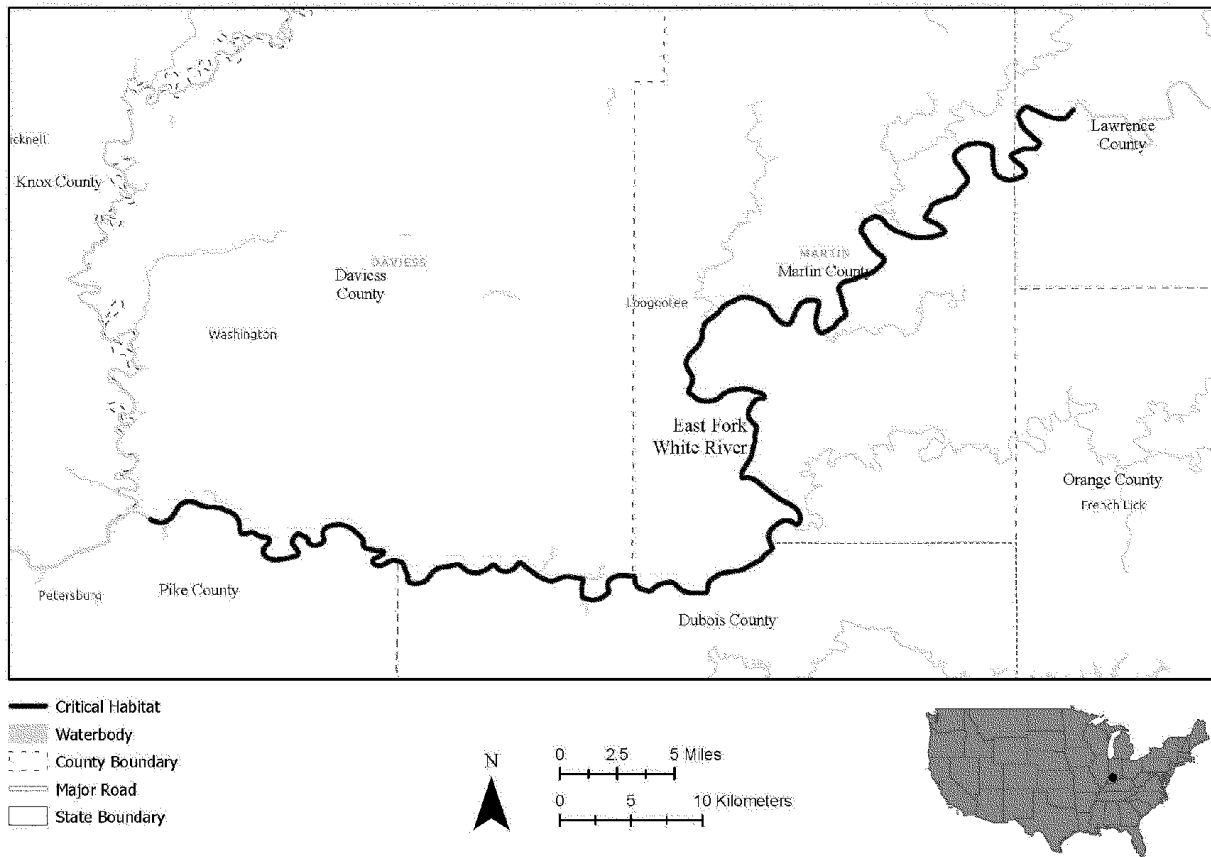
(A) Approximately 0.12 mile (0.19 km) is Federal land associated with the USFS's Hoosier National Forest; and

(B) Approximately 6 miles (9.66 km) are State lands associated with the IDNR's Williams Dam Public Fishing Area, Hindostan Falls Public Fishing Area, Glendale Fish and Wildlife Area, Henshaw Bend Nature Preserve, and Bluffs on Beaver Pond.

(ii) Map of Unit 33 follows:

Figure 31 to Salamander Mussel (*Simpsonaias ambigua*) paragraph (38)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 33 - East Fork White River; Dubois, Daviess, Pike, Martin, and Lawrence Counties, Indiana**



(39) Unit 34: Beech Fork River; Washington and Nelson Counties, Kentucky.

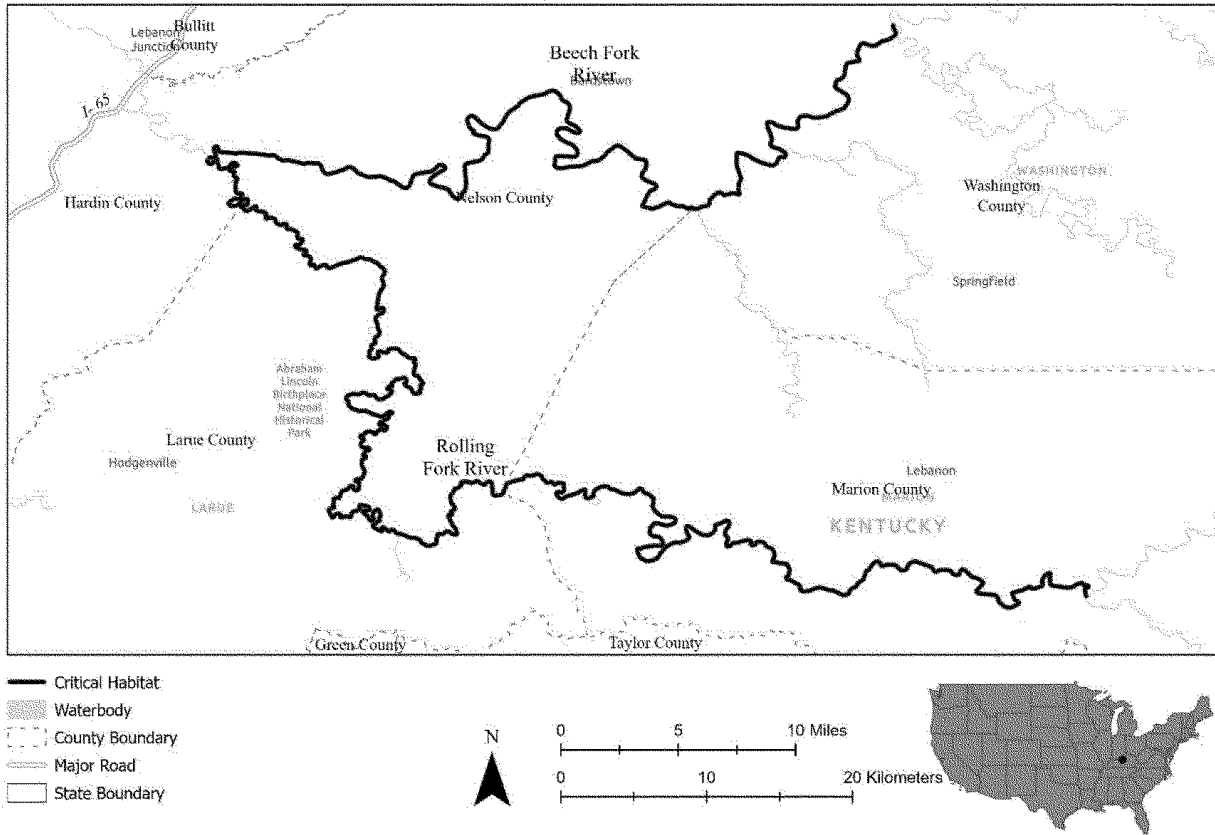
(i) Unit 34 consists of 50.39 miles (81.10 km) of Beech Fork River from the confluence of Beech Fork and Chaplin River north of Mooresville (Washington County, Kentucky) downstream to the confluence of Beech Fork River and the

Rolling Fork River northeast of Elizabethtown (Hardin County, Kentucky). This unit includes the river channel up to the ordinary high water mark. Approximately 1.99 miles (3.21 km) of the riparian lands adjacent to this unit are in public ownership, and 48.4 miles (77.89 km) are in private

ownership. The lands in public ownership are State lands associated with the KDFWR's John C. Williams Wildlife Management Area.

(ii) Map of Units 34 and 35 follows: Figure 32 to Salamander Mussel (*Simpsonias ambigua*) paragraph (39)(ii)

**Critical Habitat for Salamander Mussel**  
**Unit 34 - Beech Fork River; Washington and Nelson Counties, Kentucky**  
**Unit 35 - Rolling Fork River; LaRue, Hardin, Marion, and Nelson Counties, Kentucky**



(40) Unit 35: Rolling Fork River; LaRue, Hardin, Marion, and Nelson Counties, Kentucky.

(i) Unit 35 consists of 87.9 miles (141.47 km) of Rolling Fork River from the confluence of the North Rolling Fork River and Big South Fork River west of Bradfordsville (Marion County, Kentucky) downstream to the confluence with Beech Fork River east of Younger Creek (Hardin County, Kentucky). The unit includes the river channel up to the ordinary high water

mark. The riparian lands adjacent to this unit are in private ownership.

(ii) Map of Unit 35 is provided at paragraph (39)(ii) of this entry.

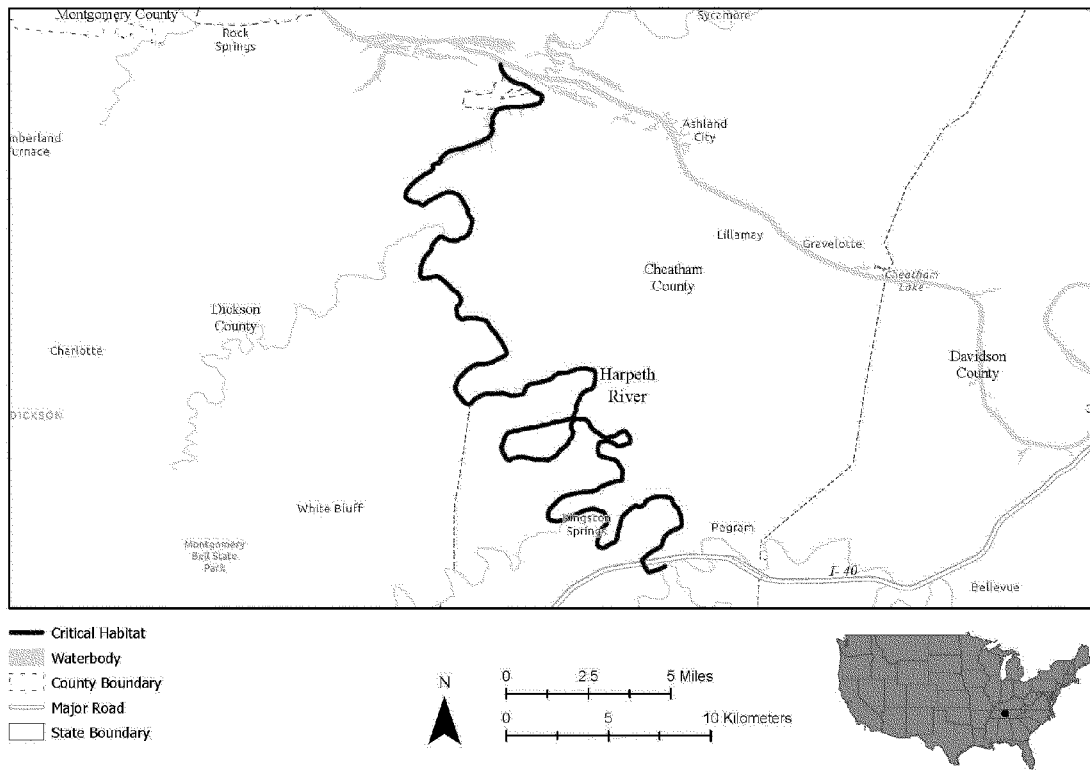
(41) Unit 36: Harpeth River; Cheatham and Dickson Counties, Tennessee.

(i) Unit 36 consists of 43.32 miles (69.72 km) of Harpeth River from the confluence of the South Harpeth River southeast of Kingston Springs (Cheatham County, Tennessee) downstream to the confluence with the Cumberland River northeast of Bellsburg (Dickson County, Tennessee).

The unit includes the river channel up to the ordinary high water mark. Approximately 6.07 miles (9.77 km) of the riparian lands adjacent to this unit are in public ownership, and 37.25 miles (59.95 km) are in private ownership. The lands in public ownership are Federal lands associated with the USACE's Cheatham Lake Reservoir.

(ii) Map of Unit 36 follows: Figure 33 to Salamander Mussel (*Simpsonia ambigua*) paragraph (41)(ii)

Critical Habitat for Salamander Mussel  
 Unit 36 - Harpeth River; Cheatham and Dickson Counties, Tennessee



(42) Unit 37: Duck River; Hickman, Humphreys, Perry, and Maury Counties, Tennessee.

(i) Unit 37 consists of 116.42 miles (187.36 km) of Duck River from the confluence of the Little Bigby Creek northwest of Columbia (Maury County, Tennessee) downstream to the confluence of the Duck River and the

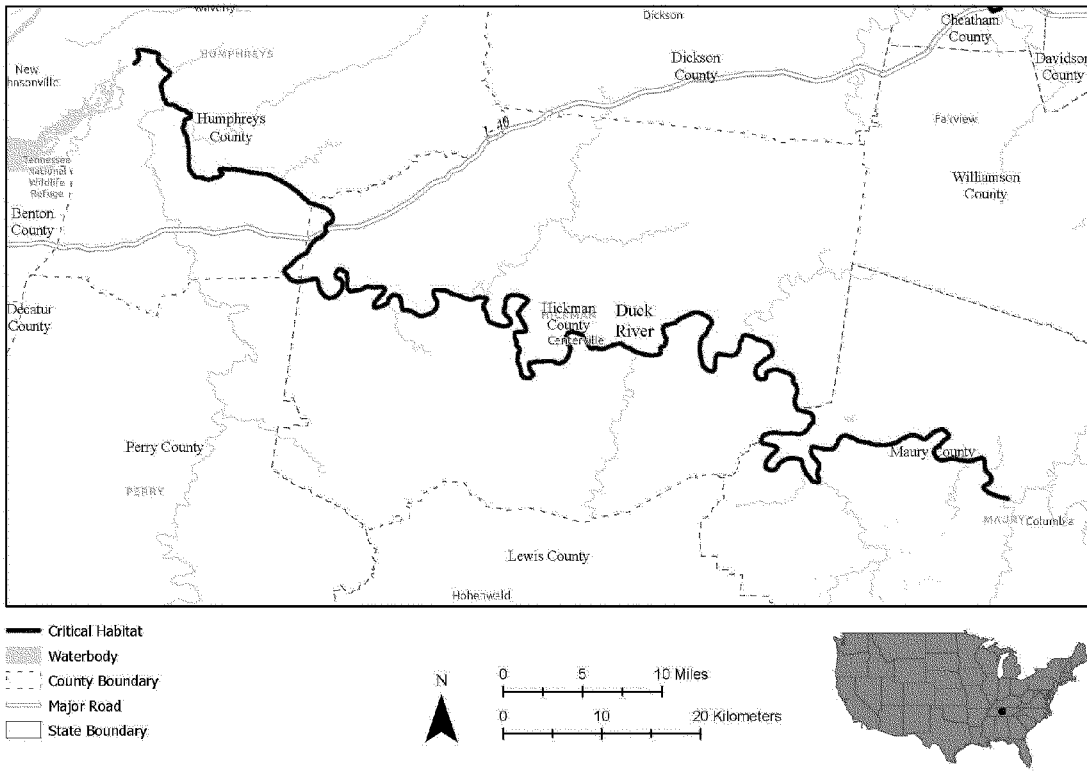
Tennessee River, which creates a backwater effect at Elysian Grove (Humphreys County, Tennessee). The unit includes the river channel up to the ordinary high water mark. Approximately 0.52 mile (0.83 km) of the riparian lands adjacent to this unit are in public ownership, and 115.9

miles (186.53 km) are in private ownership. The land in public ownership is Federal land associated with the NPS's Natchez Trace Parkway.

(ii) Map of Unit 37 follows:

Figure 34 to Salamander Mussel (*Simpsonia ambigua*) paragraph (42)(ii)

Critical Habitat for Salamander Mussel  
Unit 37 - Duck River; Hickman, Humphreys, Perry, and Maury Counties, Tennessee



\* \* \* \* \*

**Wendi Weber,**  
*Acting Director, U.S. Fish and Wildlife Service.*

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