DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R5–ES–2023–0012; FF09E21000 FXES1111090FEDR 234]

RIN 1018–BF80

Endangered and Threatened Wildlife and Plants; Threatened Species Status With Section 4(d) Rule for Green Floater 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 green floater (*Lasmigona subviridis*), a mussel species from as many as 10 States in the eastern United States and the District of Columbia, as a threatened species with a rule issued under section 4(d) of the Endangered Species Act of 1973, as amended (Act). This document also serves as our 12-month finding on a petition to list the green floater. After a review of the best available scientific and commercial information, we find that listing the species is warranted. We also propose to designate critical habitat for the green floater under the Act. In total, approximately 2,553 kilometers (1,586 miles) of streams in Maryland, New York, North Carolina, Pennsylvania, Virginia, and West Virginia fall within the boundaries of the proposed critical habitat designation. We also announce the availability of a draft economic analysis of the proposed designation of critical habitat for the green floater. If we finalize this rule as proposed, it would add this species to the List of Endangered and Threatened Wildlife and extend the Act's protections to the species and its designated critical habitat.

DATES: We will accept comments received or postmarked on or before September 25, 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 September 11, 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–R5–ES–2023–0012, 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–R5–ES–2023–0012, 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 at *https://www.regulations.gov* at Docket No. FWS–R5–ES–2023–0012. 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 proposed critical habitat designation and are available at *https://www.regulations.gov* at Docket No. FWS–R5–ES–2023–0012 and on our internet site at *https://www.fws.gov/office/new-york-ecological-services-field.*

FOR FURTHER INFORMATION CONTACT: Ian Drew, Field Supervisor, U.S. Fish and Wildlife Service, New York Ecological Services Field Office, 3817 Luker Road, Cortland, NY 13045; telephone 607–753–9334. 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 endangered 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 green floater meets the Act's definition of a threatened 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 making a critical habitat designation 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 the listing of the green floater as a threatened species with a rule under section 4(d) of the Act (a ''4(d) rule''), 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 habitat degradation (Factor A), resulting from the cumulative impacts of land use change and associated watershed-level effects on water quality, habitat connectivity, and stream conditions, poses the greatest risk to the future viability of the green floater. Habitat degradation can occur as a result of increased surface runoff, sedimentation, and pollution, and decreased substrate stability, both instream and along streambanks. These degraded conditions negatively impact the green floater by, for example, smothering the organism or washing the organism downstream. In the future, climate change (Factor A) is expected to exacerbate the degradation of the green floater's habitat through increased water temperatures, changes and shifts in seasonal patterns of precipitation and runoff, and extreme weather events such as flood or droughts.

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, including additional information, concerning:

(1) The species' biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, 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;

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

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

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

(a) Factors that may affect 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) The historical and current status of this species.

(4) Regulations that may be necessary and advisable to provide for the conservation of the green floater and that we can consider in developing a 4(d) rule for the species. In particular, we seek information concerning the extent to which we should include any of the section 9 prohibitions in the 4(d) rule or whether we should consider any additional exceptions from the prohibitions in the 4(d) rule.

(5) Specific information on the species' habitat, including:

(a) The amount and distribution of green floater habitat;

(b) Any additional areas occurring within the range of the species (the States of Alabama, Georgia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia, and the District of Columbia) 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 (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 may help us evaluate the potential to include areas not occupied at the time of listing. Additionally, 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.

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

(7) 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.

(8) 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.

(9) 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.

(10) 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 determinations 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 endangered instead of threatened, 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 addition, we may change the parameters of the prohibitions or the exceptions to those prohibitions in the 4(d) rule if we conclude it is appropriate in light of comments and new information received. For example, we may expand the prohibitions to include prohibiting additional activities if we conclude that those additional activities are not compatible with conservation of the species. Conversely, we may establish additional exceptions to the prohibitions in the final rule if we conclude that the activities would facilitate or are compatible with the conservation and recovery 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

In our November 21, 1991, candidate notice of review (CNOR; published at 56 FR 58804) we identified the green floater as a Category 2 candidate species. Category 2 candidate species were those taxa for which listing was possibly appropriate, but for which conclusive data on biological vulnerability and threats were not available to support proposed rules. In the February 28, 1996, CNOR (61 FR 7596), we discontinued the designation of species as Category 2 candidates; therefore, the green floater was no longer a candidate species.

On April 20, 2010, we were petitioned to list 404 aquatic species in the southeastern United States, including the green floater. In response to the petition, we published a partial 90-day finding on September 27, 2011 (76 FR 59836), in which we announced our finding that the petition contained substantial information that listing might be warranted for numerous species, including the green floater.

Peer Review

A species status assessment (SSA) team prepared an SSA report for the green floater (Service 2021, entire). 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 green floater SSA report. We sent the SSA report to five independent peer reviewers and received one response. Results of this structured peer review process can be found at *https://www.regulations.gov* under Docket No. FWS–R5–ES–2023–0012. In preparing this proposed rule, we incorporated the results of this review, as appropriate, into the SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in Peer Review above, we received comments from one peer reviewer on the draft SSA report. We reviewed all comments we received from the peer reviewer for substantive issues and new information regarding the information contained in the SSA report. The peer reviewer generally concurred with our methods and conclusions and provided additional information and other editorial suggestions. No substantive changes to our analysis and conclusions within the SSA report were necessary, and peer reviewer comments are addressed in version 1.0 of the SSA report (Service 2021, entire).

I. Proposed Listing Determination

Background

The green floater is a freshwater mussel found in small streams to large rivers in the eastern United States. It is historically native to the District of Columbia and 10 States (Alabama, Georgia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia). Today, however, green floaters are considered extirpated in Alabama and Georgia, and there are no recent records from New Jersey or the District of Columbia.

Green floaters are small freshwater mussels with ovate trapezoidal shaped shells. Their shells are yellowish brown to olive green with green rays (Bogan and Ashton 2016, p. 43). Adults rarely exceed 5.5 centimeters (cm) (2.2 inches (in)) (Johnson 1970, p. 344) but can grow to 7.0 cm (2.8 in) in length (Watters et al. 2009, p. 347). Like all freshwater mussels, the green floater is an omnivore that feeds on a wide variety of microscopic particulate matter (*i.e.,* bacteria and algae).

The best available information suggests the green floater is a short-lived, fast-growing species compared to similar mussels. The green floater is considered a long-term brooder because individuals produce eggs that develop as larvae in the adult mussels and are then released after several months (Haag 2012, pp. 40–41, 203–204). In contrast, short-term brooders are similar in that larvae develop in the adult mussels, but the brood period is shorter, lasting several days or weeks. While some mussels can live to 100 years old, green floaters typically live just 3 to 4 years (Watters et al. 2009, p. 349). In laboratory settings, green floaters can mature and release sperm at less than 1 year of age (Mair 2020, pers. comm.)

Green floaters are hermaphroditic (Ortmann 1919, p. 122; van der Schalie 1970, p. 106) and have the ability to self-fertilize, which increases the probability of fertilization (Haag 2012, p. 191). Spawning and reproduction occur during the late summer or early fall. In the winter, green floaters can directly metamorphose larvae, called glochidia, meaning that adults keep the glochidia in their gills until they mature into juveniles and then release them into the water column in the spring (Barfield and Watters 1998, p. 22; Lellis and King 1998, p. 23; Haag 2012, p. 150). For most freshwater mussels, glochidia are released into the water column and must attach to the gills of a host fish in order to undergo metamorphosis and transform into juveniles. Several weeks or months

later, the juveniles detach from the fish and burrow into the substrate. Green floater adults have the ability to expel glochidia that use fish hosts, too (J. Jones 2020, unpublished data), but it is not known what proportion of green floaters use this method of reproduction. The added ability to directly metamorphose glochidia without requiring an intermediate fish host is unique to the green floater. This life strategy may allow the green floater to occur in small streams with small populations and few fish (Haag 2012, pp. 150, 191), although the use of fish hosts is necessary for periodic upstream dispersal.

Green floaters likely maximize population growth during periods of favorable conditions (Haag 2012, pp. 208, 284). Adult green floaters can produce between 2,600 and 33,300 juveniles per individual each year (R. Mair, Service, unpublished data), and the number of juveniles produced can vary greatly from year to year. For example, researchers at Harrison Lake National Fish Hatchery in Virginia observed that the average number of juveniles released per individual jumped from 4,600 to 22,500 per individual in a 2-year span. These numbers do not represent the total number of juveniles expected to survive to adulthood, a number which is unknown but is likely to be a small proportion of the juveniles released. When they are found in natural environments, green floaters can occur singly or in small aggregations of a few individuals.

Streams with slow to medium flows and good water quality provide the best habitat for green floaters (Ortmann 1919, p. 124; Johnson 1970, p. 345; Clarke 1985, p. 56; Kerferl 1990, p. 47). They are often found in sand or small gravel substrates where they establish a foothold and bury themselves as deep as 38 cm (15 in) (Haag 2012, p. 31; Lord 2020, pers. comm.). Their mobility is limited, and fast flowing currents or high-water events can cause them to be washed downstream (Strayer 1999, pp. 468, 472). When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents (WVDNR 2008, p. 2).

For more information, please refer to the SSA report (version 1.0; Service 2021, pp. 1–30), which presents a thorough review of the taxonomy, life history, and ecology of the green floater.

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 endangered and threatened 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 the green floater's 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 change, 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 use 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 Docket No. FWS–R5–ES–2023–0012 on *https://www.regulations.gov.*

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. We analyze these factors both individually and cumulatively to determine the current condition of the species and project the future condition of the species under several plausible future scenarios.

Species Needs

We assessed the best available information to identify the physical and biological needs to support all life stages for the green floater. Green floaters occur in a variety of habitats across the species' large range, but they require specific conditions for the habitat to be suitable. Water flow, streambed substrate, water quality, water temperature, and conditions that support their host fish are all important habitat components for the health of green floaters.

Green floaters occur in small streams to large rivers, pools, eddies, and canals with current speeds that are low or moderate (Ortmann 1919, p. 124; Clarke 1985, p. 56; WVDNR 2008, p. 2). The optimal current is stable, not flashy, and responds slowly to precipitation events (Strayer 1993, pp. 241, 244). Green floaters require slow and stable flows because they spend most of their lives buried just below the surface of the streambed with their posterior end angled upward and their anterior end in the substrate. This position allows them to siphon water through their incurrent aperture, secrete waste through their excurrent aperture, and stabilize themselves using their foot. The incoming current speeds must be adequate to deliver a steady supply of food and oxygen.

Green floaters are able to survive high flow events by burying into the substrate. Adult green floaters have been found buried between 8 and 13 cm (3 and 5 in) while juveniles have been found as deep as 38 cm (15 in) (Barber 2020, pers. comm.; Lord 2020, pers. comm.). They are associated with substrates composed primarily of sand or small gravel (Holst 2020, pers. comm.). They can be found in both quiet, backwater areas (*e.g.,* eddies) with more silt and large, boulder-dominated streams, but some amount of sand or gravel is necessary for them to establish a foothold (Clayton 2020, pers. comm.). If they become dislodged from the substrate, they can take up to 30 minutes to rebury themselves, possibly requiring less time in sand and silt substrates (Haag 2012, p. 32). If they become dislodged during a high water event or flood, they could be washed downstream (Strayer 1999, pp. 468, 472).

Like all freshwater mussels, green floaters are sensitive to certain water quality parameters and need clean water with low levels of contaminants, adequate dissolved oxygen, and low salinity. Juvenile mussels may be more sensitive than adults to the presence of contaminants, especially copper and ammonia, which can cause physiological effects or death (Goudreau et al. 1993, pp. 224, 226–227; Jacobson et al. 1993, p. 882). The specific dissolved oxygen requirements for green floaters are unknown; however, other freshwater mussels begin to exhibit stress when dissolved oxygen levels fall below 6 milligrams per liter (mg/L) (Chen et al. 2001, pp. 213–214). Stress is apparent through behavioral changes such as gaping (*i.e.,* opening of the shells to maintain oxygen levels) and lying on the surface of the substrate (Sparks and Strayer 1998, pp. 131–133). Green floaters are also intolerant to brackish water and require the low salinity levels that occur naturally in freshwater streams.

Green floaters require water temperatures that are warm enough for glochidia release but not so warm that they kill or stress the adults. Research from lab and field studies indicate that the appropriate temperature for glochidia release is likely between 15 and 20 degrees Celsius (°C) (59 and 68 degrees Fahrenheit (°F)). Adult mussels begin to exhibit the gaping behaviors described above when water temperatures get too warm. Lethal maximum water temperatures for green floaters have not been studied but are expected to be between 25.3 and 42.7 °C (77.5 and 106.0 °F), similar to those reported for comparable species. Maximum temperatures are related to the duration of exposure. Mussels can survive temperatures on the higher end of the spectrum for short periods of time (*i.e.,* minutes or hours) and can survive temperatures on the lower end for days or weeks. Juvenile mussels may be more sensitive to warm temperatures.

Adequate water quality and temperatures are important habitat components for the health of host fish as well, which green floaters require for upstream dispersal. In laboratory studies, green floaters successfully used mottled sculpin (*Cottus bairdii*), rock bass (*Ambloplites rupestris*), central

stoneroller (*Campostoma anomalum*), blacknose dace (*Rhinichthys atratulus*), and margined madtom (*Noturus insignis*) for glochidia metamorphosis (J. Jones 2020, unpublished data). These species all occur within the range of the green floater and could function as hosts in natural settings as well.

The green floater historically occurred in four major drainages: the Atlantic Slope (*i.e.,* watersheds along the east coast of the United States), St. Lawrence-Great Lakes, Mississippi River (Clarke 1985, p. 57), and Gulf (*i.e.,* hydrologically connected to the Gulf of Mexico) (Brim Box and Williams 2000, p. 59). We delineated analysis units for the green floater in these drainages based on recent occupancy information. We used data from surveys conducted by partners, including State agencies, Federal agencies, nonprofit organizations, and contractors, between 1999 to 2019. This period covers approximately three generations of green floaters, which are thought to live up to 7 years (Watters et al. 2009, p. 349). Using these survey data, we determined the green floater historically existed in 179 watersheds across 10 States and the District of Columbia; 85 of these watersheds have had no sightings since 1999 (see figure 1, below, and Service 2021, appendix C).

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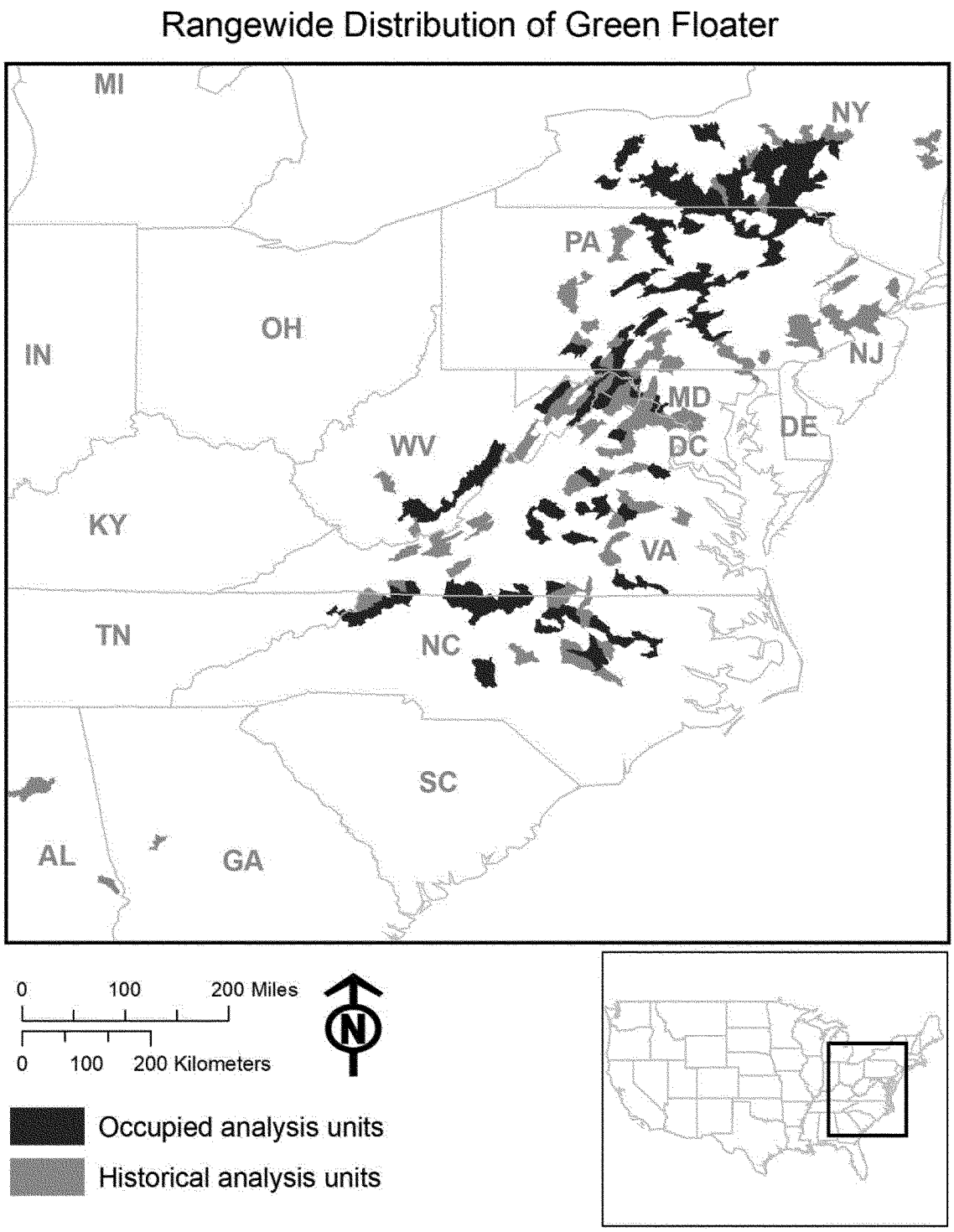

Figure 1. Distribution of recent (1999–2019) and historical (pre-1999) occurrences of green floaters in Hydrologic Unit Code (HUC) 10 watersheds in the eastern United States.

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To assess resiliency, we evaluated relevant environmental and demographic factors to determine the condition of populations across the range of the species. Green floater populations must be able to survive varying habitat conditions (*i.e.,* good and bad years) to respond to and recover from stochastic events (*e.g.,* seasonal events such as heavy rain or severe drought). They must have a healthy demography, *i.e.,* a population that includes organisms at a range of life stages and occupy areas with suitable habitat conditions for all life stages and seasons. Healthy demography is achieved by having a sufficient number

of adults, recruitment (*i.e.,* presence of adults and juveniles), and habitat connectivity that supports genetic exchange within and between populations. Genetic exchange is needed to preserve genetic diversity, without which the health of populations can decrease. Barriers, such as large dams and blocked culvert pipes, can impede genetic exchange by limiting the dispersal of juvenile mussels and preventing host fish migration. Some populations are found between barriers and downstream of dams, but the healthiest green floater populations are likely to be found in free-flowing streams and rivers.

To assess representation, we evaluated the ecological and genetic diversity across the current range of the species. It is important to have sufficiently resilient populations (referred to in figure 1, above, as analysis units) where both genetic and ecological differences are apparent to maintain the existing adaptive capacity. To evaluate representation in the current condition of the green floater, we consider both genetic information and the geographic distribution of populations. The green floater must have healthy populations distributed across the range to capture the breadth of genetic, climate, elevation, and habitat diversity, and sufficient connectivity for periodic genetic exchange across the range of the species.

To assess redundancy, we considered the number and distribution of populations across the range of the species and the potential for catastrophic events to impact the green floater's ability to persist. To have high redundancy, the species needs to have multiple populations distributed across a large area relative to the scale of anticipated catastrophic events.

Factors Influencing Species Viability

Excessive Sedimentation

Excessive sedimentation is one of the primary factors affecting green floater viability. Sedimentation originates from instream (*e.g.,* bank erosion, shifting channels) and upland sources (*e.g.,* soil erosion). Increases in sediment load can accumulate on the stream/river bottom and may lead to bottom scour; lead to embeddedness of rocks, gravel, and cobble; and affect some baseline water quality parameters (*e.g.,* turbidity). Excess sedimentation can harm mussels in multiple ways: suspended particles can abrade mussels and clog the gills and respiratory systems of both mussels and host fish, while deposited sediment can bury mussels and smother host fish eggs (Wood and Armitage 1997, p. 211; Burkhead and Jelks 2001, p. 965). Even where sedimentation does not clog gills so severely as to kill mussels, it may still significantly impact their feeding efficiency and filtering clearance rates (Aldridge et al. 1987, p. 25; Brim Box and Mossa 1999, pp. 100–101).

Increases in suspended sediment can also adversely affect mussels' ability to feed and reproduce. Mussels must have their valves open to feed, but in heavily silted water, they are forced to close their valves to wait for conditions to improve. Mussels in turbid water have been observed closing their valves up to 90 percent of the time, compared to 50 percent of the time for individuals in silt-free environments (Ellis 1936, p. 40). Extended valve closure can lead to decreased health or starvation. Increases in suspended particles can also reduce mussels' ability to encounter sperm, become gravid, and reproduce (Landis et al. 2013, p. 74).

However, a reduced sediment load can also destabilize the stream channel. When a decrease in sediment supply coincides with increased stream flow, the imbalance can cause streams to narrow and deepen (Rakovan and Renwick 2011, p. 40), channeling the flow of water and making the habitat unsuitable for green floaters. Other activities, like dredging, channelization, or storm damage, can also adversely affect physical habitat. Changes in primary productivity (*i.e.,* algae and aquatic plant growth) as a result of nutrient loads or reduced stream flows can limit the suitability of stream habitats for the green floater and other aquatic species (Bogan 1993, p. 604; Wood and Armitage 1997, pp. 209–210; Taylor et al. 2007, p. 374). Fine sediment suspension and deposition affect the primary producers by reducing the amount of sunlight and damaging leaves of plants, which reduces photosynthesis (Lewis 1973, p. 253; Davies-Colley et al. 1992, p. 232), and, in extreme cases, by smothering and eliminating algae and plants (Yamada and Nakamura 2002, p. 489).

During periods of stress, green floaters bury themselves deeper in the substrate and take refuge in interstitial spaces (*i.e.,* small openings between rocks and gravels). While in interstitial spaces, they rely on available pore water (*i.e.,* the water in interstitial spaces between rock and gravel substrates) for oxygen and food particles. Interstitial spaces provide essential habitat for adults and juvenile green floaters by protecting them from high water events and periods of drought, and allowing water loaded with oxygen and food particles to reach the mussels. Excess sedimentation adversely affects mussel habitat by blocking or filling in the interstitial spaces. Excess sand or silt can reduce or block these areas (Brim Box and Mossa 1999, p. 100), which may cause them to become unsuitable for green floaters by having reduced dissolved oxygen levels and limited food availability (Strayer and Malcom 2012, p. 1781).

Pollutants bound to fine sediment and pore water inside interstitial spaces can also be toxic to mussels. The degree of bioavailability of pollutants bound to sediments can be affected by environmental characteristics such as oxygen, temperature, hardness, alkalinity, dissolved organic carbon, chloride, and acidity (Farris and van Hassel 2006, p. 206; Archambault et al. 2017, p. 403).

Excessive sedimentation can be caused by land-disturbing activities associated with development (*i.e.,* residential/commercial, energy, and transportation development). These types of activities increase the amount of impervious surfaces and leave areas of bare, unvegetated soil exposed to direct rainfall. Energy development, agriculture, and forestry activities all take place within the range of the green floater. Energy development is a source of sediment because solar farms, oil and gas pipelines, and transmission lines can cause soil disturbance during installation and maintenance of equipment. Agriculture activities can also cause excessive sedimentation when best management practices are not implemented to minimize soil erosion and increased overland flow, and some forestry practices have the potential to result in increased siltation in riparian systems through the cycle of forest thinning, final harvest, site preparation, and re-planting activities. However, implementation of best management practices and establishment of streamside management zones can minimize the impacts from forestry (Service 2018 and 2019, chapter 6). Adherence to these best management practices and streamside management zones broadly protects water quality, particularly related to sedimentation (as reviewed by Cristan et al. 2016, entire; Warrington et al. 2017, entire; Schilling et al. 2021, entire).

Impervious surfaces (*e.g.,* roads, concrete) are a source of pollutants such as oil and gas because the surfaces prevent liquids from entering the ground. During precipitation events, the pollutants collect in the rainfall, and because water is unable to absorb into the impervious surfaces too, the mixture flows into overland and subsurface drainage runoff. In addition, sediments, which come from the bare, unvegetated

soil, join the polluted runoff and flow into rivers and streams. The increased surface and drainages waters lead to higher stream flows which erode streambanks and riverbanks, increasing turbidity and decreasing streambed stability, all of which negatively impact green floaters.

Water Quality Degradation

In addition to impacts to water quality from sedimentation, water quality can be degraded due to contamination or changes in temperature. Chemical contaminants are widespread and are a major reason for the current declining status of freshwater mussel species nationwide (Augspurger et al. 2007, p. 2025). Chemical contamination of waterways can greatly impact aquatic organisms, and freshwater mussels appear to be more sensitive to some of these chemical contaminants than other test organisms. As sedentary benthic feeders, mussels are exposed to toxic pollutants that enter aquatic environments through direct discharges and stormwater runoff. Contaminants can enter waterways through both point and nonpoint sources, including spills, industrial discharges, municipal effluents, agricultural runoff, and atmospheric deposition from precipitation. These sources contribute excess nutrients, organic compounds, heavy metals, pesticides, and a wide variety of newly emerging contaminants (*e.g.,* antibiotics and hormones from wastewater treatment facilities) to the aquatic environment.

Green floaters are negatively affected by low levels of dissolved oxygen. Dissolved oxygen levels become reduced when nutrients in the water column increase, causing eutrophication and algal blooms. Both natural and anthropogenic sources of organic matter can increase nutrient levels in waterways, but most nutrient pollution is the result of ongoing and large-scale discharges of nitrogen from anthropogenic sources, such as fertilizers and livestock waste. Depletion of dissolved oxygen affects the chemistry and increases the bioavailability of some contaminants. Dissolved oxygen may have the greatest impact on juvenile mussels, which are more sensitive to low levels than adults (Dimock and Wright 1993, p. 189; Sparks and Strayer 1998, pp. 131–133). When there is low dissolved oxygen, juveniles exhibit stress behaviors, such as surfacing, gaping, and exposing their foot and siphons, that expose them to predators (Sparks and Strayer 1998, pp. 132–133).

Freshwater mollusks, including the green floater, are sensitive to chemical pollutants, including chlorine, ammonia, copper, fungicides, and herbicide surfactants (Augspurger et al. 2007, pp. 2025–2028). These chemicals occur in sediments and water and are ingested when mussels filter and feed on particles (Yeager et al. 1994, p. 217; Newton et al. 2003, p. 2553). Ammonia occurs naturally in aquatic systems as a waste product from bacteria. Additional ammonia is deposited into streams through surface water runoff from sources such as industrial, municipal, and agricultural wastewater; decomposition of organic nitrogen; and atmospheric ammonia (Newton 2003, p. 2543; Yao and Zhang 2019, p. 22139). Ammonia is suspended in the atmosphere and returns to the ground as either gaseous ammonia or ammonium ions in precipitation (Air Quality Research Subcommittee 2000, pp. 8–9). Domestic livestock is the largest global contributor to atmospheric ammonia and a growing source of atmospheric deposition (Bouwman et al. 1997, p. 561). Excess nitrogen (in the form of nitrates) in waterways causes plants and algae to flourish and die off, using up dissolved oxygen sources in the water, depleting sources of oxygen for other aquatic organisms, causing eutrophication, and increasing the risk of die offs of fish and aquatic invertebrates (USGS 2022, unpaginated). Excessive inputs of organic matter can also cause ammonia in waterways to reach levels that are detrimental to freshwater mussels (Haag 2012, p. 379). However, the degree of ammonia toxicity varies depending on temperature and pH conditions, which influence the proportion of ammonia in its less toxic (ionized ammonium, NH_4+) or more toxic (un-ionized ammonia, NH_3) state (Augspurger et al. 2003, pp. 2569–70; Haag 2012, p. 379). When temperature and pH levels increase, concentrations of the more highly toxic un-ionized ammonia also increase and can reach levels that are lethal to the green floater and other freshwater mussels (Strayer 2020, pers. comm.). High concentrations of un-ionized ammonia are thought to be a contributing cause of widespread decline of mussels in the Hudson River (Strayer and Malcom 2012, p. 1786). When un-ionized ammonia reached concentrations of 0.2 mg/L, recruitment in wild mussel populations failed (Strayer and Malcom 2012, p. 1787). Juvenile mussels are highly sensitive to un-ionized ammonia, and chronic exposure at concentrations of 0.57 mg/L in 25 °C (77 °F) water was lethal to juveniles in the lab (Augspurger et al. 2003, p. 2572). The *Lasmigona* genus, of which the green floater is a member, was the most sensitive of 12 genera tested for ammonia toxicity of juveniles and adults (Augspurger et al. 2003, p. 2573).

In addition to ammonia, manganese, nickel, chlorine, and sodium dodecyl sulfate have also been linked to mussel declines and/or toxicity (Archambault et al. 2017, entire; Gibson 2015, pp. 90–91; Gibson et al. 2016, p. 33). Sediments that contain manganese and ammonia as a result of mining and agriculture can negatively affect mussel survival and biomass, as observed in the Clinch River and its tributaries (Archambault et al. 2017, pp. 403–405). Manganese and nickel generally enter waterways in the wastewater from various industries, including alloy, glass, and battery manufacturing; via atmospheric deposition as a result of the combustion of fossil fuels; and in the runoff from agriculture and mining operations (Rollin 2011, pp. 618–619). Long-term exposure to ammonia and manganese could reduce immunity and fecundity in mussels (Archambault et al. 2017, p. 405). Sodium dodecyl sulfate, a surfactant found in household detergents and herbicides, can be lethal to some mussels after acute exposure (Gibson et al. 2016, p. 30).

State and Federal regulatory mechanisms (*e.g.,* the Clean Water Act (33 U.S.C. 1251 *et seq.*)) have helped to reduce the negative effects of point source discharges since the 1970s. However, while new water quality criteria are being developed that consider more sensitive aquatic species, most criteria currently do not have any limits associated with them. On August 22, 2013, the U.S. Environmental Protection Agency (EPA) published in the **Federal Register** (78 FR 52192) national recommended ambient water quality criteria for the protection of aquatic life from the effects of ammonia in fresh water. These criteria incorporate the latest scientific knowledge on the toxicity of ammonia to freshwater aquatic species, including freshwater mollusks. So far, few States have adopted the new criteria, which are considerably more stringent than previous criteria. Nickel and chlorine have been shown to be toxic to juvenile mussels at levels below the EPA's current water quality criteria (Gibson 2015, pp. 90–91). Water quality criteria for other compounds that are harmful to mussels, such as sodium dodecyl sulfate, do not currently exist (Gibson et al. 2016, p. 33).

Increased water temperature caused by loss of riparian trees, impoundments, climate change, stormwater, wastewater effluents, and low flows during drought

periods can exacerbate low dissolved oxygen levels and negatively affect juvenile and adult green floaters. Higher water temperatures increase metabolic processes in freshwater mussels and can outstrip energy reserves if they remain above the natural thermal tolerance of a mussel for extended periods of time. Because ammonia toxicity in freshwater environments increases as temperature and pH increase (Newton 2003, p. 2543), temperature increases may exacerbate existing pollution, compounding the threats to green floater growth and survival.

Salt, which enters waterways from road runoff and industrial discharges, can be toxic to freshwater mussels, and concentrations observed in streams and rivers have resulted in death of glochidia in laboratory settings (Gillis 2011, pp. 1704–1707). The largest chloride spikes happen in the winter (Kaushal et al. 2005, pp. 13518–13519), when road salt washes into waterways, keeping chloride levels elevated in months when green floaters release glochidia.

Discharges of high salinity wastewater (called brine), a waste product from oil and gas drilling operations, into streams can also adversely affect freshwater mussels. In Pennsylvania, mussel abundance and diversity were found to be lower downstream of a brine treatment facility (Patnode et al. 2015, p. 59). In northern Appalachia, natural gas operations have negatively affected groundwater and surface water quality through wastewater disposal and increased sedimentation (Vidic et al. 2013, p. 1235009–6; Olmstead et al. 2013, p. 4966), likely impacting mussels in the region.

Organic contaminants such as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) are toxic to humans and organisms and can bioaccumulate in plants and animals (Newton and Cope 2007, entire; Maryland DNR 2020, unpaginated). These toxins contaminate water via petroleum spills and discharges, industrial and municipal wastewater, and atmospheric deposition (*e.g.,* coal plants, incinerators) (Albers 2003, p. 346). Natural sources of PAHs are forest and grassland fires, oil seeps, volcanoes, plants, fungi, and bacteria. Anthropogenic sources are petroleum, electric power generation, burning of waste, home heating oil, coke (a fuel derived from coal), carbon, coal tar, asphalt, and internal combustion engines (Albers 2003, p. 345). Oil and gas that drip from automobiles onto pavement eventually enter waterways, especially in urban environments. Where roads cross over streams, PAHs are found in significantly higher concentrations than in upstream reaches (Archambault et al. 2018, p. 470). Cumulative concentrations of PAHs in streams can cause adverse effects to mussels, including reduced immune system function and reduced reproduction (Archambault et al. 2018, p. 474).

In use between approximately 1929 until 1978, PCBs are long-lasting toxic compounds that have significantly degraded major waterbodies throughout the range of the green floater. Despite having been banned, PCBs have accumulated and persist in sediment, affecting aquatic life (including mussels) to this day (Jahn 2020, pers. comm.). For example, up to 1.3 million pounds of PCBs were discharged into the Hudson River between the 1940s and 1970s (USEPA 2016, entire). The area is now a Federal Superfund remediation site, and cleanup activities, which began in 2009, include dredging of the riverbed. Because PCBs exist in the sediment, they are released into the water and continue to persist in the environment.

Alteration of Water Flows

Mussels typically experience low flow and high flow periods and are adapted to deal with seasonal variability. However, extreme drought or flooding can adversely affect mussel populations that are already stressed (Hastie *et al.* 2001, p. 114; Golladay *et al.* 2004, p. 504) and can eliminate appropriate habitats. Green floaters may be able to survive extreme low or high flow events if the duration is short (in the case of stream drying), but populations that experience these events regularly or for extended durations may be at risk.

Very low water levels can be caused by severe drought or water use. During low water flow periods, mussel mortality is primarily caused by dehydration, thermal stress, and exposure to predation (Golladay *et al.* 2004, p. 504; Pandolfo *et al.* 2010, p. 965; Galbraith *et al.* 2015, pp. 49–50). Water withdrawals are associated with public and private water uses, sewage treatment, and power generation (*e.g.,* dams), and may be exacerbated by climate change (Neff *et al.* 2000, p. 207). Rapid dewatering can lead to increased stress and mortality, especially in more sensitive mussel species (Galbraith *et al.* 2015, p. 50), and prevent dispersal. While green floaters can survive short periods of low flows, persistent low flows can cause them to experience oxygen deprivation and increased water temperatures, ultimately stranding them in place if conditions do not improve or they are unable to relocate. If deeper water is unavailable, they may bury themselves for long periods of time, which can cause mortality, stress, and reduced reproduction and recruitment in the population.

High flows can be caused by extreme precipitation (*i.e.,* snowmelt or rainfall) events or regulated dam releases. These events cause water levels to rise, increasing flow velocities which can substantially change, destabilize, or destroy mussel habitat. High flow velocities can completely change the course of the stream, scour streambeds, erode stream banks, and fill interstitial spaces with sediment. Where a channel is no longer connected to floodplains, peak flows are higher and faster, which can degrade or eliminate green floater habitat (Clayton 2020, pers. comm.).

High flows may also result in dislodgement or displacement of mussels. Flooding can bury mussels in silt, crush them with large rocks moved by the current, or dislodge and relocate them to downstream areas that may or may not provide suitable habitat (Hastie *et al.* 2001, pp. 113–114).

Barriers, such as improperly installed or maintained culverts, and impoundments associated with dams (reservoirs), reduce the diversity and abundance of mussels by altering habitat both upstream and downstream (Bogan 1993, p. 605; Neves *et al.* 1997, p. 63). Culverts and dams can inundate upstream shallow-water habitats, increasing sediment deposition behind the barrier. The excess sediment can smother green floaters by filling the interstitial spaces where they occur, thereby depriving them of oxygen and nutrients. Besides sedimentation, the increase in depth can degrade mussel habitat in a few ways. For instance, in large reservoirs, deep water is very cold and often devoid of oxygen and necessary nutrients. Smaller reservoirs often accumulate excess nutrients, and hence lower dissolved oxygen, and have higher water temperatures than adjacent stream reaches, all of which can stress mussel populations.

Dams and other barriers also tend to reduce the water available to mussel populations downstream. In addition, the frequency, duration, timing, and location of water releases from dams can affect the suitability of downstream habitats for green floaters. Sudden, high-volume releases can increase scour in some places by washing away sediment, then smother other areas by depositing sediment, filling interstitial spaces, and burying the sandy and gravelly habitats that mussels prefer. Large fluctuations in flow regimes from dam releases can also cause seasonal dissolved oxygen depletion, lead to significant variation in water temperatures, and change the

species of fish present in the stream, all of which can lead to unsuitable conditions and negatively impact green floaters. The instability of sediment from scour, flushing, and deposition of eroded bank material can result in juvenile mussels failing to settle and stay in interstitial spaces (Hastie *et al.* 2001, p. 114).

Nevertheless, there are cases of populations of other mussel species thriving in stable conditions downstream of some dams, especially small, low head dams (Gangloff 2013, p. 476 and references therein; Bowers-Altman 2020, pers. comm.). Smaller dams have fewer adverse effects because they do not tend to act as complete barriers for water flow. Small dams and their impoundments can benefit mussel habitat by filtering and lowering nutrient loads, oxygenating streams during low-water periods, and stabilizing stream beds (Gangloff 2013, pp. 478–479). Impoundments can also benefit the habitat by retaining fine sediments and associated toxins, inhibiting the spread of invasive species, and slowing or weakening water flows during flood events (Fairchild and Velinsky 2006, p. 328; Jackson and Pringle 2010, entire). Although dams and impoundments are considered to have an overall negative impact across the range of the green floater, altered or reduced hydrologic connectivity can be preferable to natural connectivity regimes in highly developed landscapes.

Loss and Fragmentation of Habitat

Habitat fragmentation isolates mussel populations, which contributes to their risk of extirpation from stochastic events (Haag 2012, pp. 336–338). Streams are naturally dynamic, frequently creating, destroying, or shifting areas of quality habitat over a particular timeframe. However, human-caused factors can lead to permanent fragmentation of suitable habitat. For instance, barriers (*e.g.,* dams, improperly installed or maintained culverts with poor fish passage) can disrupt the connectivity of green floater habitat and isolate mussel populations by preventing host fish from moving upstream or downstream. Dams have caused genetic isolation in river systems for fish and could have the same effect on mussel populations. The alteration in fish populations can be a threat to the survival of mussels and their overall reproductive success over time (Haag 2009, pp. 117–118).

Fragmentation has other causes, too. Pollution or other habitat degradation at specific points can completely separate stream reaches from one another (Fagan 2002, p. 3246). Similarly, drought conditions can temporarily fragment habitat by reducing or eliminating flows and preventing movement of fish hosts carrying glochidia. Where mussel populations are small, habitat fragmentation can cause local extirpation because populations cannot be reestablished by colonization from other areas. Connectivity between mussel beds or occupied habitats is thus particularly important where reaches of suitable habitat are created and destroyed frequently.

Invasive Species

Several invasive species, including zebra and quagga mussels (*Dreissena* spp.), Asian clams (*Corbicula fluminea*), invasive crayfish species (especially the rusty crayfish (*Faxonius rusticus*)), and various species of bass, catfish, and carp are present in the green floater's range and are likely to prey upon or compete with green floater and alter the green floater's habitat (Strayer 2020, pers. comm). Although the extent of the effects of these invasive species on the green floater are unknown, their influence on the green floater is likely to be detrimental and is expected to increase in the future. Populations of these species and others are expanding their ranges and becoming established in more watersheds inhabited by green floaters over time. When invasive species are introduced to natural systems, they may have many advantages over native species, such as the ability to adapt to varying environments and a high tolerance of conditions that allows them to thrive outside of their native range. There may not be natural predators adapted to control the invasive species; thus, they have the potential to live longer and reproduce more often, rapidly increasing their populations and range. Native species may become an easy food source for invasive species, and the invasive species can carry diseases that could potentially spread to native species. Some invasive species can drastically alter aquatic habitats by affecting flow dynamics and can contaminate streams by dying in mass mortality events that change the amount of dissolved oxygen and ammonia in the water.

Effects of Climate Change

There are a multitude of ongoing and anticipated changes in the environment resulting from climate change. Likely impacts of these changes on aquatic systems that could affect green floaters include increases in water temperatures, changes in seasonal precipitation, and changes in extreme precipitation events. Sedentary freshwater mussels have limited refugia from disturbances such as droughts and floods, and since their physiological processes are constrained by water temperature, increases in water temperature caused by climate change can further stress vulnerable populations and lead to shifts in mussel community structure (Galbraith *et al.* 2010, p. 1176). Extreme events have become more common as the climate changes, and both floods and droughts can degrade habitat and affect water quality parameters, like dissolved oxygen (see ''Alteration of Water Flows,'' above). Low water flows (*e.g.,* following a prolonged summer drought) can expose mussels to intense opportunistic predation (Wicklow *et al.* 2017, pp. 45, 47, 55, 137). All of these predicted impacts of climate change are already occurring in the range of the green floater, and they are expected to worsen over time (Poff *et al.* 2002, pp. ii–v), and human alteration of channels and flow regimes may limit the ability of green floater and host fish species to adapt and relocate.

Inherent Factors

Green floaters exhibit several inherent traits that likely influence population viability, including hermaphroditism, direct development of juvenile mussels in the marsupia (*i.e.,* brood chamber in the outer gills), and low fecundity compared to some other mussel species. When habitat conditions are favorable, their abilities to develop glochidia without host fish and to self-fertilize allow green floaters to persist in small streams with small populations and few fish, which positively impacts the species' viability (Haag 2012, pp. 150, 191). However, low fecundity rates limit the ability of populations to quickly rebound after stochastic events. In addition, hermaphroditism can lead to lower genetic diversity, and reliance on juvenile development without a host fish can lead to a diminished distribution.

Green floaters are frequently found in low numbers within their occupied habitats, with some found in mussel beds along with other mussel species and some found individually. Smaller population size puts sites at greater risk of extirpation from demographic or environmental stochasticity (*e.g.,* periods of poor reproductive success or periods of severe flooding or drought) or genetic drift. The smallest populations of green floaters also face greater threats from anthropogenic changes and management activities that affect habitat. In addition, smaller populations may have reduced genetic diversity and

fitness and thus are more susceptible to environmental changes.

Conservation Efforts and Regulatory Mechanisms

There are several regulatory mechanisms that protect the green floater or its habitat. The green floater is State-listed as endangered or threatened in 8 States (Maryland, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia) of the 10 States where it historically occurred. In these eight States, the green floater receives some level of protection due to the State listing, though this varies by State. The green floater has been identified on the lists of Northeast and Southeast Regional Species of Greatest Conservation Need, which enables States in those regions to prioritize research and conservation of the species through State wildlife action plans.

Green floaters may be afforded some protection by the Clean Water Act's (CWA) dredge or fill permitting framework. CWA section 404 established a program to regulate the discharge of dredged and fill material into waters of the United States. Permits to fill wetlands or streams are issued by the U.S. Army Corps of Engineers, and mitigation is required to offset impacts above minimal levels. Such mitigation could include preservation or restoration of stream reaches inhabited by the green floater. CWA section 401 requires that an applicant for a Federal dredge or fill permit under section 404 obtain a certification that any discharges from the facility will not violate water-quality standards, including some established by States. Current State water quality standards are designed to be protective of aquatic organisms; however, freshwater mollusks may be more susceptible to the effects of some pollutants than organisms for which the CWA standards were developed. In addition, several State laws require setbacks or buffers for development in or near aquatic systems but allow variances/waivers for those restrictions. Accordingly, both Federal and State laws and regulations afford some protection to water quality in the green floater's habitat; however, because these laws do not prohibit development, and because it is not known whether existing water quality standards are adequate to protect the green floater, the impacts caused and protections afforded by the regulatory framework are not precisely known.

Several States are taking additional actions to improve habitat for freshwater mussels, including green floaters. For example, the West Virginia Department of Natural Resources has created a West Virginia Conservation Strategy (2019) and works with partners to implement watershed protection, stream protection, the restoration and maintenance of natural flow regimes, and the reduction of pollutants (*e.g.,* road salt, industrial and agricultural effluents, and sewage) to improve aquatic habitat for mussels. In a bridge project on the Rappahannock River, for instance, the Virginia Department of Wildlife Resources collected and relocated a total of 30 green floaters. Agency staff subsequently documented recruitment of green floaters at the relocation site in the Rappahannock River (Watson 2020, pers. comm.).

A variety of agencies and organizations (*e.g.,* the Service, the U.S. Department of Agriculture's Natural Resources Conservation Service, The Nature Conservancy, Trout Unlimited, and American Rivers) fund and implement projects to remove barriers to fish passage, plant and maintain sufficient riparian buffers, and improve water quality by capturing and treating wastewater and sediment before they enter rivers and streams. These efforts have the effect of improving habitat for freshwater mussels, among other aquatic species. For instance, Federal and State agencies (Delaware, the District of Columbia, Maryland, Pennsylvania, New York, Virginia, and West Virginia), local governments, nonprofit organizations, and academic institutions have worked together since 1983 to implement the Chesapeake Bay Watershed Agreement, with the goal of reducing pollution (in particular, nutrient pollution), restoring wetland and other aquatic habitats, and promoting environmentally friendly land-use practices in the Chesapeake Bay watershed. In 2017, a system was put in place to monitor progress and document adaptive management strategies. These efforts have demonstrated continued improvement of the habitat over time, which has likely benefited green floater populations in the area.

Several captive breeding efforts have been conducted to determine the feasibility of propagating green floaters. In 2017 and 2018, the White Sulphur Springs National Fish Hatchery grew over 80,000 juvenile green floaters in West Virginia. The Harrison Lake National Fish Hatchery in Richmond has successfully propagated and released juvenile green floaters into Virginia rivers and streams. These efforts have the potential to restore populations of green floater in the future; however, they are currently limited in scope, and long-term population increases in the wild have yet to be documented.

Summary

Our analysis of the factors influencing the green floater revealed multiple threats to the current and future viability of the species: habitat loss or fragmentation; changes in water flows; degraded water quality; and impacts of climate change. Factors like low fecundity that are inherent to the species contribute to the likelihood of populations becoming extirpated, especially when populations consist of just a few individuals. Secondary factors that may pose a threat are the impacts that invasive species may have on the green floater. Other potential factors such as disease and predation were also considered but the extent of these issues and their effects on green floater populations are unknown. There are conservation programs and water quality standards that may benefit freshwater mussels but few that target the green floater specifically.

Many of the above-summarized risk factors may act synergistically or additively on the green floater. The combined impact of multiple stressors is likely more harmful than a single stressor acting alone. For the green floater, the inherent factor of having low fecundity is likely to work in conjunction with each of the other stressors to limit the species' ability to recover from catastrophes (*e.g.,* severe floods, droughts) or to expand the population when conditions are favorable. For a full explanation of the impact of stressors on the viability of the species, see chapter 4 of the SSA report (Service 2021, pp. 36–57).

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

To evaluate the current condition of the green floater, we considered the resiliency of the known population, the redundancy of populations or analysis

units, and the ecological or genetic representation within the species across its range. We assessed the resiliency of the 179 analysis units by evaluating the number of live green floaters reported per year and trend, the length of occupied stream segments, and habitat quality that were established based on evidence from documented studies, available unpublished information, and expert opinion (see Service 2021, appendix C). Metrics were evaluated in sequential order. Abundance and trend data from surveys were considered the most accurate indicators of current condition and the occupied habitat and habitat quality metrics were only assessed if abundance and trend data were lacking. Then current condition categories of high, medium, low, presumed extirpated, and historical/unknown were assigned to the analysis units. Condition categories were assigned as high, medium, or low resiliency in places where one or more live individuals were found in a geographic area since 1999. High resiliency indicates that green floaters are abundant (more than 100 individuals) in the analysis unit and that the population appears to be stable or increasing. For analysis units that meet the requirements for high resiliency, the amount of occupied habitat and habitat quality are not considered. Medium resiliency indicates either that green floaters are common (10 to 100 individuals) in the analysis unit and the population is stable or increasing, or that green floaters are abundant in the analysis unit and the population is decreasing. Medium resiliency also indicates that occupied steams are greater or equal to 1 km (0.62 mi) in length. Low resiliency indicates that green floaters are rare (fewer than 10 individuals) and that the likelihood of the population withstanding a stochastic event is low. Low resiliency also indicates that occupied steams are less than 1 km (0.62 mi) in length or observations are highly fragmented, and that the habitat is considered by experts to be less suitable for green floaters. Presumed extirpated was assigned to geographic areas where green floaters have not been found recently (1999 to 2019), and multiple surveys have been conducted and local experts do not expect to find them there in the future. Historical/unknown was assigned to geographic areas in which green floaters have not been found recently (1999 to 2019), but sufficient surveys have not been conducted to declare the analysis unit as having the condition ''presumed extirpated.''

The results of our analysis show that across the range of the green floater, 16 percent of analysis units are designated as having medium (13 percent) or high (3 percent) resiliency. The condition of the other 84 percent of analysis units is low (36 percent), presumed extirpated (14 percent), or historical/unknown (34 percent). In many of the analysis units where the green floater's condition is designated as medium or high, distribution is not continuous and small groups of green floaters are found in pockets of habitat. It is common to find fewer than 10 live individuals at a location in a survey year, and in many analysis units, few green floaters are found over long stretches of river. For example, in several analysis units in New York (including the Cohocton and Unadilla Rivers), green floaters were found in very low numbers dispersed over 20 to 30 miles of suitable habitat. In addition, there is one analysis unit in West Virginia (Knapp Creek) in which green floaters were found in 2014 in high numbers but, due to habitat alterations, were not found the subsequent year. In these unique cases, information provided by local experts helped determine the appropriate condition category.

Green floaters have not been found in approximately half (47 percent) of the analysis units since before 1999. However, many of these analysis units were categorized as historical/unknown because not enough surveys have been conducted to determine with high confidence that the species no longer occurs. Of the 179 analysis units, 60 are considered historical/unknown. Using present land use (*e.g.,* landscape attributes and water quality) and climate projections, we modeled the probabilities of the historical/unknown units being in each category (high, medium, low, or presumed extirpated). The results suggest that almost all of the analysis units designated as historical/unknown are likely in low condition, with a small subset of eight analysis units having a high likelihood of being presumed extirpated. The analysis indicates that green floaters currently occupy the majority (53 to 82 percent) of analysis units in their historical range (see full results in table 1).

TABLE 1—SUMMARY OF THE CURRENT CONDITION OF THE RESILIENCY OF GREEN FLOATER ANALYSIS UNITS, INCLUDING MODELED RESULTS FOR ANALYSIS UNITS IN THE HISTORICAL/UNKNOWN CATEGORY

	Number of analysis units			
	High	Medium	Low	Presumed extirpated
Current condition of high, medium, low, and presumed extirpated analysis units	6	24	64	25
Modeled condition of historical/unknown analysis units	*1	*1	51	8
Totals	7	25	115	33

*One analysis unit (South Branch Potomac, West Virginia) was predicted to have lower risk of being in the presumed extirpated or low categories. Therefore, the unit is likely in medium or high condition, but the model was not designed to predict one over the other.

The green floater must be able to respond to physical (*e.g.,* climate conditions, habitat conditions or structure across large areas) and biological changes (*e.g.,* novel diseases, pathogens, predators) in its environment into the future. The species' adaptive capacity is shown through its multiple reproductive strategies (*i.e.,* direct development of glochidia and use of host fish) and ability to occur over a large geographical range. The green floater occurs in both sides of the Eastern Continental Divide in the Atlantic Slope and Mississippi River drainages, a rare distribution for mussels, where it endures a wide array of climatic conditions (*e.g.,* temperatures) and elevational gradients (*e.g.,* 200 to 900 meters (650 to 3,000 feet) above sea level in West Virginia). We assume that there is little connectivity between populations separated by the Continental Divide now and there is significant genetic information indicating the species does not exist as a single continuous population as well. A zone of discontinuity exists suggesting individuals in the northern part of the

range are evolving separately from those in the southern parts (King *et al.* 1999, pp. S69–73, S76).

We considered the green floater's reproductive strategies as well as its broad historical geographic range to determine the breadth of the species' representation and adaptive capacity in five regions, which we refer to as representation units (Great Lakes, Mid-Atlantic, South Atlantic, Mississippi, and Gulf). The boundaries of these units are based on the major watersheds and locations of known genetic differences among green floater populations. The genetic differences that exist among populations north and south of the Potomac River indicate that populations in the Mid-Atlantic and South Atlantic representation units may be adapted to local environmental conditions (*e.g.,* temperature).

As discussed in the paragraphs above, the majority of the analysis units considered in the resiliency analysis are categorized as low or presumed extirpated, and these are scattered throughout four representation units (Great Lakes, Mid-Atlantic, South Atlantic, and Mississippi). The green floater is likely extirpated entirely from the Gulf representation unit. Analysis units designated as medium and high are unevenly distributed across the representation units: 17 are found in the Mid-Atlantic, 9 are found in the South Atlantic, 4 are found in the Mississippi, and none are found in the Great Lakes representation unit.

We considered the green floater's current redundancy by assessing the number of and distribution of healthy populations across the species' range. Thirty of the 179 analysis units (16 percent) were found to be sufficiently resilient (in medium or high condition). Green floater populations in six of these analysis units (designated as high condition) are thought to be capable of expanding their range if suitable adjacent habitat is available. Should a large-scale catastrophic event occur, the species would be best able to recover without human intervention in the Mid-Atlantic, South Atlantic, and Mississippi representation units.

Future Condition Projections

To assess the future condition of the green floater, we projected changes in land use and climate to model future conditions for each analysis unit to year 2060. We first modeled the probability that an analysis unit would be classified in each condition category based on historical land use and climate patterns. These probabilities produced by the present condition model represent the species' current (or baseline) risk profile. We then modeled future condition for each analysis unit out to year 2060 and incorporated a range of plausible scenarios for each parameter, including land use projections under four emission scenarios (A1B, A2, B1, and B2), and climate projections under 12 climate scenarios derived from six global climate models (bcc–csm1–1–m, BNU–ESM, CanESM2, GFDL–ESM2G, GFDL–ESM2M, inmcm4) and two representative concentration pathways (RCP 4.5 and 8.5) (see Service 2021, Appendix D). The presentation of the results focused on the probability that an analysis unit would be classified as either presumed extirpated or low condition, combining the two categories discussed in the current condition analysis. Presumed extirpated and low were grouped together in the results to accurately represent the uncertainty of the model for each category.

The variables most likely to have negative effects on green floater condition were the percentage of developed land, the patch density of developed land (*i.e.,* proportional cover of development and its spatial pattern), and mean runoff, which likely reflect deteriorating habitat quality from increased erosion, decreased substrate stability, and poor water quality.

The results of the present condition model indicated that all analysis units (179 total), except 4 in West Virginia and North Carolina, have a mean probability greater than 50 percent of being classified as presumed extirpated or low resiliency based on surrounding land use. Sixty-four of the 94 analysis units with confirmed occurrence are currently classified as having low resiliency, and the remaining 30 appear to be at high risk of becoming so, based on land use patterns. Most analysis units (97 of 179) are located within the Mid-Atlantic representative unit, which is the central region that has the greatest future risk. According to the future condition model, 2 of the 179 analysis units (1 percent) are projected to be in high condition in 2060, 4 analysis units (2 percent) are projected to be in medium condition, and 173 analysis units (97 percent) are projected to be in presumed extirpated or low condition. The future risk of an analysis unit being classified as presumed extirpated or low condition at 2060 was generally similar to baseline risk throughout the range; however, variation tended to be wider for most analysis units due to the added uncertainty across multiple future scenarios. The major rangewide trends indicate there is a high risk that future populations will have low resiliency in the central portion of the range and, according to the future condition model, a projected increase in risk in the remaining southern portion. Most populations have already been extirpated from regions where there is projected increase in development (the metro areas of Washington, District of Columbia; Philadelphia, Pennsylvania; New York, New York; and Albany, New York). The major exceptions are analysis units in the southern portion of the range surrounding Greensboro, North Carolina; Raleigh-Durham, North Carolina; and Lynchburg, Virginia. The risk of extirpation (presumed extirpated) is projected to increase 20 to 30 percent in populations in these metro areas (James, Dan, Eno, Neuse, and Tar River watersheds) by 2060. This suggests that increased risk in the southern portion of the range could have large impacts on species-level resilience and representation.

In summary, there are very few locations where the green floater is expected to continue to be healthy and sufficiently resilient into the future. By the year 2060, 97 percent of the known locations are likely to have low resiliency or will be extirpated. We anticipate a continued declining status of the green floater due to ongoing and increasing threats primarily related to increases in developed land use. Due to the biology and current distribution of the species, it is unlikely that green floaters will be able to disperse and shift their range in response to predicted habitat changes or novel threats in most watersheds.

Determination of Green Floater'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, our analysis indicates that the most important risk factor affecting the green floater's current and future status and trends is the destruction and modification of its habitat (Factor A). The primary drivers of the status of the species to the present have been excessive sedimentation, water quality degradation, alteration of water flows, loss and fragmentation of habitat, invasive species, and the effects of climate change (Factor A). Land-disturbing activities associated with development (*e.g.,* residential/commercial, energy, and transportation development) have contributed to soil erosion and excessive sedimentation in many areas of the green floater's range. Development and an increase in impervious surfaces have created conditions in which heavy rain events cause higher stream flows, which have eroded streambanks and riverbanks, increased turbidity, and decreased streambed stability at numerous sites. These conditions have also caused sediment and pollutants from a wide variety of anthropogenic sources (*e.g.,* mining, agriculture, wastewater, industrial discharge, oil and gas drilling operations) to wash into rivers and streams. Many of these stressors have directly killed green floaters while others have reduced the fitness of individuals or reduced fecundity.

We considered whether the green floater is presently in danger of extinction and determined that, despite the stressors acting upon the species, proposing endangered status is not appropriate. Green floaters currently occupy the majority (53 to 82 percent) of analysis units in their historical range. They are currently found in seven States, primarily occurring in the Atlantic Slope. Individuals have recently been found in New York, Pennsylvania, Maryland, West Virginia, Virginia, North Carolina, and Tennessee, although the range has contracted, and the species occurs as disjunct populations in rivers and streams in these States. Green floaters have been observed recently (since 1999) in 94 of the 179 analysis units and are likely to occur in another 52 units for which the status was modeled based on current land use patterns. Populations in 30 of the observed locations (32 percent) are currently healthy and resilient to stochastic events. Populations in six of the observed locations (6 percent) are likely capable of expanding their range if suitable adjacent habitat is available. These moderately to highly resilient populations are scattered across the Mid-Atlantic, South Atlantic, and Mississippi regions, an area covering both sides of the Eastern Continental Divide in the Atlantic Slope and Mississippi River drainages. Given the number and distribution of sufficiently resilient populations, the green floater is likely to persist at multiple locations should a large-scale catastrophic event occur, and it is unlikely that a single catastrophic event would affect the entire species across its large range.

The species' current representation (adaptive capacity) is evident through its use of two reproductive strategies (*i.e.,* direct development of glochidia and use of host fish) and continued persistence over a large geographical range where the climatic and habitat conditions vary widely. While threats are currently acting on the species and many of those threats are expected to continue into the future (see below), we did not find that the green floater is currently in danger of extinction throughout all of its range. With 30 moderately or highly resilient populations in three physiographic regions, the current condition of the species provides for enough resiliency, redundancy, and representation such that it is not currently at risk of extinction.

While the green floater is not currently in danger of extinction, under the Act we must determine whether the species is likely to become in danger of extinction within the foreseeable future throughout all of its range (*i.e.,* whether the species warrants listing as threatened). In the foreseeable future, we anticipate the status of the green floater to continue to decline due to ongoing and increasing threats primarily related to increases in developed land use (Factor A). By the year 2060, 173 (97 percent) of green floater analysis units have a mean probability greater than 50 percent of being in low condition or extirpated, and only 6 analysis units (3 percent) are expected to be moderately or highly resilient. Green floater populations in the Mid-Atlantic and South Atlantic regions that are currently the most highly resilient, especially those near growing metropolitan areas in North Carolina and Virginia, are expected to experience the greatest change. Loss of green floaters from these regions could impact the species' resilience and representation by severely decreasing its distribution in the central and southern parts of the range.

Concurrent with the growing threat of loss and degradation of habitat caused by development, climate change (Factor A) is expected to further exacerbate the degradation of green floater habitat through increased water temperatures, changes and shifts in seasonal patterns of precipitation and runoff, and extreme weather events such as flood or droughts. These changes will make the habitat less hospitable to the species in the future by disrupting fundamental ecological processes upon which the species relies to meet basic needs such as food and oxygen. The effects of climate change on the environment are expected to disrupt and limit green floater reproduction as well. Because of biological factors inherent to the species' life history, the green floater has likely always occurred in smaller populations compared to other mussel species. However, in conjunction with the climate-related stressors such as floods and droughts, small population size puts the species at high risk of becoming extirpated from sites where the habitat is in poor condition, such as those conditions expected with increased development. The cumulative effect of these threats will be continued decreases in the green floater's resiliency, redundancy, and representation, which will negatively impact the species' viability into the future. Thus, after assessing the best available information, we conclude that the green floater is not currently in danger of extinction but is likely to become in danger of extinction within the foreseeable future throughout all of 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 in the foreseeable future throughout all or a significant portion of its range. The court in *Center for Biological Diversity* v. *Everson,* 435 F. Supp. 3d 69 (D.D.C. 2020) (*Everson*), 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'' (hereafter ''Final Policy''; 79 FR 37578, July 1, 2014) that provided 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.

Therefore, we proceed to evaluating whether the species is endangered in a significant portion of its range—that is, whether there is any portion of the species' range for which both (1) the portion is significant; and (2) the species

is in danger of extinction in that portion. Depending on the case, it might be more efficient for us to address the ''significance'' question or the ''status'' question first. We can choose to address either question first. Regardless of which question we address first, if we reach a negative answer with respect to the first question that we address, we do not need to evaluate the other question for that portion of the species' range.

Following the court's holding in *Everson,* we now consider whether there are any significant portions of the species' range where the species is in danger of extinction now (*i.e.,* endangered). In undertaking this analysis for the green floater, we choose to address the status question first—we consider information pertaining to the geographic distribution of both the species and the threats that the species faces to identify any portions of the range where the species may be endangered.

We evaluated the range of the green floater to determine if the species is in danger of extinction now in any portion of its range. The range of a species can theoretically be divided into portions in an infinite number of ways. We focused our analysis on portions of the species' range that may meet the definition of an endangered species. For the green floater, we considered whether the threats or their effects on the species are greater in any biologically meaningful portion of the species' range. We examined the following threats: excessive sedimentation, water quality degradation, alteration of water flows, the loss and fragmentation of habitat, invasive species, climate change, and factors inherent to the species, including cumulative effects.

We identified one portion of the species' range that warranted further consideration as a potentially significant portion of the range. We identified the Great Lakes representation unit as a portion of the range for further analysis because no populations with moderate or high resiliency are located there. We analyzed whether the Great Lakes representation unit might be a biologically meaningful portion of the species' range where threats are impacting individuals differently from how they are affecting the species elsewhere in its range. Overall, we found that the loss and degradation of suitable habitats caused by the threats is pervasive across the green floater's range and we did not identify any threats that were concentrated in any of the five representation units analyzed or other portions of the range, including the Great Lakes. However, although we did not identify any particular threats that are concentrated in the Great Lakes representation unit, all six analysis units in that area have low resiliency. It is possible that the threats affecting the Great Lakes region could be having a disproportionate impact in that area compared to the rest of the species' range. Therefore, the species' response to those threats may be causing the species in that portion of the range to have a different biological status than its biological status rangewide.

Because we concluded that the biological status of the green floater in the Great Lakes representation unit may differ from its biological status rangewide, we next evaluated whether or not this area is significant. Of the representation units that are currently occupied by green floaters, the Great Lakes unit is the smallest, covering the smallest land area and containing only 6 percent of the analysis units with confirmed occupancy rangewide. Although all representation units provide some contribution to the species' resiliency, representation, and redundancy, the Great Lakes representation unit encompasses only a small portion of the total range, the habitat there is not high quality relative to the other portions of the range, and the unit does not constitute high or unique value habitat for the species. Therefore, we concluded that the Great Lakes representation unit is not significant in the context of our ''significant portion of the range'' analysis.

The Gulf representation unit, which is part of the green floater's larger historical range, has no resilient populations, but because it is completely extirpated, we cannot consider it as part of this analysis to be a significant portion of the range.

While there may be some variation in the intensity of threats in the five representation units, we found that the loss and degradation of suitable habitats caused by the threats is pervasive across the species' range. Consequently, no portion of the species' range provides a basis for determining that the species is in danger of extinction in a significant portion of its range, and we determine that the species is likely to become in danger of extinction within the foreseeable future throughout all of its range. This does not conflict with the courts' holdings in *Desert Survivors* v. *U.S. Department of the Interior,* 321 F. Supp. 3d 1011, 1070–74 (N.D. Cal. 2018) and *Center for Biological Diversity* v. *Jewell,* 248 F. Supp. 3d 946, 959 (D. Ariz. 2017) because, in reaching this conclusion, we did not need to consider whether any portions are significant, and, therefore, we did not apply the aspects of the Final Policy, including the definition of ''significant'' that those court decisions held to be invalid.

Determination of Status

Our review of the best available scientific and commercial information indicates that the green floater meets the Act's definition of a threatened species. Therefore, we propose to list the green floater as a threatened species in accordance with sections 3(20) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition 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 New York 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 Alabama, Georgia, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia would be eligible for Federal funds to implement management actions that promote the protection or recovery of the green floater. 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 green floater 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 green floater 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 the U.S. Fish and Wildlife Service, U.S. Forest Service, and National Park Service, 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 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. Examples of Federal agency actions that may require consultation for the green floater could include replacing and repairing bridges and culverts, road construction projects, and managing vegetation near streams. Federal agencies should coordinate with the local Service Field Office (see **FOR FURTHER INFORMATION CONTACT**, above) with any specific questions on section 7 consultation and conference requirements.

It the policy of the Service, 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. Although most of the prohibitions in section 9 of the Act apply to endangered species, sections 9(a)(1)(G) and 9(a)(2)(E) of the Act prohibit the violation of any regulation under section 4(d) pertaining to any threatened species of fish or wildlife, or threatened species of plant, respectively. Section 4(d) of the Act directs the Secretary to promulgate protective regulations that are necessary and advisable for the conservation of threatened species. As a result, we interpret our policy to mean that, when we list a species as a threatened species, to the extent possible, we identify activities that will or will not be considered likely to result in violation of the protective regulations under section 4(d) for that species.

At this time, we are unable to identify specific activities that will or will not be considered likely to result in violation of section 9 of the Act beyond what is already clear from the descriptions of prohibitions and exceptions established by protective regulation under section 4(d) of the Act.

Questions regarding whether specific activities would constitute violation of section 9 of the Act should be directed to the New York Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

II. Proposed Rule Issued Under Section 4(d) of the Act

Background

Section 4(d) of the Act contains two sentences. The first sentence states that the Secretary shall issue such regulations as she deems necessary and advisable to provide for the conservation of species listed as threatened species. The U.S. Supreme Court has noted that statutory language similar to the language in section 4(d) of the Act authorizing the Secretary to take action that she ''deems necessary and advisable'' affords a large degree of deference to the agency (see *Webster* v. *Doe,* 486 U.S. 592, 600 (1988)). Conservation is defined in the Act to mean the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Additionally, the second sentence of section 4(d) of the Act states that the Secretary may by regulation prohibit with respect to any threatened species any act prohibited under section 9(a)(1), in the case of fish or wildlife, or section 9(a)(2), in the case of plants. Thus, the combination of the two sentences of section 4(d) provides the Secretary with wide latitude of discretion to select and promulgate appropriate regulations tailored to the specific conservation needs of the threatened species. The second sentence grants particularly broad discretion to the Service when adopting one or more of the prohibitions under section 9.

The courts have recognized the extent of the Secretary's discretion under this standard to develop rules that are appropriate for the conservation of a species. For example, courts have upheld, as a valid exercise of agency authority, rules developed under section 4(d) that included limited prohibitions against takings (see *Alsea Valley Alliance* v. *Lautenbacher,* 2007 WL 2344927 (D. Or. 2007); *Washington Environmental Council* v. *National Marine Fisheries Service,* 2002 WL 511479 (W.D. Wash. 2002)). Courts have also upheld 4(d) rules that do not address all of the threats a species faces (see *State of Louisiana* v. *Verity,* 853 F.2d 322 (5th Cir. 1988)). As noted in the legislative history when the Act was initially enacted, ''once an animal is on the threatened list, the Secretary has an almost infinite number of options available to [her] with regard to the permitted activities for those species. [She] may, for example, permit taking, but not importation of such species, or [she] may choose to forbid both taking and importation but allow the transportation of such species'' (H.R. Rep. No. 412, 93rd Cong., 1st Sess. 1973).

The provisions of this proposed 4(d) rule would promote conservation of the green floater by encouraging management of the habitat in ways that meet both stream management considerations and the conservation needs of the green floater. The provisions of this proposed rule are one of many tools that we would use to promote the conservation of the green floater. This proposed 4(d) rule would apply only if and when we make final the listing of the green floater as a threatened species.

As mentioned above in Available Conservation Measures, 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, even before the listing of any species or the designation of its critical habitat is finalized, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action that 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.

These requirements are the same for a threatened species with a species-specific 4(d) rule. For example, as with an endangered species, if a Federal agency determines that an action is ''not likely to adversely affect'' a threatened species, it will require the Service's written concurrence (50 CFR 402.13(c)). Similarly, if a Federal agency determinates that an action is ''likely to adversely affect'' a threatened species, the action will require formal consultation with the Service and the formulation of a biological opinion (50 CFR 402.14(a)).

Provisions of the Proposed 4(d) Rule

Exercising the Secretary's authority under section 4(d) of the Act, we have developed a proposed rule that is designed to address the green floater's conservation needs. As discussed above in Summary of Biological Status and Threats, we have concluded that the green floater is likely to become in danger of extinction within the foreseeable future primarily due to habitat degradation caused by development and climate change. Section 4(d) requires the Secretary to issue such regulations as she deems necessary and advisable to provide for the conservation of each threatened species and authorizes the Secretary to include among those protective regulations any of the prohibitions that section 9(a)(1) of the Act prescribes for endangered species. We find that, if finalized, the protections, prohibitions, and exceptions in this proposed rule as a whole satisfy the requirement in section 4(d) of the Act to issue regulations deemed necessary and advisable to provide for the conservation of the green floater.

The protective regulations we are proposing for green floater incorporate prohibitions from the Act's section 9(a)(1) to address the threats to the species. Section 9(a)(1) prohibits the following activities for endangered wildlife: importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce. This protective regulation includes all of these prohibitions because the green floater is at risk of extinction within the foreseeable future and putting these prohibitions in place will help prevent further declines, preserve the species' remaining populations, slow its rate of decline, and decrease synergistic, negative effects from other ongoing or future threats.

In particular, this proposed 4(d) rule would provide for the conservation of the green floater by prohibiting the following activities, unless they fall within specific exceptions or are otherwise authorized or permitted: importing or exporting; take; possession and other acts with unlawfully taken specimens; delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of commercial activity; or selling or offering for sale in interstate or foreign commerce.

Under the Act, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Some of these provisions have been further defined in regulations at 50 CFR 17.3. Take can result knowingly or otherwise, by direct and indirect impacts, intentionally or incidentally.

Regulating take would help preserve the species' remaining populations, slow their rate of decline, and decrease synergistic, negative effects from other ongoing or future threats. Therefore, we propose to prohibit take of the green floater, except for take resulting from those actions and activities specifically excepted by the 4(d) rule.

Exceptions to the prohibition on take would include all of the general exceptions to the prohibition against take of endangered wildlife, as set forth in 50 CFR 17.21 and certain other specific activities that we propose for exception, as described below.

The proposed 4(d) rule would also provide for the conservation of the species by allowing exceptions that incentivize conservation actions or that, while they may have some minimal level of take of the green floater, are not expected to rise to the level that would have a negative impact (*i.e.,* would have only de minimis impacts) on the species' conservation. The proposed exceptions to these prohibitions include streambank restoration projects and bridge and culvert replacement or removal projects (described below) that are expected to have negligible impacts to the green floater and its habitat.

A major threat to the green floater is the degradation of stream habitat, particularly the erosion of banks, which leads to excessive sedimentation and poor water quality that can bury green floaters or deprive them of oxygen and nutrients. Stream bank restoration projects that stabilize and vegetate bare or incised stream banks help to reduce bank erosion and concomitant instream sedimentation and improve habitat conditions for the species. Streambank projects that use vegetation and bioengineering techniques (*e.g.,* instream structures to redirect flows) rather than hardscapes (*e.g.,* rock revetments and riprap) to stabilize the habitat create more suitable conditions for green floaters. Vegetated banks contribute to cooler water temperatures and provide habitat for other wildlife. When streambanks are stable, the streams are more resilient to damage caused by catastrophic events related to climate change like heavy precipitation and floods.

Bridge and culvert replacement or removal projects can benefit the green floater by restoring water flow to stream segments that have become disconnected from the larger watershed or improving fish passage or both. In places where bridges and culverts have collapsed, become blocked, or in some other way prevent the flow of water, green floater glochidia are not able to disperse to other suitable habitat, and reproduction and gene flow become limited. Water flows that are too slow to hold adequate oxygen can cause green floaters to become stressed or die. Before conducting instream activities in places where green floaters may occur, surveys are required to determine if they are present. Survey plans must be submitted to and approved by the local Service field office before conducting surveys. All surveys must be conducted by a qualified and permitted biologist, as allowed by Section 10(a)(1)(A) of the Act. If green floaters are found, the biologist must coordinate with their local Service field office regarding salvage and relocation of individuals to suitable habitat before project implementation. Should green floaters be relocated, monitoring must be conducted after project implementation. In most cases where water flows are very low, we would not expect conditions to support live green floaters. This step is meant to prevent unintended harm where individuals have survived and preserve potential adaptive traits to low-quality habitats.

Despite these prohibitions regarding threatened species, we may under certain circumstances issue permits to carry out one or more otherwise prohibited activities, including those described above. The regulations that govern permits for threatened wildlife state that the Director may issue a permit authorizing any activity otherwise prohibited with regard to threatened species. These include permits issued for the following purposes: for scientific purposes, to enhance propagation or survival, for economic hardship, for zoological exhibition, for educational purposes, for incidental taking, or for special purposes consistent with the purposes of the Act (50 CFR 17.32). The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

We recognize the special and unique relationship with our State natural resource agency partners in contributing to conservation of listed species. State agencies often possess scientific data and valuable expertise on the status and distribution of endangered, threatened, and candidate species of wildlife and plants. State agencies, because of their authorities and their close working relationships with local governments and landowners, are in a unique position to assist us in implementing all aspects of the Act. In this regard, section 6 of the Act provides that we must cooperate to the maximum extent practicable with the States in carrying out programs authorized by the Act. Therefore, any qualified employee or agent of a State conservation agency that is a party to a cooperative agreement with us in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, would be able to conduct activities designed to conserve green floater that may result in otherwise prohibited take without additional authorization.

Nothing in this proposed 4(d) rule would change in any way the recovery planning provisions of section 4(f) of the Act, the consultation requirements under section 7 of the Act, or our ability to enter into partnerships for the management and protection of the green floater. However, interagency cooperation may be further streamlined through planned programmatic consultations for the species between us and other Federal agencies, where appropriate. We ask the public, particularly State agencies and other interested stakeholders that may be affected by the proposed 4(d) rule, to provide comments and suggestions regarding additional guidance and methods that we could provide or use, respectively, to streamline the implementation of this proposed 4(d) rule (see Information Requested, above).

III. 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 each Federal agency 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 an area designated as 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 and commercial 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 the 4(d) rule. 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 green floater occurs in small streams to large rivers with stable flow regimes and suitable substrates. When they occur in larger streams and rivers, they are found in quieter pools and eddies, away from strong currents. Their mobility is limited, and fast flowing currents or high-water events can cause them to lose their foothold and be washed downstream.

The primary habitat elements that influence resiliency of the green floater include water flow, streambed substrate, water quality, water temperature, and conditions that support their host fish. All life stages of green floaters require aquatic habitats with stable sand and gravel substrates, a sufficient amount of clean water with slow to moderate flow and refugia (*i.e.,* eddies and ponded areas in streams), and sufficient food resources (*i.e.,* microscopic particulates from plankton, bacteria, detritus, or dissolved organic matter). Based on what is known from studying surrogate species, glochidia require temperatures between 59 and 68 °F (15 and 20 °C) for release, and juvenile mussels cannot survive temperatures above 86 °F (30 °C). Green floaters have the ability reproduce by directly metamorphosing glochidia without requiring an intermediate fish host, but the use of fish hosts is necessary for upstream dispersal of the species. 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 (Service 2021, pp. 18–35).

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of green floater from studies of the species' habitat, ecology, and life history as described below. Additional information can be found in the SSA report (Service 2021, entire; available on *https://www.regulations.gov* under Docket No. FWS–R5–ES–2023–0012). We have determined that the following physical or biological features are essential to the conservation of green floater:

(1) Flows adequate to maintain both benthic habitats and stream connectivity, allow glochidia and juveniles to become established in their habitats, allow the exchange of nutrients and oxygen to mussels, and maintain food availability and spawning habitat for host fishes. The characteristics of such flows include a stable, not flashy, flow regime, with slow to moderate currents to provide refugia during periods of higher flows.

(2) Suitable sand and gravel substrates and connected instream habitats characterized by stable stream channels and banks and by minimal sedimentation and erosion.

(3) Sufficient amount of food resources, including microscopic particulate matter (plankton, bacteria, detritus, or dissolved organic matter).

(4) 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, those general to other mussel species:

- Adequate dissolved oxygen;
- Low salinity;
- Low temperature (generally below 86 °F (30 °C));
- Low ammonia (generally below 0.5 parts per million total ammonia-nitrogen), PAHs, PCBs, and heavy metal concentrations; and
- No excessive total suspended solids and other pollutants, including contaminants of emerging concern.

(5) The presence and abundance of fish hosts necessary for recruitment of the green floater (including, but not limited to, mottled sculpin (*Cottus bairdii*), rock bass (*Ambloplites rupestris*), central stoneroller (*Campostoma anomalum*), blacknose dace (*Rhinichthys atratulus*), and margined madtom (*Noturus insignis*)).

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 green floater may require special management considerations or protection to reduce the following threats: (1) land-disturbing activities associated with development (*i.e.,* residential/commercial, energy, and transportation development); (2) agriculture and forestry activities that do not implement best management practices to minimize soil erosion and increased overland flow and (3) barriers that fragment streams and rivers (*e.g.,* dams and improperly installed or maintained culverts); (4) contaminants from point and non-point sources (*e.g.,* spills, industrial discharges, municipal effluents, agricultural runoff, and atmospheric deposition from precipitation); (5) impacts of climate change; and (6) potential effects of nonnative species.

Special management considerations or protection may be required within critical habitat areas to address these threats. Management activities that could ameliorate these threats include, but are not limited to, protecting and restoring streams and streambank habitats, including stable sand and gravel substrates; maintaining and restoring slow to moderate, not flashy, water flows in streams that may support the species; maintaining and restoring connectivity between streams; reducing or removing contaminants from waterways and sediments; coordinating with landowners and local managers to implement best management practices during agriculture and forestry activities; and minimizing the likelihood that agriculture or energy development projects will impact the quality or quantity of suitable habitat.

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 the occupied areas are sufficient to conserve the species.

We anticipate that recovery will require maintaining and, where necessary, improving habitat and habitat connectivity to ensure the long-term viability of the green floater. We have determined that the areas containing one or more of the essential physical or biological features and occupied by the green floater are sufficient to maintain the species' resiliency, redundancy, and representation and to conserve the species. Therefore, we are not currently proposing to designate any areas outside the geographical area occupied by the species.

In summary, for areas within the geographic area occupied by the species at the time of listing, we delineated critical habitat stream segment boundaries using the following criteria: Evaluate suitability of streams within the hydrologic units occupied at the time of listing and delineate those areas that contain some or all of the physical or biological features necessary to support life-history functions essential to the conservation of the species. All stream segments proposed for designation contain one or more of the physical or biological features and support multiple life-history processes.

From the complete list of occupied watersheds (see Service 2021, appendix C), which were based on HUC 10 watersheds, we identified a subset of watersheds that provide the most highly suitable green floater habitat and present the best opportunities for the species' recovery. This subset includes all the analysis units classified as being in medium or high condition according to the SSA report (version 1.0; Service 2021, pp. 61–76). This subset also includes analysis units classified or modeled as being in low condition that are between or adjacent to units in medium or high condition. These low condition areas represent areas where green floaters are expected to be able to increase in numbers with the protections afforded by the Act, potentially increasing the future resiliency of the species. We then also identified analysis units classified or modeled as being in low condition in the SSA report, but that are disconnected from watersheds determined to be in better condition, that present opportunities to increase the species' future resiliency, redundancy, and representation.

The critical habitat designation does not include all rivers and streams currently occupied by the species, nor all rivers and streams known to have been occupied by the species historically. Instead, it includes only the occupied rivers and streams within the current range that we determined have the physical or biological features that are essential to the conservation of these species and meet the definition of critical habitat. These rivers and streams contain populations most likely to be self-sustaining over time and populations that will allow for the maintenance and expansion of the species. Adjacent units and disconnected units in low condition that are not being proposed as critical habitat have been omitted because they are located near highly developed areas or have very low-quality habitat that is unlikely to be restored to a condition suitable to support a healthy population of green floaters. Analysis units where green floater occupancy has not been confirmed since before 1999 have also been omitted because they are not considered currently occupied. The time period between 1999 and 2019 was selected to represent recent occurrences because this period covers approximately three generations of green floaters and is notable for the relative increase in mussel survey effort. We are not designating any areas outside the areas confirmed occupied by the green floater during this time period because we determined that these areas are sufficient to conserve the species.

In the selected analysis units, we identified the coordinates of the occupied rivers and streams and then refined the length of each segment by matching the starting and ending points to locations of known green floater occurrences collected between 1999 and 2019. We then expanded the area upstream to the next named tributary and downstream to the next confluence, stream intersection, or barrier. We assumed that where green floaters have been observed or collected, the entire stream is occupied upstream to the next named tributary and downstream to the next confluence, stream intersection, or barrier. Thus, we have interpreted ''occupied'' in a conservative manner and have assumed green floaters to be present in all stream segments with similar conditions that are physically accessible to the ones in which they have been documented.

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 the physical or biological features necessary for green floaters. 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 stream and river segments 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.

Stream and river segments are proposed for designation based on one or more of the physical or biological features being present to support the green floater's life-history processes. All of the segments contain one or more of the physical or biological features necessary to support the green floater's particular use of that habitat. Because all of the proposed segments are currently occupied by the species, they are likely to contain all of the physical or biological features necessary to support the species to some degree, but the quality of those physical or biological features may not be in optimal condition. For example, a unit may have some sand and gravel substrates but the suitability of these substrates for green floaters may be improved if sources of sedimentation and erosion were minimized.

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–R5–ES–2023–0012 and on our

internet site at *https://www.fws.gov/office/new-york-ecological-services-field.*

Proposed Critical Habitat Designation

We are proposing to designate approximately 2,553 river km (1,586 river mi) in eight units as critical habitat for the green floater. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for green floater. The eight areas we propose as critical habitat are the following watersheds: (1) Southwestern Lake Ontario, (2) Susquehanna, (3) Potomac, (4) Kanawha, (5) Lower Chesapeake, (6) Chowan-Roanoke, (7) Neuse-Pamlico, and (8) Upper Tennessee. Table 2 shows the proposed critical habitat units and subunits and the approximate area of each.

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR THE GREEN FLOATER

[All proposed units are occupied by the species]

Critical habitat unit	Adjacent riparian land ownership by type	Approximate river km (mi)
Unit 1: Southwestern Lake Ontario Watershed (NY):		
1. Genesee River	Private	55.6 (34.6)
Unit 2: Susquehanna Watershed (NY and PA):		
2a. Susquehanna River	Public (State)	10.3 (6.4)
	Private	335.5 (208.5)
2b. Fivemile Creek	Private	13.9 (8.7)
2c. Cohocton River	Public (State, Local)	6.6 (4.1)
	Private	41.1 (25.6)
2d. Tioga River	Public (State)	0.6 (0.4)
	Private	15.1 (9.4)
2e. Chemung River	Public (State, Local)	11.0 (6.8)
	Private	62.0 (38.5)
2f. Catatonk Creek	Private	34.2 (21.2)
2g. Tunkhannock Creek	Private	4.5 (2.8)
2h. Tioughnioga River	Public (Local)	0.2 (0.1)
	Private	59.2 (36.8)
2i. Chenango River	Public (State)	6.3 (3.9)
	Private	134.7 (83.7)
2j. Unadilla River	Private	93.7 (58.2)
2k. Upper Susquehanna River	Private	99.3 (61.7)
2l. Pine Creek	Public (State)	39.1 (24.3)
	Private	76.4 (47.5)
2m. Marsh Creek	Public (State)	1.7 (1.1)
	Private	2.7 (1.7)
2n. West Branch Susquehanna	Private	45.8 (28.5)
2o. Buffalo Creek	Public (Local)	7.4 (4.6)
	Private	5.8 (3.5)
2p. Penns Creek	Public (Local)	0.3 (0.2)
	Private	35.2 (21.9)
Unit 3: Potomac Watershed (PA, MD, and WV):		
3a. Potomac River	Public (Federal, State)	52.7 (32.7)
	Private	27.6 (17.1)
3b. Patterson Creek	Private	22.3 (13.9)
3c. Sideling Hill Creek	Public (State)	16.5 (10.3)
	Private	34.8 (21.6)
3d. Cacapon River	Private	123.0 (76.5)
3e. Licking Creek	Private	6.7 (4.1)
3f. Back Creek	Private	46.8 (29.1)
Unit 4: Kanawha Watershed (NC, VA, and WV):		
4a. Greenbrier	Public (Federal, State)	258.0 (160.3)
	Private	1.7 (1.1)
4b. Deer Creek	Public (Federal, State)	17.4 (10.8)
4c. Knapp Creek	Public (Federal, State, Local)	30.3 (18.8)
	Private	1.9 (1.2)
4d. New River	Public (State)	6.5 (4.0)
	Private	9.0 (5.6)
4e. Little River (Kanawha)	Private	17.9 (11.1)
4f. South Fork New River	Private	146.7 (90.5)
Unit 5: Lower Chesapeake Watershed (VA):		
5a. Tye River	Public (Federal)	0.6 (0.4)
	Private	53.5 (33.2)
5b. Pedlar River	Private	8.6 (5.4)
Unit 6: Chowan-Roanoke Watershed (NC and VA):		
6a. Dan River	Public (State, Local)	2.5 (1.6)
	Private	218.8 (135.9)
6b. South Mayo	Public (State)	1.8 (1.1)
	Private	2.8 (1.8)
6c. North Mayo	Public (State)	2.5 (1.6)
	Private	3.4 (2.1)

TABLE 2—PROPOSED CRITICAL HABITAT UNITS FOR THE GREEN FLOATER—Continued

[All proposed units are occupied by the species]

Critical habitat unit	Adjacent riparian land ownership by type	Approximate river km (mi)
6d. Mayo River	Public (State)	15.9 (9.9)
	Private	9.2 (5.7)
6e. Meherrin River	Private	106.1 (65.9)
Unit 7: Neuse-Pamlico Watershed (NC):		
7a. Neuse River	Public (State, Local)	16.0 (9.9)
	Private	10.8 (6.7)
7b. Eno River	Public (Federal, State, Local)	33.1 (20.6)
	Private	21.3 (13.2)
7c. Flat River	Public (Federal, State, Local)	17.6 (10.9)
	Private	13.3 (8.3)
7d. Little River (Neuse-Pamlico)	Public (State, Local)	7.4 (4.6)
	Private	1.2 (0.8)
Unit 8: Upper Tennessee Watershed (NC):		
8. Watauga River	Private	16.0 (9.9)
Total		2,552.6 (1,586.1)

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all proposed units, and reasons why they meet the definition of critical habitat for the green floater, below. Each of these proposed units and subunits are occupied by the species and currently support the breeding, feeding, and sheltering needs for the species.

Unit 1: Southwestern Lake Ontario Watershed

Unit 1 consists of 55.6 stream km (34.6 mi) of the Genesee River in the Southwestern Lake Ontario watershed in Livingston County, New York, from New York Route 36 downstream to the river's confluence with White Creek. It includes the river channel up to the ordinary high water mark. Riparian lands that border the unit are all (100 percent) privately owned. This unit contains one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 1 to address excess nutrients, sediment, and pollutants that enter the river as well as recreation and management activities. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff that could come from the nearby towns of Avon, Geneseo, and Mount Morris adjacent to the river or towns located upstream. The Mount Morris Lake and Dam and Genesee River Gorge are approximately 2.4 km (1.5 mi) upstream of Unit 1. Management activities, such as debris and sediment removal at the dam and lake, as well as water releases from the dam, have the potential to impact the water quality and quantity in Unit 1.

Unit 2: Susquehanna Watershed

Unit 2 consists of 16 subunits of the Susquehanna watershed in New York (Broome, Chemung, Chenango, Cortland, Delaware, Herkimer, Madison, Otsego, Steuben, and Tioga Counties) and Pennsylvania (Bradford, Clinton, Columbia, Dauphin, Lackawanna, Luzerne, Lycoming, Montour, Northumberland, Perry, Snyder, Tioga, Union, and Wyoming Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 2 to address excess nutrients, sediment, and pollutants that enter the river, construction projects, and conservation activities. Several major urban areas are encompassed by Unit 2, including Scranton, Pennsylvania, and Binghamton, New York, in addition to numerous small towns adjacent to rivers and streams that have the potential to influence the water quality and quantity in the unit. Future construction projects to repair or replace bridges, roads, culverts, and embankments; to remove debris; and to repair or remove hazard dams have the potential to impact habitat in this unit as well.

In New York, the U.S. Department of Agriculture's Natural Resources Conservation Service supports several programs designed to restore and conserve rivers and streams. Future restoration plans include construction of stream crossings, planting of riparian buffers, installation of streambank and shoreline protection, channel bed stabilization, and clearing and snagging woody debris from streams. During construction, these restoration activities may result in short-term impacts to water quality but are expected to benefit the green floater in the long term.

The subunits of Unit 2 overlap with numerous public lands for which existing protections and management will likely maintain habitat conditions that support the green floater (water quality, water quantity/flow, instream substrate, and connectivity) into the future. In Pennsylvania, these public lands include State-owned forests and natural areas (*e.g.,* Tioga and Tiadaghton State Forests, Pine Gorge State Natural Area, Algerine Wild Area) and State Parks (*e.g.,* Colton Point and L. Harrison State Parks). In New York, public lands include the Chenango Valley State Park and a series of easements associated with the Federal Wetlands Reserve Program. Each of these land types ensure some protection from development and land-disturbing activities. Activities on Wetlands Reserve Program easements that would affect vegetation or hydrology, or would alter wildlife patterns, would first require a compatible use permit, and only activities consistent with the long-term protection and enhancement of the easement area are authorized.

Subunit 2a is a total length of 345.8 km (214.9 mi) of the Susquehanna River in Tioga County, New York, and Columbia, Montour, and Northumberland Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. The upper section of subunit 2a flows from the entrance of Owego Creek to Harvey's Creek. The lower section starts at Nescopeck Creek and flows to the confluence of Fishing Creek. The land adjacent to the Susquehanna River in this subunit is primarily private (97 percent), although

some land along the river is owned by the State of Pennsylvania (3 percent).

Subunit 2b consists of a 13.9-km (8.7-mi) segment of Fivemile Creek in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of an unnamed tributary and ends at the confluence of Fivemile Creek and the Cohocton River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2c consists of a 47.6-km (29.6-mi) segment of the Cohocton River in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Cotton Creek and Tenmile Creek and ends at the confluence of the Tioga River and Middle Cohocton Creek. The land adjacent to the Cohocton River in this subunit is primarily private (86 percent), although some land along the river is owned by the State of New York (6 percent) and local governments (8 percent).

Subunit 2d consists of a 15.7-km (9.7-mi) segment of the Canisteo and Tioga Rivers in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Tuscarora Creek at the Canisteo River and ends at the confluence of the Tioga River and Chemung River. The land adjacent to the Canisteo and Tioga Rivers in this subunit is primarily private (96 percent), although some land along the river is owned by the State (4 percent).

Subunit 2e consists of a 73.0-km (45.4-mi) segment of the Chemung River in Steuben and Chemung Counties, New York, and Bradford County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the Tioga River with the Cohocton River and ends at the confluence of the Chemung River and the Susquehanna River. The land adjacent to the Tioga River in this subunit is primarily private (85 percent), although some land along the river is owned by the State (9 percent) and local governments (6 percent).

Subunit 2f consists of a 34.2-km (21.2-mi) segment of Catatonk Creek in Tioga County, New York, and Bradford County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Miller Creek and Michigan Creek and ends at the confluence of Fishing Creek and West Branch Owego Creek. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2g consists of a 4.5-km (2.8-mi) segment of Tunkhannock Creek in Bradford, Wyoming, Lackawanna, and Luzerne Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Billings Mill Brook and ends at the confluence of Tunkhannock Creek and the Susquehanna River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2h consists of a 59.4-km (36.9-mi) segment of the Tioughnioga River in Broome and Cortland Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the East Branch Tioughnioga and West Branch Tioughnioga Rivers and ends at the confluence of the Tioughnioga River and the Chenango River. The land adjacent to the Tioughnioga River in this subunit is primarily private (nearly 100 percent), although some land along the river is owned by local governments (less than 1 percent).

Subunit 2i consists of a 140.9-km (87.6-mi) segment of the Chenango River in Broome, Chenango, and Madison Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts in the Sangerfield River downstream of Ninemile Swamp and ends at the confluence of the Chenango River and the Susquehanna River. The land adjacent to the Chenango River in this subunit is primarily private (96 percent), although some land along the river is owned by the State of New York (4 percent).

Subunit 2j consists of a 93.7-km (58.2-mi) segment of the Unadilla River in Chenango, Herkimer, and Otsego Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of North Winfield Creek and ends at the confluence of the Unadilla River and the Susquehanna River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2k consists of a 99.3-km (61.7-mi) segment of the Upper Susquehanna River in Broome, Chenango, Delaware, and Otsego Counties, New York, and Susquehanna County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Mill Creek and ends at the entrance of Starrucca Creek. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2l consists of a 115.5-km (71.8-mi) segment of Pine Creek in Clinton, Lycoming, and Tioga Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Phoenix Run and ends at the confluence of Pine Creek and the Susquehanna River. The land adjacent to Pine Creek in this subunit is owned by private entities (66 percent) and the State of Pennsylvania (34 percent).

Subunit 2m consists of a 4.4-km (2.7-mi) segment of Marsh Creek in Tioga County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Asaph Run and ends at the confluence of Marsh Creek and Pine Creek. The land adjacent to Marsh Creek in this subunit is owned by private entities (62 percent) and the State of Pennsylvania (38 percent).

Subunit 2n consists of a 45.8-km (28.5-mi) segment of the West Branch Susquehanna River in Lycoming, Northumberland, and Union Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Muncy Creek and ends at the confluence of the West Branch Susquehanna River and the Susquehanna River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 2o consists of a 13.2-km (8.2-mi) segment of Buffalo Creek in Union County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the intersection of Johnson Mill Road and Buffalo Creek and ends at the confluence of Buffalo Creek and the West Branch Susquehanna River. The last segment of Buffalo Creek is also known as Mill Race. The land adjacent to Buffalo Creek in this subunit is owned by local governments (56 percent), nongovernmental organizations (5 percent), and private entities (39 percent).

Subunit 2p consists of a 35.5-km (22.1-mi) segment of Penns Creek in Dauphin, Northumberland, Perry, Snyder, and Union Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of an unnamed tributary near the intersection of Penns Creek Road and Wildwood Road and ends at the confluence of Penns Creek and the Susquehanna River. The land adjacent to Penns Creek in this subunit is primarily private (99 percent), although some land along the creek is owned by local governments (1 percent).

Unit 3: Potomac Watershed

Unit 3 consists of six subunits of the Potomac watershed in Pennsylvania (Bedford and Fulton Counties),

Maryland (Allegany and Washington Counties), and West Virginia (Berkeley, Hampshire, Hardy, Mineral, and Morgan Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 3 to address excess nutrients, sediment, and pollutants that enter the river, as well as maintenance and construction projects. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff that come from Cumberland, Maryland; Martinsburg, West Virginia; and numerous small towns adjacent to rivers and streams that influence the water quality and quantity in the unit. The Potomac River is adjacent to the Chesapeake and Ohio (C&O) Canal National Historical Park, a federally owned property managed by the National Park Service. In support of a recent project to stabilize a retaining wall within the banks of the Potomac River, National Park Service staff surveyed for freshwater mussels and observed 10 green floaters. Anticipated maintenance projects in the National Historical Park include dredging of sediment and repairs of utility lines, walls, and boat ramps along the C&O Canal. Future construction projects throughout the watershed to repair or remove hazard dams and canals, dredge sections of the river, install pipelines, and replace bridges have the potential to impact water quality and quantity in this unit as well.

The subunits of Unit 3 overlap with public lands for which protections and management will likely enable habitat conditions that support the green floater to remain high into the future. In Maryland, overlapping public lands include State-owned forests and parks (*e.g.,* Green Ridge State Forest and Fort Frederick State Park) and the C&O Canal National Historical Park. Beginning in Pennsylvania and continuing into Maryland, the forests and streams of Sideling Hill Creek are maintained as a nature preserve by The Nature Conservancy. These land types ensure some protection from development and land-disturbing activities.

Subunit 3a consists of an 80.3-km (49.9-mi) segment of the Potomac River in Washington County, Maryland, and Berkeley County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of the Cacapon River and ends at the entrance of Downey Branch. The land adjacent to the Potomac River in this subunit is owned by the Federal (62 percent) and State (4 percent) governments and private entities (34 percent).

Subunit 3b consists of a 22.3-km (13.9-mi) segment of Patterson Creek in Mineral County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Cabin Run and ends at the confluence of Patterson Creek and the Potomac River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 3c consists of a 51.3-km (31.9-mi) segment of Sideling Hill Creek in Allegany County, Maryland, and Bedford and Fulton Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the Rice Road crossing of West Branch Sideling Hill Creek and ends at the confluence of Sideling Hill Creek and the Potomac River. The land adjacent to Sideling Hill Creek in this subunit is owned by State governments (32 percent), nongovernmental organizations (7 percent), and private entities (61 percent).

Subunit 3d consists of a 123.0-km (76.5-mi) segment of the Cacapon River in Washington County, Maryland; and Hardy, Hampshire, and Morgan Counties, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Trout Run and ends at the confluence of the Cacapon River and the Potomac River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 3e consists of a 6.7-km (4.1-mi) segment of Licking Creek in Washington County, Maryland. This subunit includes the river channel up to the ordinary high water mark. It starts at the crossing of Pecktonville Road and ends at the confluence of Licking Creek and the Potomac River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 3f consists of a 46.8-km (29.1-mi) segment of Back Creek in Berkeley County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Big Run and ends at the confluence of Back Creek and the Potomac River. Riparian lands that border the subunit are all (100 percent) privately owned.

Unit 4: Kanawha Watershed

Unit 4 consists of six subunits of the Kanawha watershed in North Carolina (Allegany, Ashe, and Watauga Counties), Virginia (Carroll and Grayson Counties), and West Virginia (Greenbrier, Monroe, Pocahontas, and Summers Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 4 to address excess nutrients, sediment, and pollutants that enter the river, as well as land-disturbing activities. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff from the nearby towns of Boone, North Carolina; Lewisburg, West Virginia; and numerous small towns in the watershed that influence the water quality and quantity in the unit. Parts of the Kanawha waterhead are encompassed by the Monongahela National Forest, a federally owned property managed by the U.S. Forest Service. Anticipated projects within the National Forest that could impact water quality and quantity in this unit include vegetation management and removal, and maintenance of locks and dams.

In addition to the Monongahela National Forest, the subunits of Unit 4 overlap with numerous other public lands for which protections and management will help maintain habitat conditions that support the green floater. In West Virginia, overlapping public lands include State-owned forests (*e.g.,* Calvin Price and Seneca State Forests), parks (*e.g.,* Cass Scenic Railroad and Watoga State Parks), and wildlife management areas (*e.g.,* Rimel, Little River, and Neola Wildlife Management Areas). In Virginia, overlapping public lands include the New River Trail State Park. Each of these land types ensures some protection from development and land-disturbing activities.

Subunit 4a consists of a 259.7-km (161.4-mi) segment of the Greenbrier River in Greenbrier, Monroe, Pocahontas, and Summers Counties, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Cove Run and ends at the confluence of the Greenbrier River and the New River. The land adjacent to the Greenbrier River in this subunit is owned by the Federal (30 percent) and State (69 percent) governments and private entities (1 percent).

Subunit 4b consists of a 17.4-km (10.8-mi) segment of Deer Creek in Pocahontas County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Hospital Run and ends at the confluence of Deer Creek and the Greenbrier River. The land adjacent to Deer Creek in this subunit is

owned by the Federal (34 percent) and State (66 percent) governments.

Subunit 4c consists of a 32.2-km (20-mi) segment of Knapp Creek in Pocahontas County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Moore Run and Knapp Creek and ends at the confluence of Knapp Creek and the Greenbrier River. The land adjacent to Knapp Creek in this subunit is owned by the Federal (31 percent), State (62 percent), and local (1 percent) governments and private entities (6 percent).

Subunit 4d consists of a 15.5-km (9.7-mi) segment of the New River in Carroll and Grayson Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at Sarasota Lane and ends at the confluence of Chestnut Creek and the New River. The land adjacent to the New River in this subunit is owned by the State of Virginia (42 percent) and private entities (58 percent).

Subunit 4e consists of a 17.9-km (11.1-mi) segment of the Little River in the Kanawha watershed in Alleghany County, North Carolina, and Grayson County, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Brush Creek and ends at the confluence of the Little River and the New River. Riparian lands that border the subunit are all (100 percent) privately owned.

Subunit 4f consists of a 145.7-km (90.5-mi) segment of the South Fork New River in Alleghany, Ashe, and Watauga Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the East Fork South Fork New River, Middle Fork South Fork New River, and Winkler Creek and ends at the confluence of the South Fork New River and North Fork New River. Riparian lands that border the subunit are all (100 percent) privately owned.

Unit 5: Lower Chesapeake Watershed

Unit 5 consists of two subunits of the Lower Chesapeake watershed in Virginia (Amherst, Buckingham, and Nelson Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 5 to address excess nutrients, sediment, and pollutants that enter the river. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff that come from Lynchburg, Virginia, and numerous small towns adjacent to rivers and streams that have the potential to influence the water quality and quantity in the unit.

Unit 5 overlaps with public lands for which protections and management will help to maintain habitat conditions that support the green floater. The George Washington and Jefferson National Forest, a federally owned property managed by the U.S. Forest Service, overlaps with Subunit 5a.

Subunit 5a consists of a 54.1-km (33.6-mi) segment of the Tye River in Amherst, Buckingham, and Nelson Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Coxs Creek and Campbell Creek and ends at the confluence of the Tye River and the James River. The land adjacent to the Tye River in this subunit is primarily private (99 percent), although some land along the river is owned by the Federal government (1 percent).

Subunit 5b consists of a 8.6-km (5.4-mi) segment of the Pedlar River in Amherst County, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Horsley Creek and ends at the confluence of the Pedlar River and James River. Riparian lands that border the subunit are all (100 percent) privately owned.

Unit 6: Chowan-Roanoke Watershed

Unit 6 consists of five subunits in the Chowan-Roanoke watershed of North Carolina (Caswell, Rockingham, and Stokes Counties) and Virginia (Brunswick, Greensville, Halifax, Henry, Patrick, Pittsylvania, and Southampton Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 6 to address excess nutrients, sediment, and pollutants that enter the river, as well as land-disturbing activities. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff from the nearby towns Eden, North Carolina; Danville, Virginia; and numerous small towns adjacent to rivers and streams that have the potential to influence the water quality and quantity in the unit. Land-disturbing activities to maintain locks and dams have the potential to impact water quality and quantity in this unit as well.

The subunits of Unit 6 overlap with public lands for which protections and management will likely enable habitat conditions that support the green floater to remain high into the future. State Parks along the Mayo River exist in both Virginia and North Carolina. In North Carolina, overlapping public lands include the Hanging Rock State Park. This designation as a State Park ensures some protection from development and land-disturbing activities.

Subunit 6a consists of a 221.3-km (137.5-mi) segment of the Dan River in Caswell, Rockingham, and Stokes Counties, North Carolina, and Halifax, Henry, Patrick, and Pittsylvania Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Squall Creek and ends at the entrance of County Line Creek. The land adjacent to the Dan River in this subunit is primarily private (98 percent), although some land along the river is owned by nongovernmental organizations (1 percent) and State and local governments (1 percent).

Subunit 6b consists of a 4.6-km (2.9-mi) segment of the South Mayo River in Henry County, Virginia, and Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Crooked Creek and ends at the confluence of the South Mayo River and the Mayo River. The land adjacent to the South Mayo River in this subunit is owned by State governments (39 percent) and private entities (61 percent).

Subunit 6c consists of a 5.9-km (3.7-mi) segment of the North Mayo River in Henry County, Virginia, and Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Jumping Branch and ends at the confluence of the North Mayo River and the Mayo River. The land adjacent to the North Mayo River in this subunit is owned by State governments (42 percent) and private entities (58 percent).

Subunit 6d consists of a 25.1-km (15.6-mi) segment of the Mayo River in Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the North Mayo and South Mayo Rivers and ends at the confluence of the Mayo River and the Dan River. The land adjacent to the Mayo River in this subunit is owned by the State of North Carolina (63 percent) and private entities (37 percent).

Subunit 6e consists of a 106.1-km (65.9-mi) segment of the Meherrin River in Brunswick, Greensville, and Southampton Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Shining Creek and ends at the entrance of Fountains Creek.

Riparian lands that border the subunit are all (100 percent) privately owned.

Unit 7: Neuse-Pamlico Watershed

Unit 7 consists of four subunits of the Neuse-Pamlico watershed in North Carolina (Durham, Johnston, Orange, Person, and Wake Counties). Each of the subunits in this unit contain one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 7 to address excess nutrients, sediment, and pollutants that enter the river, as well as urban development. Several major urban areas are encompassed by Unit 7, including the Raleigh-Durham metro area, in addition to numerous small towns adjacent to rivers and streams that have the potential to influence the water quality and quantity in the unit. Growth and development in the Raleigh-Durham area are expected to continue and special management protections may be required to address potential decreases of forest cover and increases of impervious surfaces.

The subunits of Unit 7 overlap with numerous public lands for which protections and management will likely help maintain habitat conditions that support the green floater. Overlapping public lands include State-owned properties such as the Falls Lake Recreation Area, Occoneechee Mountain and Mitchell Mill Natural Areas, Eno River State Park, and Eno River Diabase Sill Plant Conservation Preserve. Numerous county-owned properties (*e.g.,* Neuse River Greenway, Lake Michie Recreation Area, Durham County Parks, and Wake County Parks) overlap in Unit 7 as well. The Falls Lake Natural Area is part of a larger reservoir that is owned and managed by a network of partners, including the State and local governments and the U.S. Army Corps of Engineers. Each of these land types ensure some protection from development and land-disturbing activities.

Subunit 7a consists of a 26.8-km (16.6-mi) segment of the Neuse River in Johnston and Wake Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Crabtree Creek and ends near Prestwick Drive. The land adjacent to the Neuse River in this subunit is owned by local governments (50 percent), the State of North Carolina (10 percent), nongovernmental organizations (10 percent), and private entities (30 percent).

Subunit 7b consists of a 54.4-km (33.8-mi) segment of the Eno River in Durham and Orange Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of McGowan Creek and ends at Falls Lake. The land adjacent to the Eno River in this subunit is owned by Federal (3 percent), State (40 percent), and local (18 percent) governments, nongovernmental organizations (1 percent), and private entities (38 percent).

Subunit 7c consists of a 30.9-km (19.2-mi) segment of the Flat River in Durham and Person Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the North Flat River and South Flat River and ends at Falls Lake. The land adjacent to the Flat River in this subunit is owned by Federal (8 percent), State (18 percent), and local (31 percent) governments, and private entities (43 percent).

Subunit 7d consists of an 8.6-km (5.4-mi) segment of the Little River in the Neuse-Pamlico watershed in Wake County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence with Perry Creek and ends at the entrance of Big Branch. The land adjacent to the Little River in this subunit is owned by State (17 percent) and local (69 percent) governments, nongovernmental organizations (3 percent), and private entities (11 percent).

Unit 8: Upper Tennessee Watershed

Unit 8 consists of 16.0-km (9.9-mi) of the Watauga River in the Upper Tennessee Watershed in Watauga County, North Carolina, from the entrance of Baird Creek to the entrance of Beech Creek. It includes the river channel up to the ordinary high water mark. Riparian lands that border the unit are all (100 percent) privately owned. This unit contains one or more of the physical or biological features essential to the species' conservation.

Special management considerations or protection may be required within Unit 8 to address excess nutrients, sediment, and pollutants that enter the river. Sources of these types of pollution are wastewater, agricultural runoff, and urban stormwater runoff from numerous small towns and farms adjacent to rivers and streams.

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 reinitiate 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 reinitiation 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 reinitiate 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.

Application of the ''*Destruction or Adverse Modification*'' *Standard*

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 alter the minimum flow or the existing flow regime. Such activities could include, but are not limited to, impoundment, channelization, water diversion, water withdrawal, and hydropower generation. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the green floater and its fish hosts by decreasing or altering flows to levels that would adversely affect their ability to complete their life cycles.

(2) Actions that would significantly alter water chemistry or temperature. Such activities could include, but are not limited to, release of chemicals (including pesticides, pharmaceuticals, metals, and salts), biological pollutants, or heated effluents into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions to levels that are beyond the tolerances of the mussel or its host fish and result in direct or cumulative adverse effects to these individuals and their life cycles.

(3) Actions that would significantly increase sediment deposition within the stream channel. Such activities could include, but are not limited to, excessive sedimentation from livestock grazing, road and other construction projects, oil and gas exploration and extraction, channel alteration, timber harvest, off-road vehicle use, and other watershed and floodplain disturbances. When appropriate best management practices are not followed, these activities could eliminate or reduce the habitat necessary for the growth and reproduction of the green floater and its host fish by increasing the sediment deposition to levels that would adversely affect their ability to complete their life cycles.

(4) Actions that would significantly increase the algal community within the stream channel. Such activities could include, but are not limited to, release of nutrients into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities can result in excessive algal growth, which degrades or reduces habitat for the green floater and its fish hosts, by generating nutrients during their decay and decreasing dissolved oxygen levels to levels below the tolerances of the mussel and/or its fish hosts. Algae can also directly compete with mussel offspring by covering the sediment, thereby preventing the glochidia from settling into the sediment.

(5) Actions that would significantly alter channel morphology or geometry. Such activities could include, but are not limited to, channelization, impoundment, road and bridge construction, pipeline and utility maintenance, oil and gas extraction, mining, dredging, and destruction of riparian vegetation. These activities may lead to changes in water flows and levels that would degrade or eliminate the mussel or its fish hosts and/or their habitats. These actions can also lead to increased sedimentation and degradation in water quality to levels that are beyond the tolerances of the green floater or its fish hosts.

(6) Actions that result in the introduction, spread, or augmentation of nonnative aquatic species in occupied stream segments, or in stream segments that are hydrologically connected to occupied stream segments, even if those segments are occasionally intermittent, or introduction of other species that compete with or prey on the green floater. Possible actions could include, but are not limited to, stocking of nonnative fishes, stocking of sport fish, or other related actions. These activities can introduce parasites or disease for host fish, and could result in direct predation, or affect the growth, reproduction, and survival, of green floaters.

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 (hereafter, the ''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 for when a regulation is considered a ''significant regulatory action,'' and if any one of these criteria are met, the regulation requires additional analysis, review, and approval. 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. Therefore, our consideration of economic impacts uses a screening analysis to assess whether a designation of critical habitat for the green floater is likely to have an annual effect on the economy of $200 million or more.

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 green floater (IEc 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 geographic 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 green floater; 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 green floater, first we identified, in the IEM dated June 7, 2022, probable incremental economic impacts associated with the following categories of activities: (1) culvert and bridge replacement; (2) pipeline maintenance;

(3) bank stabilization; (4) stream crossing; (5) watershed restoration; (6) road construction and maintenance; (7) pesticide use; (8) streambank and shoreline protection; (9) channel bed stabilization; and (10) riparian forest buffer. 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 only affects activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the green floater 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 green floater's critical habitat. Because the designation of critical habitat for green floater 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 green floater 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 green floater totals approximately 2,553 km (1,586 mi) of stream in eight units, all of which are currently occupied by the species. Ownership of riparian lands adjacent to the proposed units includes 2,007 km (1,247 mi; 79 percent) in private ownership and 546 km (339 mi; 21 percent) in public (Federal, State, or local government) ownership.

The total incremental costs of critical habitat designation for the green floater is anticipated to be less than $8.8 million per year. The costs are reflective of the proposed critical habitat area, the presence of the species (*i.e.,* already occupied) in these areas, and the presence of other federally listed species and designated critical habitats. Since consultation is already required in some of these areas as a result of the presence of three other aquatic listed species (*i.e.,* candy darter (*Etheostoma osburni*), Carolina madtom (*Noturus furiosus*), and Neuse River waterdog (*Necturus lewisi*)) and their critical habitats and would be required as a result of the listing of the green floater, the economic costs of the critical habitat designation would likely be primarily limited to additional administrative efforts to consider adverse modification for the green floater in section 7 consultations. In total, 4,198 section 7 consultation actions (approximately 58 formal consultations, 3,100 informal consultations, and 1,040 technical assistance efforts) are anticipated to occur annually in proposed critical habitat areas. Critical habitat may also trigger additional regulatory changes. For example, the designation may cause other Federal, State, or local permitting or regulatory agencies to expand or change standards or requirements. Regulatory uncertainty generated by critical habitat may also have impacts. For example, landowners or buyers may perceive that the rule would restrict land or water use activities in some way and therefore value the use of the land less than they would have absent critical habitat. This is a perception, or stigma, effect of critical habitat on markets.

We are soliciting data and comments from the public on the DEA discussed above, as well as on all aspects of this proposed rule and our required determinations. 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 authority of section 4(b)(2), 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 green floater 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.

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

In preparing this proposal, we have determined that no HCPs or other management plans for the green floater currently exist, and the proposed designation does not include any Tribal lands or trust resources or any lands for which designation would have any economic or national security impacts. Therefore, we anticipate no impact on Tribal lands, partnerships, or HCPs from this proposed critical habitat designation and thus, as described above, we are not considering excluding any particular areas on the basis of the presence of conservation agreements or impacts to trust resources.

However, if through the public comment period we receive information that we determine indicates that there are potential economic, national security, or other relevant impacts from designating particular areas as critical habitat, then as part of developing the final designation of critical habitat, we will evaluate that information and may conduct a discretionary exclusion analysis to determine whether to exclude those areas under authority of section 4(b)(2) 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 (*e.g.,* dams, pipelines) occur within some units of the proposed critical habitat designation and may potentially be affected. We determined that consultations, technical assistance, and requests for species lists may be necessary in some instances. However, in our economic analysis, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use and will not have an annual effect on the economy of $200 million or more. 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 do not 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 and, as such, a Small Government Agency Plan is not required. 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 the green floater 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 green floater, 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 and species-specific protective regulations promulgated concurrently with a decision to list or reclassify a species as threatened. The courts have upheld this position (*e.g., Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995) (critical habitat); *Center for Biological Diversity* v. *U.S. Fish and Wildlife Service,* 2005 WL 2000928 (N.D. Cal. Aug. 19, 2005) (concurrent 4(d) rule)).

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 Secretaries' 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 determined that no Tribal lands fall within the boundaries of the proposed critical habitat for the green floater, so no Tribal lands would be affected by the proposed designation.

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 New York 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 New York 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, in paragraph (h), amend the List of Endangered and Threatened Wildlife by adding an entry for ''Floater, green'' 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				
* * * * * * *				
Floater, green	*Lasmigona subviridis*	Wherever found	T	[**Federal Register** citation when published as a final rule]; 50 CFR 17.45(h); [4d] 50 CFR 17.95(f).[CH]
* * * * * * *				

■ 3. Amend § 17.45 by adding a new paragraph (h) to read as follows:

§ 17.45 Special rules—snails and clams.

* * * * *

(h) Green floater (*Lasmigona subviridis*)—(1) *Prohibitions.* The following prohibitions that apply to endangered wildlife also apply to the green floater. Except as provided under paragraph (h)(2) of this section and §§ 17.4 and 17.5, it is unlawful for any person subject to the jurisdiction of the United States to commit, to attempt to commit, to solicit another to commit, or cause to be committed, any of the following acts in regard to this species:

(i) Import or export, as set forth at § 17.21(b) for endangered wildlife.

(ii) Take, as set forth at § 17.21(c)(1) for endangered wildlife.

(iii) Possession and other acts with unlawfully taken specimens, as set forth at § 17.21(d)(1) for endangered wildlife.

(iv) Interstate or foreign commerce in the course of commercial activity, as set forth at § 17.21(e) for endangered wildlife.

(v) Sale or offer for sale, as set forth at § 17.21(f) for endangered wildlife.

(2) *Exceptions from prohibitions.* In regard to this species, you may:

(i) Conduct activities as authorized by a permit under § 17.32.

(ii) Take, as set forth at § 17.21(c)(2) through (4) for endangered wildlife.

(iii) Take, as set forth at § 17.31(b).

(iv) Possess and engage in other acts with unlawfully taken wildlife, as set forth at § 17.21(d)(2) for endangered wildlife.

(v) Take incidental to an otherwise lawful activity caused by:

(A) Stream bank restoration projects that use bioengineering methods to replace preexisting, bare, eroding stream banks with vegetated, stable stream banks, thereby reducing bank erosion and instream sedimentation and improving habitat conditions for the species. Following these bioengineering methods, stream banks must be stabilized using native species appropriate for the region (*e.g.,* native species live stakes (live, vegetative cuttings inserted or tamped into the ground in a manner that allows the stake to take root and grow), native species live fascines (live branch cuttings, usually willows, bound together into long, cigar-shaped bundles), or native species brush layering (cuttings or branches of easily rooted tree species layered between successive lifts of soil fill)). These methods must not include the sole use of quarried rock (riprap) or the use of rock baskets (*e.g.,* gabion baskets). Stream bank restoration projects must also satisfy all Federal, State, and local permitting requirements.

(B) Bridge or culvert replacement/removal projects that remove migration barriers (*e.g.,* collapsing, blocked, or perched culverts) or generally allow for improved connectivity and upstream and downstream movements of green floaters or their fish hosts while maintaining normal stream flows, preventing bed and bank erosion, and improving habitat conditions for the species (using aquatic organism passage methods). Before starting stream crossing activities, surveys to determine presence of green floaters must be performed by a qualified and permitted biologist (defined as a biologist or aquatic resources manager that has been approved by the Service to locate, identify, and handle green floaters as allowed by Section 10(a)(1)(A) of the Endangered Species Act). Before conducting instream activities in places where green floaters may occur, surveys are required to determine if they are present. Survey plans must be submitted to and approved by the local Service field office before conducting surveys. If green floaters are found, the biologist must coordinate with their local Service field office regarding salvage and relocation of individuals to suitable habitat before project implementation. Should green floaters be relocated, monitoring must be conducted after project implementation. Bridge or culvert replacement/removal projects must also satisfy all Federal, State, and local permitting requirements.

■ 4. In § 17.95, amend paragraph (f) by adding an entry for ''Green Floater (*Lasmigona subviridis*)'' immediately before the entry for ''Carolina Heelsplitter (*Lasmigona decorata*)'', to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and Snails.*

* * * * *

Green Floater (*Lasmigona subviridis*)

(1) Critical habitat units are depicted on the maps in this entry for Allegany and Washington Counties, Maryland; Broome, Chemung, Chenango, Cortland, Delaware, Herkimer, Livingston, Madison, Otsego, Steuben, and Tioga Counties, New York; Allegany, Ashe, Caswell, Durham, Johnston, Orange, Person, Rockingham, Stokes, Wake, and Watauga Counties, North Carolina; Bedford, Bradford, Clinton, Columbia, Dauphin, Fulton, Lackawanna, Luzerne, Lycoming, Montour, Northumberland, Perry, Snyder, Susquehanna, Tioga, Union, and Wyoming Counties, Pennsylvania; Amherst, Brunswick, Buckingham, Carroll, Grayson, Greensville, Halifax, Henry, Nelson, Patrick, Pittsylvania, and Southampton Counties, Virginia; and Berkeley, Greenbrier, Hampshire, Hardy, Mineral, Monroe, Morgan, Pocahontas, and Summers Counties, West Virginia.

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

(i) Flows adequate to maintain both benthic habitats and stream connectivity, allow glochidia and juveniles to become established in their habitats, allow the exchange of nutrients and oxygen to mussels, and maintain food availability and spawning habitat for host fishes. The characteristics of

such flows include a stable, not flashy, flow regime, with slow to moderate currents to provide refugia during periods of higher flows.

(ii) Suitable sand and gravel substrates and connected instream habitats characterized by stable stream channels and banks and by minimal sedimentation and erosion.

(iii) Sufficient amount of food resources, including microscopic particulate matter (plankton, bacteria, detritus, or dissolved organic matter).

(iv) 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, those general to other mussel species:

(A) Adequate dissolved oxygen;

(B) Low salinity;

(C) Low temperature (generally below 86 °F (30 °C));

(D) Low ammonia (generally below 0.5 parts per million total ammonia-nitrogen), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and heavy metal concentrations; and

(E) No excessive total suspended solids and other pollutants, including contaminants of emerging concern.

(v) The presence and abundance of fish hosts necessary for recruitment of the green floater (including, but not limited to, mottled sculpin (*Cottus bairdii*), rock bass (*Ambloplites rupestris*), central stoneroller (*Campostoma anomalum*), blacknose dace (*Rhinichthys atratulus*), and margined madtom (*Noturus insignis*)).

(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 the final rule.

(4) Data layers defining map units were created by overlaying Natural Heritage Element Occurrence data and U.S. Geological Survey hydrologic data for stream reaches. The hydrologic data used in the critical habitat maps were extracted from the U.S. Environmental Protection Agency's National Hydrography Dataset Plus Version 2 (NHDPlusV2) 1:100k scale nationwide hydrologic layer (USEPA 2012, unpaginated) with a projection of NAD83 Geographic. Natural Heritage program and State mussel database species presence data from Maryland, New York, North Carolina, Pennsylvania, Virginia, and West Virginia were used to select specific river and stream segments for inclusion in the critical habitat layer. The U.S. Major Rivers database is from ArcGIS Online (last modified February 22, 2018) with a projection of World Geodetic System (WGS) 1984 Web Mercator Auxiliary Sphere. 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://fws.gov/office/new-york-ecological-services-field,* at *https://www.regulations.gov* at Docket No. FWS–R5–ES–2023–0012, 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 Green Floater (*Lasmigona subviridis*) paragraph (5)

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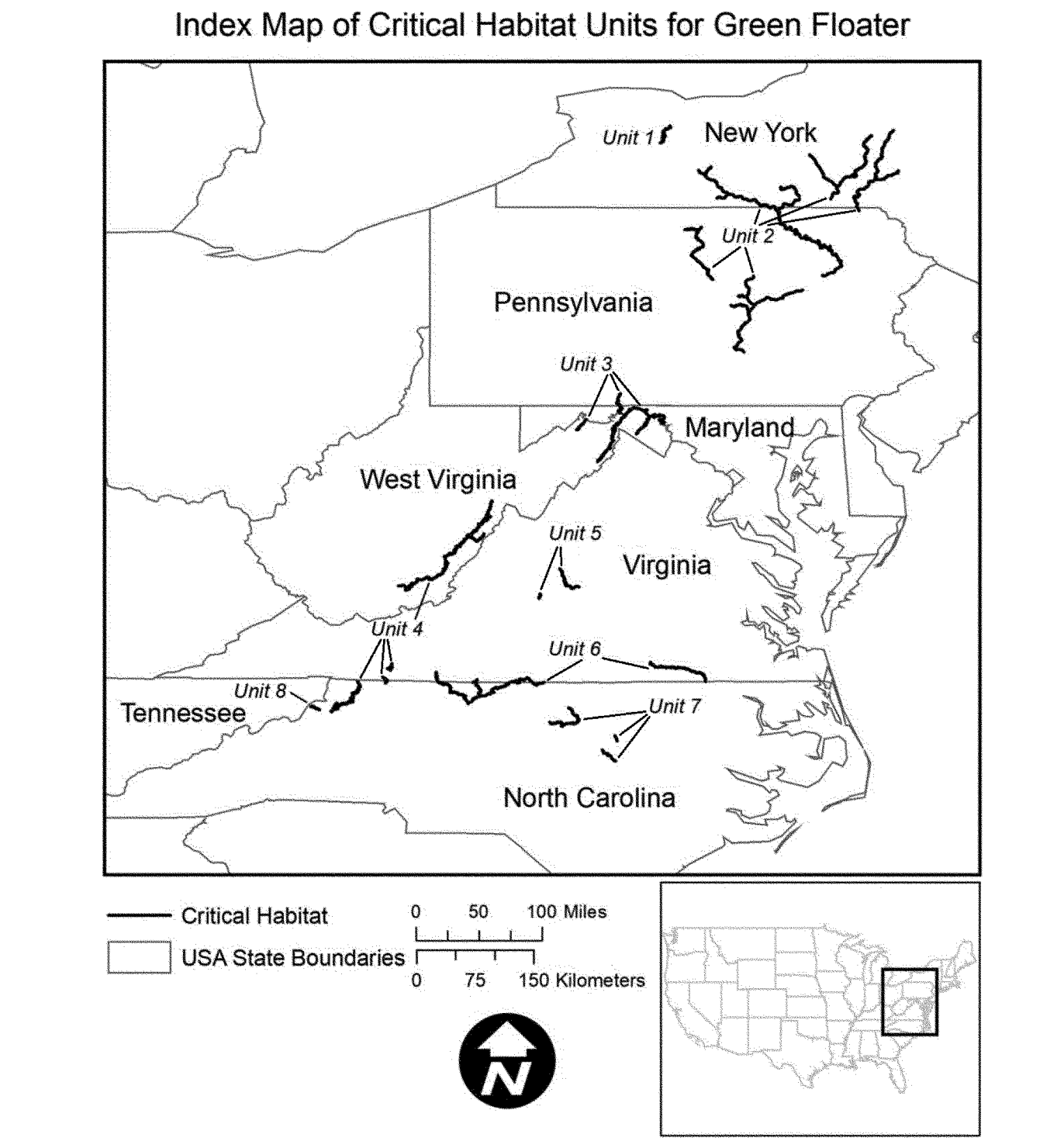
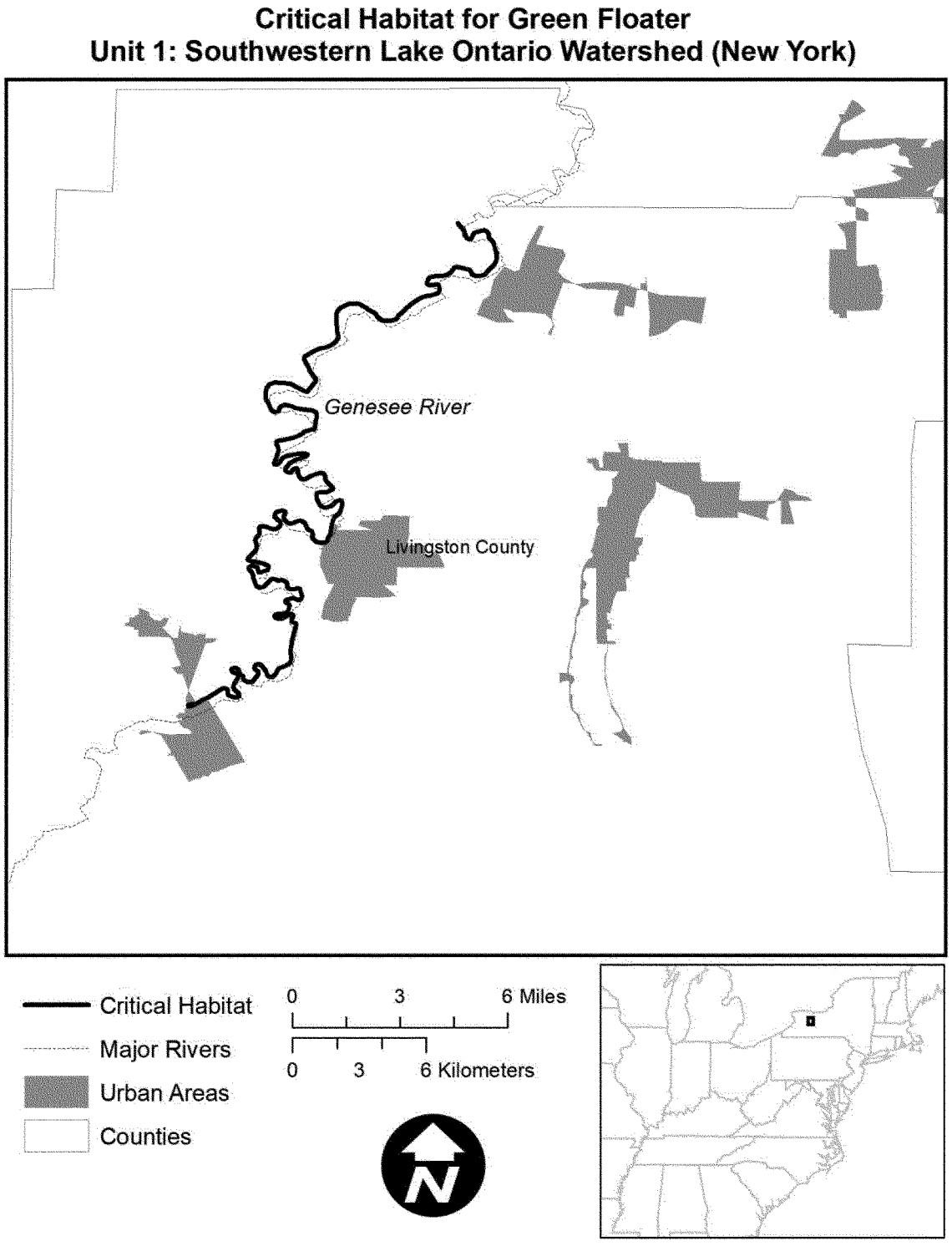


(6) Unit 1: Southwestern Lake Ontario Watershed (Livingston County, New York).

(i) Unit 1 consists of 55.6 stream kilometers (km) (34.6 stream miles (mi)) of the Genesee River in Livingston County, New York, from New York Route 36 downstream to the river's confluence with White Creek. It includes the river channel up to the ordinary high water mark.

(ii) Map of Unit 1 follows:

Figure 2 to Green Floater (*Lasmigona subviridis*) paragraph (6)(ii)



(7) Unit 2: Susquehanna Watershed (Broome, Chemung, Chenango, Cortland, Delaware, Herkimer, Madison, Otsego, Steuben, and Tioga Counties, New York; and Bradford, Clinton, Columbia, Dauphin, Lackawanna, Luzerne, Lycoming, Montour, Northumberland, Perry, Snyder, Susquehanna, Tioga, Union, and Wyoming Counties, Pennsylvania).

(i) Unit 2 consists of the following 16 subunits:

(A) Subunit 2a is a total length of 345.8 km (214.9 mi) of the Susquehanna River in Tioga County, New York, and Columbia, Montour, and Northumberland Counties, Pennsylvania. This subunit includes the

river channel up to the ordinary high water mark. The upper section of Subunit 2a flows from the entrance of Owego Creek to Harvey's Creek. The lower section starts at Nescopeck Creek and flows to the confluence of Fishing Creek.

(B) Subunit 2b consists of a 13.9-km (8.7-mi) segment of Fivemile Creek in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of an unnamed tributary and ends at the confluence of Fivemile Creek and the Cohocton River.

(C) Subunit 2c consists of a 47.6-km (29.6-mi) segment of the Cohocton River in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Cotton Creek and Tenmile Creek and ends at the confluence of the Tioga River and Middle Cohocton Creek.

(D) Subunit 2d consists of a 15.7-km (9.7-mi) segment of the Canisteo and Tioga Rivers in Steuben County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Tuscarora Creek at the Canisteo River and ends at the confluence of the Tioga River and Chemung River.

(E) Subunit 2e consists of a 73.0-km (45.4-mi) segment of the Chemung River in Steuben and Chemung Counties, New York, and Bradford County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the Tioga River with the Cohocton River and ends at the confluence of the Chemung River and the Susquehanna River.

(F) Subunit 2f consists of a 34.2-km (21.2-mi) segment of Catatonk Creek in Tioga County, New York, and Bradford County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Miller Creek and Michigan Creek and ends at the confluence of Fishing Creek with West Branch Owego Creek.

(G) Subunit 2g consists of a 4.5-km (2.8-mi) segment of Tunkhannock Creek in Bradford, Wyoming, Lackawanna, and Luzerne Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Billings Mill Brook and ends at the confluence of Tunkhannock Creek and the Susquehanna River.

(H) Subunit 2h consists of a 59.4-km (36.9-mi) segment of the Tioughnioga River in Broome and Cortland Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the East Branch Tioughnioga and West Branch Tioughnioga Rivers and ends at the confluence of the Tioughnioga River and the Chenango River.

(I) Subunit 2i consists of a 140.9-km (87.6-mi) segment of the Chenango River in Broome, Chenango, and Madison Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts in the Sangerfield River downstream of Ninemile Swamp and ends at the confluence of the Chenango River and the Susquehanna River.

(J) Subunit 2j consists of a 93.7-km (58.2-mi) segment of the Unadilla River in Chenango, Herkimer, and Otsego Counties, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of North Winfield Creek and ends at the confluence of the Unadilla River and the Susquehanna River.

(K) Subunit 2k consists of a 99.3-km (61.7-mi) segment of the Upper Susquehanna River in Broome, Chenango, Delaware, and Otsego Counties, New York, and Susquehanna County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Mill Creek and ends at the entrance of Starrucca Creek.

(L) Subunit 2l consists of a 115.5-km (71.8-mi) segment of Pine Creek in Clinton, Lycoming, and Tioga Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Phoenix Run and ends at the confluence of Pine Creek and the Susquehanna River.

(M) Subunit 2m consists of a 4.4-km (2.7-mi) segment of Marsh Creek in Tioga County, New York. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Asaph Run and ends at the confluence of Marsh Creek and Pine Creek.

(N) Subunit 2n consists of a 45.8-km (28.5-mi) segment of the West Branch Susquehanna River in Lycoming, Northumberland, and Union Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Muncy Creek and ends at the confluence of the West Branch Susquehanna River and the Susquehanna River.

(O) Subunit 2o consists of a 13.2-km (8.2-mi) segment of Buffalo Creek in Union County, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the intersection of Johnson Mill Road and Buffalo Creek and ends at the confluence of Buffalo Creek and the West Branch Susquehanna River. The last segment of Buffalo Creek is also known as Mill Race.

(P) Subunit 2p consists of a 35.5-km (22.1-mi) segment of Penns Creek in Dauphin, Northumberland, Perry, Snyder, and Union Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of an unnamed tributary near the intersection of Penns Creek Road and Wildwood Road and ends at the confluence of Penns Creek and the Susquehanna River.

(ii) Maps of Unit 2 follow:

Figure 3 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)

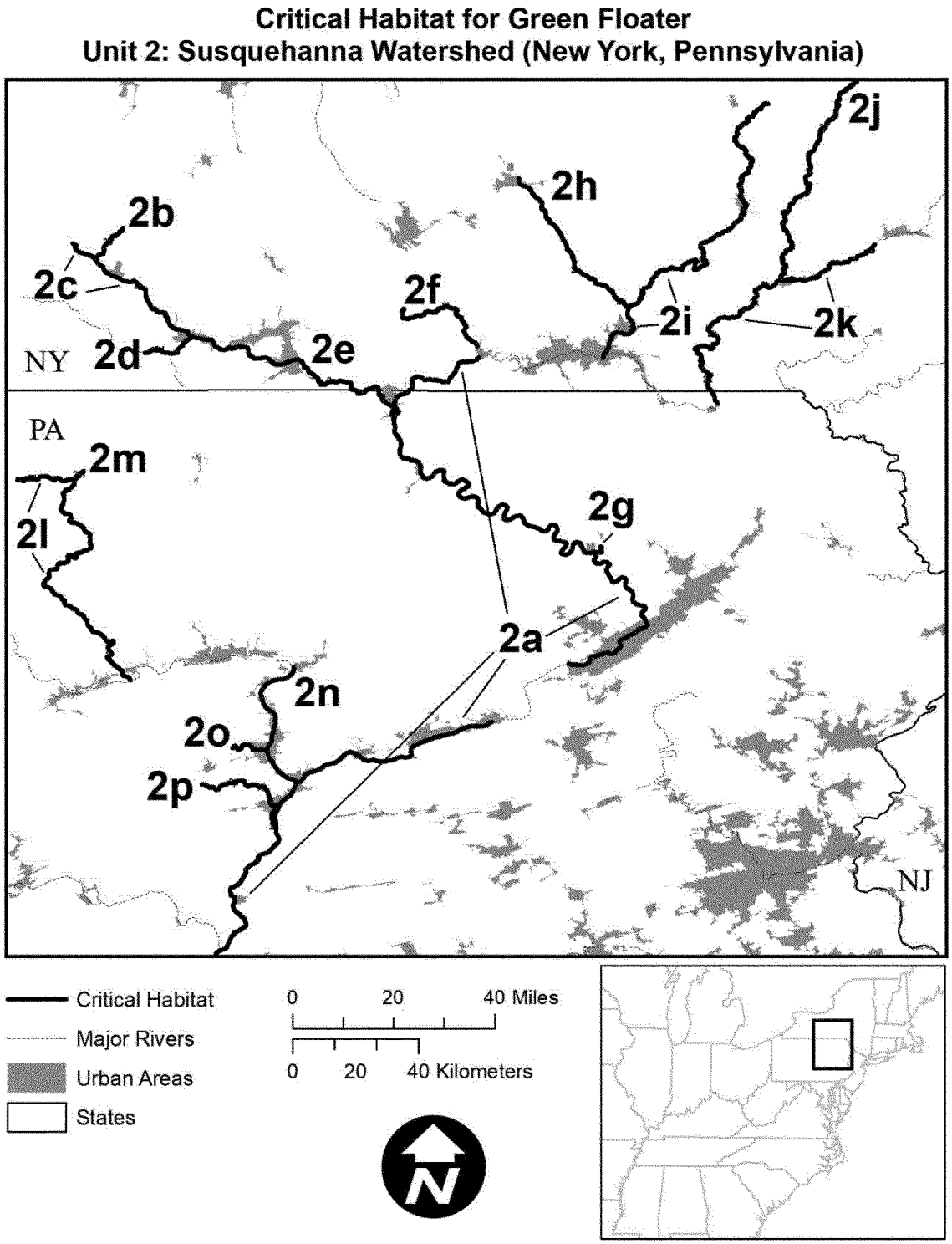


Figure 4 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)

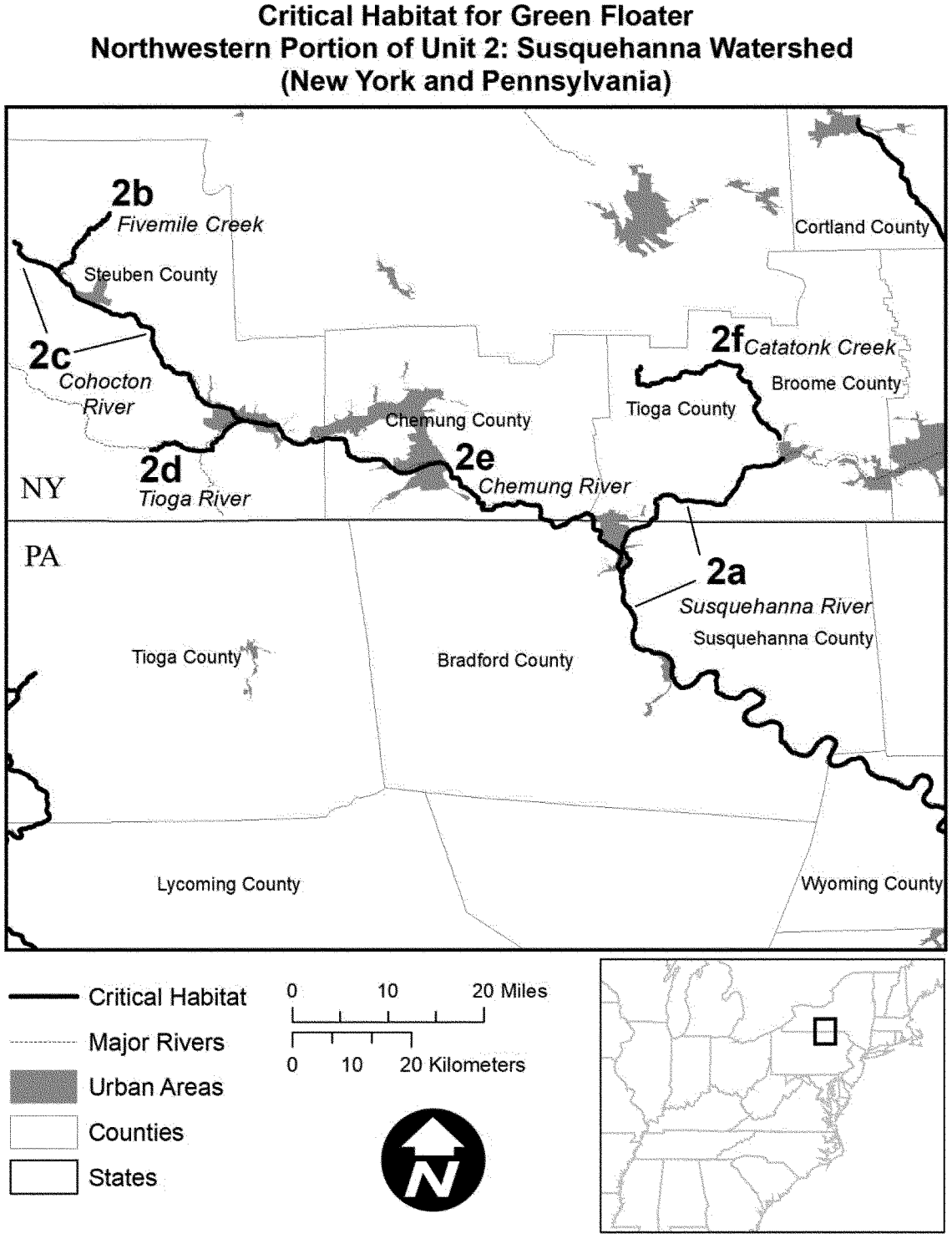


Figure 5 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)

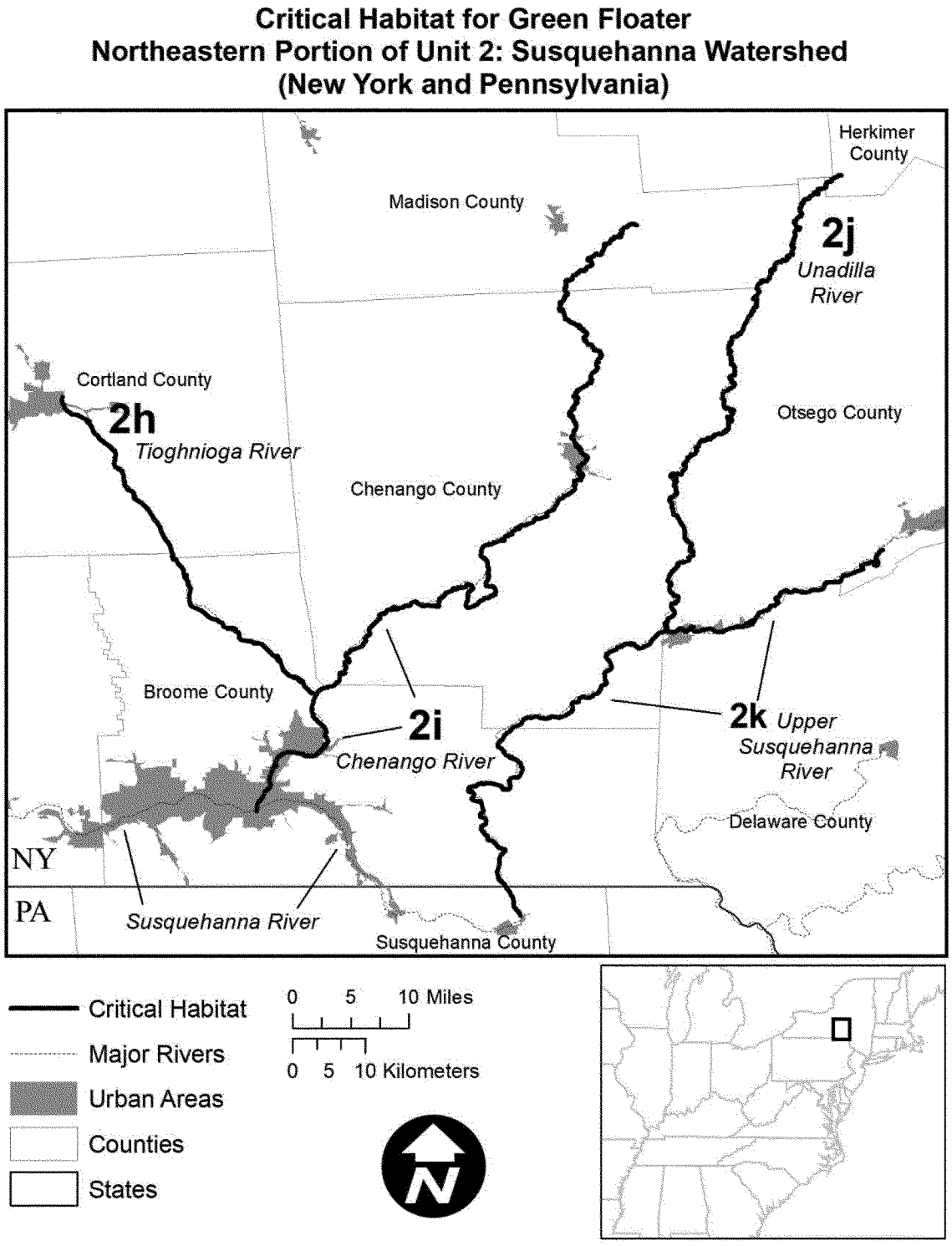


Figure 6 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)

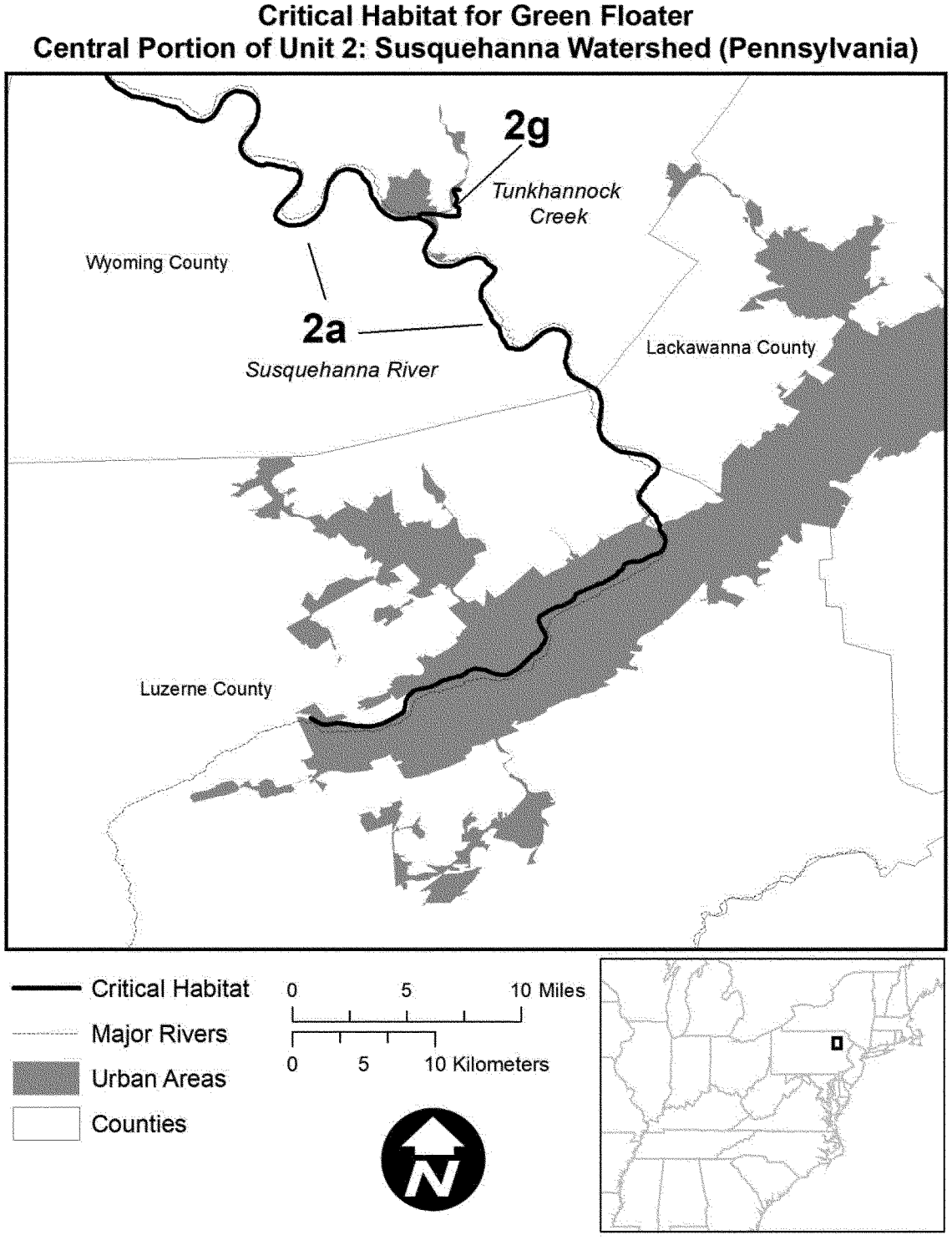


Figure 7 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)

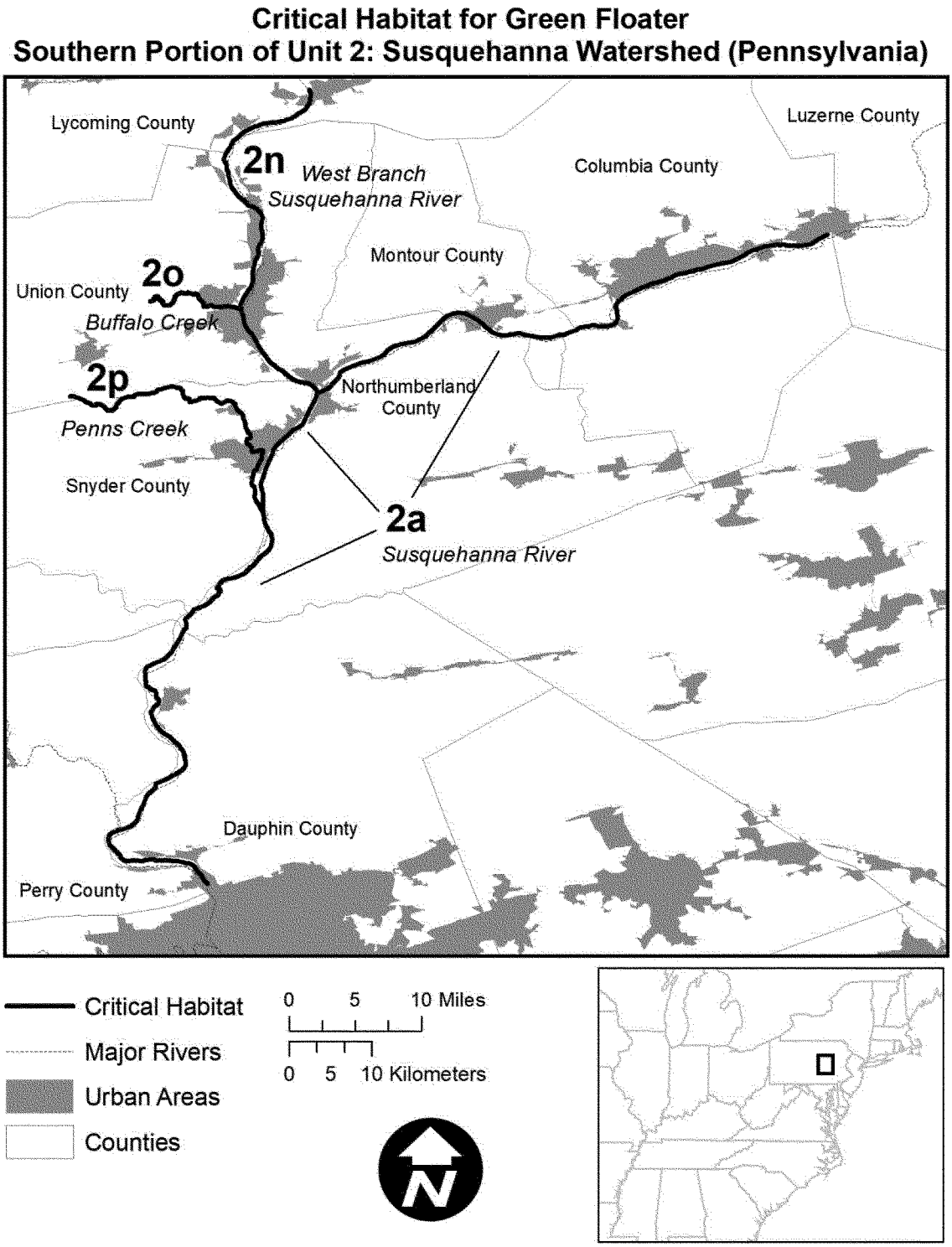
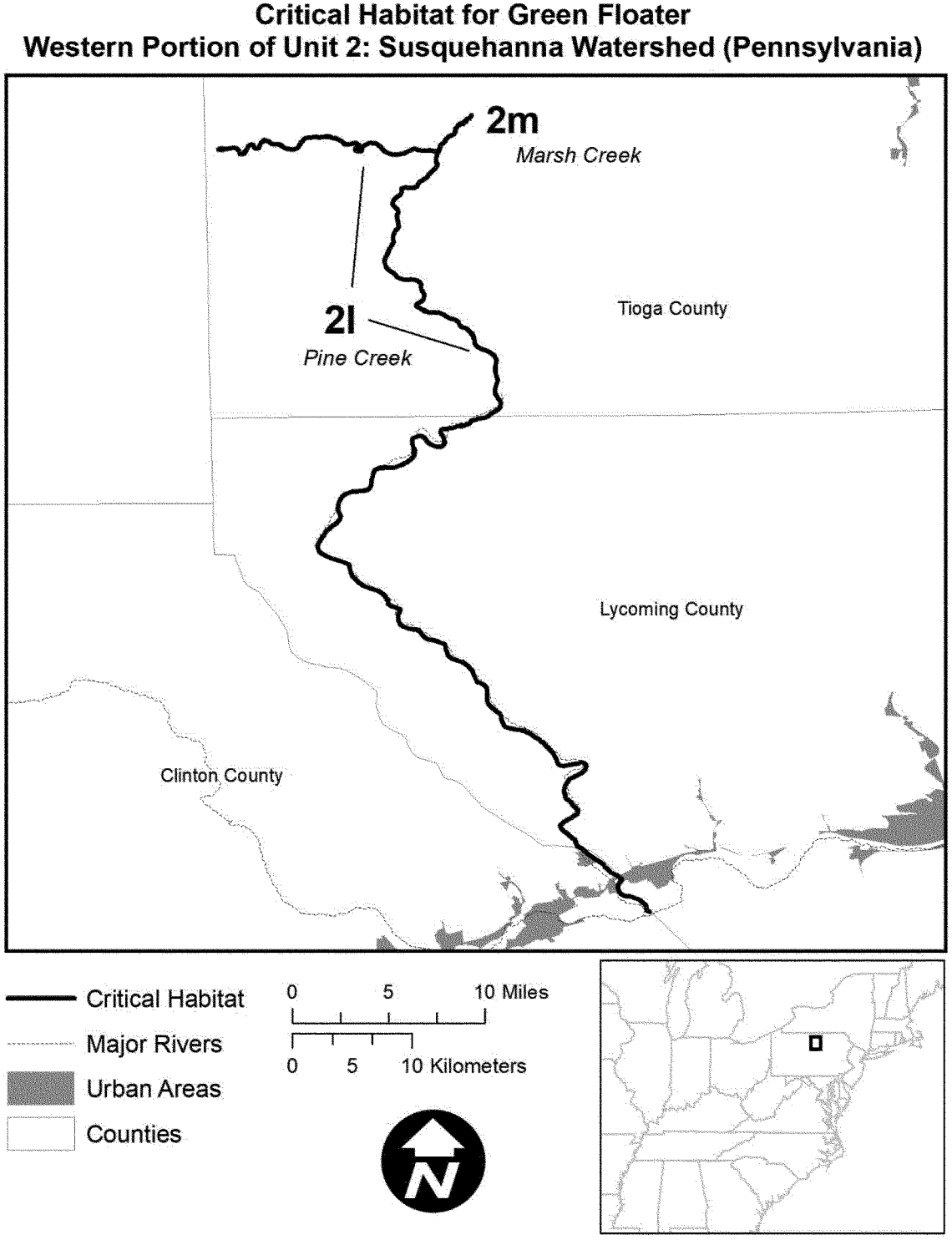


Figure 8 to Green Floater (*Lasmigona subviridis*) paragraph (7)(ii)



(8) Unit 3: Potomac Watershed (Bedford and Fulton Counties, Pennsylvania; Allegany and Washington Counties, Maryland; and Berkeley, Hampshire, Hardy, Mineral, and Morgan Counties, West Virginia).

(i) Unit 3 consists of the following six subunits:

(A) Subunit 3a consists of an 80.3-km (49.9-mi) segment of the Potomac River in Washington County, Maryland, and Berkeley County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of the Cacapon River and ends at the entrance of Downey Branch.

(B) Subunit 3b consists of a 22.3-km (13.9-mi) segment of Patterson Creek in

Mineral County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Cabin Run and ends at the confluence of Patterson Creek and the Potomac River.

(C) Subunit 3c consists of a 51.3-km (31.9-mi) segment of Sideling Hill Creek in Allegany County, Maryland, and Bedford and Fulton Counties, Pennsylvania. This subunit includes the river channel up to the ordinary high water mark. It starts at the Rice Road crossing of West Branch Sideling Hill Creek and ends at the confluence of Sideling Hill Creek and the Potomac River.

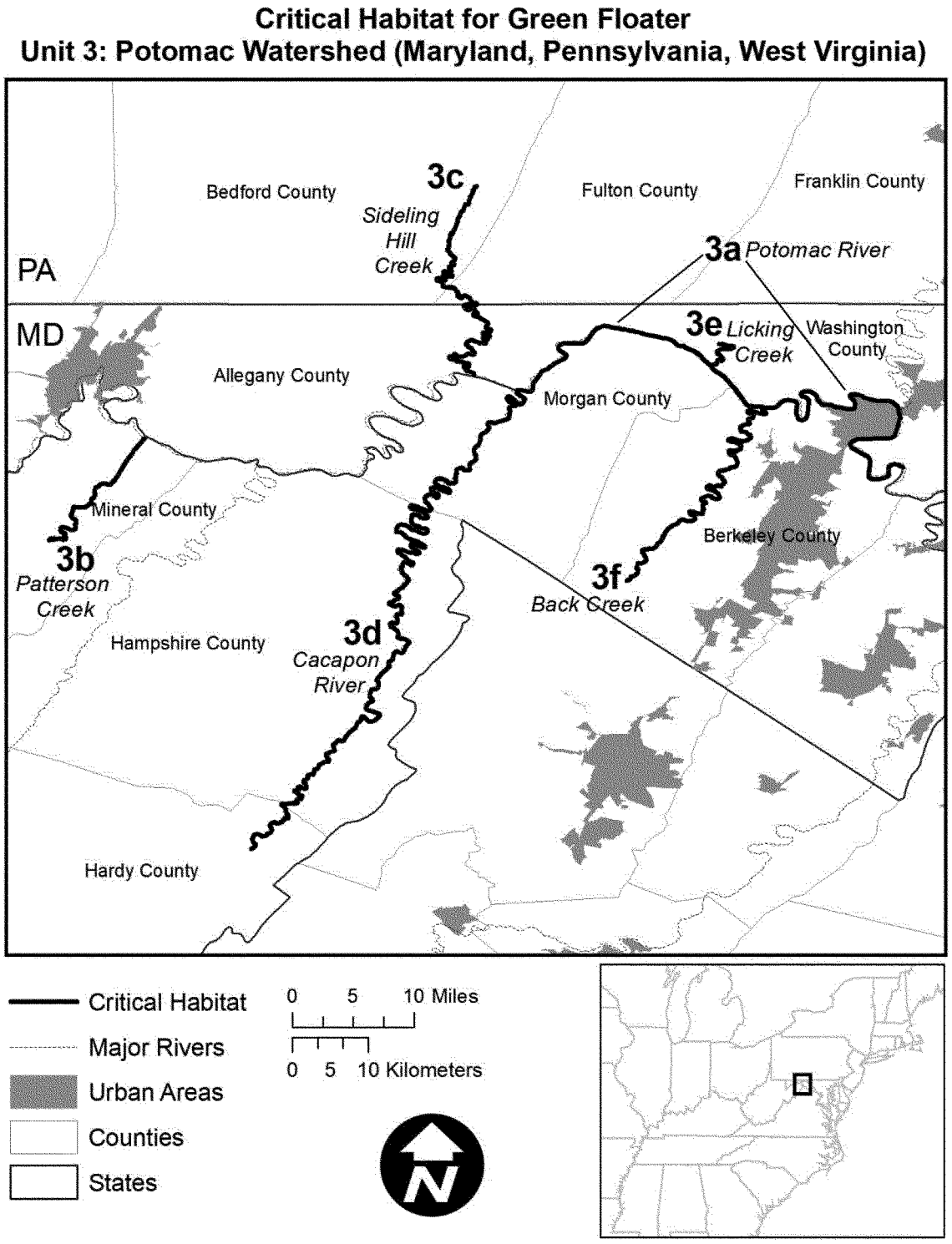
(D) Subunit 3d consists of a 123.0-km (76.5-mi) segment of the Cacapon River in Washington County, Maryland, and in Hardy, Hampshire, and Morgan Counties, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Trout Run and ends at the confluence of the Cacapon River and the Potomac River.

(E) Subunit 3e consists of a 6.7-km (4.1-mi) segment of Licking Creek in Washington County, Maryland. This subunit includes the river channel up to the ordinary high water mark. It starts at the crossing of Pecktonville Road and ends at the confluence of Licking Creek and the Potomac River.

(F) Subunit 3f consists of a 46.8-km (29.1-mi) segment of Back Creek in Berkeley County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Big Run and ends at the confluence of Back Creek and the Potomac River.

(ii) Map of Unit 3 follows:

Figure 9 to Green Floater (*Lasmigona subviridis*) paragraph (8)(ii)



(9) Unit 4: Kanawha Watershed (Allegany, Ashe, and Watauga Counties, North Carolina; Carroll and Grayson Counties, Virginia; and Greenbrier, Monroe, Pocahontas, and Summers Counties, West Virginia).

(i) Unit 4 consists of the following six subunits:

(A) Subunit 4a consists of a 259.7-km (161.4-mi) segment of the Greenbrier River in Greenbrier, Monroe, Pocahontas, and Summers Counties, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Cove Run and ends at the confluence of the Greenbrier River and the New River.

(B) Subunit 4b consists of a 17.4-km (10.8-mi) segment of Deer Creek in Pocahontas County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Hospital Run and ends at the confluence of Deer Creek and the Greenbrier River.

(C) Subunit 4c consists of a 32.2-km (20-mi) segment of Knapp Creek in Pocahontas County, West Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Moore Run and Knapp Creek and ends at the confluence of Knapp Creek and the Greenbrier River.

(D) Subunit 4d consists of a 15.5-km (9.7-mi) segment of the New River in Carroll and Grayson Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at Sarasota Lane and ends at the confluence of Chestnut Creek and the New River.

(E) Subunit 4e consists of a 17.9-km (11.1-mi) segment of the Little River in the Kanawha watershed in Alleghany County, North Carolina, and Grayson County, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Brush Creek and ends at the confluence of the Little River and the New River.

(F) Subunit 4f consists of a 145.7-km (90.5-mi) segment of the South Fork New River in Alleghany, Ashe, and Watauga Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the East Fork South Fork New River, Middle Fork South Fork New River, and Winkler Creek and ends at the confluence of the South Fork New River and North Fork New River.

(ii) Maps of Unit 4 follow:

Figure 10 to Green Floater (*Lasmigona subviridis*) paragraph (9)(ii)

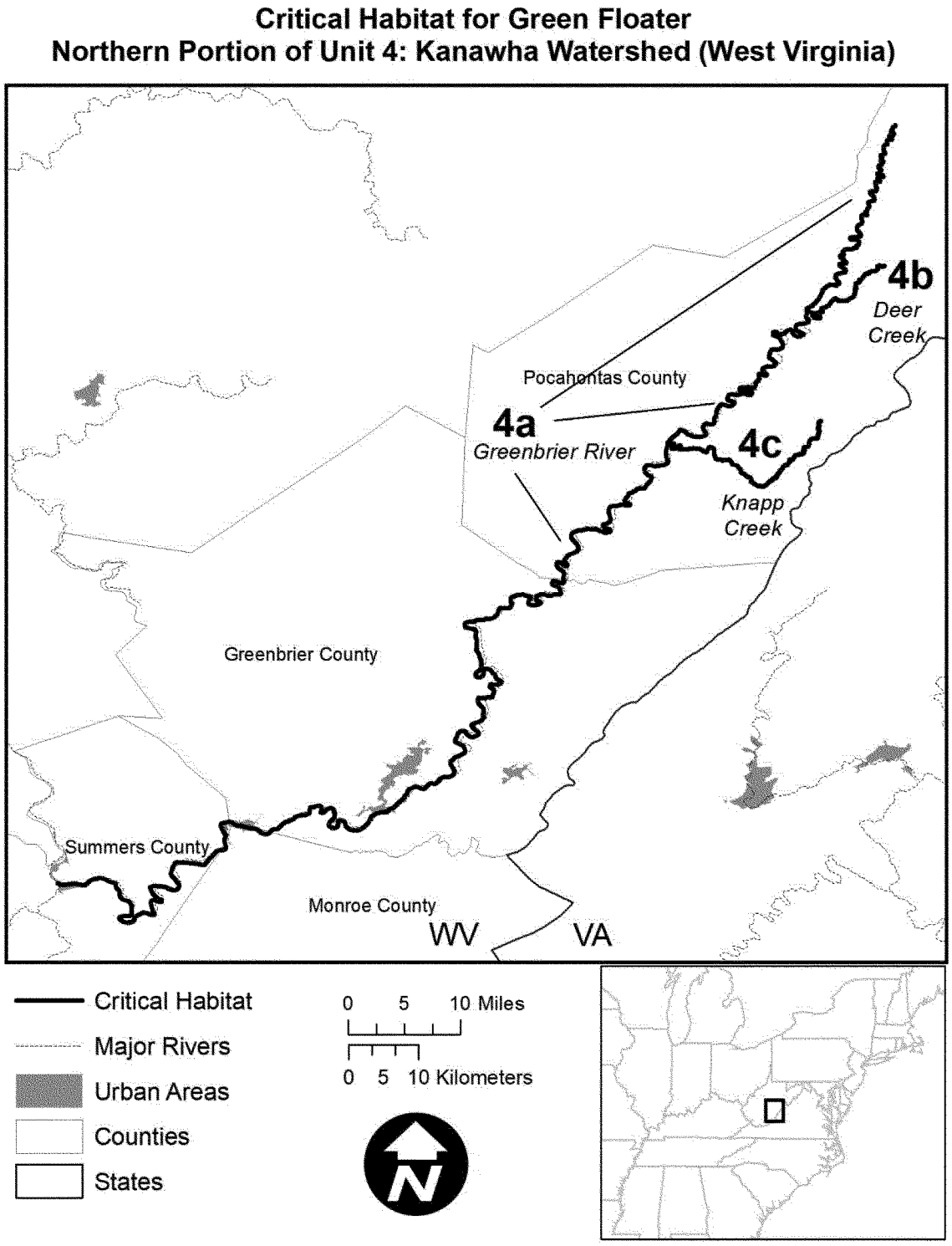
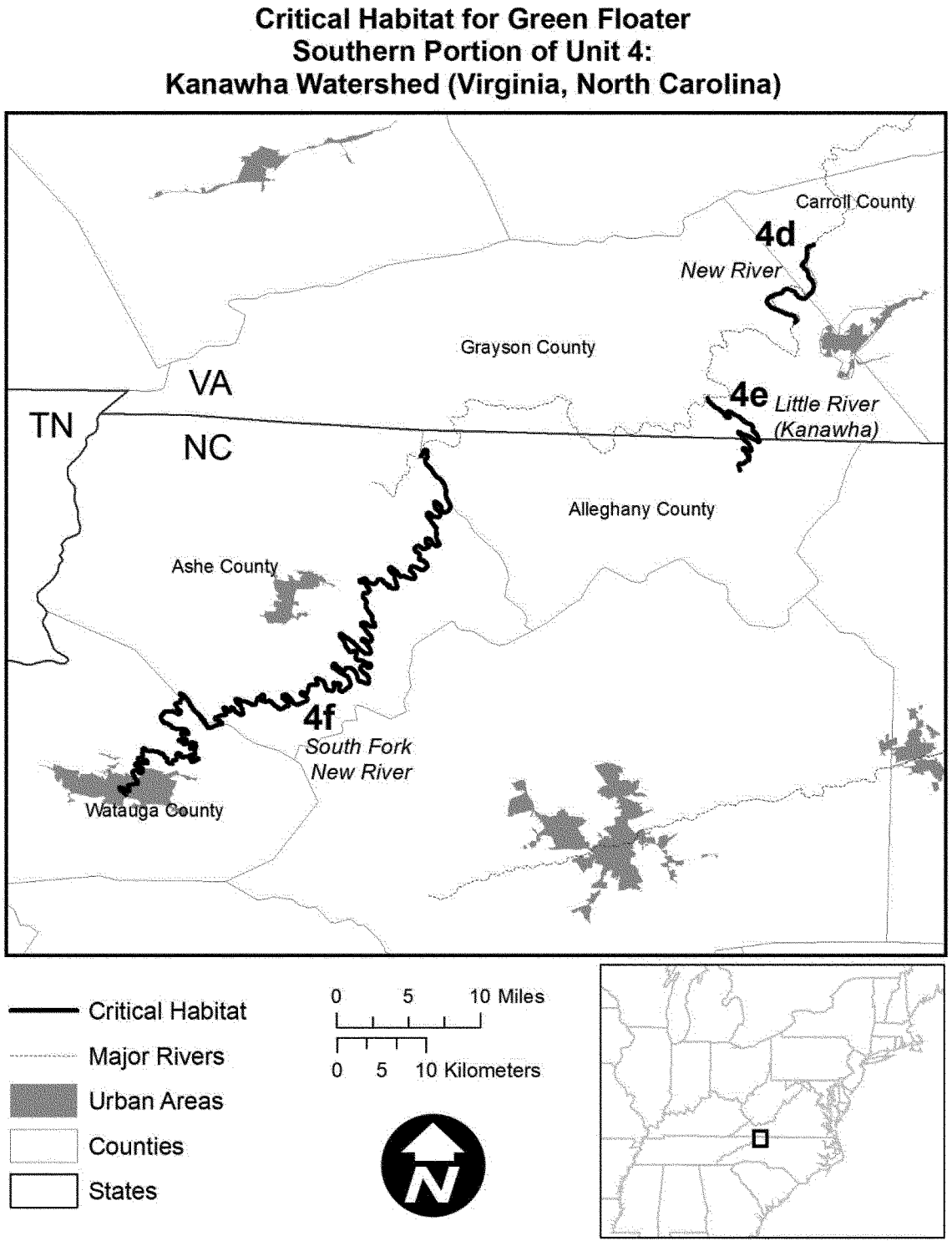


Figure 11 to Green Floater (*Lasmigona subviridis*) paragraph (9)(ii)



(10) Unit 5: Lower Chesapeake Watershed (Amherst, Buckingham, and Nelson Counties, Virginia).

(i) Unit 5 consists of the following two subunits:

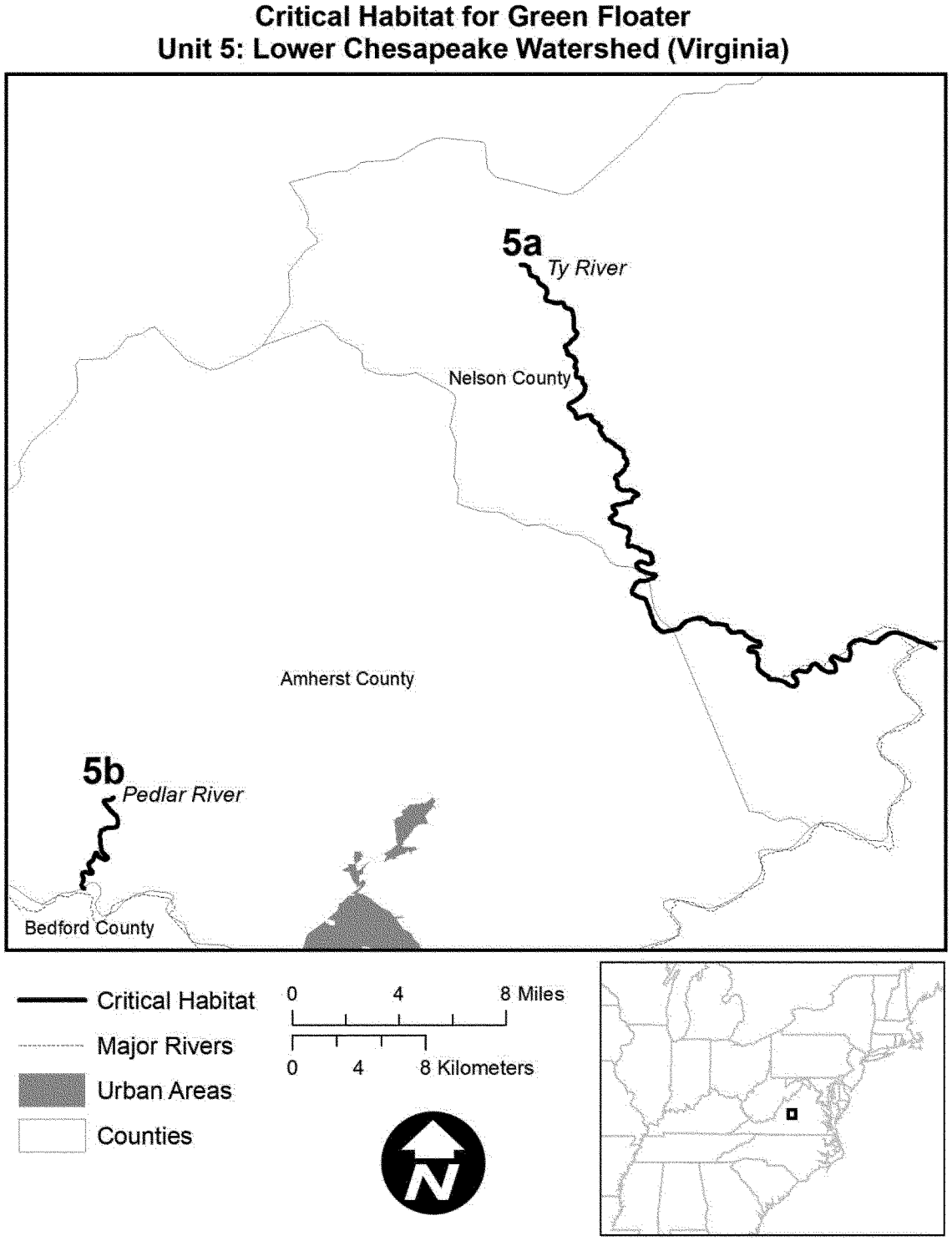
(A) Subunit 5a consists of a 54.1-km (33.6-mi) segment of the Tye River in Amherst, Buckingham, and Nelson Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of Coxs Creek and Campbell Creek and ends at the confluence of the Tye River and the James River.

(B) Subunit 5b consists of a 8.6-km (5.4-mi) segment of the Pedlar River in Amherst County, Virginia. This subunit

includes the river channel up to the ordinary high water mark. It starts at the entrance of Horsley Creek and ends at the confluence of the Pedlar River and James River.

(ii) Map of Unit 5 follows:

Figure 12 to Green Floater (*Lasmigona subviridis*) paragraph (10)(ii)



(11) Unit 6: Chowan-Roanoke Watershed (Caswell, Rockingham, and Stokes Counties, North Carolina; and Brunswick, Greensville, Halifax, Henry, Patrick, Pittsylvania, and Southampton Counties, Virginia).

(i) Unit 6 consists of the following five subunits:

(A) Subunit 6a consists of a 221.3-km (137.5-mi) segment of the Dan River in Caswell, Rockingham, and Stokes Counties, North Carolina, and in Halifax, Henry, Patrick, and Pittsylvania

Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Squall Creek and ends at the entrance of County Line Creek.

(B) Subunit 6b consists of a 4.6-km (2.9-mi) segment of the South Mayo River in Henry County, Virginia, and Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Crooked Creek and ends at the confluence of the South Mayo River and the Mayo River.

(C) Subunit 6c consists of a 5.9-km (3.7-mi) segment of the North Mayo River in Henry County, Virginia, and Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Jumping Branch and ends at the confluence of the North Mayo River and the Mayo River.

(D) Subunit 6d consists of a 25.1-km (15.6-mi) segment of the Mayo River in Rockingham County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the North Mayo and South Mayo Rivers and ends at the confluence of the Mayo River and the Dan River.

(E) Subunit 6e consists of a 106.1-km (65.9-mi) segment of the Meherrin River in Brunswick, Greensville, and Southampton Counties, Virginia. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Shining Creek and ends at the entrance of Fountains Creek.

(ii) Maps of Unit 6 follow:

Figure 13 to Green Floater (*Lasmigona subviridis*) paragraph (11)(ii)

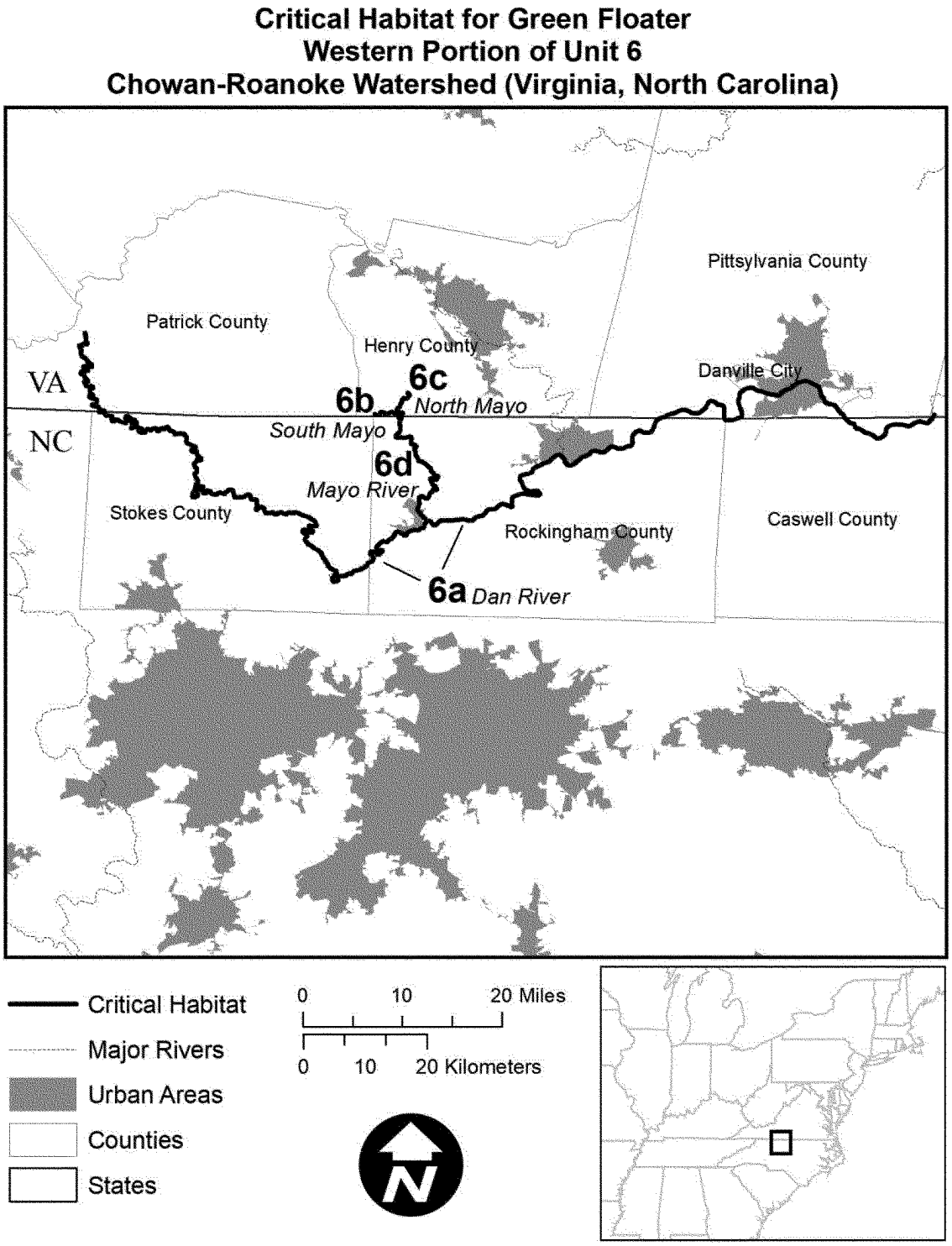
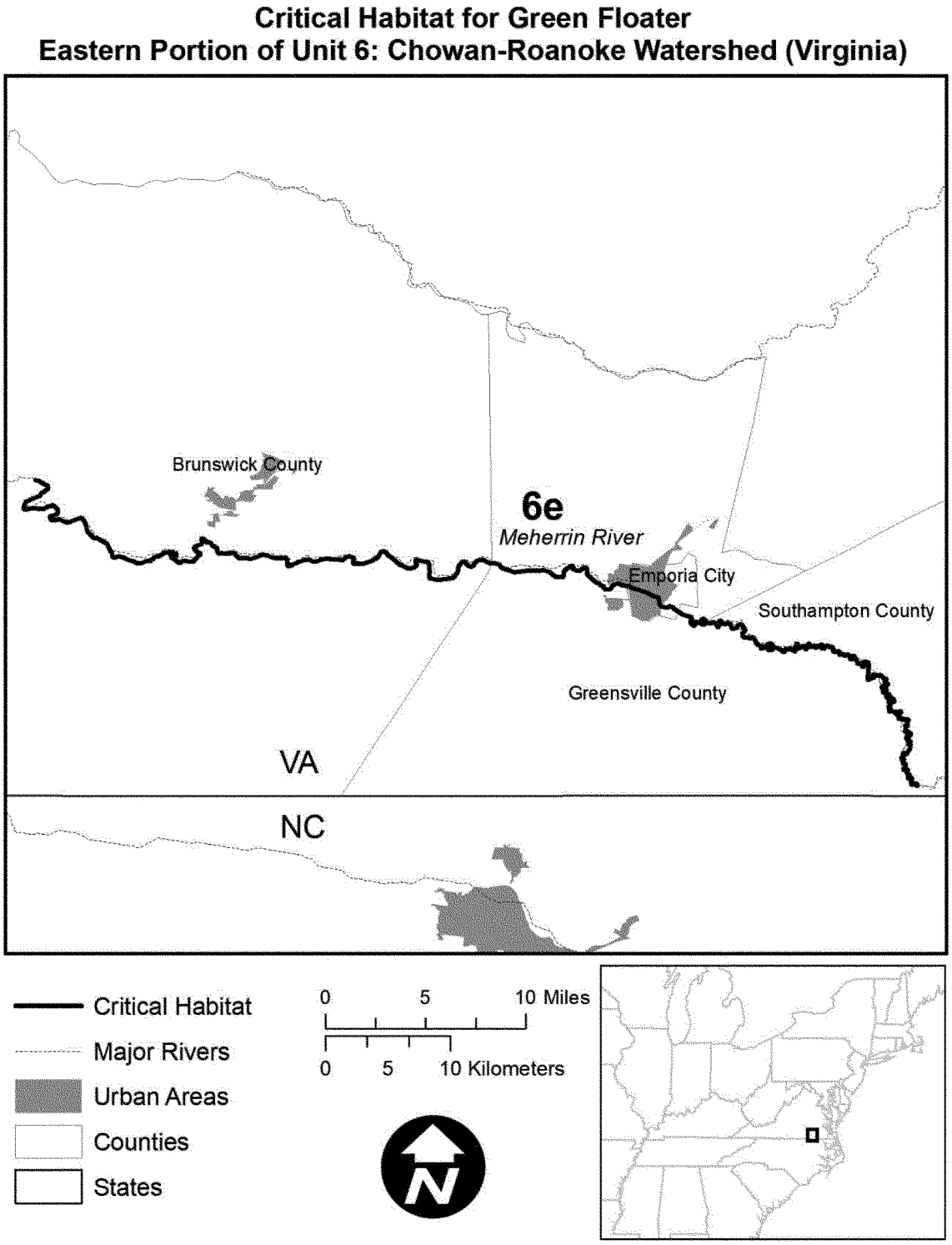


Figure 14 to Green Floater (*Lasmigona subviridis*) paragraph (11)(ii)



(12) Unit 7: Neuse-Pamlico Watershed (Durham, Johnston, Orange, Person, and Wake Counties, North Carolina).

(i) Unit 7 consists of the following four subunits:

(A) Subunit 7a consists of a 26.8-km (16.6-mi) segment of the Neuse River in Johnston and Wake Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of Crabtree Creek and ends near Prestwick Drive.

(B) Subunit 7b consists of a 54.4-km (33.8-mi) segment of the Eno River in Durham and Orange Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the entrance of McGowan Creek and ends at Falls Lake.

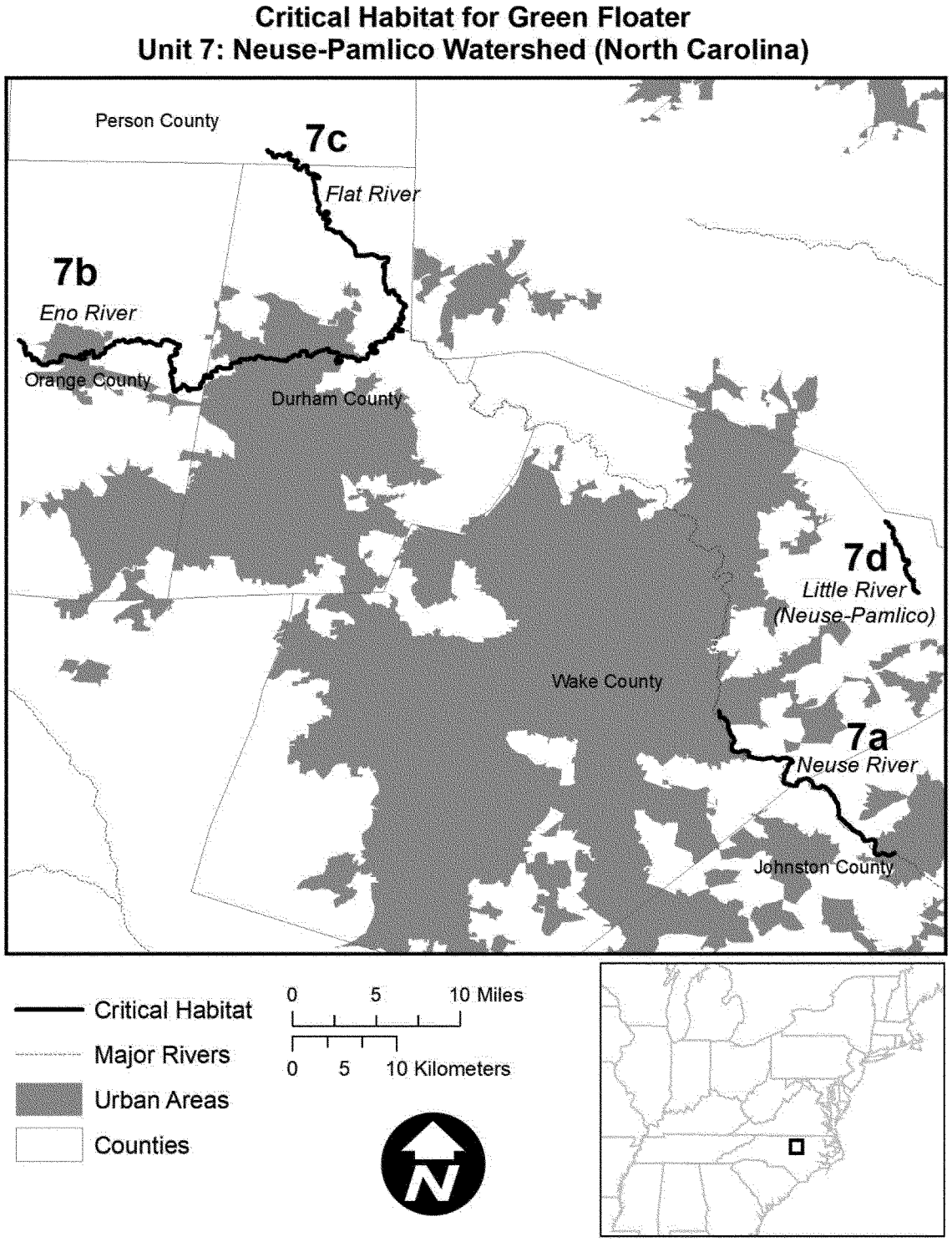
(C) Subunit 7c consists of a 30.9-km (19.2-mi) segment of the Flat River in Durham and Person Counties, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence of the North Flat River and South Flat River and ends at Falls Lake.

(D) Subunit 7d consists of an 8.6-km (5.4-mi) segment of the Little River in

the Neuse-Pamlico watershed in Wake County, North Carolina. This subunit includes the river channel up to the ordinary high water mark. It starts at the confluence with Perry Creek and ends at the entrance of Big Branch.

(ii) Map of Unit 7 follows:

Figure 15 to Green Floater (*Lasmigona subviridis*) paragraph (12)(ii)

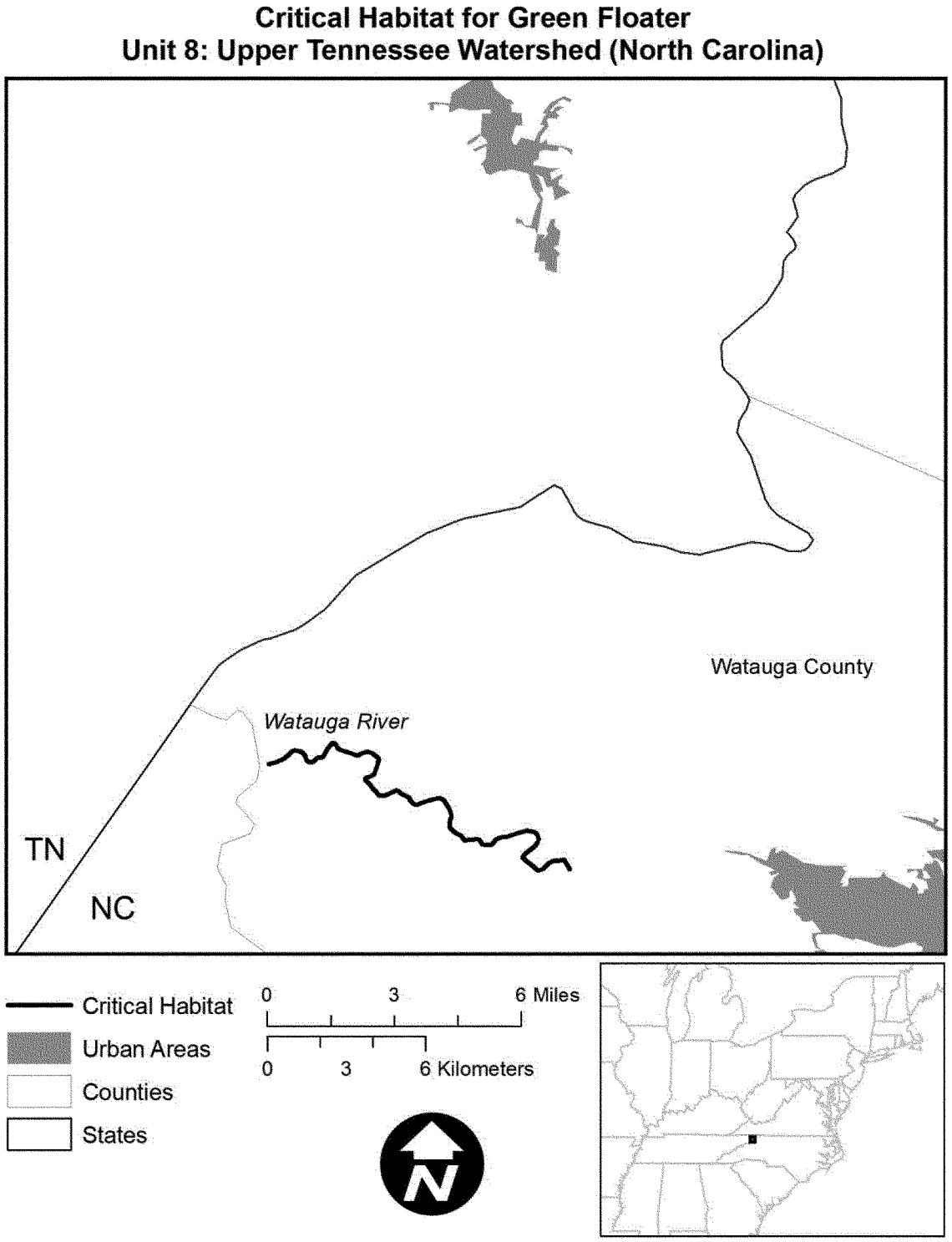


(13) Unit 8: Upper Tennessee Watershed (Watauga County, North Carolina).

(i) Unit 8 consists of 16.0-km (9.9-mi) of the Watauga River in Watauga County, North Carolina, from the entrance of Baird Creek to the entrance of Beech Creek. It includes the river channel up to the ordinary high water mark.

(ii) Map of Unit 8 follows:

Figure 16 to Green Floater (*Lasmigona subviridis*) paragraph (13)(ii)



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Martha Williams,

Director, U.S. Fish and Wildlife Service.

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