

BEFORE THE U.S DEPARTMENT OF THE INTERIOR

AND

THE U.S. FISH AND WILDLIFE SERVICE

PETITION FOR RULEMAKINGS DESIGNATING CRITICAL HABITAT FOR THE

Shenandoah Salamander (*Plethodon shenandoah*)

Roseate Tern Northeast DPS (*Sterna dougallii dougallii*)

James Spinemussel (*Pleurobema collina*)

Clubshell (*Pleurobema clava*)

Dwarf Wedgemussel (*Alasmodonta heterodon*)

Hay's Spring Amphipod (*Stygobromus hayi*)

Roanoke Logperch (*Percina rex*)

Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*)

Puritan Tiger Beetle (*Cicindela puritan*)



CENTER FOR BIOLOGICAL DIVERSITY



**CENTER FOR BIOLOGICAL DIVERSITY, PETITIONER
NOTICE OF PETITION**

January 22, 2015

The Honorable Sally Jewell
Secretary
Department of the Interior
1849 C Street, NW
Washington, D.C. 20240

The Honorable Dan Ashe
Director
U.S. Fish and Wildlife Service
1849 C Street, NW
Washington, D.C. 20240

Re: Petition to the U.S. Department of Interior and the U.S. Fish and Wildlife Service for Rulemakings Designating Critical Habitat for Nine Northeast Species.

Dear Secretary Jewell and Director Ashe:

Pursuant to 16 U.S.C. § 1533 of the Endangered Species Act, 16 U.S.C. §§ 1531-1544 (“ESA”) and its implementing regulation at 50 C.F.R. § 424.14(d), and 5 U.S.C. § 553(e) of the Administrative Procedure Act (“APA”), the Center for Biological Diversity (“Center”) hereby petitions the U.S. Department of the Interior (“DOI”), by and through the U.S. Fish and Wildlife Service (“Service”), to meet its mandatory duty to designate critical habitat for the Shenandoah Salamander (*Plethodon shenandoah*), Roseate Tern Northeast DPS (*Sterna dougallii dougallii*), James Spiny mussel (*Pleurobema collina*), Clubshell (*Pleurobema clava*), Dwarf Wedgemussel (*Alasmidonta heterodon*), Hay’s Spring Amphipod (*Stygobromus hayi*), Roanoke Logperch (*Percina rex*), Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*), and Puritan Tiger Beetle (*Cicindela puritan*).¹

The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy and environmental law. The Center has over 800,000 members and online activists throughout the United States, including the northeastern U.S. from Virginia to Maine.

These nine species were all listed after the 1978 Amendments to the ESA, which made the designation of critical habitat a mandatory duty at the time a species is protected under the ESA.² Unfortunately, each of these species was denied critical habitat due to the Service’s invalid legal interpretation, at the time of their listing, regarding what the critical habitat provisions of the ESA

¹ 43 C.F.R. § 14.2 provides that:

[A]ny person may petition for the issuance, amendment, or repeal of a rule (5 U.S.C. 553(e)). The petition will be addressed to the Secretary of the Interior, U.S. Department of the Interior, Washington, D.C. 20240. It will identify the rule requested to be repealed or provide the text of a proposed rule or amendment and include reasons in support of the petition.

The regulatory text for each proposed rule for each species in this petition is provided in Appendix A.

² See Endangered Species Act Amendments of 1978, Pub. L. 95–632, 92 Stat. 3751 (Nov. 10, 1978).

required.³ While the Service's legal position on critical habitat was rejected in Federal courts, the Service has never revisited its decisions to deny hundreds of species critical habitat. Unfortunately, a large proportion of the threatened and endangered species that are still declining are those that have not received critical habitat.

Each of the species identified in this petition has an extremely tenuous conservation status.⁴ Each of these species is found on land or waters where there is a clear Federal nexus triggering the consultation provisions of Section 7 — meaning that the additional conservation benefits would likely accrue to these species from the Service enforcing Section 7's prohibition against Federal agencies adversely modifying or destroying critical habitat. And finally, each of these species faces continuing threats that could be addressed and alleviated if critical habitat were to be designated. Accordingly, the Center requests that the Service designate critical habitat for these species.

The ESA's implementing regulations provide that, upon receipt of a petition to designate critical habitat for any listed species, the Service "shall promptly conduct a review in accordance with the Administrative Procedure Act (5 U.S.C. 553) and applicable Departmental regulations, and take appropriate action."⁵ The Administrative Procedure Act directs that "[e]ach agency (of the Federal Government) shall give an interested person the right to petition for the issuance...of a rule."⁶ This petition constitutes a petition for the issuance of a separate rule for each of the species listed above to designate critical habitat under the ESA and Administrative Procedure Act.

As described in this petition below, the areas identified for each of the species listed above meet all the criteria for such designation as defined at 16 U.S.C. § 1532(5).⁷ The best available science, including the Service's own data and documents, clearly demonstrate that designating these areas is warranted. However, in the event that the Service determines that some portions of the requested critical habitat do not meet the criteria for designation, in the alternative we request that the Service analyze whether subsets of those areas should be designated as critical habitat and also evaluate whether other areas not identified by the petition should be designated.

Dated this 22nd day of January, 2015,



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³ See, e.g., *Natural Resources Defense Council v. Dept. of Interior*, 113 F.3d 1121 (9th Cir. 1996).

⁴ U.S. Fish and Wildlife Service, REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES: FISCAL YEARS 2009-2010 (2011); U.S. Fish and Wildlife Service, REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES: FISCAL YEARS 2011-2012 (2014).

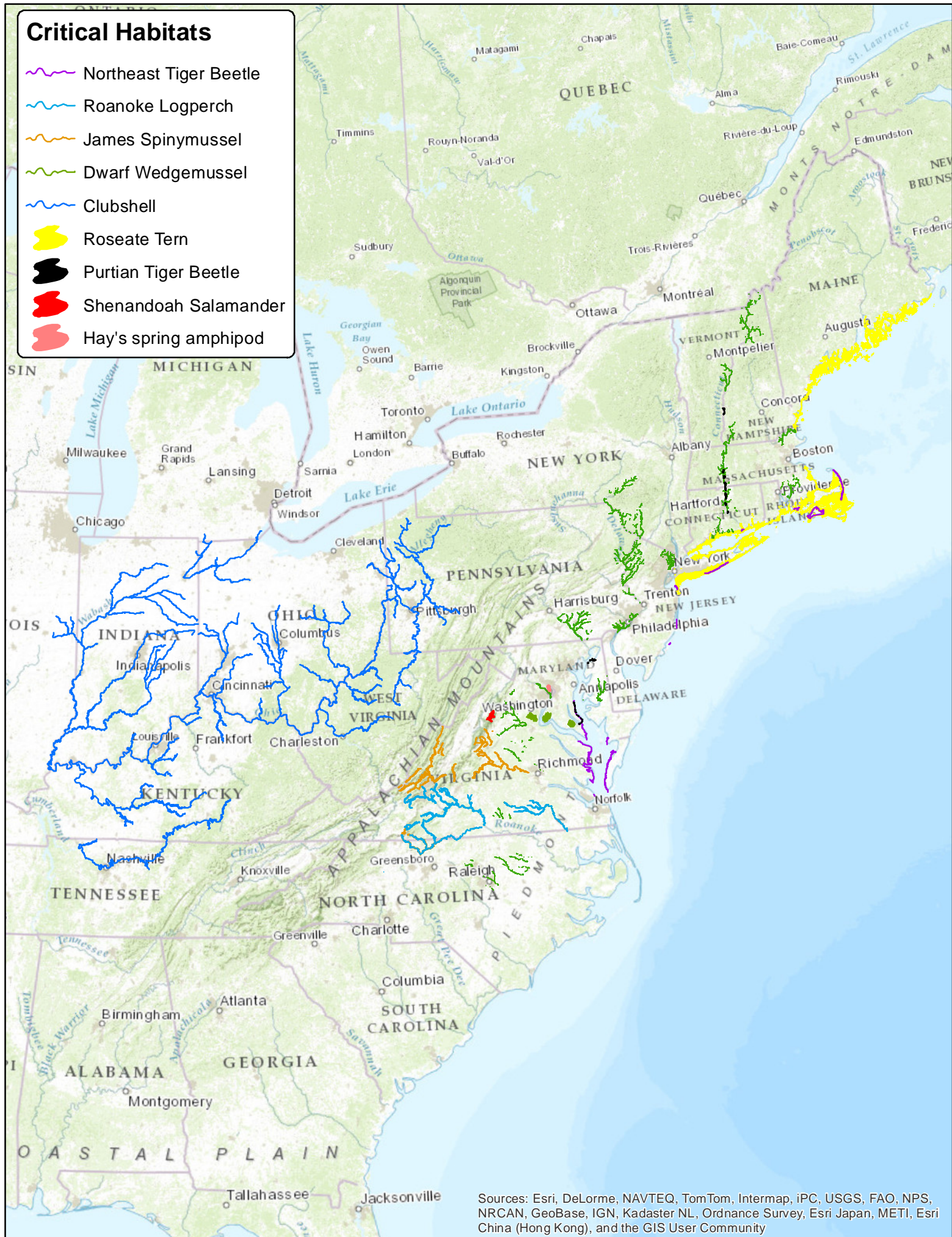
⁵ 50 U.S.C. § 424.14(d).

⁶ 5 U.S.C. § 553(e).

⁷ On May 12, 2014, the U.S. Fish and Wildlife Service and National Marine Fisheries Service proposed amending the regulations at 50 C.F.R. Part 424 regarding the designation of critical habitat. Accordingly, this petition follows the requirements of the Endangered Species Act itself regarding the legally required elements to designate critical habitat. For purposes of this petition, the Center is applying the statutory terms "physical or biological features" in describing critical habitat, however, we believe that each of these elements also qualifies as a "primary constituent element" as described in 50 C.F.R. § 424.12(b)(5).

Critical Habitats

-  Northeast Tiger Beetle
-  Roanoke Logperch
-  James Spnymussel
-  Dwarf Wedgemussel
-  Clubshell
-  Roseate Tern
-  Purtian Tiger Beetle
-  Shenandoah Salamander
-  Hay's spring amphipod



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, IPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

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INTRODUCTION

I. History of Critical Habitat Under the Endangered Species Act.

The number one driver of modern-day extinctions, which has now approached the scale of one of the great extinction events on Earth, is human-caused habitat loss.⁸ Although Congress may not have been fully aware of the scale of the extinction crisis, when debating the passage of the Endangered Species Act of 1973, it was acutely aware of the threats facing imperiled species, and the differing magnitude and severity of these threats:

Man can threaten the existence of species of plants and animals in any of a number of ways, by excessive use, by unrestricted trade, by pollution or by other destruction of their habitat or range. The most significant of those has proven also to be the most difficult to control: *the destruction of critical habitat.*⁹

Despite the recognition of the importance of addressing habitat loss, the Endangered Species Act of 1973 did not require the Service to designate critical habitat when a species was listed as threatened or endangered.¹⁰ Nevertheless, the Service developed a regulatory process to designate critical habitat and defined the term “critical habitat” to include “air, land, or water areas...the loss of which would appreciably decrease the likelihood of survival and recovery of a listed species...”¹¹

In 1976, Congress reauthorized the ESA and substantially increased funding to the Service. Congress was particularly concerned that since the ESA’s enactment three years earlier, the Service had failed to protect a single plant species despite a report from the Smithsonian Institution recommending the protection of over 3,300 plant species under the ESA. Congress also expressed concern that, despite developing a regulatory structure for designating critical habitat, the Service had failed to designate critical habitat for any of the 108 high-priority species that would benefit from such designation.¹² In approving additional funding for the Service, Congress explained:

[C]lassifying a species as endangered or threatened is only the first step in insuring its survival. Of equal or more importance is the determination of the habitat necessary for that species’ continued existence. Once a habitat is so designated, the Act requires that proposed Federal actions not adversely affect the habitat. If the protection of endangered and threatened species depends in large measure on the preservation of the species’ habitat, then *the ultimate*

⁸ Pimm, S.L. et al., 2014. *The biodiversity of species and their rates of extinction, distribution, and protection*. Science 344: DOI: 10.1126/science.1246752.

⁹ H.R. Rep. 93-412 at 4 (1973) (emphasis added).

¹⁰ See generally, Endangered Species Act of 1973, Pub. L. No. 93-205, 87 Stat. 884 (Dec. 28, 1973).

¹¹ 50 C.F.R. § 402.02 (1978); see also H.R. Rep. No. 95-1625, at 7-8 (1978), reprinted in 1978 U.S.C.C.A.N. 9453, 9458.

¹² H.R. Rep. No. 95-1625 (1978). At the end of 1978, the U.S. Fish and Wildlife Service had designated critical habitat for only 32 listed species.

*effectiveness of the Endangered Species Act will depend on the designation of critical habitat.*¹³

Following the Supreme Court's landmark decision in *Tennessee Valley Authority v. Hill*, 437 U.S. 153 (1978), Congress amended the ESA again in 1978 to address several policy issues related to the Section 7 consultation process and the Federal government's obligation to avoid jeopardizing the continued existence of any threatened or endangered species. Hence, the 1978 amendments clarified the consultation process and created an exemption process for Federal projects where jeopardy and/or the loss of critical habitat could not be avoided. Congress made two specific changes to the ESA to make clear the Service's obligation to designate critical habitat. First, Congress provided a definition for "critical habitat" as:

- (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, 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 protection; and
- (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.¹⁴

Second, Congress modified Section 4 of the ESA to read as follows:

At the time any such regulation is proposed, the Secretary *shall* also by regulation, to the maximum extent prudent, specify any habitat of such species which is then considered to be critical habitat.¹⁵

What was once an optional, rarely completed, exercise became a mandatory duty for all species listed after the 1978 Amendments. Several courts have since made clear that designating critical habitat for species listed before 1978 is discretionary, while for species listed after 1978, designation is mandatory. For example, in *Conservancy of Southwest Florida v. U.S. Fish and Wildlife Service*, the 11th Circuit explained:

Congress amended the ESA to require that "[a]t the time any such regulation [listing a species as endangered or threatened] is proposed, the Secretary shall also by regulation, to the maximum extent prudent, specify any habitat of such species which is then considered to be critical habitat." The 1978 amendments also provided, however, that this requirement "shall not apply with respect to any species which was listed prior to enactment of the [1978 amendments]." As for those species, Congress instead allowed that "[c]ritical habitat may be established." The law now stands, in relevant part, essentially as the 1978

¹³ H.R. Rep. No. 94-887, at 3 (1976) (emphasis added).

¹⁴ 16 U.S.C. § 1532(5).

¹⁵ Endangered Species Act Amendments of 1978, Pub. L. No. 95-632, § 11(1), 92 Stat. 3751, 3764 (emphasis added).

amendments left it, although further amendments in 1982 modified slightly the required timing of the critical-habitat designation.⁴ Under current law, the Secretary generally must designate critical habitat “concurrently with making a determination...that a species is an endangered species or a threatened species.”¹⁶

Thus, following the 1978 Amendments, the law became quite clear — the Service “shall” designate critical habitat to the “maximum extent” prudent. Furthermore, Congress was quite clear what this non-discretionary mandate required of the Service — critical habitat would be designated for the overwhelming majority of species moving forward:

The committee intends that in most situations the Secretary will, in fact, designate critical habitat at the same time that a species is listed as either endangered or threatened. It is only in *rare* circumstances where the specification of critical habitat concurrently with the listing would not be beneficial to the species.¹⁷

Despite this clear instruction, a large number of species listed after 1978 did not receive critical habitat. In fact, between the end of 1978 and the end of 1982 — the next time Congress amended the ESA to address critical habitat — over 80 species failed to receive any designated critical habitat. In 1982, Congress again amended Section 4 of the ESA by including a clear process and strict deadlines for the completion of all listing decisions and critical habitat determinations. However, the fundamental requirement to designate critical habitat for all post-1978 listed species remained unaltered. The 1982 amendments slightly modified the 1978 requirement from requiring the designation of critical habitat to the “maximum extent prudent” to requiring “to the maximum extent prudent and determinable.”¹⁸ Other provisions of Section 4 of the ESA make clear that if critical habitat is not “determinable” at the time of listing, that this only provides the Service with one additional year to collect data and make a final designation of critical habitat. As Congress explained in 1982:

At the present time, the Secretary is required to withdraw a proposal from further consideration if he fails to make a final determination with respect to the status of the species within two years after it has been proposed for listing or delisting. Since 1978, this requirement has caused the Secretary to withdraw numerous listing proposals solely because the Secretary has been unable, within the prescribed two year period, to complete the economic analysis of critical habitat designation. Other proposals have been withdrawn because the scientific information necessary to designate critical habitat has been unavailable.¹⁹

¹⁶ 677 F.3d 1073, 1075 (11th Cir. 2012); *See also*, *Center for Biological Diversity v. Fish and Wildlife Service*, 450 F.3d 930 (9th Cir. 2006) (“While the Service ‘shall’ designate critical habitat, it ‘may’ revise critical habitat designations ‘from time-to-time... as appropriate.’ When ‘may’ and ‘shall’ are both used in a statute, ‘the normal inference is that each is being used in its ordinary sense — the one being permissive, the other mandatory.’ It follows that critical habitat designations are mandatory, but revisions are discretionary.”) (internal citations omitted).

¹⁷ H.R. Rep. No. 95-1625 at 17 (1978), reprinted in 1978 U.S.C.C.A.N. 9453, 9467 (emphasis added).

¹⁸ Endangered Species Act Amendments of 1982 Amendments, Pub. L. 97-3041 § 2, 96 Stat. 1411 (Oct. 13, 1982) (emphasis added).

¹⁹ S. Rep. No. 418, 97th Cong., 2d Sess. 11 (1982); *see also* H.R. Rep. No. 567, 97th Cong., 2d Sess., at 11-12, reprinted in 1982 U.S.C.C.A.N. 2807.

By providing an additional 12 months to determine critical habitat, Congress made clear that designation of critical habitat should occur even with less-than-perfect information, rather than using uncertainty as a means to either perpetually delay designation or deny designation altogether. As the House Committee on Merchant Marine and Fisheries explained:

By the inclusion of the word “determinable” the Committee recognizes that, because of the combination of biological studies and the economic analysis required under Section 4(b)(4) of the Act...it may be difficult to determine the most appropriate critical habitat within the time frame contained in the legislation for the listing of species. The Committee feels strongly, however, that, *where the biology relating to the status of the species is clear*, it should not be denied the protection of the Act because of the inability of the Secretary to complete the work necessary to designate critical habitat....²⁰

Thus, the legislative history of the ESA from 1978 through 1982 makes abundantly clear that the intent of Congress was for the Service to designate critical habitat absent extraordinary circumstances.²¹ But despite this clear Congressional intent, the Service wrongly has utilized the “maximum extent prudent and determinable” provision in the ESA as an escape clause to *avoid* designating critical habitat for hundreds of threatened and endangered species that were listed between 1978 and the present. Despite the virtual universal rejection by Federal courts of the Service’s repeated tactic of using the “maximum extent prudent and determinable” provision of the ESA to avoid designation, the Service has taken little affirmative action to remedy this situation even for the most-imperiled of these post-1978 listed species.

The conservation harm to the threatened and endangered species that were wrongly denied critical habitat has been substantial. According to the Service’s 2010 report to Congress on the recovery of listed species, there are nearly 100 endangered and threatened species that never received critical habitat and whose conservation status continues to decline or whose conservation status is uncertain due to lack of information. The lack of the critical habitat safeguard has made it harder to address and redress impacts to listed species, and the absence of spatial information has hindered recovery implementation efforts. This petition addresses a few of these highly imperiled species in the hope that the Service will begin taking proactive control of its own recovery implementation efforts to prioritize conservation efforts for the most neglected, high-risk species already protected by the ESA.

II. Abuse of the “Not Prudent and Determinable” Exception for Designating Critical Habitat.

Since 1978, the Service has made hundreds of “not prudent” determinations with respect to the designation of critical habitat. Of the 715 species that were listed between 1978 and 2000, approximately 600 species (84 percent) received no critical habitat primarily because the Service

²⁰ H.R. Rep. No. 567, 97th Cong., 2d Sess., at 19-20, *reprinted in* 1982 U.S.C.C.A.N. 2807, 2819-20 (emphasis added).

²¹ *See, Enos v. Marsh*, 769 F.2d 1363, 1371 (9th Cir. 1985) (holding that the Secretary “may only fail to designate a critical habitat under rare circumstances”); *Northern Spotted Owl v. Lujan*, 758 F. Supp. 621, 626 (W.D. Wash. 1991) (“This legislative history leaves little room for doubt regarding the intent of Congress: The designation of critical habitat is to coincide with the final listing decision absent *extraordinary* circumstances.”).

concluded that it would be “not prudent” to do so. The Service’s rationale for these “not prudent” determinations fell into two general categories: (1) designating critical habitat would increase the risks to the species from illegal take/collection; or (2) designating critical habitat would provide no additional conservation benefit beyond that provided by other regulatory provisions of the ESA. The use of these generic, overbroad rationales for invoking the “not prudent” exception have been rejected by Federal courts.

A. Increased Risk of Harm to Species

In declining to designate critical habitat, the Service routinely asserted that the designation of critical habitat would make a species more vulnerable to harm by making it easier to maliciously destroy or vandalize habitats; making it easier to directly kill, poach or take listed species; or making it easier to collect species for trade. The Service contended it was “not prudent” to designate critical habitat for eight of the nine species in this petition based on this generic assertion that designation would increase the risk of harm from willful killing, vandalism, and collection.

Congress was certainly aware that when geographically detailed information is available to the public, this can increase the risks to an endangered species, especially when that species is targeted for collection/harvest for illegal trade. In fact, Congress anticipated the threat of taking to some endangered or threatened species, but it declared that designation of critical habitat is the general rule:

...the designation of critical habitat for some endangered plants may only encourage individuals to collect these plants to the species’ ultimate detriment. The committee intends that in most situations the Secretary will, in fact, designate critical habitat at the same time that a species is listed as either endangered or threatened. It is only in rare circumstances where the specification of critical habitat concurrently with the listing would not be beneficial to the species.²²

The ESA and Federal courts have made clear that, as a general rule, designation should be made unless there is specific, factual evidence that such a designation is not beneficial. The Service must consider evidence specific to each species regarding the increased likelihood of taking caused by the designation of a critical habitat and must complete a detailed assessment of the risks and benefits of designation if it determines that it is not prudent to designate critical habitat. The Service cannot unilaterally declare that designating any or all potential critical habitat for a particular species would categorically place such species at increased risk.

For example, in 1993, the Service declined to designate any critical habitat for the California Gnatcatcher (*Poliophtila californica*) when it listed the species as threatened, because doing so—according to the Service—would enable landowners to identify gnatcatcher sites and “likely make the species more vulnerable to [prohibited takings] activities.”²³ The Ninth Circuit rejected this generic rationale because, even if designation of critical habitat increased the risk of

²² H.R. Rep. No. 95-1625 at 17 (1978), reprinted in 1978 U.S.C.A.N. 9453, 9467.

²³ *Determination of Threatened Status for the Coastal California Gnatcatcher*, 58 Fed. Reg. 16742, 16756 (Mar. 30, 1993).

poaching or take, the Service must balance the benefits and harms of designating critical habitat under Section 4(b)(2) of the Act. The Service can only exclude *portions* of habitat from designation “if the benefits of such exclusion *outweigh the benefits* of specifying such area as part of the critical habitat.”²⁴ The court held that the Service failed to weigh the benefits of designation against the risks of designation. The record showed only a few instances of deliberate habitat destruction across more than 400,000 acres of suitable gnatcatcher habitat, which suggested that deliberate habitat destruction was very rare. The Service failed to identify any evidence showing designation would cause more landowners to destroy, rather than protect, gnatcatcher habitat. While it might have been appropriate to exclude some small, specific portion of habitat based on a *real* threat of poaching or other willful habitat destruction, this potential threat did not justify refusing to designate *any* critical habitat for the species.²⁵

Likewise, when the Service listed the California red-legged frog in 1996 under the ESA as a threatened species, it declined to designate critical habitat because doing so “would reveal precise locality data” and consequently make the frog more vulnerable to vandalism and taking.²⁶ This generic assertion was rejected because there were simply no specific facts to support it. As the court explained in *Jumping Frog Research Institute v. Babbitt*, the listing decision and publicly available documents in the record already disclosed the locations of red-legged frog populations, frog population locations were already well-documented and well-known to the people who lived nearby, and despite this knowledge there were no indications that this publicly available knowledge put the red-legged frog at greater risk of poaching or take.²⁷

Furthermore, the Service failed to weigh the possible benefits of designating critical habitat against the possible risk of increased harm to the red-legged frog. As the court explained, the critical designation “would itself inform the public as well as state and local governments about locations and habitat needs of imperiled species. Where the public is educated as to the location and specific habitat needs of imperiled species at risk, inadvertent acts of destruction may be avoided.”²⁸ By failing to consider the benefits of designation, the Service could not determine if designation would result in a net benefit to the red-legged frog.

B. No Benefit to the Species

The other “not prudent” rationale advanced by the Service was that designating critical habitat would provide “no benefit” to the species. In these instances, the Service categorically asserted that designating critical habitat would provide no additional benefit when, for example, a species was found on public lands and was already protected by other regulatory mechanisms.²⁹

²⁴ *Natural Resources Defense Council v. Dept. of Interior*, 113 F.3d 1121, 1125 (9th Cir. 1996) (emphasis added); see also, 16 U.S.C. § 1533(b)(2).

²⁵ *Id.*

²⁶ *Jumping Frog Research Institute v. Babbitt*, 1999 U.S. Dist. LEXIS 23175 (N.D. Cal., Dec. 15, 1999).

²⁷ *Id.* at *5.

²⁸ *Id.* at *4.

²⁹ See, e.g., *Designation of Critical Habitat for the California Tiger Salamander in Sonoma County*, 70 Fed. Reg. 44301 (Aug. 2, 2005) (“the Service has found that the designation of statutory critical habitat provides little additional protection to most listed species, while consuming significant amounts of available conservation resources. The Service’s present system for designating critical habitat has evolved since its original statutory prescription into a process that provides little real conservation benefit, is driven by litigation and the courts rather

Conversely, when a listed species was found mostly on private lands, the Service would assert that designating critical habitat “would not appreciably benefit the species” because critical habitat only impacts activities when there is a clear Federal nexus invoking a Federal action.³⁰ Occasionally, the Services offered a third rationale: designating critical habitat proved no benefits beyond what already existed from the “jeopardy” prohibition within Section 7 — the prohibitions were functionally equivalent.³¹

These assertions were repeatedly rejected by courts because, at its most basic, designating critical habitat does benefit the vast and overwhelming number of listed species beyond the Section 7 jeopardy prohibition. Even on private lands where they may not always be a Federal nexus triggering consultations, designating critical habitat provides several important benefits.³² First, designating critical habitat is precautionary — even if no Federal activity currently occurs on private land, there may be Federal activity in the future that will trigger consultations, and it is highly unlikely that the Service would designate a critical habitat at that time or that such a designation would be timely. Second, the designation itself informs the public as well as the state and local governments allowing all parties to engage in targeted conservation efforts. It is generally difficult to efficiently or effectively plan conservation if no one knows where threatened and endangered species are located. Impacts to many listed species are caused by inadvertent acts that degrade habitat. Education of the public and state and local government may reduce these threats.

Third, a critical habitat designation establishes a uniform framework for the development of a recovery plan and for consultations. In the absence of critical habitat, determining which areas

than biology, limits our ability to fully evaluate the science involved, consumes enormous agency resources, and imposes huge social and economic costs.”).

³⁰ *Natural Resources Defense Council v. Dept. of Interior*, 113 F.3d at 1126.

³¹ See, e.g., *Sierra Club v. U.S. Fish and Wildlife Service*, 245 F. 3d 434 (5th Cir. 2001) (Service declined to designate critical habitat for Gulf Sturgeon because “designation would not provide additional benefit to the species beyond other statutory regimes and conservation programs in place.”).

³² See, *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27066 at 27067 (May 12, 2014) (“Once critical habitat is designated, it provides for the conservation of listed species in several ways. Specifying the geographic location of critical habitat facilitates implementation of section 7(a)(1) of the Act by identifying areas where Federal agencies can focus their conservation programs and use their authorities to further the purposes of the Act. Designating critical habitat also helps focus the conservation efforts of other conservation partners, such as State and local governments, nongovernmental organizations, and individuals. Furthermore, when designation of critical habitat occurs near the time of listing it provides early conservation planning guidance (e.g., identifying some of the areas that are needed for recovery, the physical and biological features needed for the species, and special management considerations or protections) to bridge the gap until the Services can complete more thorough recovery planning. In addition to serving as a notification tool, the designation of critical habitat also provides a significant regulatory protection—the requirement that Federal agencies consult with the Services under section 7(a)(2) of the Act to ensure that their actions are not likely to destroy or adversely modify critical habitat. The Federal Government, through its role in water management, flood control, regulation of resources extraction and other industries, Federal land management, and the funding, authorization, and implementation of a myriad of other activities, may propose actions that are likely to affect critical habitat. The designation of critical habitat ensures that the Federal Government considers the effects of its actions on habitat important to species’ conservation and avoids or modifies those actions that are likely to destroy or adversely modify critical habitat. This benefit should be especially valuable when, for example, species presence or habitats are ephemeral in nature, species presence is difficult to establish through surveys (e.g., when a species such as a plant’s ‘presence’ may be limited to a seed bank), or protection of unoccupied habitat is essential for the conservation of the species.”).

are important to a species' conservation is made piecemeal and in an *ad hoc* manner, as individual Federal projects arise and agencies consult with the Service. This creates inconsistencies and inefficiencies in the implementation of the ESA and potentially undermine species conservation work. Thus, a critical habitat designation ensures that the proper attention and focus is provided in determining a recovery plan.³³

On public lands and where a clear Federal nexus exists through a Federal action, there are further benefits in designating critical habitat beyond those mentioned above. The Section 7 prohibition on jeopardy is not equivalent to the prohibition on adverse modification or destruction of critical habitat. While it is certainly clear that these two inquiries can and do overlap (for example, as in *Tennessee Valley Authority v. Hill* where the proposed agency action to build a dam would both destroy a species' habitat and kill individual members of the species at the same time), many agency actions do cause adverse modification to critical habitat without rising to the level of harm causing jeopardy to the species as a whole.³⁴ The Service promulgated regulations in 1986 that defined "jeopardize the continued existence" of a species and "destruction or adverse modification" of critical habitat to mean essentially the same thing.³⁵ This became known as Service's policy of "functional equivalence," in which the Section 7 prohibition against actions that jeopardize listed species was virtually identical to the Section 7 prohibition against actions that adversely modify critical habitat. As a result of the functional equivalence policy, the Service came to view critical habitat designations as serving "a minimal additional function separate from the listing," and as "unhelpful, duplicative, and unnecessary."³⁶ As such, the Service routinely argued that critical habitat designations would have no real benefit to listed species.

However, the Fifth Circuit Court of Appeals rejected the Service's functional equivalence theory in a case challenging the Service's failure to designate critical habitat for the Gulf sturgeon. The Fifth Circuit explained:

The ESA defines "critical habitat" as areas which are "essential to the conservation" of listed species. "Conservation" is a much broader concept than mere survival. The ESA's definition of "conservation" speaks to the recovery of a threatened or endangered species. Indeed, in a different section of the ESA, the statute distinguishes between "conservation" and "survival." Requiring consultation only where an action affects the value of critical habitat to both the recovery and survival of a species imposes a higher threshold than the statutory language permits....

³³ *Northern Spotted Owl v. Lujan*, 758 F. Supp. 621, 629 (W.D. Wash. 1991) ("Common sense dictates that the spotted owl would be poorly served by a hastily crafted or uninformed habitat plan.").

³⁴ See Owen, D. 2012. *Critical Habitat and the Challenge of Regulating Small Harms*. Florida Law Review 64:141-199.

³⁵ 50 C.F.R. § 402.02.

³⁶ *Cape Hatteras Access Pres. Alliance v. U.S. Dept. of Interior*, 344 F. Supp. 2d 108, 127 (D.D.C. 2004); *N.M. Cattle Growers Ass'n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277, 1283 (10th Cir. 2001).

As we have concluded that the regulatory definition of the destruction/adverse modification standard is flawed, this ‘functional equivalence’ argument is untenable.”³⁷

These court decisions prompted the Service to change its policy and recognize that critical habitat provides increased protection for species beyond the actual listing.³⁸ And in 2014, the Service proposed a new regulatory definition for the phrase “destruction or adverse modification” of critical habitat that also rejects the logic of the “functional equivalence” policy.³⁹ Indeed, the ESA’s prohibition on “destruction or adverse modification” provides an important check on actions that impact habitat, but do not individually rise to the level that would jeopardize the existence of listed species. In sum, designating critical habitat “provides substantial, additional protection for a species beyond the consultation requirement.”⁴⁰

Perhaps most importantly, designating critical habitat furthers the two goals of the ESA: the recovery of listed species, and the protection of ecosystems upon which endangered species depend. These two goals are intertwined — most species have become endangered due to habitat loss and habitat degradation. Not surprisingly, research has shown that species with critical habitat are twice as likely to be recovering as species without designated critical habitat.⁴¹

For the nine species in this petition, the Service invoked the “not prudent” rationale to avoid designation of critical habitat. For all of these species, declining to designate critical habitat is a clear violation of the ESA. Accordingly, the Center hereby petitions the Service to designate critical habitat for each of these species as follows:

³⁷ *Sierra Club v. U.S. Fish and Wildlife Service*, 245 F.3d 434 (5th Cir. 2001); *Gifford Pinchot Task Force v. United States Fish & Wildlife Service*, 378 F.3d 1059, 1069-70 (9th Cir. 2004).

³⁸ USFWS, 2004. Application of the “Destruction or Adverse Modification” Standard under Section 7(a)(2) of the Endangered Species Act (Dec. 9, 2004), available at: <http://www.fws.gov/midwest/endangered/permits/hcp/pdf/AdverseModGuidance.pdf>.

³⁹ *Definition of Destruction or Adverse Modification of Critical Habitat*, 79Fed. Reg. 27060 (May 12, 2014)

⁴⁰ *Conservation Council for Hawaii v. Babbitt*, 2 F. Supp. 2d 1280 (D. Haw. 1998).

⁴¹ Taylor, M. T., K. S. Suckling, and R. R. Rachlinski. 2005. *The effectiveness of the Endangered Species Act: A quantitative analysis*. *BioScience* 55 (4): 360–367.

I. Critical Habitat Designation for the Shenandoah Salamander

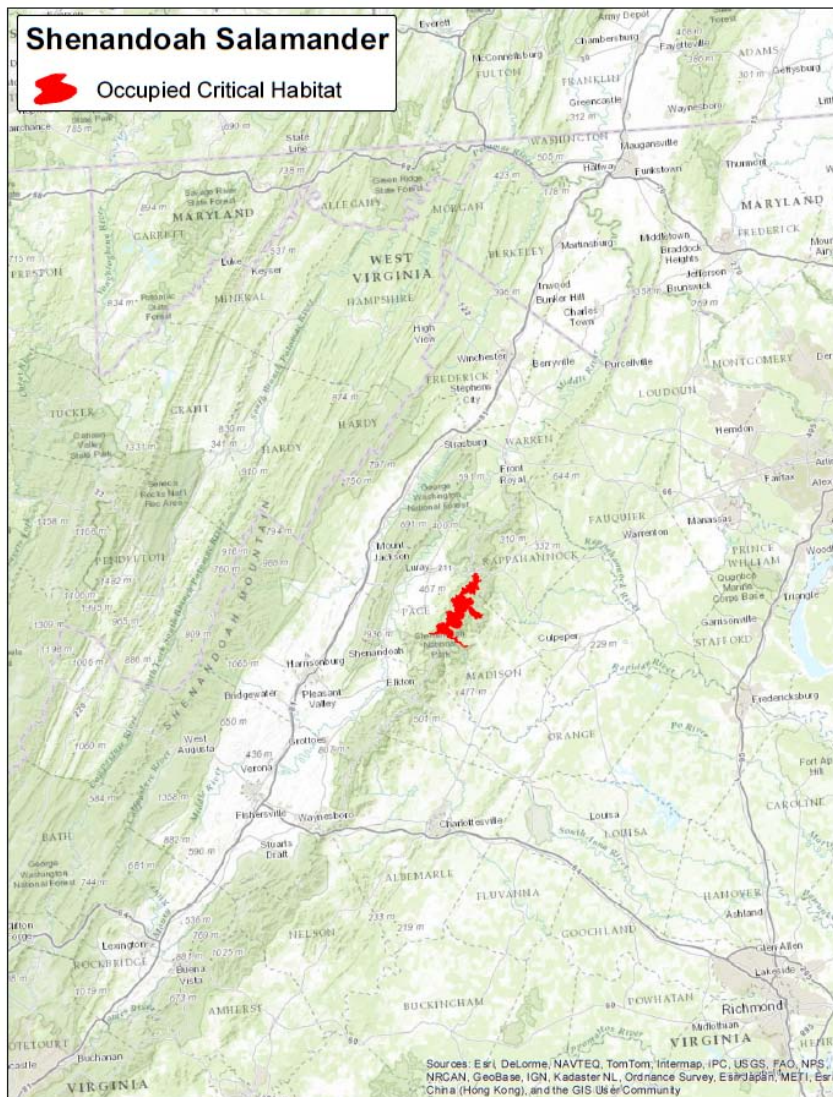


Figure One.

The Center requests that the Service designate approximately 16,891 acres as critical habitat for the Shenandoah Salamander (*Plethodon shenandoah*) as shown in Figure One. These areas contain the physical and biological features that are essential to the conservation of the salamander, and would help further the recovery of this declining species.

The Shenandoah Salamander is a small, exclusively terrestrial salamander that is found on three mountain ridges within Shenandoah National Park. The salamander requires very specific habitat conditions — cool and moist montane forests above 800 meters (2600 ft) with an understory that includes talus or rocky debris. While the salamander has always been restricted to these high-elevation mountains in the Virginia, it is under increasing threats from climate change, the spread of invasive species, pollution, and human activities.

The Shenandoah salamander was protected as an endangered species in 1989.⁴² At the time of listing, the Service stated that designating critical habitat for the salamander was not prudent, claiming that doing so “would result in no known benefit to the species” and “[n]early all of the known habitat for the salamander is under the jurisdiction of Federal agencies.”⁴³ Despite the fact that the salamander’s habitat is exclusively on Federal lands, the species’ habitat is under continued threat from fragmentation and continues to degrade.⁴⁴ The Shenandoah Salamander’s recovery is also threatened by human activities within Shenandoah National Park, including National Park Service management, construction, and maintenance. Designating critical habitat listing would likely address potentially incompatible Park Service management and would be beneficial for the conservation of this declining species.

A. Natural History, Threats, and Conservation Status of the Shenandoah Salamander

1. Natural History

The Shenandoah Salamander is a slender, moderate-sized salamander with a total length between 3.5-4.5 inches.⁴⁵ Individuals can occur in two color phases: a striped phase with a narrow red or yellow stripe down the length of the back, or a uniformly-black phase with brass-colored flecks.⁴⁶ It was once considered a subspecies of the Ravine Salamander (*Plethodon richmondi*) but subsequent genetic analyses resulted in it being elevated to full species status in 1979.⁴⁷ The Shenandoah Salamander is exclusively terrestrial and belongs to the genus *Plethodon*, a group also referred to as woodland salamanders. *Plethodon* salamanders are lungless, and breathe through their skin surface, requiring that their skin remain moist at all time.⁴⁸ This respiratory mechanism restricts the maximum size of these salamanders and influences their behavioral patterns and distribution in the environment. Shenandoah Salamanders are mainly nocturnal, remaining under cover during the day, and restricting activity during drought.⁴⁹

The Shenandoah Salamander is found almost completely within the boundaries of Shenandoah National Park and primarily on three mountains (Hawksbill, The Pinnacles, and Stony Man). On those mountains, it is found on talus slopes, at elevations above 800 meters, and usually on the north-facing aspects of those mountains.⁵⁰ Additional survey work in the early 1990s extended

⁴² *Determination of Threatened Status for the Cheat Mountain Salamander and Endangered Status for the Shenandoah Salamander*, 54 Fed. Reg. 34464 (Aug. 18, 1989).

⁴³ *Id.*

⁴⁴ USFWS, 2012. PROGRAMMATIC BIOLOGICAL OPINION FOR SHENANDOAH NATIONAL PARK MANAGEMENT ACTIVITIES (hereafter “SALAMANDER BIOP”) at 22 (May 4, 2012). The Service initiated a status review for the Shenandoah Salamander in 2008 (73 Fed. Reg. 3991) and again in 2012 (77 Fed. Reg. 13251), but has not completed the review for the Salamander. The 2012 biological opinion represents the most current information on the status of the Shenandoah Salamander.

⁴⁵ USFWS, 1994. SHENANDOAH SALAMANDER (*PLETHODON SHENANDOAH*): RECOVERY PLAN (hereafter “SALAMANDER RECOVERY PLAN”) (Sept. 29, 1994) at 7-8, available at: http://ecos.fws.gov/docs/recovery_plan/940929a.pdf.

⁴⁶ *Id.* at 1.

⁴⁷ Highton, R. and A. Larson. 1979. *The genetic relationships of the salamanders of the genus Plethodon*. Syst. Zool. 28: 579-99.

⁴⁸ SALAMANDER RECOVERY PLAN at 2.

⁴⁹ *Id.* at 6

⁵⁰ *Id.* at 2.

the distribution on Stony Man to include Bushytop and a narrow area below Hemlock Springs Overlook.⁵¹ More recently, the USGS National Gap Analysis Program (“GAP”) has extended this distribution further using a deductive model to predict areas suitable for occupation within a species’ range. This model identified additional high elevation slopes in Shenandoah National Park, including Old Rag Mountain, as potential habitat.⁵²

On these mountains, the Shenandoah Salamander is generally found in cool, montane forests, where the presence of an over-story promotes surface moisture. Home ranges tend to be very small and are only a few meters to a few dozen meters in diameter.⁵³ The Salamander is confined to deep pockets of soil within the talus on the north and northwestern faces of mountains in mixed-conifer forest in areas that are shaded and moisture is present.⁵⁴ These areas provide the moist conditions and shelter, in the form of crevices, needed to maintain the skin moisture required for respiration.⁵⁵ Seasonal rainfall patterns strongly influence salamander surface activity, which typically terminates in October and usually resumes in April. The Salamanders forage on the surface of the leaf litter and in low vegetation during moist nights.⁵⁶ Their diet generally consists of mites, springtails, flies, small beetles, and other soil invertebrates small enough to be ingested.⁵⁷

Breeding takes place in late spring or summer, via internal fertilization. In contrast with most salamanders, complete development of the embryo takes place within the egg, thus eliminating the aquatic larval stage and the need for habitat with larger water sources.⁵⁸ Small egg clusters (3-17 eggs) are guarded by the female Shenandoah Salamanders after being laid in damp logs, moss, or other available crevices. Incubation lasts one to three months, during which time the female does not forage for food.⁵⁹ Females do not breed before four years of age, and breed only every other year. Adult survival is high and life span long, with a small percentage surviving 25 years or longer.⁶⁰

2. Threats to the Shenandoah Salamander

While the Shenandoah salamander was naturally uncommon, human activities pose a continuing and growing threat to this species. Primary threats to the Shenandoah Salamander include (1) defoliation of trees within its habitat associated with outbreaks of introduced, non-native forest pests, most prominently the gypsy moths (*Lymantria dispar*) and hemlock woolly adelgids (*Adelges tsugae*); (2) degradation of forest canopy and changes in soil chemistry due to acid rain deposition and other sources of atmospheric pollution; (3) loss of suitable habitat due to climate

⁵¹ SALAMANDER BiOP at 21-22.

⁵² U.S. Geological Survey Gap Analysis Program. 2011. National GAP vertebrate species distribution model. <http://gapanalysis.usgs.gov/species>.

⁵³ Glenn A. Marvin & A.H. Price, *Age, Growth, and Long-Term Site Fidelity in the Terrestrial Plethodontid Salamander Plethodon kentucki*, 2001 COPEIA 108-117 (2001).

⁵⁴ SALAMANDER RECOVERY PLAN at 2-3.

⁵⁵ *Id.* at 5-6.

⁵⁶ See Robert G. Jaeger, *Plant climbing by salamanders: Periodic availability of plant-dwelling prey*, 1978 COPEIA 686-691 (1978).

⁵⁷ SALAMANDER RECOVERY PLAN at 6.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

change; and (4) loss of habitat connectivity and direct harm to habitat due to inadequate management of human activities within Shenandoah National Park.⁶¹

Defoliation and tree mortality associated with gypsy moths and hemlock wooly adelgids are causing significant changes to mature forest composition within Shenandoah National Park, which in turn threatens the Shenandoah Salamander.⁶² Loss in canopy cover results in increased ground-level insulation, resulting in drier conditions overall, and with potentially-harmful impacts to Salamander populations. Shenandoah Salamander have been found to occupy red oak-dominated forests, which have particularly hard hit by the gypsy moth. Hemlock mortality can also change soil chemistry, increasing soil acidity, which in turn can alter invertebrate populations to the detriment of foraging Salamanders.⁶³

Acid rain deposition and other atmospheric pollution represent additional threats to the Shenandoah Salamander's habitat. For example, acid rain deposition may act synergistically with forest insect pests, further increasing tree mortality. These Salamanders are particularly susceptible to the irritating effects acid deposition has on their integument — the outer skin layer — as they forage during rainy or foggy weather. Moreover, acidification of its habitat substrate could affect the species' food supply and could impair reproduction by directly affecting egg hatchability and neonate viability.⁶⁴

The Shenandoah Salamander will likely be negatively impacted by global climate change. Climate change is expected to result in dramatic alterations to the Appalachians, with the most severe impacts anticipated in high-elevation habitats. Rapid and significant changes in temperature and moisture will likely result in changing forest structure and vegetation communities. The high-elevation forests that the Salamander requires will become more and more fragmented, with some forest areas potentially disappearing altogether.⁶⁵

Finally, management by the National Park Service and impacts from human recreational activities pose a threat to the Shenandoah Salamander if those threats are not adequately mitigated. Use and maintenance of roads and trails, backcountry camping, and other park traffic are known to disturb soil and vegetation features essential to the Shenandoah Salamander and may exacerbate habitat fragmentation.⁶⁶ In addition, use of pesticides and herbicides for weed control may also negatively impact Salamander populations, caused by direct effects or negative effects on food availability.⁶⁷

3. Conservation Status of the Shenandoah Salamander

The Shenandoah Salamander is known primarily from three isolated populations within the Shenandoah National Park in Virginia — Hawksbill Mountain, the Pinnacles, and Stony Man

⁶¹ SALAMANDER BIOP at 29-35.

⁶² *Id.*

⁶³ *Id.* at 21.

⁶⁴ *Id.* at 22.

⁶⁵ *Id.* at 23.

⁶⁶ See Hartwell H. Welsh Jr. & Sam Droege, *A Case for Using Plethodontid Salamanders for Monitoring Biodiversity and Ecosystem Integrity of North American Forests*, 15 CONSERVATION BIOLOGY 558-564 (2001).

⁶⁷ SALAMANDER BIOP at 30.

Mountain — and is mostly confined to pockets of soil and/or vegetative debris at elevations above 800 meters.⁶⁸ Historical abundance of the species is general unknown, but current abundance apparently varies depending on microhabitat location. In the area of occurrence that overlap with eastern red-backed salamanders generally outside of talus habitats, Shenandoah Salamander density is low. In contrast, in areas within talus habitat that do not overlap with red-backed salamanders, densities are likely higher. Surveys initiated in 2007 indicate that the largest populations are on Hawksbill and Stonyman Mountains and smaller populations are found on the Pinnacles and the site near Hemlock Spring Overlook.⁶⁹ Based on survey data, spring populations were estimated at 140,652 in 2008 and at 110,265 in 2009. However, additional survey data must be obtained before more accurate population estimates and trends can be determined.⁷⁰ The 2010 Report to Congress acknowledges the lack of data regarding the Shenandoah Salamander by designating the species with an “uncertain” conservation status.⁷¹

Although the species has not yet received a complete status review, a biological opinion completed in 2012 assessed the National Park Service’s ongoing management activities at Shenandoah National Park, and concluded that the Salamander is still experiencing declines from habitat degradation, specifically due to anthropogenic activities.⁷² Due to its endangered status, likely declines, and susceptibility to anthropogenic threats, habitat impacts must be better addressed.

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The ESA defines “critical habitat” as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”⁷³ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.⁷⁴

Physical or biological features include those that 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.⁷⁵

⁶⁸ SALAMANDER RECOVERY PLAN at 2. 1994; NatureServe Explorer, Global Conservation Status Factors for the Shenandoah Salamander; Virginia Dep’t of Game & Inland Fisheries, *Shenandoah Salamander Distribution*.

⁶⁹ SALAMANDER BIOP at 21-22.

⁷⁰ *Id.* at 22.

⁷¹ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

⁷² SALAMANDER BIOP at 21.

⁷³ 16 U.S.C. § 1532(5)(A)(i).

⁷⁴ 16 U.S.C. § 1532(5)(A)(ii).

⁷⁵ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

The ESA allows the Service to designate occupied critical habitat years after a species is listed.⁷⁶ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”⁷⁷ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” As an example, when designating critical habitat for the jaguar (*Panthera onca*) in 2014, the Service determined that sightings within 10 years of the species’ listing in 1972 would still qualify as “occupied” critical habitat.⁷⁸ For the purposes of this petition, given the uncertainties regarding the distribution of the Shenandoah Salamander at the time of listing, the Center believes that all of the areas requested as critical habitat qualify as “occupied” critical habitat.

Physical features of critical habitat for the Shenandoah Salamander include high-elevation, north-facing, talus slopes above 800 meters; cool microclimates that retain moisture; burrow and natural crevices that provide sheltering and nesting locations; and habitat connectivity between these core habitat areas to preserve metapopulation dynamics.⁷⁹ Biological features of critical habitat include forest-canopy cover of either hemlock or oak; leaf-litter substrate layer that supports cool, moist microhabitat; and sufficient invertebrate prey availability.

Given the restricted range and narrow habitat requirements of this species, the Center was unable to identify unoccupied areas that are essential to the conservation of the Shenandoah Salamander that should be designated as critical habitat. However, this petition requests that, as part of its evaluation, the Service conduct a review and determine whether unoccupied areas should be included within any final critical habitat designated for this species.⁸⁰

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.⁸¹ Thus, the consideration of whether features in an area may require special

⁷⁶ See, *Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev’d on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

⁷⁷ 16 U.S.C. § 1532(5)(A)(i).

⁷⁸ *Designation of Critical Habitat for Jaguar*, 79 Fed. Reg. 12572 (Mar. 5, 2014).

⁷⁹ SALAMANDER RECOVERY PLAN at 2.

⁸⁰ 16 U.S.C. § 1532(5)(A)(ii) (critical habitat is to include the “specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act ... upon a determination by the Secretary that such areas are essential for the conservation of the species”).

⁸¹ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

management or protection occurs independent of whether any form of management or protection occurs in the area.⁸²

It is clear that the proposed areas of critical habitat may require special management considerations to address the threats to this species' critical habitat. The National Park Service has already begun to manage some of the threats to forest habitats through control efforts targeting the gypsy moth and the hemlock wooly adelgids. The Park Service also manages human activities within Shenandoah National Park by limiting and controlling human access to sensitive areas. However, most human use areas in the Park are at high-elevation locations, and more management protections are required to ensure connectivity between salamander populations and to protect high quality habitats including restrictions on road maintenance and construction and trail construction. Finally, the Clean Air Act includes several provisions to prevent acid rain deposition and to prevent visibility impairment in class I areas such as National Parks.⁸³

D. Critical Habitat Designation Is Both Prudent and Determinable

As explained in Part I of this petition, critical habitat must be designated to the maximum extent prudent and determinable.⁸⁴ Here, the designation of critical habitat for the Shenandoah Salamander is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat or any portion thereof will place the Shenandoah Salamander at increased risk for take or destruction of salamander habitat. In addition, the above information demonstrates clearly that critical habitat is determinable for this species. Accordingly, the Center requests that the Service designate critical habitat for the Shenandoah Salamander in the area requested by the petition.

⁸² *Id.* See also, 79 Fed. Reg. 27006

⁸³ 42 U.S.C. § 7651; 42 U.S.C. § 7492.

⁸⁴ 16 U.S.C. § 1533(b)(6)(C)(ii).

II. Critical Habitat Designation for the Roseate Tern Northeast DPS

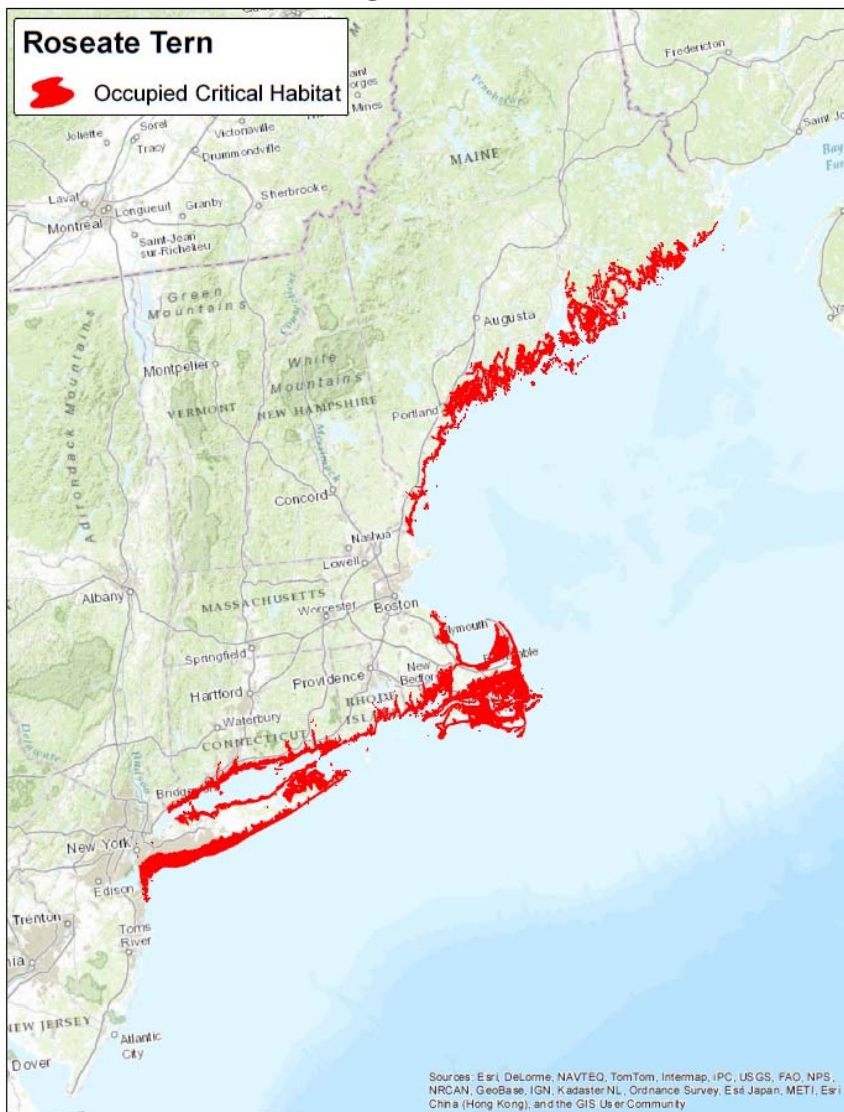


Figure Two.

The Center requests that the Service designate approximately 2,698,000 acres as critical habitat for the Roseate Tern Northeast DPS (*Sterna dougallii dougallii*), as shown in Figure Two. These areas contain the physical and biological features that are essential to the conservation of the Roseate Tern, and designating these areas would further the recovery of this declining species.

Roseate Terns are predominately tropical seabirds, breeding on small islands and protected beaches in tropical oceans across the world. The Northeast DPS is notable therefore, because it represents one of the few areas outside of the tropics that this seabird breeds. Roseate Terns arrive on their breeding grounds in late spring and are generally present in the northeastern United States through the early fall. Roseate Terns were severely impacted in the late 1800s due to the millinery trade, and have been harmed by the presence of invasive species on their island breeding grounds. Although the northeast population had rebounded following protection under

the Migratory Bird Treaty Act and then later under the Endangered Species Act, threats to the Roseate Tern are not abating, and the population in the Northeast DPS is significantly declining.

At the time of listing, the Service stated that designating critical habitat for the Roseate Tern was not prudent, claiming that there would be “no demonstrable overall benefit to the roseate tern in designating critical habitat and that such an action is not prudent at this time.”⁸⁵ The Service claimed that there would be no benefit because (1) other government agencies already were aware of the tern’s breeding locations (2) locations of some colonies and feeding areas change over time, and (3) following the breeding season, the terns dispersed into more pelagic areas that are difficult to identify.⁸⁶ These are not valid reasons to deny critical habitat and are no longer factually correct given additional knowledge of the Tern’s natural history. Designating critical habitat listing both onshore and offshore would likely address some of the threats faced by the Roseate Tern and would further the species’ recovery.

A. Natural History, Threats, and Conservation Status of the Roseate Tern Northeast DPS

1. Natural History

The Northeast DPS of the Roseate Tern is composed of the subspecies *Sterna dougallii dougallii*, which is one of four described subspecies of *Sterna dogallii*, and the only subspecies present in North America. The Roseate Tern is medium-sized (35-40 centimeters long) and weighs approximately 100-120 grams (4 ounces).⁸⁷ Several features morphologically distinguish the Roseate Tern from other tern species, including a distinct voice, shorter wings, very long white tail-streamers, and occasionally a faint roseate (pinkish) underside. Roseate Terns in the Northeast DPS have black bills, which change in color to an orange-red at the base during the breeding season.⁸⁸

Roseate Terns are exclusively marine — they usually breeds on small islands or on sand dunes at the end of barrier beaches. In the Northeast, Roseate Terns nest exclusively within colonies of the Common Tern (*Sterna hirundo*), with Roseate Terns usually nesting in more densely vegetated parts of the nesting colony, including in nest boxes and under objects that provide cover or shelter.⁸⁹ Colonies have a high density of nests, with nests typically between 20 and 70 inches apart and sometimes at even greater densities.

Roseate Terns are specialists that feed on small, schooling marine fish and forage over shallow marine coastal waters — shallow bays, tidal inlets, sandbars — surrounding the breeding

⁸⁵ *Determination of Endangered and Threatened Status for Two Populations of the Roseate Tern*, 52 Fed. Reg. 42064 (Nov. 2, 1987).

⁸⁶ *Id.*

⁸⁷ USFWS, 1998. ROSEATE TERN (*STERNA DOUGALLII*) NORTHEASTERN POPULATION RECOVERY PLAN (hereafter “TERN RECOVERY PLAN”) at 1, available at: http://ecos.fws.gov/docs/recovery_plan/981105.pdf.

⁸⁸ *Id.* at 3.

⁸⁹ Joanna Burger & Michael Gochfeld, *Nest Site Selection and Temporal Patterns in Habitat Use of Roseate and Common Terns*. 105 AUK 433-438 (1988); Jeffrey A. Spindel, 1996. *Comparisons of nesting habitat modification techniques for roseate terns at Falkner Island, CT*. Pages 18-21 in N. Ratcliffe, (ed.) *Proc. of the roseate tern workshop*, Glasgow University.

colonies.⁹⁰ These areas concentrate prey close to the surface, either from predatory fish chasing them from below or by vertical movements of the water. Roseate Terns usually feed in clearer and deeper water than those favored by Common Terns from the same colony sites and rarely feed close to shore or in marshy inlets.⁹¹ Generally, Roseate Terns forage at depths less than 16.5 feet (5 m), by either plunge-diving, plunging vertically into the water often from heights of 20 feet, and by surface-dipping.⁹² They often hunt in loose groups and fly long distances between dives and may even follow schools of predatory fish. Roseate Terns often forage at sites up to 15 miles (25 km) from their nesting colony; returning to these foraging sites each day.⁹³

Young Roseate Terns are dependent on their parents for food for a minimum of six weeks after fledging.⁹⁴ By late August and September, they disperse from the breeding area, and forage in larger groups as they prepare to migrate to tropical waters off of South America. Often, Roseate Terns will gather on barrier island beaches in large flocks, containing hundreds or even thousands of birds, in preparation of migration. Although relatively little is known about the wintering grounds of the Roseate Tern, they have been found as far south as the Bahia coast of Brazil.⁹⁵

2. Threats to the Roseate Tern

Roseate Terns started to decline in the late 19th century due to unsustainable harvests driven by the millinery trade.⁹⁶ Populations stabilized following protection under the 1918 Migratory Bird Treaty Act (MBTA), however populations began to fall again beginning in the 1950s, with rapid declines in the 1970s. Although its population had begun to increase again following its protection under the ESA in 1987, the Northeast Roseate Tern DPS has once again begun to decline. Threats to the Roseate Tern include habitat loss, reduced prey availability, invasive species and the spread of predators to nesting locations, direct human disturbance, contaminants, and climate change.

On breeding grounds, direct human disturbance — whether deliberate or accidental — can have significant negative effects on breeding success of Roseate Terns.⁹⁷ Birds may be driven away from ideal breeding habitats areas due to disturbance from pedestrians, beach vehicles, aircraft,

⁹⁰ Nisbet, I. C. T., *Biological characteristics of the roseate tern (Sterna dougallii)* (1981) (unpublished report, on file with the U.S. Fish and Wildlife Service, Newton Corner, MA); Carl Safina, Richard H. Wagner, David A. Witting, & Kelly J. Smith, *Prey Delivered to Roseate and Common Tern Chicks; Composition and Temporal Variability*, 61 J. OF FIELD ORNITHOLOGY 331-338 (1990).

⁹¹ TERN RECOVERY PLAN at 10.

⁹² USFWS, 2010. CARIBBEAN ROSEATE TERN AND NORTH ATLANTIC ROSEATE TERN (*STERNA DOUGALLII DOUGALLII*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter “TERN STATUS REVIEW”) at 5, available at: http://ecos.fws.gov/docs/five_year_review/doc3588.pdf; Jennifer C. Rock et. al., *Foraging Habitat and Chick Diets of Roseate Tern, Sterna dougallii, Breeding at Country Island, Nova Scotia*, 2 AVIAN CONSERVATION & ECOLOGY 4 (2007).

⁹³ *Id.*

⁹⁴ *Id.* at 11.

⁹⁵ TERN RECOVERY PLAN at 11-12.

⁹⁶ *Id.* at 12.

⁹⁷ Ellen Jedrey et al., *Roseate Terns—Citizens of the World: The Canada to Cape Cod Connection*, 36 BIRD OBSERVER 146-150 (2010); Peter Trull et al., *Staging of Roseate Terns Sterna dougallii in the Post-Breeding Period around Cape Cod, Massachusetts*, 1 ATLANTIC SEABIRDS 145-158 (1999).

boats, and dogs. Although little is known about the wintering grounds of the Roseate Tern, human disturbance and hunting in these areas is thought be less regulated, and could reduce both survival and winter fitness.⁹⁸

Habitat degradation is also caused by several types of activity. The spread of invasive species of plants at breeding areas can create dense, impenetrable vegetation that is unsuitable for nesting. Invasive plants are seriously affecting habitat quality at several important roseate tern colony sites including at Great Gull Island, Seavey Island, Bird Island, Penikese Islands, Outer Green Island, and Eastern Egg Rock.⁹⁹ Sand mining and dredging of sand bars, shoals, and around inlets in the coastal zone, reduces locations where Roseate Terns can feed by increasing the average depth of water. Eliminating sand bars that are tidally exposed eliminates roosting habitats for the tern.¹⁰⁰

Increased predation by a variety of avian and mammalian species also threaten the Roseate Tern. Herring gulls (*Larus argentatus*) and Great Black-backed Gulls (*Larus marinus*) have increased in population beyond their historical levels due to increased food availability from human sources, and are considered to be a major predator of Roseate Tern chicks and eggs.¹⁰¹ Raccoon (*Procyon lotor*), American mink (*Neovison vison*), and Great Horned Owls (*Bubo virginianus*) are also major predators of adult and young Roseate Terns and their ability to prey upon terns increases as breeding habitats and surrounding areas become more altered and favorable to these generalist-species.¹⁰²

Roseate Terns feed primarily on small fish such as sand lance, white hake, and herring — all of these species are harvested by commercial fisheries. If fisheries are not managed properly, in low food years, there can be significant competition with commercial fisheries for resources and food shortages for Roseate Terns are likely to occur. Although the National Marine Fisheries Service concluded in 2013 that the river herring and alewife did not warrant listing under the Endangered Species Act, the assessment concluded that many stocks of herring were depleted.¹⁰³ Likewise, Roseate Terns often feed with schools of predatory fish that help drive smaller fish towards the surface.¹⁰⁴ Commercial overfishing of these predatory fish could also have significant effects on the foraging success of Roseate Terns.

Offshore and onshore wind-turbines are a potential threat to Roseate Terns due to the possibility of mortality from a strike by wind-turbine rotor.¹⁰⁵ Several wind turbines within the breeding range of the roseate tern in the western North Atlantic have been constructed, and several more are either proposed or planned. Five small-scale wind turbine generators have been constructed

⁹⁸ TERN STATUS REVIEW at 57.

⁹⁹ *Id.* at 56.

¹⁰⁰ Miles O. Hayes & Jacqueline Michel, A COAST FOR ALL SEASONS: A NATURALIST'S GUIDE TO THE COAST OF SOUTH CAROLINA 285 (Pandion Books, Columbia, SC) (2008).

¹⁰¹ TERN STATUS REVIEW at 55.

¹⁰² *Id.* at 41-43.

¹⁰³ *Endangered Species Act Listing Determination for Alewife and Blueback Herring*, 78 Fed. Reg. 48944 (Aug. 12, 2013).

¹⁰⁴ TERN STATUS REVIEW at 5.

¹⁰⁵ Joris Everaert & Eric W.M. Stienen, *Impact of wind turbines on birds in Zeebrugge (Belgium), Significant effect on tern colony due to collisions*, BIODIVERSITY AND CONSERVATION doi 10.1007/s10531-006-9082-1 (2006).

on Sable Island, Nova Scotia, where in recent years several pairs of Roseate Terns have nested.¹⁰⁶ The Department of Interior has authorized several lease sales for offshore wind-farms in recent years that may eventually have impacts on the Roseate Tern.

Contaminants including oil, heavy metals, polychlorinated biphenyls (PCBs), and microplastic debris, threaten the Roseate Tern.¹⁰⁷ In 2004, 98,000 gallons of heating oil spilled into Buzzard Bay when a transportation barge struck a reef, causing significant damage to Roseate Tern Habitat. Oil spills on a larger scale are becoming more likely as the Department of Interior moves towards permitting seismic surveys in the mid-Atlantic region, which are a precursor to drilling in the Atlantic Ocean. Given the flow of the Gulf Stream, a spill anywhere in the mid-Atlantic would have significant impacts on the Roseate Tern's breeding grounds in New England.

Finally, climate change and sea-level rise threaten the Roseate Tern. Oceanic birds are extremely vulnerable to climate change due to low reproductive potential, the use of island nesting sites, and reliance on rapidly changing marine ecosystems.¹⁰⁸ Sea level rise threatens to inundate key areas of nesting and staging habitat, including sandy beaches barrier islands, and sand flats. Many of the nesting islands are less than 10 feet above sea level, and thus very susceptible to inundation and erosion. The negative impacts of erosion on nesting sites have already become more prominent over the past two decades. In addition, sea level rise will result in the loss of sand bars and shoals where Roseate Terns catch small prey fish that swim in shallow depths at high tide and use to rest during low tide.¹⁰⁹

3. Conservation Status of the Roseate Tern Northeast DPS

Over the past two decades, the U.S. Geological Survey has conducted comprehensive population monitoring of the Roseate Tern's breeding colonies, and has coordinated colony stewardship programs, nesting habitat restoration, and predator management activities. Despite these efforts, the recovery goal of 8,500 pairs of Terns — the likely historic population size in the northeast — has proven elusive. The Northeast DPS only briefly exceeded 4,000 nesting pairs in the 1999 and 2000 breeding seasons, and only three colonies have consistently supported 200 or more Roseate Tern pairs.¹¹⁰ Since 2000 the Northeast DPS population has declined by 25% to approximately 3000 pairs. Roseate Tern numbers have continued to decline along the south shore of Long Island, New York and these breeding areas were largely abandoned by 2009. Roseate Terns at Falkner Island declined to their historical low by 2009.¹¹¹

The Service completed a status review of the Roseate Tern in 2010 which concluded “the rangewide population in the Northeast declined 25 percent (1,000 breeding pairs) between 2000 to 2009. The delisting objective (increase population to historic high of 8,500 pairs) clearly has not been achieved.”¹¹² Similarly, the 2011 Recovery Report to Congress concluded that the

¹⁰⁶ TERN STATUS REVIEW at 64.

¹⁰⁷ *Id.* at 62.

¹⁰⁸ TERN STATUS REVIEW at 55.

¹⁰⁹ *Id.* at 55.

¹¹⁰ *Id.* at 8.

¹¹¹ *Id.* at 18, 38.

¹¹² *Id.* at 119.

Northeast DPS of the Roseate Tern is “declining.”¹¹³

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”¹¹⁴ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.¹¹⁵

Physical or biological features include those that 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.¹¹⁶

The ESA allows the Service to designate occupied critical habitat years after a species is listed.¹¹⁷ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”¹¹⁸ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.”

For the purposes of this petition, the Center believes that all of the areas requested as critical habitat are “occupied” by the Roseate Tern.¹¹⁹ The Center was unable to identify unoccupied areas essential to the conservation of the Roseate Tern. However, this petition requests that the Service examine whether unoccupied areas should be included within any final critical habitat designated for this species.

¹¹³ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

¹¹⁴ 16 U.S.C. § 1532(5)(A)(i).

¹¹⁵ 16 U.S.C. § 1532(5)(A)(ii).

¹¹⁶ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

¹¹⁷ *See, Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev'd on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

¹¹⁸ 16 U.S.C. § 1532(5)(A)(i).

¹¹⁹ TERN STATUS REVIEW at 12. Nesting sites locations were obtained from Bob Houston, Senior Biologist with the USFWS, and are the same data used to describe the distribution of the Northeastern roseate tern in the USFWS 2010 five year review of the Roseate Tern.

Physical features of occupied terrestrial critical habitat for the Northeast DPS of Roseate Tern include: sandy barrier islands and isolated beaches for breeding; sand bars for roosting/resting; and post-breeding/roosting beaches to stage for migration. Biological features of occupied terrestrial critical habitat include: interspersed/clumped native vegetation and other objects that provide shelter for nests and common tern nesting colonies. Physical features of occupied marine terrestrial habitat include offshore waters less than 10 meters in depth within 25 kilometers of a tern colony; biological features of occupied marine terrestrial habitat include forage fish aggregations and presence of predatory fish.

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.¹²⁰ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.¹²¹

Most breeding locations of Roseate Tern are managed by the Service or by State fish and game agencies to limit human disturbance, manage invasive species, control predators, and restore habitat. Additional management is needed to protect Roseate Terns at roosting and post-breeding locations to limit human disturbance and other threats. Likewise, additional management measures may be needed to preserve foraging fish populations to ensure an adequate food source for the tern. Special management measures are also required to address the growing threats of oil spills, offshore wind energy, and climate change. As a result, the areas petitioned for as critical habitat meet the criterion that they may need special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.¹²² Here, the designation of critical habitat for the Northeast DPS of the Roseate Tern is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat or any portion thereof will place the Roseate Tern at increased risk for take or destruction of habitat. In addition, the above information demonstrates clearly that critical habitat is determinable for this species. Accordingly, the Center requests that the Service designate critical habitat for the Roseate Tern the areas requested by the petition.

¹²⁰ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

¹²¹ *Id.*

¹²² 16 U.S.C. § 1533(b)(6)(C)(ii).

III. Critical Habitat Designation for the James Spinymussel

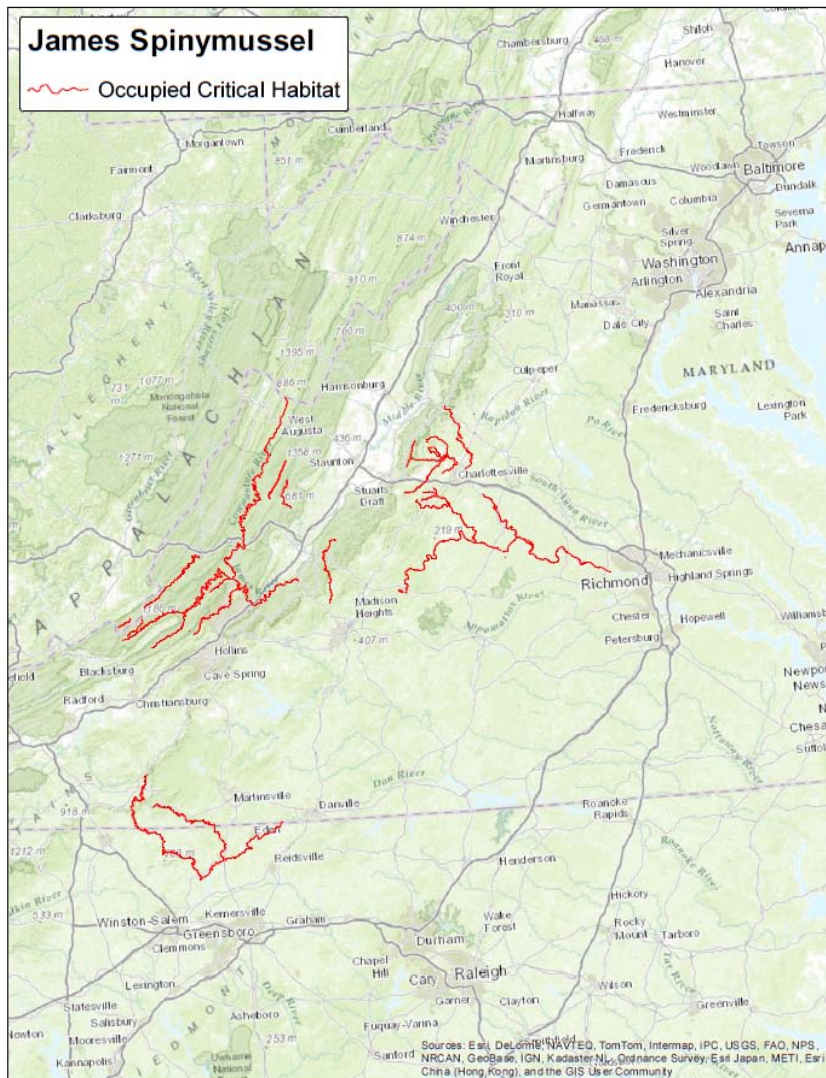


Figure Three.

The Center requests that the Service designate approximately 974 river miles as critical habitat for the James Spinymussel (*Pleurobema collina*) as shown in Figure Three. These areas contain the physical and biological features that are essential to the conservation of Spinymussel and would further the recovery of this declining species.

The United States is a global hotspot for freshwater biological diversity, containing a nearly unparalleled diversity of fauna.¹²³ Over 61% of the world's crayfish species and over 29% of the world's freshwater mussels are found within the United States. Unfortunately, North America's 292 species of freshwater mussels are one of the most at-risk groups of animals on the planet,

¹²³ George W. Folkerts, STATE AND FATE OF THE WORLD'S AQUATIC FAUNA, in AQUATIC FAUNA IN PERIL: THE SOUTHEASTERN PERSPECTIVE 1-16 (George W. Benz & David E. Collins eds., Se. Aquatic Research Inst. Special Publ'n 1997); Richard J. Neves et al., STATUS OF AQUATIC MOLLUSKS IN THE SOUTHEASTERN UNITED STATES: A DOWNWARD SPIRAL OF DIVERSITY in AQUATIC FAUNA IN PERIL: THE SOUTHEASTERN PERSPECTIVE 1, 43-85 (George W. Benz & David E. Collins eds., Se. Aquatic Research Inst. Special Publ'n 1997).

with over 70% at risk of extinction.¹²⁴ Dozens of freshwater mussel species have already gone extinct in the United States, and many more are listed as threatened or endangered. Despite their perilous conservation status, as a group, few freshwater mussels have received critical habitat under the Endangered Species Act.

The James Spiny mussel is highly endangered and has been extirpated from over 90% of its historic range, with survival documented primarily in a few small tributaries of the James River. In recent years, Service personnel have discovered a few, small additional populations in the Roanoke River basin, including portions of the Dan River, the South Fork Mayo River, and the Mayo River, but none of these newly-discovered populations are “viable” according to the Service.¹²⁵ Unfortunately, on February 2, 2014, approximately 39,000 tons of coal ash spilled into the Dan River, contaminating approximately 70 miles of river habitat.¹²⁶ Although the Dan River does not contain large populations of the James Spiny mussel, the spill has likely set back the recovery of this species and illustrates the difficulty of assessing the magnitude and importance of these catastrophic impacts if little is known about a species’ habitat or distribution.

At the time of listing in 1988, the Service stated that designating critical habitat for the James Spiny mussel was not prudent, claiming “This rare mussel is very unusual, being one of only three known species of spined freshwater mussels. There is a small but significant demand by collectors for this species. Because of this, the Service believes a detailed description of the species’ habitat, required as part of any critical habitat designation, could increase the species’ vulnerability to illegal taking.”¹²⁷ This rationale is not valid as there is no evidence that the information needed to make a critical habitat designation would provide more specific information regarding the location of these mussels beyond what is already available to the public. Indeed, the Service’s 2007 draft status review for this species concluded, “There is no evidence to suggest that overutilization...is a relevant threat.”¹²⁸ Instead, the Service stated that the “general lack of public awareness of the existence of [the James Spiny mussel], its distribution and biological significance in aquatic ecosystems” is a threat to the species.¹²⁹ As the presence of critical habitat can provide significant informational benefits regarding the presence of endangered species, the Center requests that the Service designate critical habitat at this time.

A. Natural History, Threats, and Conservation Status of the James Spiny mussel

1. Natural History

¹²⁴ Shaffer, M. L., and B. Stein, *SAFEGUARDING OUR PRECIOUS HERITAGE in PRECIOUS HERITAGE: THE STATUS OF BIODIVERSITY IN THE UNITED STATES* at 66, 101 (B. A. Stein, L.S. Kutner & J.S. Adams, eds., Oxford University Press, New York 2000).

¹²⁵ USFWS, 2008. DRAFT JAMES SPINY MUSSEL (*PLEUROBEMA COLLINA*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter “SPINY MUSSEL STATUS REVIEW”) at 8. The Service initiated a status review for the Spiny mussel in January of 2008 (73 Fed. Reg. 3991). Although the review was not completed, the Center obtained a copy of the draft from the Service in 2013.

¹²⁶ See <http://www.fws.gov/southeast/pubs/facts/DanRiverCoalAshReleaseFacts.pdf>.

¹²⁷ *Determination of Endangered Status for the James Spiny mussel*, 53 Fed. Reg. 27689 (Jul. 22, 1988).

¹²⁸ SPINY MUSSEL STATUS REVIEW at 12.

¹²⁹ *Id.* at 13.

The James Spiny mussel is a small freshwater mussel slightly less than three inches in length. Adults have a dark brown shell with prominent growth rings and short spines on each valve. Young mussels have a shiny yellow shell with or without one to three short spines.¹³⁰ Like most freshwater mussels, the Spiny mussel is a filter feeder and feeds on plankton collected from water that is passed over its gills.

The reproductive cycle of freshwater mussels is complex and unusual. During spawning, the male releases sperm into the water column and the sperm is taken into the female through its gills. The resulting larvae (known as glochidia) are released from the female into the water column and must attach to a fish host within a few days in order to survive. The glochidia attach to the fish host's gills, and parasitize the fish for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom or other substrate where they continue to develop, provided they land in a suitable substratum with the correct water conditions.¹³¹ Known fish hosts for the James Spiny mussel include the bluehead chub (*Nocomis leptocephalus*), rosyside dace (*Clinostomus funduloides*), blacknose dace (*Rhinichthys atratulus*), mountain redbelly dace (*Phoxinus oreas*), rosefin shiner (*Lythrurus ardens*), satinfish shiner (*Cyprinella analostana*), central stoneroller (*Campeostoma anomalum*), and swallowtail shiner (*Notropis procne*).¹³²

Adult Spiny mussel are found in a variety of freshwater habitats and water depths. Most commonly, they are found in streams and rivers with a width of 10 to 75 feet with a water depth of 0.5 to 3 feet.¹³³ Historic sites on the main stem of the James River occurred in far wider sections of the river—up to 500 feet across—and much deeper as well. The water velocity at sites supporting the Spiny mussel are generally slow to moderate. Bottom sediments are usually sand and cobble with or without boulders, pebbles, or silt.¹³⁴

2. Threats to James Spiny mussel

Spiny mussel are primarily threatened by water pollution — primarily caused by increased sedimentation and siltation in stormwater runoff from by land development, agricultural practices and silviculture. In general, freshwater mussels are sedentary and unable to move long distances to more suitable areas in response to heavy silt loads. Many forms of human activities and development have the potential to create excessively heavy silt loads that can have severe effects on mussels and other aquatic organisms. Suspended sediment can clog the gills of filter feeding mussels and eventually suffocate them, so mussels often respond by closing their valves. However, by closing their valves, Spiny mussel individuals are forced to reduce the time they are

¹³⁰ USFWS, 1990. JAMES SPINY MUSSEL (*PLEUROBEMA COLLINA*) RECOVERY PLAN (hereafter “SPINY MUSSEL RECOVERY PLAN”) at 2-3, available at: http://ecos.fws.gov/docs/recovery_plan/900924b.pdf.

¹³¹ Hove, M. 1990. *Distribution and life history of the endangered James spiny mussel, Pleurobema collina* (*Bivalvia: Unionidae*). M.S. Thesis. Virg. Polytech. Inst. And State Univ., Blacksburg, Virginia. 113 pp.

¹³² SPINY MUSSEL RECOVERY PLAN at 8.

¹³³ Clarke, A.H. and R. J. Neves. 1984. STATUS SURVEY OF THE JAMES RIVER SPINY MUSSEL, *CANTHYRIA COLLINA*, IN THE JAMES RIVER, VIRGINIA. A REPORT FOR REGION 5 OF THE U.S. FISH AND WILDLIFE SERVICE. 32 pp.

¹³⁴ *Id.*

able to feed, which in turn can lower reproductive output, reduce survival, and results in other chronic impacts that stress the remaining Spiny mussel populations.¹³⁵

Toxic chemical spills, runoff of pesticides and fertilizer used in agricultural and urban development settings, and pollution from ammonia, copper, heavy metals, and endocrine disrupting compounds also harm Spiny mussel. The Service has characterized the loading of pollutants in Spiny mussel habitats from both point and non-point sources as “ubiquitous.”¹³⁶

Very little riverine or riparian habitat that is adjacent or nearby to extant Spiny mussel populations is protected other than by local land use regulations. Less than 5% of the riparian habitat that is adjacent to or nearby Spiny mussel populations is close to or adjacent to state or Federal lands. As a result, further development of these watersheds is likely and continues to pose a significant and pervasive threat.

Finally, the invasion of the Asian clam also is a threat to the James Spiny mussel and other native freshwater mussels. The Asian clam is one of 204 introduced mollusk species in North America. It was first discovered in the United States in Oregon in 1939 and has spread across the United States.¹³⁷ Once established in a river, the Asian clam expands rapidly and can achieve densities as high as 1,000 per square inch in the James River.¹³⁸ These non-native mussels that can persist in degraded habitats, and may outcompete native freshwater mussels by removing 40-60% of the phytoplankton available for freshwater mussels.¹³⁹

3. Conservation Status of James Spiny mussel

The James Spiny mussel has been extirpated from more than 90% of its historic range, and when listed, was thought to be confined to the James river almost exclusively. Johns Creek, Mill Creek, South Fork Potts Creek, and the South Fork Mayo River support populations of 300-800 individuals over each creek.¹⁴⁰ However, most populations are low and these are at risk of extirpation due to loss of productivity and difficulty reproducing. Since listing, Spiny mussel populations have been found in a few new locations in other river drainages. The new discoveries are probably due to a greater number of methodological surveys being conducted rather than new populations being established. Some of these populations are extremely small and may have been extirpated since discovery.

As described above, in February of 2014, approximately 39,000 tons of coal ash spilled into the Dan River, contaminating approximately 70 miles of river habitat, some of which has been

¹³⁵ SPINY MUSSEL RECOVERY PLAN at 9; *see also*, Kitchel, H. E., J. C. Widlak, and R. J. Neves. 1981. THE IMPACT OF COAL MINING WASTES ON ENDANGERED MUSSEL POPULATIONS IN THE POWELL RIVER, LEE COUNTY, VIRGINIA. Final Report to State Water Control Board, Richmond, VA. 26 pp.

¹³⁶ SPINY MUSSEL STATUS REVIEW at 12.

¹³⁷ Dundee, D. S., *Introduced molluscs of the United States*, 9 MALACOLOGIA 264 (1969).

¹³⁸ Diaz, R. J., *Asiatic clam, Corbicula manilensis (Philippi) in the tidal James River, Virginia*, 15 CHESAPEAKE SCIENCE 118-120 (1974).

¹³⁹ Ronald R. Cohen, Paul V. Dresler, Elizabeth J. Phillips & Robert L. Cory, *The effect of the Asiatic clam, Corbicula fluminea, on phytoplankton of the Potomac River, Maryland*, 29 LIMNOLOGY AND OCEANOGRAPHY 170-180 (1984).

¹⁴⁰ SPINY MUSSEL STATUS REVIEW at 10.

identified as potentially occupied habitat of the James Spiny mussel. The coal ash spill is estimated to have caused at least \$300 million in damages, including ecological damage, recreational impacts, effects on human health and consumptive use, and aesthetic value losses.¹⁴¹ Because of the sensitivity of mussels to this type of pollution, the reestablishment of the Spiny mussel in this river system will almost certainly be set back if not precluded. The 2011 Recovery Report to Congress concluded that the James Spiny mussel is “stable.” However, given the recent coal ash spill and the precarious status of the species overall, this conclusion is likely no longer accurate.¹⁴²

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”¹⁴³ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.¹⁴⁴

Physical or biological features include those that 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.¹⁴⁵

The ESA allows the Service to designate occupied critical habitat years after a species is listed.¹⁴⁶ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”¹⁴⁷ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” In light of the difficulty detecting this species, and the Service’s own record of discovering additional populations, for the purposes of this petition, the Center believes that all of the areas

¹⁴¹ Dennis A. Lemly, *Damage Cost of the Dan River Coal Ash Spill*, 197 ENVIRONMENTAL POLLUTION 55-61 (2014) (In Press).

¹⁴² USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

¹⁴³ 16 U.S.C. § 1532(5)(A)(i).

¹⁴⁴ 16 U.S.C. § 1532(5)(A)(ii).

¹⁴⁵ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

¹⁴⁶ *See, Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev'd on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

¹⁴⁷ 16 U.S.C. § 1532(5)(A)(i).

requested as critical habitat are “occupied” by the James Spinemussel. However, this petition requests that the Service examine whether unoccupied areas should be included within any final critical habitat designated for this species as part of its evaluation.

Physical features of critical habitat for the Spinemussel include: low velocity river and stream habitat; bottom sediment of sand or cobble; and low levels of pollutants and sediments. Biological features of critical habitat include: presence of fish host species including Bluehead chub, Rosyside dace, Blacknose dace, Mountain redbelly dace, Rosefin shiner, Satinfish shiner, and Stoneroller; and phytoplankton food availability.

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.¹⁴⁸ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.¹⁴⁹

Freshwater habitats are managed and protected under several Federal laws, although they provide only a patchwork of protections. The Fish and Wildlife Coordination Act requires Federal agencies to give consideration to fish and wildlife resources in their project planning and in the review of applications for Federal permits and licenses. These agencies must consult regarding the potential impacts of their proposed actions and obtain recommendations to protect fish and wildlife, but those recommendations are not binding. The Clean Water Act regulates the fill and destruction of wetlands adjacent to water bodies like those where the Spinemussel are found, and the Act also provides several tools to control non-point pollution including setting water quality standards and total maximum daily loads of pollutants. Virginia State Law prohibits the taking of listed species within the state, but it does not protect the Spinemussel’s habitat.¹⁵⁰ Additional special management measures are required to address the growing threats of chemical spills, like the recent coal ash spill, and to address other impacts to these freshwater habitats. As a result, the areas petitioned for as critical habitat meet the criterion that they may need special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.¹⁵¹ Here, the designation of critical habitat for the James Spinemussel is both prudent and determinable,

¹⁴⁸ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D.Ariz. 2003).

¹⁴⁹ *Id.*

¹⁵⁰ VIR. CODE. ANN. tit. 29 § 29.1-564 (2014).

¹⁵¹ 16 U.S.C. § 1533(b)(6)(C)(ii).

and as a result, the Service must promptly designate such habitat. The Service's own draft 5-year review for this species concludes that collection is not a threat to this species, and that the informational benefits of critical habitat would potentially help bring attention to this species' plight. The above information demonstrates clearly that critical habitat is determinable for this species. Accordingly, the Center requests that the Service designate critical habitat for the Spinemussel in the areas requested by the petition.

IV. Critical Habitat Designation for the Clubshell



Figure Four.

The Center requests that the Service designate approximately 6,054 river miles as critical habitat for the Clubshell (*Pleurobema clava*) as shown in Figure Four. These areas contain the physical and biological features that are essential to the conservation of Clubshell and would further the recovery of this declining species.

The Clubshell was once found throughout the Ohio River system and its tributaries in Kentucky, Illinois, Indiana, Ohio, as well as isolated river systems in Michigan, Pennsylvania, and West Virginia. This mussel was once widespread and abundant, but is now highly imperiled.¹⁵² The Clubshell was listed in 1993 in the same proposal to protect the Northern Riffleshell mussel. At the time of listing, the Service stated that designating critical habitat for both of these species

¹⁵² Watters, T. 1988. THE NAIAD FAUNA OF SELECTED STREAMS IN OHIO. I. STILLWATER RIVER OF MIAMI RIVER. II. STREAM SYSTEMS OF SOUTH CENTRAL OHIO FROM THE LITTLE MIAMI RIVER TO THE HOCKING RIVER, EXCLUDING THE SCIOTO RIVER PROPER. Final Report to the Division of Wildlife, Ohio Department of Natural Resources. 440 pp.

was not prudent: “Because of their sedentary nature and susceptibility to a wide variety of changes in water quality, mussels are highly vulnerable to vandalism. Due to the low number of reproducing populations of these species, even a single such incident could be catastrophic. The publication of critical habitat maps could increase this risk.”¹⁵³

This rationale is not valid as there is no evidence that the information needed to make a critical habitat designation would provide more specific information regarding the location of these mussels beyond what is already available to the public. Indeed, the Service’s 2008 status review for this species concluded, “Collection is not known to present a significant threat at this time. The Clubshell is not a commercially valuable species.”¹⁵⁴ Accordingly, the Center requests that the Service designate critical habitat for this species at this time.

A. Natural History, Threats, and Conservation Status of the Clubshell

1. Natural History

The Clubshell is a fairly large freshwater mussel (up to 3 inches) and has been described as “one of the most striking” mussels in the United States.¹⁵⁵ The Clubshell has a triangular shell with an elongated posterior end and green rays on the umbo, the prominence near the hinge of the shell. Adults have a dark brown shell with prominent growth rings and short spines on each valve, while immature mussels have a shiny yellow shell, some with up to three short spines. Like other freshwater mussels, the Clubshell is a filter feeder that collects plankton from water that is passed over its gills.

The reproductive cycle of freshwater mussels is complex and unusual. During spawning in April through June, the male releases sperm into the water column and the sperm is taken into the female through its gills. The resulting larvae (known as glochidia) are released from the female into the water column and must attach to a fish host within a few days in order to survive. The glochidia attach to the fish host’s gills, and parasitize the fish for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom or other substrate where they continue to develop, provided they land in a suitable substratum with the correct water conditions. Known fish hosts for the Clubshell include the striped shiner (*Notropis chrysocephalus*), central stoneroller (*Camptostoma anomalum*), blackside darter (*Percina maculata*), and the common logperch (*Percina caprodes*).¹⁵⁶ The Clubshell likely reaches sexual maturity between 3-5 years, and can live 20 years or more.¹⁵⁷

¹⁵³ *Determination of Endangered Status for the Northern Riffleshell Mussel (Epioblasma torulosa rangiana) and the Clubshell Mussel (Pleuroberns clava)*, 58 Fed. Reg. 5638 (Jan. 22, 1993).

¹⁵⁴ USFWS, 2008. CLUBSHELL (*PLEUROBEMA CLAVA*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter “CLUBSHELL STATUS REVIEW”) at 13, available at: http://ecos.fws.gov/docs/five_year_review/doc2580.pdf.

¹⁵⁵ Charles T. Simpson, A DESCRIPTIVE CATALOGUE OF THE NAIADES OR PEARLY FRESH-WATER MUSSELS 1539 (1900).

¹⁵⁶ Scott H. O’Dee, S. H. & G. Thomas Watters, s, G. T. 2000. *New or Cconfirmed Hhost Ffish Iidentifications for 10 Ffreshwater Mmussels*. Proceeding of the Conservation, Captive Care and Propagation of Freshwater mussels Symposium, 1998, pp. 77-82, Ohio Biological Survey 77-82, Columbus, Ohio(1998).

¹⁵⁷ Weaver, L. R., et al., 1991. *Reproductive biology and fish hosts of the Tennessee Clubshell Pleurobema oviforme (Mollusca: :Unionidae) in Virginia*. AMERICAN MIDLAND NATURALIST 126:82-89.

The Clubshell is generally found in clean, coarse sand and gravel in runs, often just downstream of a riffle, in both streams and small rivers. The Clubshell is a cryptic species, with up to 70 percent of individuals within a population occurring 2-4 inches below the substrate surface. Because the species occurs mostly within the substrate of a river or stream, it is very susceptible to excess siltation caused by human activities. Silt clogs the substrate interstices and suffocates the Clubshell. Clubshell are intolerant of permanently slack water conditions, but can otherwise tolerate a range of water velocities. Some Clubshell have been found in Navigation Pools of the Allegheny River at depths of 10 to 15 feet, and Clubshell may have been found in a small portion of Lake Erie.

2. Threats to Clubshell

Major threats to the Clubshell include water quality degradation caused by a range of human activities, dams, fossil fuel extraction activities, and invasive species. The largest threat to the Clubshell comes from human activities that degrade water quality. Residential, commercial, and agricultural development near streams and rivers results in the loss of riparian habitat, an increase in impervious surfaces and associated stormwater runoff, increased sedimentation, and increased amounts of pollutants entering freshwater systems. As populations increase, there are greater discharges from sewage treatment plants, as well as an increase in the amount of sewage discharged from existing plants.¹⁵⁸ Freshwater mussels may be more sensitive to several components of treated sewage effluent (e.g., ammonia, chlorine and copper) than are the typical organisms used to establish criteria protective of aquatic life. As a result, some of the water quality criteria established by the U.S. Environmental Protection Agency to protect aquatic life may not be protective of mussels.¹⁵⁹ Small streams, in which most remnant Clubshell populations are located, are particularly vulnerable to sewage effluent, which can comprise a significant portion of the total stream flow. For example, Clubshell populations were eliminated from over 1000 feet of suitable habitat immediately downstream of a municipal sewage treatment plant — probably due to lethal levels of chlorine and ammonia — at the Conneaut Outlet in Crawford County, Pennsylvania.¹⁶⁰

Dams have many detrimental effects — as well as a few beneficial effects — on the Clubshell.¹⁶¹ Because dams trap sediment, they can have some ameliorating effects on water quality for a short distance downstream of the dam itself. However, dam impoundments produce slack-water conditions upstream that Clubshell cannot survive in. Dams and their impoundments also represent permanent barriers to Clubshell dispersal that in turn further fragment the remaining populations. Dams alter the natural river flow regime by changing temperature and volume of water moving through freshwater systems.

Several types of instream activities threaten the Clubshell populations, including sand and gravel dredging, gravel bar removal, bridge construction, and pipeline construction. Because Clubshell are generally found in the river substrate, the Service has recognized that mitigating the effects of

¹⁵⁸ CLUBSHELL STATUS REVIEW at 14.

¹⁵⁹ Tom J. Augspurger et al., *Water quality guidance for protection of freshwater mussels (Unionidae) from ammonia exposure*, 22 ENVIRONMENTAL TOXICOLOGY & CHEMISTRY 2569-2575 (2003).

¹⁶⁰ CLUBSHELL STATUS REVIEW at 14.

¹⁶¹ *Id.* at 12.

such activities “depends on accurately identifying the location of the populations.”¹⁶² Instream activities can result in long-lasting alteration of stream-flow patterns that may eliminate previously suitable habitat some distance from the disturbance. Exploration for and extraction of coal, oil, and natural gas resources occurs throughout the watersheds where Clubshell are found. These activities can result in increased siltation, a changed hydro graph, and altered water quality even at a distance from the mine or well field.¹⁶³ In addition, the construction and operation of oil and gas wells may result in the discharge of brine, which changes the salinity of freshwater and can harm freshwater mussels.

Invasive zebra mussels (*Dreissena polymorpha*) have been documented in headwater lakes and reservoirs of a number of streams supporting Clubshell populations. As a result, there is a threat that the mussels will colonize downstream reaches and displace or outcompete Clubshell populations. Because zebra mussels cause significant damage to human infrastructure, there is also a risk that molluscides used to treat zebra mussel infestations in the watershed would have detrimental impacts on Clubshell and other native freshwater mussels.¹⁶⁴

3. Conservation Status of the Clubshell

The Clubshell was once found throughout the Ohio River basin and tributaries of western Lake Erie and was documented historically in more than 100 streams throughout its range.¹⁶⁵ Now, it is limited to 13 populations distributed in 21 streams, and its distribution is highly fragmented. The Service has concluded that almost every extant population is at threat, and that most riverine habitats adjacent to existing populations are not well-protected.¹⁶⁶ Only seven Clubshell populations show evidence of recent reproductive success, and it is unknown why other extant Clubshell populations do not appear to be reproducing.¹⁶⁷ As a result, the Clubshell continues to decline in half of the streams where it was present when listed as endangered in 1993, and is nearing extirpation in Fish Creek, Hackers Creek, Pymatuning Creek, and Conneaut Outlet. The Service concluded in its status review that without “significant recovery activities targeted at understanding the life history traits of the Clubshell that make it susceptible to land use changes, as well as a concerted effort to address ongoing threats, it is unlikely the species can be downlisted in the near future, since there is a real possibility of further range contraction.”¹⁶⁸ Similarly, the 2011 Recovery Report to Congress concluded that the Clubshell is “declining.”¹⁶⁹

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.* at 14.

¹⁶⁵ USFWS, 1994. CLUBSHELL (*PLEUROBEMA CLAVA*) AND NORTHERN RIFFLESHELL (*EPIOBASMA TORULOSA* RANGIANA) RECOVERY PLAN (hereafter “CLUBSHELL RECOVERY PLAN”) at 6-8, available at: http://ecos.fws.gov/docs/recovery_plan/940921.pdf.

¹⁶⁶ CLUBSHELL STATUS REVIEW at 15-16.

¹⁶⁷ *Id.*

¹⁶⁸ *Id.*

¹⁶⁹ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”¹⁷⁰ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.¹⁷¹

Physical or biological features include those that 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.¹⁷²

The ESA allows the Service to designate occupied critical habitat years after a species is listed.¹⁷³ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”¹⁷⁴ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” Given the continuing decline and historic extirpation of many Clubshell populations prior to the species’ listing, the Center believes that extensive areas of unoccupied habitat should be designated as critical habitat. Unoccupied critical habitat was determined using the Service’s recovery plan and status review for this species, and is essential to the conservation of the Clubshell in light of the species’ continuing decline.

Physical features of occupied critical habitat for the Clubshell include: low to moderate velocity river and stream habitat; coarse sand and gravel substrate; high water quality with low pollution and very low sediment levels. Biological features of occupied critical habitat include: presence of fish host species including the striped shiner, central stoneroller, blackside darter, and the common Logperch; and phytoplankton food availability.

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also

¹⁷⁰ 16 U.S.C. § 1532(5)(A)(i).

¹⁷¹ 16 U.S.C. § 1532(5)(A)(ii).

¹⁷² Implementing Changes to the Regulations for Designating Critical Habitat, 79 Fed. Reg. 27006 (May 12, 2014).

¹⁷³ See, *Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev’d on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

¹⁷⁴ 16 U.S.C. § 1532(5)(A)(i).

make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.¹⁷⁵ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.¹⁷⁶

Freshwater habitats are managed and protected under several Federal laws, although they provide only a patchwork of protections. The Fish and Wildlife Coordination Act requires Federal agencies to give consideration to fish and wildlife resources in their project planning and in the review of applications for Federal permits and licenses. These agencies must consult regarding the potential impacts of their proposed actions and obtain recommendations to protect fish and wildlife, but those recommendations are not binding. The Clean Water Act regulates the fill and destruction of wetlands adjacent to water bodies like those where the Clubshell are found, and the Act also provides several tools to control non-point pollution including setting water quality standards and total maximum daily loads of pollutants. As a result, the areas petitioned for as critical habitat meet the criterion that they may need special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.¹⁷⁷ Here, the designation of critical habitat for the Clubshell is both prudent and determinable, and as a result, the Service must promptly designate such habitat. The Service’s own 5-year review for this species concludes that collection is not a threat to this species, and that the informational benefits of critical habitat would potentially help bring attention to this species’ plight. The above information demonstrates clearly that critical habitat is determinable for this species. Accordingly, the Center requests that the Service designate critical habitat for the Clubshell in the areas requested by the petition.

¹⁷⁵ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

¹⁷⁶ *Id.*

¹⁷⁷ 16 U.S.C. § 1533(b)(6)(C)(ii).

V. Critical Habitat Designation for the Dwarf Wedgemussel



Figure Five.

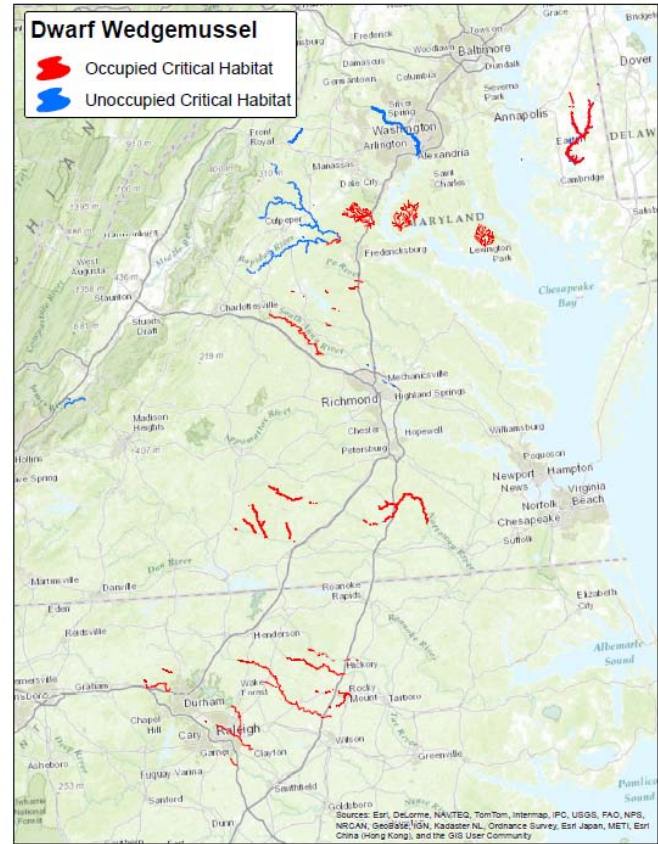


Figure Six.

The Center requests that the Service designate approximately 489,000 acres of freshwater habitat as critical habitat for the Dwarf Wedgemussel (*Alasmodonta heterodon*) as shown in Figure Five and Figure Six.¹⁷⁸ These areas contain the physical and biological features essential to the conservation of Wedgemussel and would further the recovery of this declining species.

The Dwarf Wedgemussel has declined precipitously in the past hundred years. The Wedgemussel's historic range stretched from North Carolina to New Brunswick, and historically was recorded in over 70 locations in 15 major river drainages. Unfortunately, the species has now likely been extirpated in approximately 50 of those locations and continues to decline across the rest of its range.

The Dwarf Wedgemussel was listed as endangered in 1990. At the time of listing, the Service stated that designating critical habitat for the Dwarf Wedgemussel was not prudent, claiming "This rare and unusual mussel is sought after by amateur and scientific collectors. Its occurrence in small, localized populations makes this species particularly vulnerable to overcollecting. Because of this, the Service believes a detailed description of the species' habitat, required as part of any critical habitat designation, could increase the species' vulnerability to illegal taking

¹⁷⁸ Given the width of the rivers and estuarine systems implicated for this species, critical habitat was calculated in acres instead of river miles.

and increase law enforcement problems.”¹⁷⁹ This generic explanation is not supported by any factual evidence and is not legally valid as designating critical habitat would not provide more detailed information than what is already to the public regarding locations of the Wedgemussel. Moreover, the Service’s 2007 status review does not even list collection as a threat to the species.¹⁸⁰ Instead, the review concludes that the Service must “Develop habitat protection strategies for high priority populations” of the Wedgemussel to move the species towards recovery.¹⁸¹ The Center agrees with this assessment and accordingly requests that the Service designate the requested areas as critical habitat for this species.

A. Natural History, Threats, and Conservation Status of the Dwarf Wedgemussel

1. Natural History

The Dwarf Wedgemussel is a small, freshwater mussel that rarely exceeds 1.5 inches in length. It is the only freshwater mussel on the Atlantic coast that has two lateral teeth on the right valve, but only one tooth on the left.¹⁸² The outer shell is dark brown or yellowish brown, and young mussels can have greenish rays. Like most freshwater mussels, it feed by filtering phytoplankton and small particles from the water. The Wedgemussel is not a long-lived species as compared to other freshwater mussels with a life expectancy of approximately 12 years.¹⁸³

The Wedgemussel follows the same reproductive cycle as most freshwater mussels. During spawning, the male releases sperm into the water column and the sperm is taken into the female through its gills. The Wedgemussel is a long-term brooder. In long-term brooders, fertilization typically occurs in mid-summer and fall, and glochidia are released the following spring and summer.¹⁸⁴ The glochidia attach to the fish host’s gills, and parasitize the fish for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom or other substrate where they continue to develop, provided they land in a suitable substratum with the correct water conditions. Known fish hosts for the Wedgemussel include the tessellated darter (*Etheostoma olmstedi*), Johnny darter (*Etheostoma nigrum*), mottled sculpin (*Cottus bairdii*), slimy sculpin (*Cottus congatus*), as well as juveniles and parr of the endangered Atlantic salmon (*Salmo solar*).¹⁸⁵

The Dwarf Wedgemussel occurs in creeks and rivers of various widths and depths (3inches to 20 feet), and inhabits muddy, sand, and gravel bottoms, as well as clay banks and small riffle areas.

¹⁷⁹ *Determination of Endangered Status for the Dwarf Wedge Mussel*, 55 Fed. Reg. 9447 (Mar. 14, 1990).

¹⁸⁰ USFWS, 2007. DWARF WEDGEMUSSEL (*ALASMIDONTA HETERODON*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter “WEDGEMUSSEL STATUS REVIEW”) at 15, available at: http://ecos.fws.gov/docs/five_year_review/doc1098.pdf

¹⁸¹ *Id.*

¹⁸² Fuller, S.L.H., FRESHWATER AND TERRESTRIAL MOLLUSKS, in ENDANGERED AND THREATENED PLANTS AND ANIMALS OF NORTH CAROLINA. NC State Museum of Natural History, Raleigh, NC, 143-194 (J.E. Cooper, eds. 1977)

¹⁸³ David L. Michaelson & Richard J. Neves, *Life History and habitat of the endangered dwarf wedgemussel Alasmidonta heterodon (Bivalvia:Unionidae)* 14 J. OF N. AM. BENTHOLOGICAL SOC’Y 324-340 (1995).

¹⁸⁴ Arthur H. Clarke,,THE TRIBE ALASMIDONTINI (UNIONIDAE: ANODONTINAE), PART I: PECRIAS, ALASMIDONTA, AND ARCIDENS, No. 326 SMITHSONIAN CONTRIBUTIONS TO ZOOLOGY 101 (1981).

¹⁸⁵ David L. Michaelson & Richard J. Neves. *Life History and habitat of the endangered dwarf wedgemussel Alasmidonta heterodon (Bivalvia:Unionidae)*, 14 J. OF N. AM. BENTHOLOGICAL SOC’Y 324-340 (1995).

In the southern portion of its range, it is often found buried under logs or root mats in shallow water. It is usually found in stretches of rivers and creeks with slow to moderate current, little silt deposition, and well-oxygenated, unpolluted water.¹⁸⁶

2. Threats to the Dwarf Wedgemussel

Threats to the Dwarf Wedgemussel include direct habitat destruction from damming and channelizing of rivers, and indirect degradation of habitat due to pollution, sedimentation, invasion by exotic species, and fluctuations in water level or temperature. Industrial, agricultural, and domestic pollution are largely responsible for the disappearance of the Wedgemussel from much of the species' historic range. Dwarf Wedgemussel individuals are sensitive to potassium, zinc, copper, cadmium, and other contaminants associated with industrial activities. Runoff of pesticides and fertilizer used in agriculture, sedimentation from earthmoving activities in suburban and urban settings, and increases in endocrine disrupting compounds and other pollutants also harm the Wedgemussel.

According to the Service, little riverine and riparian habitat nearby or adjacent to Wedgemussel populations is protected other than by state and local land use regulations. Accordingly, further development of adjacent uplands continues to be a significant and pervasive threat to southern populations. For example, increased development within the Neuse River basin to support development in the vicinity of Raleigh, N.C. is likely to degrade water quality, alter river flows and fragment the Wedgemussel into two small, isolated subpopulations in the Neuse River, and if that were to occur, the species would likely no longer be viable in that river system.¹⁸⁷

3. Conservation Status of Dwarf Wedgemussel

The Dwarf Wedgemussel has a wide geographic range along the eastern seaboard that once extended all the way north into New Brunswick. Unfortunately, many populations of the Wedgemussel have declined significantly, and populations continue to be extirpated. The Service completed a status review of the Dwarf Wedgemussel in 2007 which concluded that the Wedgemussel should continue to remain listed as endangered because the threats the species persist across the species' range. Threats to the Wedgemussel are "generally more severe in the southern portion of the species' range....Without significant recovery activities targeted at southern populations, it is unlikely the species can be downlisted in the near future, since there is a real possibility of range contraction."¹⁸⁸ Likewise, the Service's 2010 Recovery Report to Congress concluded that the Wedgemussel is "declining."¹⁸⁹

¹⁸⁶ Christopher Fichtel & Douglas G. Smith, THE FRESHWATER MUSSELS OF VERMONT, 18 Vermont Fish & Wildlife Dep't Nongame and Technical Heritage Program 53 (1995) (Technical Report); Gabriel, M. 1996. MONITORING OF THE DWARFWEDGEMUSSEL (*ALASMIDONTA HETERODON*) IN THE ASHUELOT AND CONNECTICUT RIVERS, NEW HAMPSHIRE. Report submitted to The Nature Conservancy, 27 pp.; Nedeau, E. 2004. A FOURTH INVESTIGATION OF THE SURVIVAL OF DWARF WEDGEMUSSELS (*ALASMIDONTA HETERODON*) FOR THE RELOCATION PROJECT ON THE CONNECTICUT RIVER, ROUTE 2 STABILIZATION PROJECT, LUNENBURG, VERMONT. Unpublished report submitted to the U.S. Fish and Wildlife Service, Concord, New Hampshire. 7 pp

¹⁸⁷ WEDGEMUSSEL STATUS REVIEW at 13-15.

¹⁸⁸ *Id.* at 15.

¹⁸⁹ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”¹⁹⁰ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.¹⁹¹

Physical or biological features include those that 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.¹⁹²

The ESA allows the Service to designate occupied critical habitat years after a species is listed.¹⁹³ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”¹⁹⁴ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” Because the Wedgemussel has experienced numerous, historic extirpations prior its listing, the Center is requesting the designation of both occupied and unoccupied habitat as critical habitat. Unoccupied critical habitat was determined using the Service’s recovery plan and status review for this species, and is essential to the conservation of the Wedgemussel in light of the species’ continuing decline.

Physical features of occupied critical habitat for the Wedgemussel include: low velocity river and stream habitat; bottom substrates of mixed sand, pebble, gravel, clay, and cobble; and low levels of pollutants and suspended sediments. Biological features of critical habitat include: logs, root mats, and other woody debris that provide shelter/habitat; fish host species including tessellated darter, Johnny darter, mottled sculpin, slimy sculpin, and/or Atlantic salmon; and availability of phytoplankton food.

C. The Proposed Areas Require Special Management Considerations and Protection

¹⁹⁰ 16 U.S.C. § 1532(5)(A)(i).

¹⁹¹ 16 U.S.C. § 1532(5)(A)(ii).

¹⁹² *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

¹⁹³ *See, Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev’d on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

¹⁹⁴ 16 U.S.C. § 1532(5)(A)(i).

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.¹⁹⁵ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.¹⁹⁶

Freshwater habitats are managed and protected under several Federal laws, although they provide only a patchwork of protections. The Fish and Wildlife Coordination Act requires Federal agencies to give consideration to fish and wildlife resources in their project planning and in the review of applications for Federal permits and licenses. These agencies must consult regarding the potential impacts of their proposed actions and obtain recommendations to protect fish and wildlife, but those recommendations are not binding. The Clean Water Act regulates the fill and destruction of wetlands adjacent to water bodies like those where the Wedgemussel are found, and the Act also provides several tools to control non-point pollution including setting water quality standards and total maximum daily loads of pollutants.

The Service has, in some portions of the Wedgemussel’s range, developed technical assistance to protect the Wedgemussel from development which occurs within one mile upstream and 500 feet from the edge of a water body.¹⁹⁷ These best management practices help to minimize stormwater and wastewater discharges, and limit sedimentation from earthmoving activities. However, these management practices are not comprehensive and are not a substitute for critical habitat. They do demonstrate that the areas proposed to be designated may require special management consideration and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.¹⁹⁸ Here, the designation of critical habitat for the Wedgemussel is both prudent and determinable, and as a result, the Service must promptly designate such habitat. The Service’s own draft 5-year review for this species concludes that collection is not a threat to this species, and that the informational benefits of critical habitat would potentially help bring attention to this species’ plight. The above information demonstrates clearly that critical habitat is determinable for this species. Accordingly, the Center requests that the Service designate critical habitat for the Wedgemussel in the areas requested by the petition.

¹⁹⁵ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

¹⁹⁶ *Id.*

¹⁹⁷ See, <http://www.fws.gov/northeast/njfieldoffice/endangered/dwarfwedge.html>.

¹⁹⁸ 16 U.S.C. § 1533(b)(6)(C)(ii).

VI. Critical Habitat Designation for the Hay's Spring Amphipod

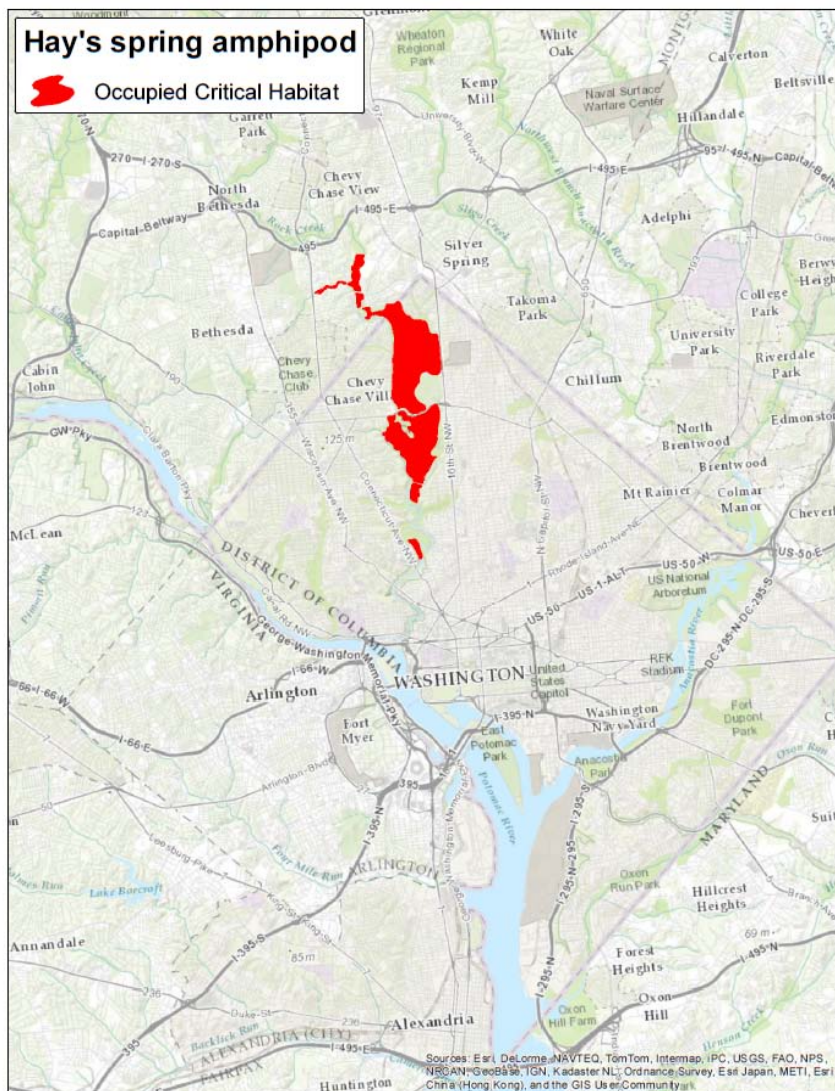


Figure Seven.

The Center requests that the Service designate approximately 2,205 acres as critical habitat for the Hay's Spring Amphipod (*Stygobromus hayi*) as shown in Figure Seven. These areas contain the physical and biological features that are essential to the conservation of amphipod and would further the conservation and recovery of this critically endangered species.

The Hay's Spring Amphipod is a small, aquatic crustacean that is found only in a few springs in Washington D.C. It is the District of Columbia's only endangered species and is an indicator of the overall health of the natural freshwater ecosystems in the District, especially in Rock Creek Park. The Amphipod looks like a very tiny shrimp, is 5-10 millimeters in length, and is both colorless and blind. It lives most of its life underground and has small hairs on its body that it uses to sense water currents and search for food — tiny pieces of leaf litter and dead insects.

At the time of listing, the Service stated that designating critical habitat for the Hay's Spring Amphipod was not prudent: "Publication of a map and description of the exact locality, which is

required for Critical Habitat designation, could expose the species to destruction of its habitat by vandalism and unauthorized taking.”¹⁹⁹ This reasoning was not valid in 1982 and is not valid today. In 1982, the Service believed that the amphipod was found in only one location in the world within the Smithsonian Zoological Park. This area has been fenced off and is inaccessible to the public, making the risk of vandalism extremely low. Second, at least seven other springs have been identified since 1982 where the amphipod may be present. These springs are actually more vulnerable due to lack of general knowledge about their conservation importance rather than the risk of vandalism. Right now, any of these seven springs are vulnerable to being accidentally or intentionally damaged since they are unprotected. Furthermore, critical habitat for the Amphipod should not be limited simply to the springs themselves, but instead should include the entire watershed that creates the hydrologic conditions for the springs and seeps to exist, as well as the surrounding forest leaf-litter environment that provides food for the Amphipod. These critical habitat areas are large enough that there is no need to identify the specific location of the spring, making the risk of vandalism to the spring itself very minor in comparison to the benefits of increased conservation that critical habitat would provide.

A. Natural History, Threats, and Conservation Status the Hay’s Spring Amphipod

1. Natural History

The Hay’s Spring Amphipod is difficult to study and monitor because it lives most of its life underground in interstitial groundwater. As a result, little is known about the natural history of the Hay’s spring amphipod. In general, amphipods in the genus *Stygobromus* tend to occur in caves or areas where there are permanent groundwater habitats that contain low levels of organic matter such as decomposing leaf litter and dead insects to feed upon.²⁰⁰ In Rock Creek Park, thick layers of clay lie beneath freshwater seeps, stopping the water and creating perched pockets of subterranean habitat for the species. More recent research suggests that the Hay’s Spring Amphipod may also be able to live in a few other valley floor habitats within Rock Creek Park that have shallow subsurface groundwater, that are high in organic matter, and may even be seasonally dry. These hypotelminorheic habitats occur when groundwater seeps to the surface from underlying bedrock to flow up through sediments and vegetative litter.²⁰¹

The Hay’s Spring Amphipod has been found in five springs that feed into Rock Creek within Rock Creek Park. Four of the springs are on land which is managed by the National Park Service, and one of the springs is found on property of the National Zoo, which is managed by the Smithsonian Institution. The Amphipod may also be present in at least three additional springs within the Rock Creek watershed, including springs and seeps located in Montgomery County Maryland.²⁰²

¹⁹⁹ *Listing Hay’s Spring Amphipod as an Endangered Species*, 47 Fed. Reg. 5425 (Feb. 5, 1982).

²⁰⁰ Pavsek, D. 2001. URBAN REFUGE FOR RARE AMPHIPODS IN THE NATIONAL CAPITOL REGION, in National Park Service, 2001. *Natural Resource Year in Review-2001* May 2001 (publication D-2255).

²⁰¹ David C. Culver, Tanja Pipan & S. Gottstein, *Hypotelminorheic—a unique freshwater habitat*, 4 SUBTERRANEAN BIOLOGY 1-8 (2006).

²⁰² See generally, <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K004> (indicating that the Hay’s Spring Amphipod is located in the District of Columbia and Montgomery County, Maryland.)

2. Threats to the Hay's Spring Amphipod

One of the greatest threats to the Hay's Spring Amphipod has been neglect by the Service. When the Amphipod was listed in 1982, it was believed that the entire world population existed in a meter-long section within a single spring at the Smithsonian National Zoo. At that time, it seemed that little could be done to improve the conservation status of the Amphipod, given its extremely tenuous existence. However since that time, several additional populations have been discovered throughout Rock Creek Park. Unfortunately, very little has been done to conserve or recover this critically endangered species. The Amphipod never received any critical habitat, the Service has never completed a recovery plan for the species, and the Service has never conducted comprehensive surveys to determine the full extent of this species' range. As a result, many threats to this species have gone unidentified and unabated.

Hay's Spring Amphipods spend the majority of their lives in groundwater, and consequently have few natural predators. They are somewhat vulnerable to predators such as stonefly larvae and salamanders when they make brief trips to the surface. One of the main threat to the Amphipod is from human caused habitat loss and habitat degradation, including alterations of groundwater flows, groundwater pollution, loss of detritus as a food source, and disturbance of spring sites.²⁰³

Rock Creek Park and the National Zoo are surrounded by high-density urban development, all of which contributes to altered hydrology and groundwater flows. As D.C. continues to develop, more and more natural areas are replaced by impervious surfaces which change the rate, amount, and direction that rainwater moves through the environment. Changes in hydrology can cause changes in flood frequency, duration and intensity, all of which can impact groundwater springs and seeps that provide habitat for the Amphipod. Altered hydrology has already impacted two springs/seeps where the Amphipod may be located making it harder to sample the springs due to greatly reduced flows in the past ten years. Intensified flooding due to altered hydrology may adversely affect the spring habitat by removing individual Amphipods, as well as the leaves and soft bottom sediments that form their microhabitat, from the spring.

Following altered hydrology, groundwater pollution is the next largest threat to the Hay's spring amphipod. Sources of water pollution are primarily from non-point runoff and include oil spills from underground storage tanks, antifreeze, road de-icing salts, herbicides, insecticides, fertilizers, sewage leaks, other chemical leaks, improper garbage disposal, and other industrial and residential activities.

Urbanization has fragmented the habitats of the Hay's Spring Amphipod by altering groundwater flows and redirecting rainfall to human-built infrastructure. In the past, subsurface groundwater may have been linked in Rock Creek through multiple, complex hydrological connections. As roads and development have bisected the park into small patches of habitat, each spring becomes functionally isolated from other springs. This isolation puts the species at even greater risk of

²⁰³ Culver, D.C., and I. Šereg. 2004. KENK'S AMPHIPOD (STYGOBROMUS KENKI HOLSINGER) AND OTHER AMPHIPODS IN ROCK CREEK PARK, WASHINGTON, D.C. 147 pp. Report to Rock Creek Park, National Capitol Region, National Park Service.

extinction by reducing the chance that a spring can be recolonized if a stochastic event were to extirpate a population from one of these springs.

In 1980, one of the two springs was destroyed when Hurricane David passed through the D.C. area toppling single tree into the spring. Even minor habitat disturbance events can wipe out an Amphipod population, showing just how fragile this species' habitat is. Many types of human activities continue to degrade amphipod habitat, including "intensive recreational use adjacent to the springs in Rock Creek Park, which increases the potential for pollution of the springs, and intensive development and associated increases in impermeable surfaces, which may decrease water quality and quantity in the springs."²⁰⁴

Loss in forest cover and intact forest canopy alters and reduces forest leaf-litter, which in turn reduces food availability for the Amphipod and increases surface temperatures. Development also degrades forest conditions through the opening of the forest canopy, furthers the spread of invasive species, changes overall forest plant and animal communities, all of which can have a negative impact on Hay's spring amphipods.

3. Conservation Status of the Hay's Spring Amphipod

The Hay's Spring amphipod is confirmed in five springs that feed into Rock Creek along a 3-mile stretch of the creek. These springs are located within Rock Creek Park, which is managed by the National Park Service, and the National Zoo, which is managed by the Smithsonian Institution. The species may be present in a 3-4 additional springs within the Rock Creek watershed, but that has not yet been confirmed.

The 2011 Recovery Report to Congress concluded that the Hay's Spring Amphipod is "stable."²⁰⁵ This conclusion is based mostly on conjecture given the lack of surveying effort and resources allocated to this species. Given that this species is critically endangered, any conclusion that its population is stable should be viewed skeptically, as much more needs to be done immediately to truly stabilize this species' conservation status.

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those "specific areas within the geographic area occupied by the species at the time it is listed" which contain the "physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections."²⁰⁶ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.²⁰⁷

²⁰⁴ USFWS, 2012. HAY'S SPRING AMPHIPOD (*STYGOBROMUS HAYI*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter "AMPHIPOD STATUS REVIEW") at 3, available at: http://ecos.fws.gov/docs/five_year_review/doc4172.pdf.

²⁰⁵ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

²⁰⁶ 16 U.S.C. § 1532(5)(A)(i).

²⁰⁷ 16 U.S.C. § 1532(5)(A)(ii).

Physical or biological features include those that 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.²⁰⁸

The ESA allows the Service to designate occupied critical habitat years after a species is listed.²⁰⁹ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”²¹⁰ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” For the purposes of this petition, the Center believes that all of the areas requested as critical habitat are “occupied” by the Hay’s Spring Amphipod. However, this petition requests that the Service examine whether unoccupied areas should be included within any final critical habitat designated for this species.

Physical features of occupied critical habitat for the Hay’s Spring Amphipod include: nearly year-round freshwater seeps and springs; hypotelmiorheic habitats; geological formations that create perched-aquifers; and connectivity within soil/leaf litter layer. Biological features of occupied critical habitat include: native forest vegetation and canopy; and leaf litter layer with sufficient organic detritus.

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.²¹¹ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.²¹²

The spring within the Smithsonian National Zoo has been managed since 1982 and protected

²⁰⁸ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

²⁰⁹ *See Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev’d on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

²¹⁰ 16 U.S.C. § 1532(5)(A)(i).

²¹¹ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

²¹² *Id.*

from human access and disturbance. Springs within Rock Creek Park are managed under the Park's general management plan. In the last two years, the National Park Service has begun an effort to reduce deer populations within Rock Creek Park, which should help restore forest understory and spring water quality. The National Park Service has also begun to remediate surface water runoff from the Carter-Barron amphitheater, which has degraded one of the springs that is known to be occupied by the Hay's Spring Amphipod. Additional management to preserve and restore hydrological conditions and improve water quality would benefit the Hay's Spring Amphipod. As a result, the areas petitioned for as critical habitat meet the criterion that they may need special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.²¹³ Here, the designation of critical habitat for the Hay's Spring Amphipod is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat will put the springs and seeps that are occupied by the amphipod at greater risk of vandalism or destruction. And it worth noting that right now, all of the springs and seeps within Rock Creek Park are unprotected — they are unfenced and anyone could alter or damage them unintentionally right now. There is no prohibition regarding where visitors may recreate in Rock Creek Park. The National Park Service has fenced off some areas of the Park for other resource management concerns, but it has not done so to protect these springs.

Moreover, this petition seeks to protect the hydrological watersheds that create these spring habitats — not just the springs themselves — as well as the areas downstream of the spring where these freshwater creeks enter Rock Creek itself. These areas are sufficiently “fuzzed” such that the risk of vandalism are negligible. Moreover, the Service has the ability to withhold the exact locations of these springs from the public even while being able to designate critical habitat. Critical habitat is clearly determinable for this species. As a result, the Center requests that the Service designate critical habitat for the Hay's Spring Amphipod.

²¹³ 16 U.S.C. § 1533(b)(6)(C)(ii).

VII. Critical Habitat Designation for the Roanoke Logperch

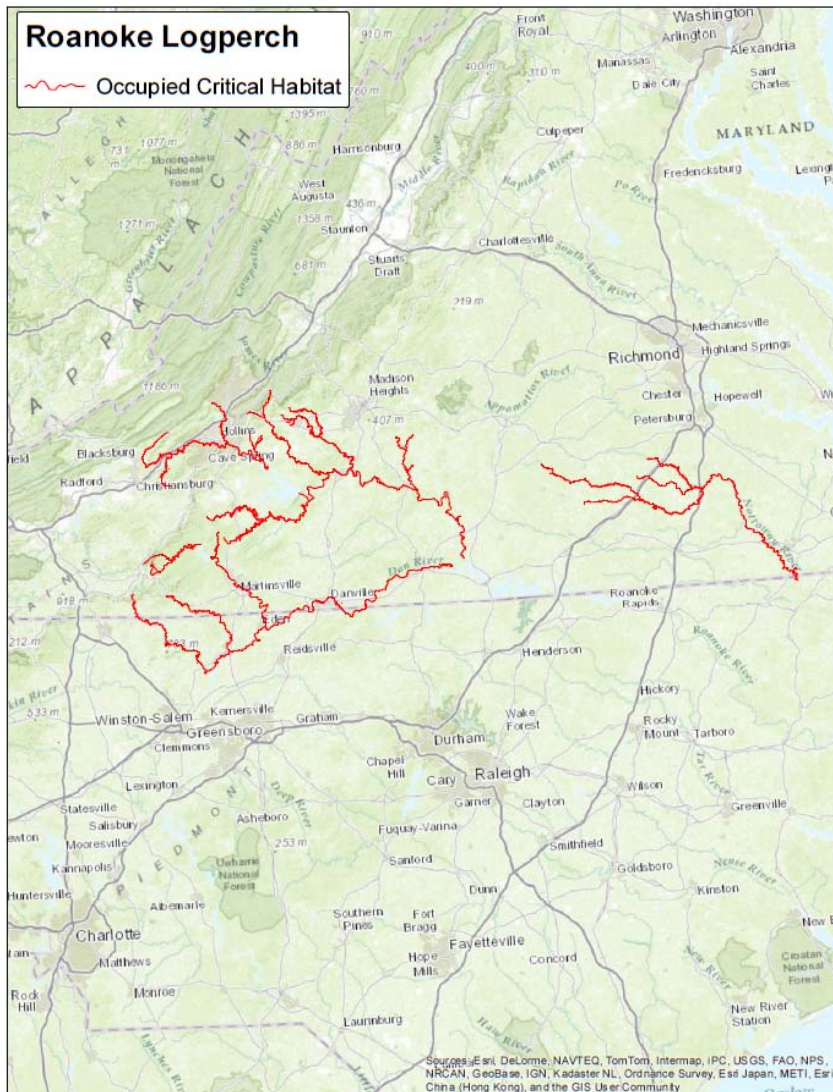


Figure Eight.

The Center requests that the Service designate approximately 1,489 river miles as critical habitat for the Roanoke Logperch (*Percina rex*), as shown in Figure Eight. These areas contain the physical and biological features that are essential to the conservation of Roanoke Logperch, and designating these areas would further the recovery of this declining species.

Logperch are small, freshwater fish found in the eastern United States and Canada and are members of the larger *Percidae* family of fish, which includes many Federally-endangered darters and perches. Logperch tend to inhabit clear, gravelly streams and lakes, reaching a maximum size of about 7 inches and can live for 3-6 years. Like many other freshwater fish in the United States, habitat alteration that degrades water quality and dams are the primary threats to this species. The Roanoke Logperch is currently found in five isolated river systems and its distribution is fragmented by the presence of several dams. On February 2, 2014, approximately 39,000 tons of coal ash spilled into the Dan River, contaminating approximately 70 miles of river

habitat. Although the Dan River does not contain large populations of the Roanoke Logperch compared to other river systems, the spill has likely set back the recovery of this species and illustrates the many dangers that this species faces.

At the time of listing, the Service declined to designate critical habitat for the Roanoke Logperch as not prudent, claiming: “No benefit to the species has been identified that would outweigh the potential threats of collection or vandalism, which would be exacerbated by publication of a detailed critical habitat description.”²¹⁴ This was not a valid reasons to deny critical habitat for the Logperch as designating critical habitat listing will provide significant benefits to this species and will further its recovery in light of the many growing threats it faces.

A. Natural History, Threats, and Conservation Status of the Roanoke Logperch

1. Natural History

Roanoke Logperch are small freshwater fish that can grow up to 5.5 inches in length. They are elongate and cylindrical in shape with a conical snout, a complete lateral line, and prominent bar markings on their sides. Logperch tends to occupy medium to large warm-water streams and rivers of moderate gradient with relatively silt-free substrata. Logperch use most of the major river habitats during their life-cycle.²¹⁵ Males are associated with shallow riffles during the breeding season period, while females are common in deep runs over gravel and small cobble, which are the observed spawning areas. Young and juveniles usually occupy slow runs and pools with clean sand bottoms. During the winter, most individuals tend to be found under boulders in deep pools. Importantly, all age classes of Logperch are intolerant of moderately to heavily silted substrata, and do not tolerate habitats that are degraded by sedimentation.²¹⁶ Logperch observed in winter appear to use habitat with slower bottom water velocities than in summer. Logperch in winter tend to select less silted habitat than in the summer. Roanoke Logperch in the Nottoway River are commonly observed in and around woody debris, such as tree falls in low flow areas.²¹⁷

Roanoke Logperch are diurnal, visual predators. They hunt for prey by flipping over stones with their snouts and ingesting exposed prey. Young Logperch feed primarily on chironomid (non-biting midge) larvae, while adults feed mainly on caddisfly larvae and chironomids adults. Roanoke Logperch commonly lives 5-6 years, with males maturing to adulthood in two years, and females maturing in three years.²¹⁸ Spawning occurs in April or May when water

²¹⁴ *Endangered Status for the Roanoke Logperch*, 54 Fed. Reg. 34468 (Aug. 18, 1989).

²¹⁵ Burkhead, N.M. 1983. ECOLOGICAL STUDIES OF TWO POTENTIALLY THREATENED FISHES (THE ORANGEFIN MADTOM, NOTURUS GILBERTI, AND THE ROANOKE LOGPERCH, PERCINA REX) ENDEMIC TO THE ROANOKE RIVER DRAINAGE. Report to Wilmington District Corps of Engineers, Wilmington, NC.

²¹⁶ *Id.*

²¹⁷ Rosenberger, AE. and P.L. Angermeier. 2002. ROANOKE LOGPERCH (*PERCINA REX*) POPULATION STRUCTURE AND HABITAT USE. FINAL REPORT TO VIRGINIA DEPARTMENT OF GAME AND INLAND FISHERIES, Blacksburg, VA.

²¹⁸ Burkhead, N.M. and R.E. Jenkins. 1991. FISHES in VIRGINIA’S ENDANGERED SPECIES, PROCEEDINGS OF A SYMPOSIUM. Karen Terwilliger (ed.). McDonald and Woodward Publishing Company, Blacksburg, VA. 672 pp.

temperatures are between 12-14°C. Like all other species in the genus *Percina*, Roanoke Logperch typically bury their eggs, with no subsequent parental care.²¹⁹

2. Threats

The Roanoke Logperch now occurs in widely separated segments of the upper Roanoke River, the Pigg River, the Nottoway River, and the Smith River. Roanoke Logperch may also be found in the Dan River and other river systems, but comprehensive surveys have not been conducted. Every population of Roanoke Logperch is inherently vulnerable because each population is relatively low density, and has a limited and fragmented range. The largest population is in the upper Roanoke River, and has been characterized by the Service as subject to the highest magnitude and intensity threats.²²⁰ All populations are threatened by large dams and reservoirs—especially the Smith Mountain and Leesville Dams; urbanization and water quality degradation; water pollution from agricultural and silvicultural activities—including sediments and pesticides; toxic chemical spills; and water withdrawals. The Smith River population is particularly vulnerable because of its very small population size.

Large dams on the Roanoke River have likely destroyed over 150 kilometers of Logperch habitat and isolated the Pigg River and Roanoke River populations, which in turn has increased the likelihood that one or both populations could be extirpated, and eliminated the possibility of recolonization downstream. Dams also alter aquatic habitats by altering temperature regimes and water flows (due to electrical demand), making those areas downstream of a dam unsuitable. This has resulted in the Town Creek population potentially becoming isolated from other Logperch populations downstream. Smaller dams on the Smith River, Pigg River, and upper Roanoke River have also isolated Logperch populations and degraded habitats.²²¹

According to the Service, the most widespread current threat to Roanoke Logperch is non-point source pollution from urban and agricultural activities, especially the increase in fine sediment silt being transported into these river systems. In upstream headwaters of these rivers, livestock have access to the stream channels, causing increased erosion of stream-banks and more sedimentation of rivers.²²²

River channelization, wetland filling activities, and other modifications to rivers themselves are also a threat. The ongoing Roanoke River Flood Reduction Project also may be having negative impacts on the Logperch because it involves major earth-moving activities that are likely increasing sediment input into the river. Continued growth in Roanoke, Salem and Blacksburg have resulted in an increase in new highway construction, highway improvement, and paved road projects. All of this development increases non-point source runoff of pollutants into Roanoke Logperch habitat.

²¹⁹ Page, L.M. and D.L. Swofford. 1984. *Morphological correlates of ecological specialization in darters*. Environmental Biology of Fishes 11:139-159.

²²⁰ USFWS, 2007. ROANOKE LOGPERCH (*PERCINA REX*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter “LOGPERCH STATUS REVIEW”) at 14-20, available at: http://ecos.fws.gov/docs/five_year_review/doc1113.pdf.

²²¹ *Id.* at 15.

²²² *Id.* at 16.

Toxic spills are, unfortunately, all too common in the rivers where the Logperch are found, but information suggests that small spills are quite common.²²³ In 1975, an accidental discharge of copper sulfate into Rocky Mount — upstream of Roanoke Logperch habitat in the Pigg River killed more than 28,000 fish of many species including the Roanoke Logperch.²²⁴ Likewise, in 2014, approximately 39,000 tons of coal ash spilled into the Dan River, contaminating approximately 70 miles of river habitat, some of which has been identified as potentially occupied habitat of the Roanoke Logperch. All Logperch populations are downstream of urban facilities that have the potential to spill other types of toxic pollutants into these river systems. Because of the small size of all populations, a significant spill could easily extirpate any one of the Logperch's remaining populations.

3. Conservation Status of the Roanoke Logperch

Although the number of known populations of Logperch has increased since the species was listed, the geographic range of the Logperch is small, populations are isolated and threats from urbanization, industrial development, road projects, water projects, catastrophic spills, and siltation from agricultural runoff all continue. The human population of the Greater Roanoke area is continuing to expand, stimulating additional development of the Roanoke Valley. Large quantities of stormwater drain from streets and lawns, carrying nutrients, oil, metals, and other pollutants into the river. In its status review, the Service concluded that there were still significant uncertainties about the viability of several Logperch populations. As a result, the Service stated that it was difficult to determine whether populations are increasing, stable, or declining over the long term. In conjunction with the risk of catastrophic threats, such as the most recent coal ash spill, the Logperch is at high risk of extinction, and urgently needs critical habitat to be designated for it.

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”²²⁵ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.²²⁶

Physical or biological features include those that 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,

²²³ Wheeler, A.P., A.E. Rosenberger, and P.L. Angermeier. 2002. POTENTIAL IMPACTS OF I-73 ON STREAM HABITAT AND BIOTA, WITH EMPHASIS ON THE ENDANGERED ROANOKE LOGPERCH. Report submitted to Virginian's for Appropriate Roads.

²²⁴ James, D.L. 1979. ECOLOGICAL STUDIES OF THE FISHES OF THE PIGG RIVER SYSTEM, SOUTH CENTRAL VIRGINIA, WITH SPECIAL REFERENCE TO THREATENED SPECIES. Master of Science thesis. Virginia Commonwealth University, 60pp.

²²⁵ 16 U.S.C. § 1532(5)(A)(i).

²²⁶ 16 U.S.C. § 1532(5)(A)(ii).

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.²²⁷

The ESA allows the Service to designate occupied critical habitat years after a species is listed.²²⁸ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”²²⁹ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” Given the lack of data and uncertainty in distribution of this species, for the purposes of this petition, the Center believes that all of the areas requested as critical habitat are “occupied” by the Roanoke Logperch. However, this petition requests that the Service examine whether unoccupied areas should be included within any final critical habitat designated for this species.

Physical features of occupied critical habitat for the Roanoke Logperch include: stream and river systems with low sediment levels; areas of shallow riffles with shallow riffles; gravel or small cobble river substrate; deep pools with boulders; and spawning water temperatures between 12-14°C. Biological features of occupied critical habitat include woody debris and tree-falls; riparian vegetation; and adequate chironomid and caddisfly prey.

C. The Proposed Areas Require Special Management Considerations and Protection

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.²³⁰ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.²³¹

Freshwater habitats are managed and protected under several Federal laws, although they provide only a patchwork of protections. The Fish and Wildlife Coordination Act requires Federal agencies to give consideration to fish and wildlife resources in their project planning and in the review of applications for Federal permits and licenses. These agencies must consult

²²⁷ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

²²⁸ *See Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev'd on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

²²⁹ 16 U.S.C. § 1532(5)(A)(i).

²³⁰ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

²³¹ *Id.*

regarding the potential impacts of their proposed actions and obtain recommendations to protect fish and wildlife, but those recommendations are not binding. The Clean Water Act regulates the fill and destruction of wetlands adjacent to water bodies like those where the Logperch are found, and the Act also provides several tools to control non-point pollution including setting water quality standards and total maximum daily loads of pollutants. Virginia State Law prohibits the taking of listed species within the state, but it does not protect the Logperch's habitat.²³² Additional special management measures are required to address the growing threats of chemical spills, like the recent coal ash spill, and to address other impacts to these freshwater habitats. As a result, the areas petitioned for as critical habitat meet the criterion that they may need special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.²³³ Here, the designation of critical habitat for the Roanoke Logperch is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat or any portion thereof will place the Logperch at increased risk for take or destruction of its habitat. In addition, the above information demonstrates clearly that critical habitat is determinable for this species, and the designation would provide significant benefits to this species. Accordingly, the Center requests that the Service designate critical habitat for the Roanoke Logperch in the areas requested by the petition.

²³² VIR. CODE. ANN. tit. 29 § 29.1-564 (2014).

²³³ 16 U.S.C. § 1533(b)(6)(C)(ii).

VIII. Critical Habitat Designation for the Northeastern Beech Tiger Beetle

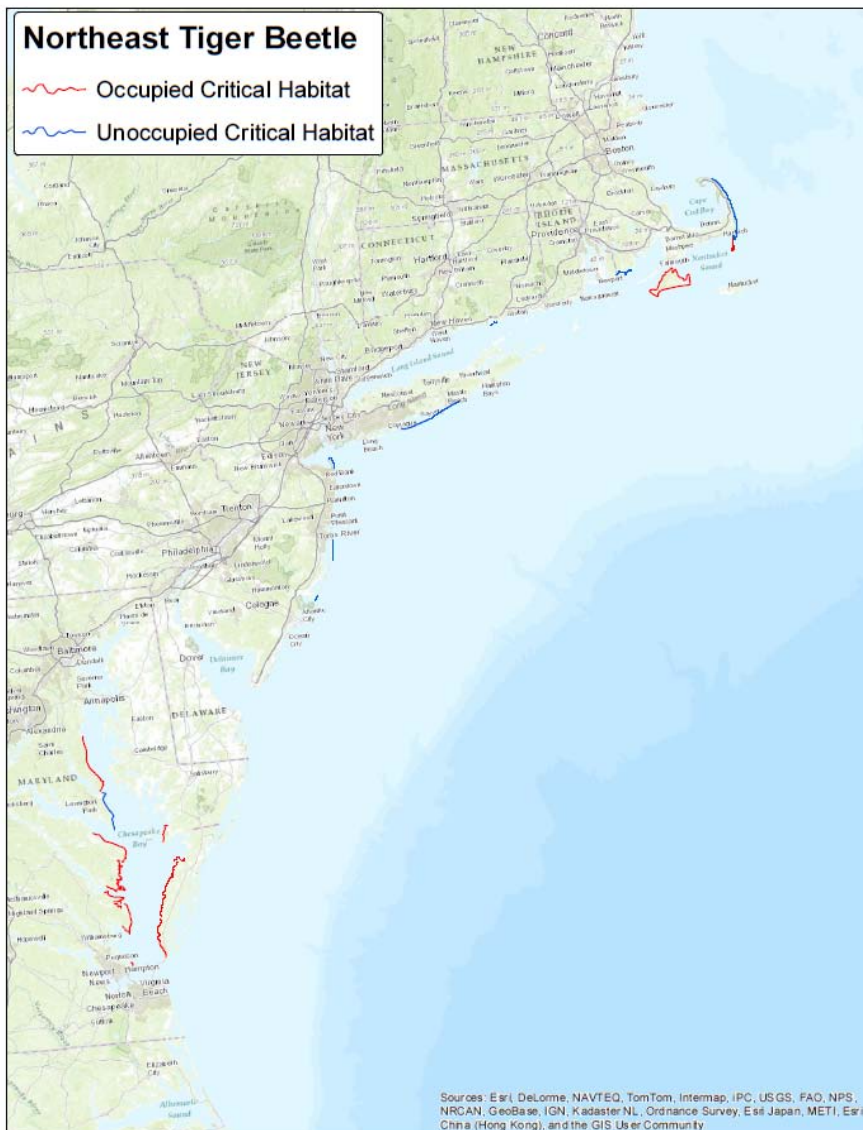


Figure Nine.

The Center requests that the Service designate approximately 42,955 acres as critical habitat for Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*), as shown in Figure Nine. These areas contain the physical and biological features that are essential to the conservation of Beach Tiger Beetle, and designating these areas would further the recovery of this declining species.

True to their name, tiger beetles are lie-in-wait, ambush predators that pounce on their insect prey, seizing them with their long, sickle-like mandibles in an aggressive, “tiger-like” manner. Tiger beetles are typically the dominant invertebrate predators in the habitats where they occur and their presence is an indicator of a healthy beach ecological community. Unfortunately the Northeastern Beach Tiger Beetle has declined significantly due to massive habitat loss. Its populations are very fragmented and isolated now, with populations along portions of the Chesapeake Bay, Long Island, and a few areas in New Jersey and Massachusetts. The

conservation status of the Beach Tiger Beetle is so dire that the Service has recommended that the species be uplisted from threatened to endangered.

At the time of listing, the Service stated that designating critical habitat for the Northeastern Beach Tiger Beetle was not prudent, claiming: “tiger beetle specimens are considered very valuable to collectors. Publication of maps detailing the specific locations of these beetles would increase the probability of their being over-collected, especially at sites containing smaller populations....On balance, the threat of over-collection as a result of designation of critical habitat would outweigh any benefit of such designation.”²³⁴ The record does not support this claim as information on the locations of Beach Tiger Beetles can be readily ascertained from existing information that is available to the public. Designating critical habitat can easily be accomplished in a way that does not put the species at further risk of collecting, and doing so would actually benefit the species.

A. Natural History, Threats, and Conservation Status of the Northeastern Tiger Beetle.

1. Natural History

The Northeastern Beach Tiger Beetle is a sand-colored terrestrial beetle measuring from 0.5-0.6 inches (13-15.5 mm) in length. Adults have a green-bronze head and thorax, paired dark markings on their cream-colored forewings, large pinching jaws, and long legs that allow for fast movements pursuing prey.

Northeastern Beach Tiger Beetles have a two-year life cycle. Adults emerge in late June, reach peak abundance by mid-July, and decline through early September. Mating and egg-laying occur during this period. Females deposit their eggs in the sand in beach dunes above the high tide line. Eggs hatch and larvae appear in late July and August. Larvae experience three developmental stages and will over-winter as larvae twice before becoming adults.²³⁵ Each spring, larvae pupate within burrows that they have constructed, emerging as larger larvae before finally emerging as adults in the third year. Depending on how early in the summer adults emerge, most will breed and die by the end of that summer, while some of the late emerging adults may over-winter for one more year.²³⁶ By November, Beach Tiger Beetle larvae and a few surviving adult become inactive and hibernate high up above the high tide line to avoid being drowned in winter storm events.

Adults Beach Tiger Beetle are active on warm, sunny days along the water’s edge. By basing in the sun, adults are able to retain high body temperatures after dark to hunt for their prey.²³⁷ Foraging occurs in the damp sand of the intertidal zone; prey species include lice, fleas, and flies. Adults also regularly scavenge dead crabs and fish.²³⁸ Immature Beach Tiger Beetles lack the

²³⁴ *Determination of Threatened Status for the Puritan Tiger Beetle and the Northeastern Beach Tiger Beetle*, 55 Fed. Reg. 32088 (Aug. 7, 1990).

²³⁵ Stamatov J., *Cicindela dorsalis endangered on northern Atlantic coast*, 4CICINDELA 78 (1972).

²³⁶ Leonard, J.G. & R.T.Bell, *NORTHEASTERN TIGER BEETLES: A FIELD GUIDE TO TIGER BEETLES OF NEW ENGLAND*, CRC PRESS 192 (1998).

²³⁷ USFWS, 1994. *NORTHEASTERN TIGER BEETLE (CICINDELA DORSALIS DORSALIS) RECOVERY PLAN* (hereafter “NE TIGER BEETLE RECOVERY PLAN”) at 9, available at: http://ecos.fws.gov/docs/recovery_plan/940929b.pdf.

²³⁸ *Id.*

hard shells of adults, and as a result build burrows in the upper intertidal zone where moisture from the ocean helps to avoid desiccation. During the summer months immature Beetles are inactive, going through a period of aestivation.

For many species of tiger beetle, populations can experience very high larval mortality and dramatic year-to-year fluctuations in abundance, with some populations even becoming locally extirpated. However, tiger beetles can compensate for these losses because of their ability to disperse significant distances, and thereby recolonize areas where extirpations have occurred. The Northeastern Beach Tiger Beetle is capable of such dispersal and recolonization behavior, with adults being recorded as dispersing up to 12 miles away from where they emerged as larvae.²³⁹ However, as populations decline and habitats become more fragmented, successful dispersal and recolonization becomes more difficult.

2. Threats to the Northeastern Beach Tiger Beetle

The greatest threat to the Beach Tiger Beetle is from human activities, especially the destruction of natural beach habitats from development and beach stabilization and armoring projects.²⁴⁰ Beach stabilization structures such as groins, jetties, rip-rap revetments, and bulkheads, which are designed to reduce erosion and protect manmade structures, prevent sand from moving along the shoreline. These result of these actions often leads to altered beach profiles, which shrink the size of the beach, steepen its profile, harden the shoreline, and ultimately degrade and eliminate the Beach Tiger Beetle's habitat.²⁴¹ Within the Chesapeake Bay, erosion is a particular problem as sea levels rise from climate change. Human developments in beach habitat interfere with natural beach development, and as sea levels increase, there is simply no available habitat for this species. The common response to eroding beaches is to augment those areas with sand that is dredged elsewhere. However these types of beach-nourishment also adversely impacts habitat by burying prey, and kill the Beach Tiger Beetles themselves under the dredged sand.²⁴²

Beach Tiger Beetles and their habitats are threatened by pollution, as well as the risk of catastrophic and chronic oil spills and slicks. In addition, pesticides exposure from upstream and upwind agricultural areas, as well as pesticides used in beach environments to control mosquitoes also have contributed to the decline of the species.²⁴³ Recreational beach activities, especially use of off-road vehicles can crush tiger beetles and their burrows, and is considered by the service to be a significant factors in the decline of the New England populations of the Beach Tiger Beetle.²⁴⁴

Natural factors can negatively impact the Beach Tiger Beetle, such as mortality from flood tides, hurricanes, erosion, and winter storms. These factors are likely to be exacerbated by climate change as sea levels rise and storm intensities increase.

²³⁹ NE TIGER BEETLE RECOVERY PLAN at 15.

²⁴⁰ USFWS, 2009. NORTHEASTERN BEACH TIGER BEETLE (*CICINDELA DORSALIS DORSALIS*) 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter "NE TIGER BEETLE STATUS REVIEW") at 15, available at: http://ecos.fws.gov/docs/five_year_review/doc2372.pdf.

²⁴¹ *Id.* at 10.

²⁴² *Id.* at 11.

²⁴³ *Id.* at 12.

²⁴⁴ *Id.* at 13.

3. Conservation Status of the Northeastern Beach Tiger Beetle

The Northeastern Beach Tiger Beetle was once “very abundant on open, sandy beaches” and occurred in “great swarms” from Massachusetts to New Jersey and on both coasts of the Chesapeake Bay in Virginia and Maryland.²⁴⁵ By the 1950s, however, most of these populations had disappeared. There are two small populations on Martha’s Vineyard in Massachusetts, but the species has been nearly or completely extirpated from Rhode Island, Connecticut, New York Long Island, and New Jersey. Aside from those two small populations, the remaining Northeastern Beach Tiger Beetle can be found at approximately 50 locations around the Chesapeake Bay.²⁴⁶ Approximately half of these locations have populations of at least 100 adult Tiger Beetles each year.

Since its listing, the Service has documented no improvement towards recovery, but instead has documented a decline in numbers of beetles, numbers of populations, and occupied habitat range-wide.²⁴⁷ Many Beach Tiger Beetle populations continue to remain at risk of being extirpated. The 5-year review of the species conducted in 2009 recommended a reclassification of the northeastern beach tiger beetle from threatened to endangered.²⁴⁸ Likewise, the Service’s 2010 Recovery Report to Congress concluded that the Beach Tiger Beetle is “declining.”²⁴⁹

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those “specific areas within the geographic area occupied by the species at the time it is listed” which contain the “physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections.”²⁵⁰ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.²⁵¹

Physical or biological features include those that 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.²⁵²

²⁴⁵ NE TIGER BEETLE RECOVERY PLAN at 2.

²⁴⁶ *Id.* at 6.

²⁴⁷ *Id.*

²⁴⁸ NE TIGER BEETLE STATUS REVIEW at 13.

²⁴⁹ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

²⁵⁰ 16 U.S.C. § 1532(5)(A)(i).

²⁵¹ 16 U.S.C. § 1532(5)(A)(ii).

²⁵² *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

The ESA allows the Service to designate occupied critical habitat years after a species is listed.²⁵³ When critical habitat designation occurs substantially after listing, it can be difficult to determine what areas qualify as occupied “at the time it is listed.”²⁵⁴ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” Because the Northeastern Beach Tiger Beetle had been extirpated from large portions of its range prior to its protection under the ESA, the Center attempted to identify both unoccupied and occupied critical habitat for this species. The Center used the Service’s 2009 5-year review and 1994 recovery plan for this species to identify unoccupied habitat. Areas proposed as unoccupied critical habitat were only included if they were identified by the Services as possessing medium or high restoration potential. Because this species continues to decline and warrants uplisting to endangered, the Center believes that unoccupied areas are essential to the conservation of this species and must be designated as critical habitat.

For occupied critical habitat for the Northeastern Beach Tiger Beetle, physical features include: open sand flats; dynamic beaches at least 5 meters in width; sparse grassy areas; intertidal wreck zones; and substrate for burrowing and egg laying. Biological features include adequate prey sources of amphipods, beach arthropods, flies, lice or fleas; and tidal wreck materials comprised of seaweed and biological detritus.²⁵⁵

C. The Proposed Areas Require Special Management Considerations and Protections

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.²⁵⁶ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.²⁵⁷

Several areas occupied by the Beach Tiger Beetle are subject to special management and protection measures. Tiger Beetle habitat located within the Monomoy National Wildlife Refuge is managed by the Service and is subject to special protection measures limiting access. In the Chesapeake Bay, Parker’s Marsh, Savage Neck, Hughlett Point, and Bethel Beach are owned by the Virginia Department of Conservation and Recreation and classified as protected and

²⁵³ See, *Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev’d on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

²⁵⁴ 16 U.S.C. § 1532(5)(A)(i).

²⁵⁵ NE TIGER BEETLE STATUS REVIEW at 10.

²⁵⁶ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

²⁵⁷ *Id.*

managed in some respects to protect Tiger Beetle habitat.²⁵⁸ However additional management measures are required to limit and regulate access to Beach Tiger Beetle habitats, especially from off-road-vehicle use, and to mitigate and regulate shoreline development and beach stabilization projects. As such, the areas proposed as critical habitat may require special management considerations and protections.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.²⁵⁹ Here, the designation of critical habitat for the Northeastern Beach Tiger Beetle is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat or any portion thereof will place the Tiger Beetle at increased risk for illegal collection or take. The reality is that collecting is extremely rare — since the beetle was listed, there has been only one instance of illegal collection in 1996.²⁶⁰ Potential collectors already know where to find the beetle, as this information is already available to the public. Designating critical habitat will not result in more precise locations for collections.

Nor is there specific evidence to suggest that there would be an increase in collecting or additional harm to the beetle following designation of critical habitat. Indeed, the Service has designated critical habitat for other species of tiger beetle.²⁶¹ Accordingly, the Center requests that the Service designate critical habitat for the Northeastern Beach Tiger Beetle in the areas requested by the petition.

²⁵⁸ NE TIGER BEETLE STATUS REVIEW at 4.

²⁵⁹ 16 U.S.C. § 1533(b)(6)(C)(ii)

²⁶⁰ NE TIGER BEETLE STATUS REVIEW at 11.

²⁶¹ *Revision of Critical Habitat for Salt Creek Tiger Beetle*, 79 Fed. Reg. 26014 (May 6, 2014)./

IX. Critical Habitat Designation for the Puritan Tiger Beetle

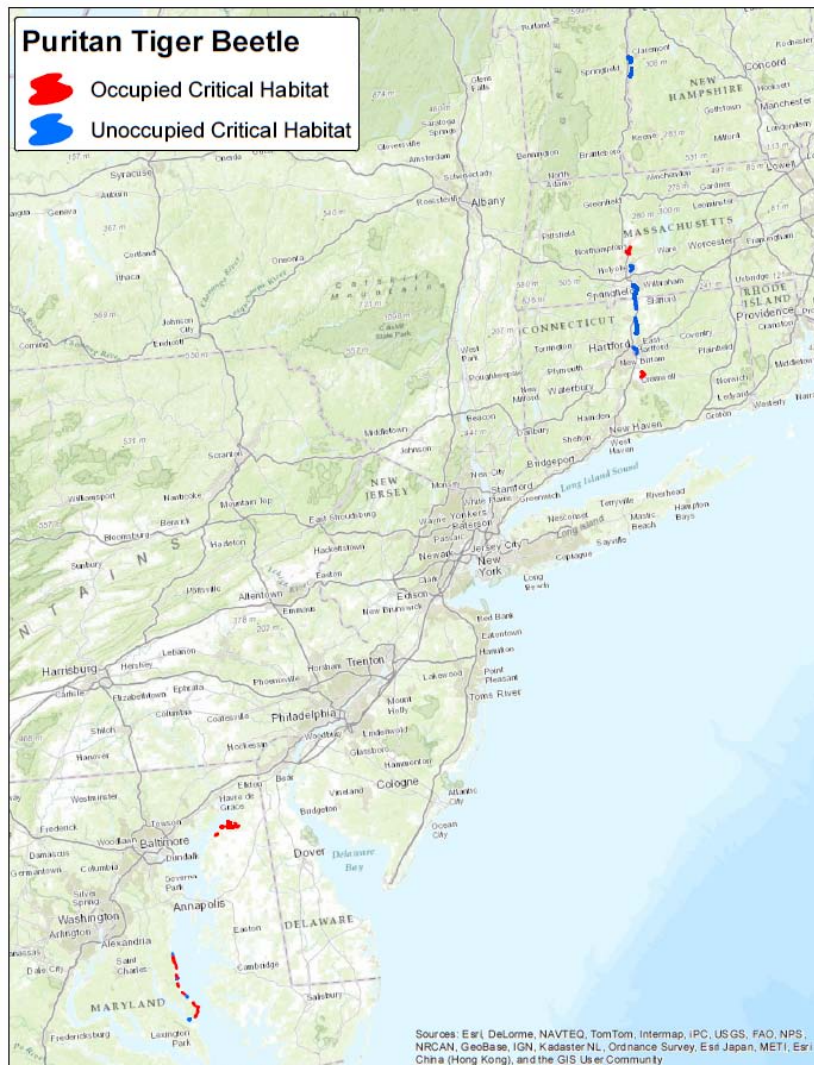


Figure Ten.

The Center requests that the Service designate approximately 13,131 acres as critical habitat for Puritan Tiger Beetle (*Cicindela puritan*) as shown in Figure Ten. These areas contain the physical and biological features that are essential to the conservation of beetle and would further the recovery of this declining species.

The Puritan Tiger Beetle was known historically from numerous sites along the Connecticut River in Vermont, New Hampshire, Massachusetts and Connecticut, and from locations around the Chesapeake Bay in Maryland. Now, it is only found in a few places in the Chesapeake Bay and just two sites on the Connecticut River. At the time of listing, the Service stated that designating critical habitat for the Puritan Tiger Beetle was not prudent, claiming: “tiger beetle specimens are considered very valuable to collectors. Publication of maps detailing the specific locations of these beetles would increase the probability of their being over-collected, especially at sites containing smaller populations....On balance, the threat of over-collection as a result of

designation of critical habitat would outweigh any benefit of such designation.”²⁶² The record does not support this claim as information on the locations of Puritan Tiger Beetles can be readily ascertained from existing information provided by the Service to the public. Designating critical habitat can easily be accomplished in a way that does not put the species at further risk of collecting, and instead would actually benefit the species.

A. Natural History, Threats, and Conservation Status of the Puritan Tiger Beetle

1. Natural History

The Puritan Tiger Beetle is medium-sized (11.5mm in length for males and 12.4mm in length for females) and long-legged, and is most recognizable by cream-colored markings on an otherwise bronze-brown to green back. The Puritan Tiger Beetle has a somewhat similar life history to the Northeastern Beach Tiger Beetle. While the Northeastern Beach Tiger Beetle is found nearly exclusively on ocean and estuary beaches, the Puritan Tiger Beetle is found along freshwater and estuary habitats, primarily in areas where there are small bluffs or cliffs above water. These sandy bluffs are utilized by larvae for burrowing purposes, and provides shelter for adults to ambush their prey.²⁶³

In general, the Puritan Tiger Beetle completes its life cycle in two years. Adult Puritan tiger beetles are usually detected beginning in late June when they emerge to feed and mate along the beach area. Adults feed actively in the wreck along the shoreline and on the bluff face, where they chase down and capture their prey, almost all of which is comprised of small invertebrates. Mating begins in mid-July and continues until mid-August, when the adults start to die off. Along the Chesapeake Bay, the females move up onto the cliffs to deposit their eggs after mating. Along the Connecticut River, females place their eggs just below the surface of the sand among scattered plants.

After about a week, the eggs hatch into larvae about one-third of an inch long. The larvae dig a burrow an inch or two deep in either the cliffs or the sand. They sit at top of the burrow, blocking the entrance with their large heads, and wait for prey, which they capture with their sickle-like mandibles.²⁶⁴ After 2-4 weeks, the larvae molt into a slightly larger second stage. By late October, these second-stage larvae close their burrows for the first of their two over-winter hibernations. In April or early May of the next spring, they open their burrows and hunt for prey for a few months, then close their burrows again until early September, when they molt to the third and final larval stage. These larvae remain active until late fall when they close their burrows for their second winter. The following spring, they are active until about June, when they pupate and transform into adults. The adult beetles then emerge from their burrows and mate, starting over the cycle.

²⁶² *Determination of Threatened Status for the Puritan Tiger Beetle and the Northeastern Beach Tiger Beetle*, 55 Fed. Reg. 32088 (Aug. 7, 1990).

²⁶³ USFWS, 1993. PURITAN TIGER BEETLE (CICINDELA PURITANA): RECOVERY PLAN (hereafter “PURITAN BEETLE RECOVERY PLAN”) at 10-11, available at: http://ecos.fws.gov/docs/recovery_plan/930929a.pdf.

²⁶⁴ *Id.* at 11.

The Puritan Tiger Beetle occurred historically in two disjunct areas: one along the Connecticut River, and another along the Chesapeake Bay shoreline in Maryland.²⁶⁵ The two populations are believed to have been separated for thousands of years and have developed significant genetic and ecological differences.²⁶⁶ In Maryland, larvae live in deep burrows, which they dig in sandy deposits on non-vegetated portions of the bluff face. They may also burrow at the base of the bluffs in sediment deposits that have eroded from the bluff face.²⁶⁷ Chesapeake Bay populations have been found to be most abundant where bluffs are long and high, with little or no vegetation, and composed at least in part of yellow or red sandy soil. Wave-producing storms and concomitant erosion of bluffs are necessary to maintain the bare bluff faces required for larval habitat since larvae will not utilize densely vegetated bluffs.²⁶⁸ In contrast, the Connecticut River populations generally do not use the low bluffs; instead, their burrows are found among scattered herbaceous vegetation at the upper portions of sandy beaches and occasionally near the river's edge. And at the lower end of Connecticut River estuary, Puritan Tiger Beetle larvae are subject to tidal flooding.²⁶⁹

2. Threats to the Puritan Tiger Beetle

Puritan Tiger Beetles have disappeared from much of their New England range and have declined in population size and distribution in their Chesapeake Bay range primarily due to human-caused habitat loss and degradation. Along the Connecticut River, the natural, fluvial processes that originally created and maintained the Puritan Tiger Beetle's habitat have been permanently altered by the construction of 17 dams.²⁷⁰ The operation of flood control and hydroelectric dams has changed the way rivers flow and flood, affecting the forces which create and maintain river beaches. Furthermore, dam reservoirs have inundated and destroyed tiger beetle habitat by permanently flooding beetle habitats. Other projects including riverbank stabilization and development have altered river habitat. The beetle larvae, in particular, are sensitive to natural and human-induced changes to beaches and bluffs, as well as human traffic and water-borne pollution.

In the Chesapeake Bay region, the beetle's habitat is also threatened by development, including shoreline erosion control projects. Shoreline stabilization structures, including revetments, offshore breakwaters, and groins, are designed to minimize wave-induced erosion at the base of the bluff such that, over time, the slope of the bluff will decrease, eventually reaching a stable angle of repose. Slopes thus stabilized eventually become vegetated, making them unsuitable for Puritan tiger beetle larval habitat.²⁷¹

²⁶⁵ *Id.* at 8.

²⁶⁶ *Id.*

²⁶⁷ *Id.* at 10.

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ USFWS 2007. PURITAN TIGER BEETLE (*CICINDELA PURITANA*) DRAFT 5-YEAR REVIEW: SUMMARY AND EVALUATION (hereafter "PURITAN TIGER BEETLE STATUS REVIEW") at 13-15, available at: http://ecos.fws.gov/docs/five_year_review/doc1114.pdf.

²⁷¹ *Id.* at 14.

3. Conservation Status of the Puritan Tiger Beetle.

Puritan tiger beetles' populations are declining both in the Chesapeake Bay and along the Connecticut River. At this time, only two small Connecticut River populations remain — one in Massachusetts and one in Connecticut. Both of these populations could easily be extirpated in the near future. In the Chesapeake Bay, there are approximately six localities with more than 500 adults, and approximately 13 smaller populations in Calvert, Kent, and Cecil counties in Maryland.

Since its listing, the Service has documented very little improvement of this species towards recovery. Instead Puritan Tiger Beetles continue to decline habitat range-wide, and populations continue to remain at risk of being extirpated.²⁷² The draft 5-year review of the species conducted in 2007 recommended a reclassification of the northeastern beach tiger beetle from threatened to endangered.²⁷³ Likewise, the Service's 2010 Recovery Report to Congress concluded that the Puritan Tiger Beetle is "declining" and should be uplisted from threatened to endangered.²⁷⁴

B. The Proposed Areas Contain Physical and Biological Features Essential to the Conservation of the Species

The Endangered Species Act defines critical habitat as those "specific areas within the geographic area occupied by the species at the time it is listed" which contain the "physical or biological features...essential to the conservation of the species and...which may require special management considerations or protections."²⁷⁵ The ESA also allows critical habitat to be designated outside the geographic area of the species when those areas are determined to be essential for the conservation of the species.²⁷⁶

Physical or biological features include those that 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.²⁷⁷

The ESA allows the Service to designate occupied critical habitat years after a species is listed.²⁷⁸ When critical habitat designation occurs substantially after listing, it can be difficult to

²⁷² *Id.*

²⁷³ *Id.* at 13.

²⁷⁴ USFWS, 2011. REPORT TO CONGRESS ON THE RECOVERY OF THREATENED AND ENDANGERED SPECIES. FISCAL YEARS 2009-2010, available at: http://www.fws.gov/endangered/esa-library/pdf/Recovery_Report_2010.pdf.

²⁷⁵ 16 U.S.C. § 1532(5)(A)(i).

²⁷⁶ 16 U.S.C. § 1532(5)(A)(ii).

²⁷⁷ *Implementing Changes to the Regulations for Designating Critical Habitat*, 79 Fed. Reg. 27006 (May 12, 2014).

²⁷⁸ *See, Otay Mesa Property v. Dept. of Interior*, 714 F. Supp. 2d 73 (D.D.C. 2010), *rev'd on other grounds*, 646 F.3d 914 (D.C. Cir. 2011).

determine what areas qualify as occupied “at the time it is listed.”²⁷⁹ The known distribution of a species can change after listing for many reasons, such as discovery of additional localities, extirpation of populations, or emigration of individuals to new areas. Where such changes reflect actual changes in the distribution of the species those areas would be considered “unoccupied” at the time of listing. In contrast, when changes reflect only new or additional information concerning a species distribution, those areas would be considered “occupied.” Because the Puritan Tiger Beetle has been extirpated from large portions of its range prior to listing under the ESA, the Center attempted to identify both unoccupied and occupied habitat for this species. The Center used the Service’s draft 2007 5-year review to identify unoccupied habitat. Because this species continues to decline and warrants uplisting to endangered, the Center believes that unoccupied areas are essential to the conservation of this species and must be designated as critical habitat.

With respect to occupied critical habitat for the Puritan Tiger Beetle, physical features include: long and high bluffs, with little or no vegetation, and composed at least in part of yellow or red sandy soil; and unaltered river beaches with scattered herbaceous vegetation at the upper portions of sandy beaches. Biological features include adequate prey sources of amphipods, beach arthropods, flies, lice or fleas; river wreck material; and tidal wreck materials comprised of seaweed and biological detritus.

C. The Proposed Areas Require Special Management Considerations and Protections

In order for an area to be designated as occupied critical habitat, the Service must make also make a determination that those areas “may require special management considerations or protections.” Whether habitat does or does not require special management is not determinative as to whether an area qualifies as critical habitat as long as those could or possibly require management. Nor does occupied critical habitat require *additional* management beyond management that is already in place. The fact that a particular habitat does, in fact, require management of some kind already is demonstrative evidence that the habitat can be designated as critical habitat.²⁸⁰ Thus, the consideration of whether features in an area may require special management or protection occurs independent of whether any form of management or protection occurs in the area.²⁸¹

Connecticut, Maryland, and Massachusetts have all listed the Puritan tiger beetle as endangered species under their respective state laws and they have taken a number of measures to ensure the protection of Puritan tiger beetle habitat. For example, Maryland has developed a Puritan Tiger Beetle Habitat Conservation Program, which provides an increased level of protection for Puritan Tiger Beetle habitat. In addition the Calvert Cliffs area has been designated as one of Maryland’s “Natural Areas” and is as such subject to special conservation and sustainable management measures. However, additional management measures are needed to stop the destruction of the cliffs that make up the Puritan Tiger Beetle’s habitat in the Chesapeake Bay, and to limit anthropogenic threats created by recreational activities, urbanization, bank

²⁷⁹ 16 U.S.C. § 1532(5)(A)(i).

²⁸⁰ *Center for Biological Diversity v. Norton*, 240 F.Supp.2d 1090 (D. Ariz. 2003).

²⁸¹ *Id.*

stabilization, water pollution of the Connecticut River. As such, the areas proposed as critical habitat may require special management considerations and protections, as required by the ESA.

D. Critical Habitat Designation Is both Prudent and Determinable

Critical habitat must be designated to the maximum extent prudent and determinable.²⁸² Here, the designation of critical habitat for the Puritan Tiger Beetle is both prudent and determinable, and as a result, the Service must promptly designate such habitat. There is no evidence to suggest that designating critical habitat or any portion thereof will place the Puritan Tiger Beetle at increased risk for illegal collection or take. Potential collectors already know where to find the beetle, as this information is already available to the public. Designating critical habitat will not result in more precise locations for collections. As mentioned above, the Service has designated critical habitat for other species of tiger beetle. Accordingly, the Center requests that the Service designate critical habitat for the Puritan Tiger Beetle in the areas requested by the petition.

²⁸² 16 U.S.C. § 1533(b)(6)(C)(ii)

APPENDIX A: PROPOSED REGULATORY LANGUAGE

I. Proposed Rule for the Shenandoah Salamander (*Plethodon shenandoah*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(d) *Amphibians.*

* * * * *

Shenandoah Salamander (*Plethodon shenandoah*)

(1) Critical habitats units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Shenandoah Salamander, including:

- (A) High-elevation, north-facing, talus slopes above 800 meters;
- (B) Cool microclimate environments created by soil conditions, crevices and burrows;
- (C) Connectivity habitats between core population areas;
- (D) Oak and hemlock forest-canopy cover;
- (E) Leaf-litter substrate; and
- (F) Invertebrate prey availability.

(3) Critical habitat for the Shenandoah Salamander does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

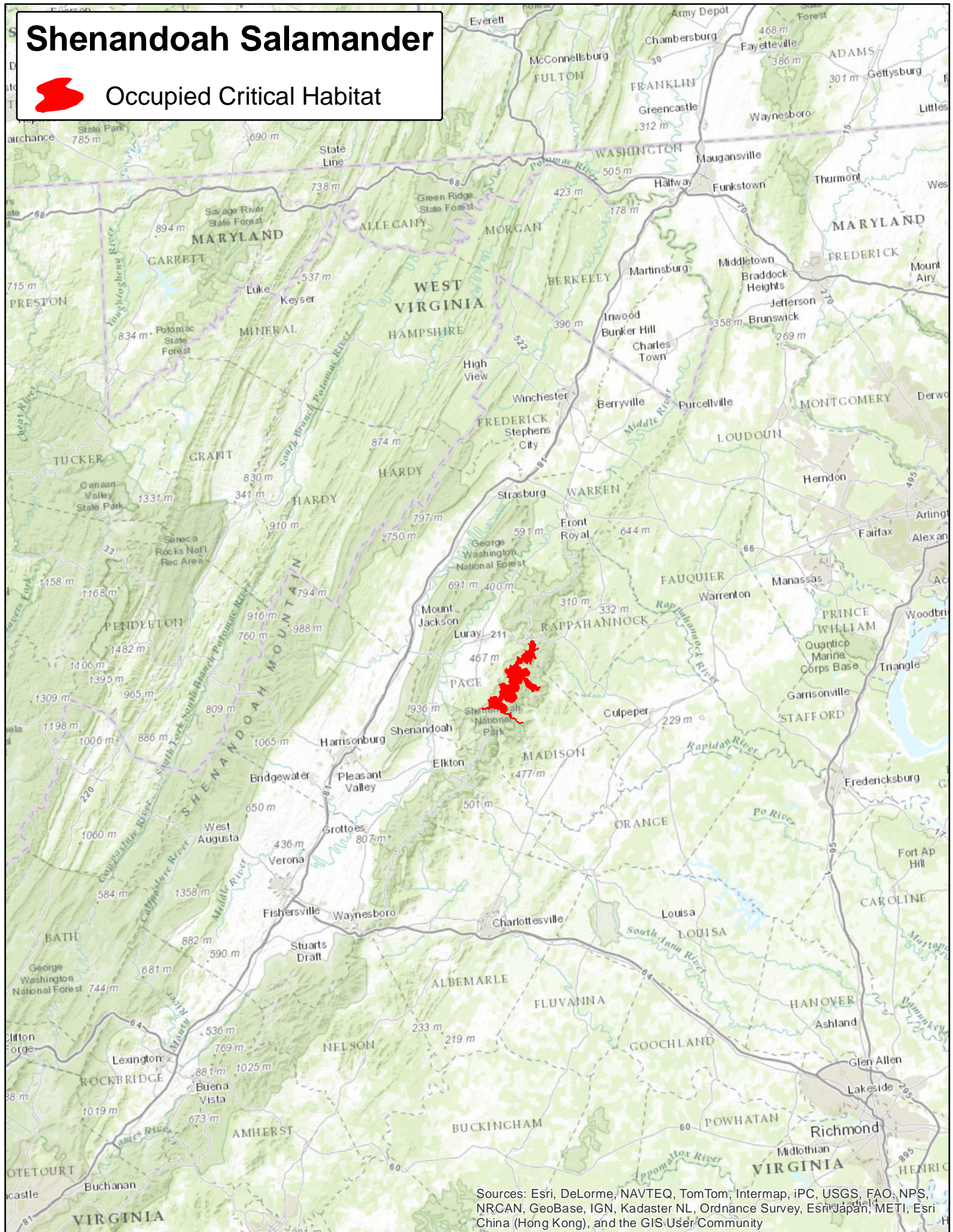
(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Shenandoah Salamander



Occupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

II. Proposed Rule for the Roseate Tern Northeast DPS (*Sterna dougallii dougallii*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(b) *Birds.*

* * * * *

Roseate Tern Northeast Distinct Population Segment (*Sterna dougallii dougallii*)

(1) Critical habitat units are depicted on the maps below.

(2) Within these areas, are the physical and biological features essential to the conservation of the Roseate Tern Northeast DPS, including:

- (A) Sandy barrier islands and isolated beaches for breeding
- (B) Sand bars for roosting/resting
- (C) Post-breeding/roosting beaches to stage for migration
- (D) Interspersed/clumped native vegetation and other objects that provide shelter for nests
- (E) Common tern nesting colonies
- (F) Offshore waters less than 10 meters in depth within 25 kilometers of a tern colony
- (G) Forage fish aggregations and presence of predatory fish.

(3) Critical habitat for the Roseate Tern does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

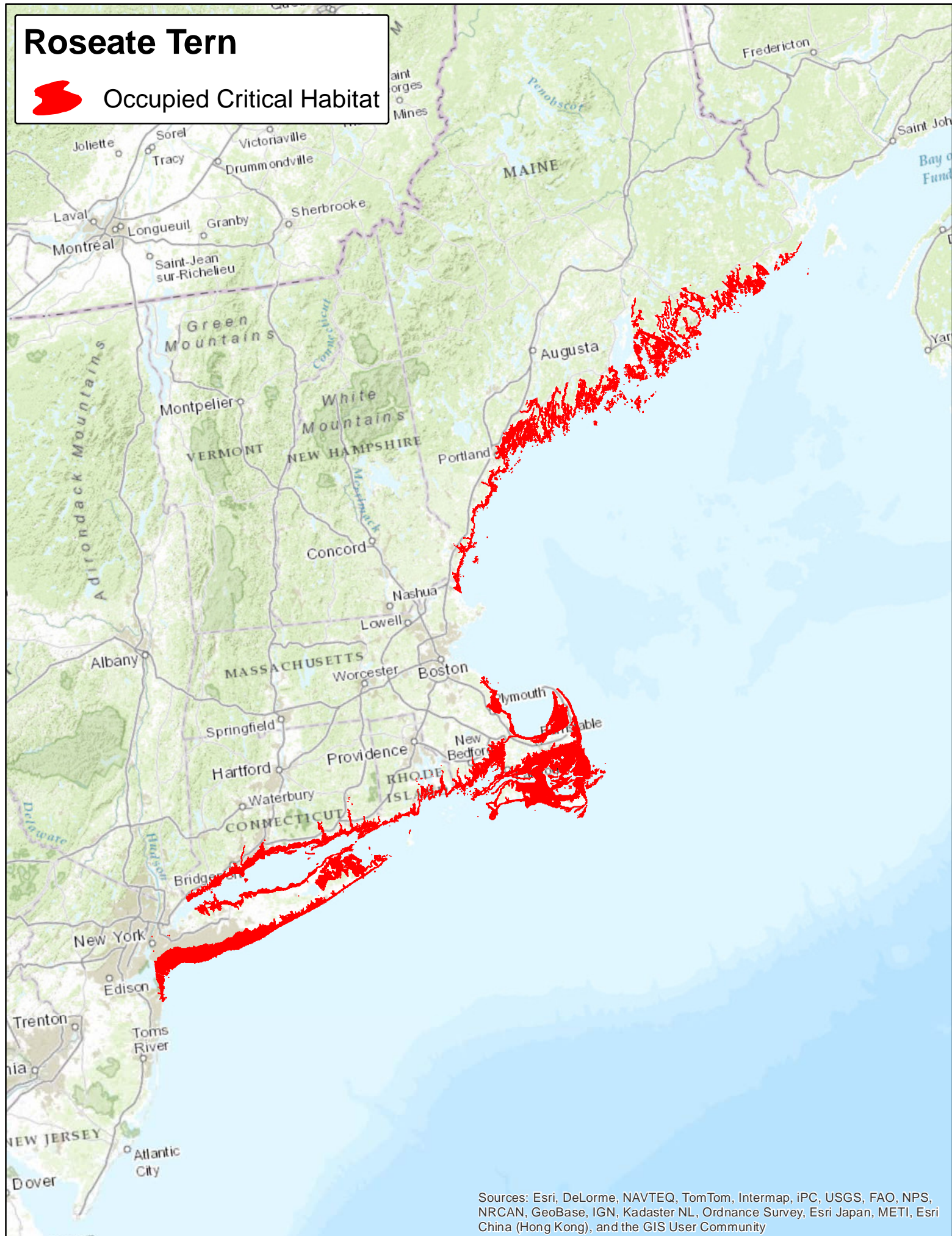
(4) *Critical habitat map units.* Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain detailed location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Roseate Tern



Occupied Critical Habitat



III. Proposed Rule for the James Spiny mussel (*Pleurobema collina*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and Snails*

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James Spiny mussel (*Pleurobema collina*)

(1) Critical habitat units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of James Spiny mussel, including:

- (A) Low velocity river and stream habitat
- (B) Sand or cobble river substrate
- (C) High water quality with low levels of pollutants and sediments
- (D) Presence of fish host species including Bluehead chub, Rosyside dace, Blacknose dace, Mountain redbelly dace, Rosefin shiner, Satinfish shiner, and Stoneroller
- (E) Phytoplankton food availability.

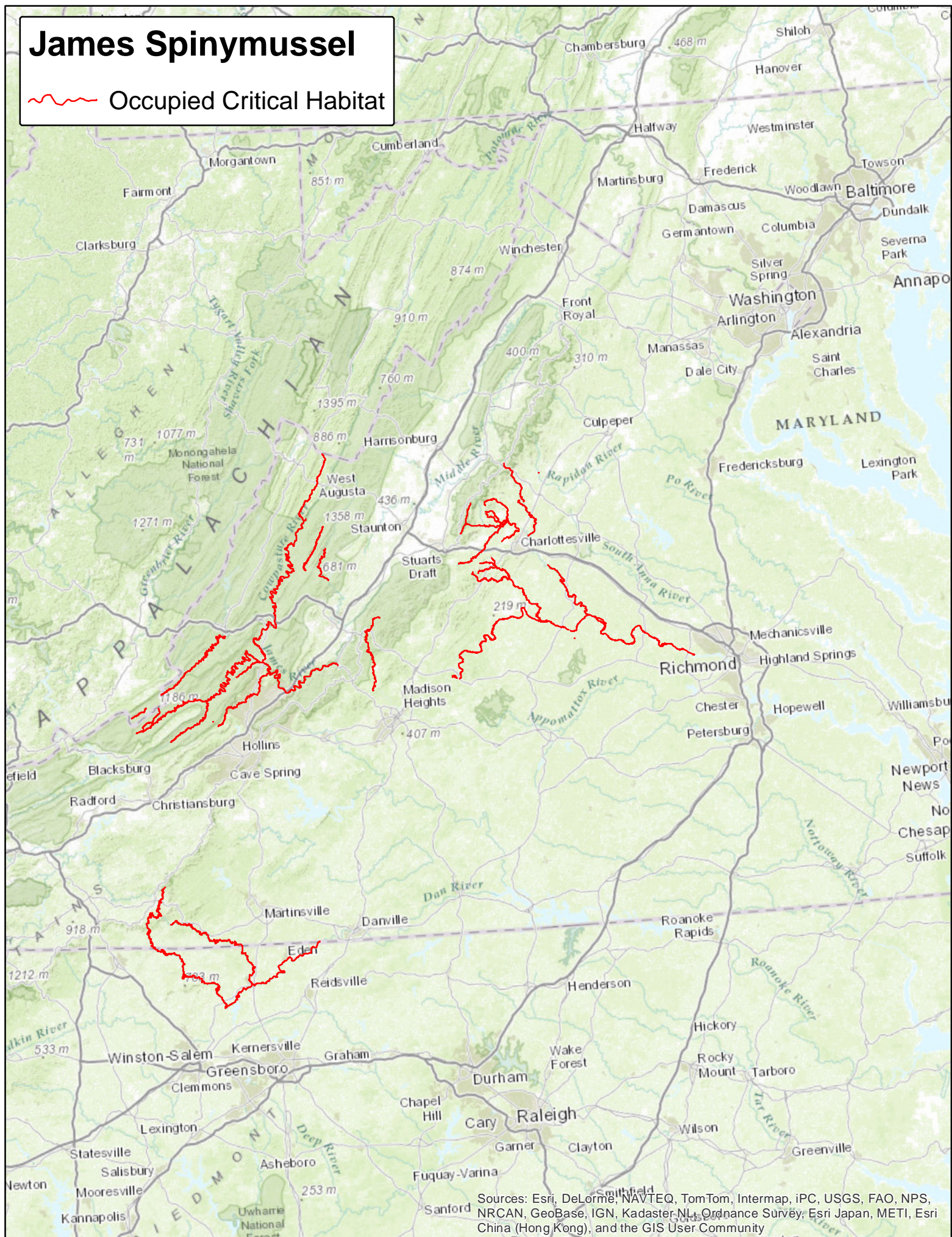
(3) Critical habitat for the James Spiny mussel does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

James Spinymussel

Occupied Critical Habitat



IV. Proposed Rule for the Clubshell (*Pleurobema clava*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and Snails*

* * * * *

Clubshell (*Pleurobema clava*)

(1) Critical habitats are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Clubshell, including:

- (A) Low velocity river and stream habitat;
- (B) River substrate of coarse sand and gravel;
- (C) high water quality with low pollution and very low sediment levels.
- (D) Presence of fish host species including the striped shiner, central stoneroller, blackside darter, and the common Logperch
- (E) Phytoplankton food availability.

(3) Critical habitat for the Clubshell does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

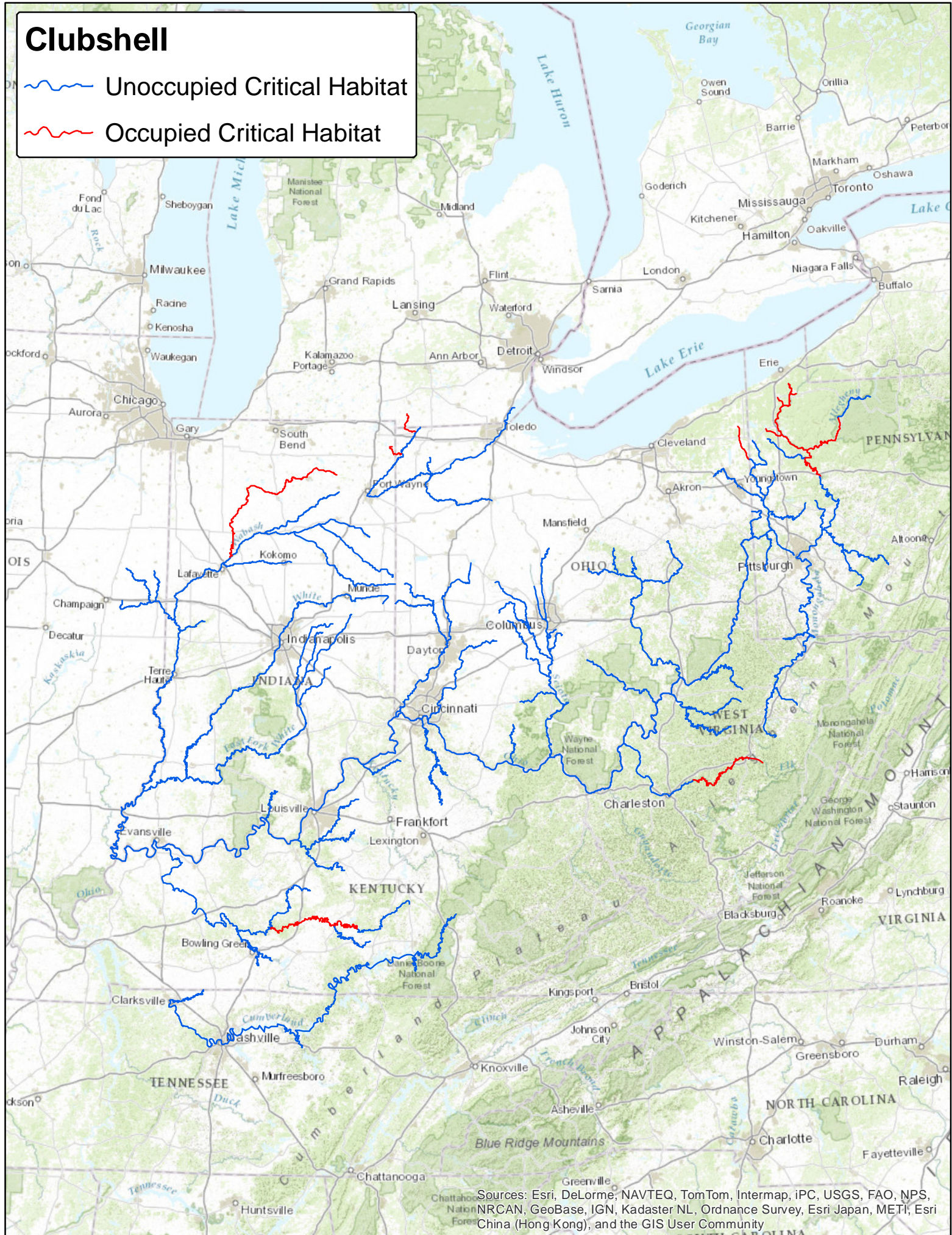
(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Clubshell

 Unoccupied Critical Habitat

 Occupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

V. Proposed Rule for the Dwarf Wedgemussel (*Alasmidonta heterodon*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(f) *Clams and Snails*

* * * * *

Dwarf Wedgemussel (*Alasmidonta heterodon*)

(1) Critical habitats units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of the Dwarf Wedgemussel, including:

- (A) Low velocity river and stream habitat;
- (B) Substrates of mixed sand, pebble, gravel, clay, and cobble
- (C) Good water quality with low levels of pollutants and suspended sediments.
- (D) Logs, root mats, and other woody debris that provide shelter/habitat;
- (E) Presence of fish host species including tessellated darter, Johnny darter, mottled sculpin, slimy sculpin, or Atlantic salmon;
- (F) Phytoplankton food availability.

(3) Critical habitat for the Dwarf Wedgemussel does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

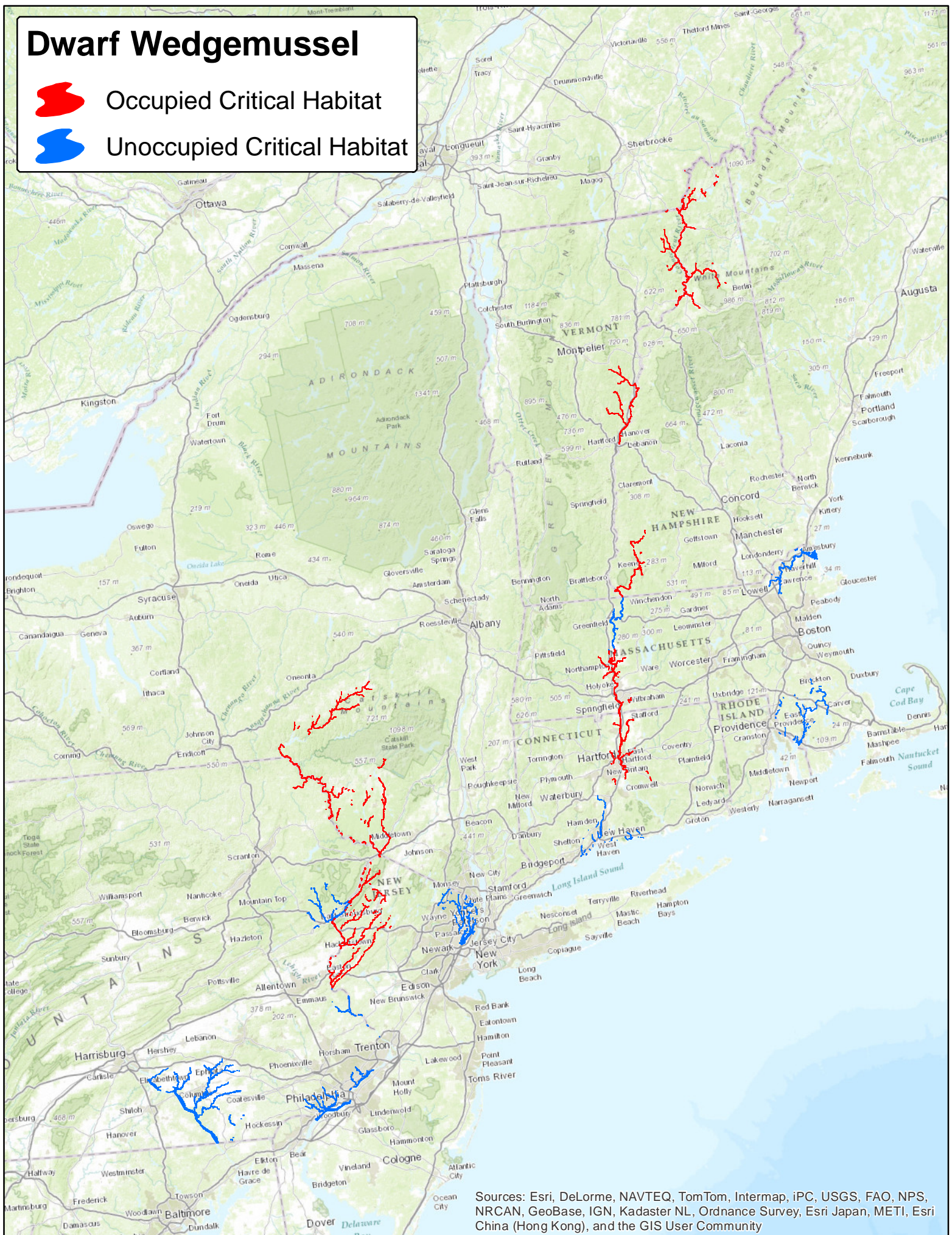
Dwarf Wedgemussel



Occupied Critical Habitat



Unoccupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, IPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

VI. Proposed Rule for the Hay's Spring Amphipod (*Stygobromus hayi*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(h) *Crustaceans*

* * * * *

Hay's Spring Amphipod (*Stygobromus hayi*)

(1) Critical habitat units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Hay's Spring Amphipod, including:

- (A) Year round or nearly year-round freshwater seeps and springs
- (B) Hypotelminorheic habitats
- (C) Geological formations that create perched-aquifers
- (D) Connectivity habitats
- (E) Native forest vegetation and canopy
- (F) Leaf litter layer with sufficient organic detritus

(3) Critical habitat for the Hay's Spring Amphipod not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

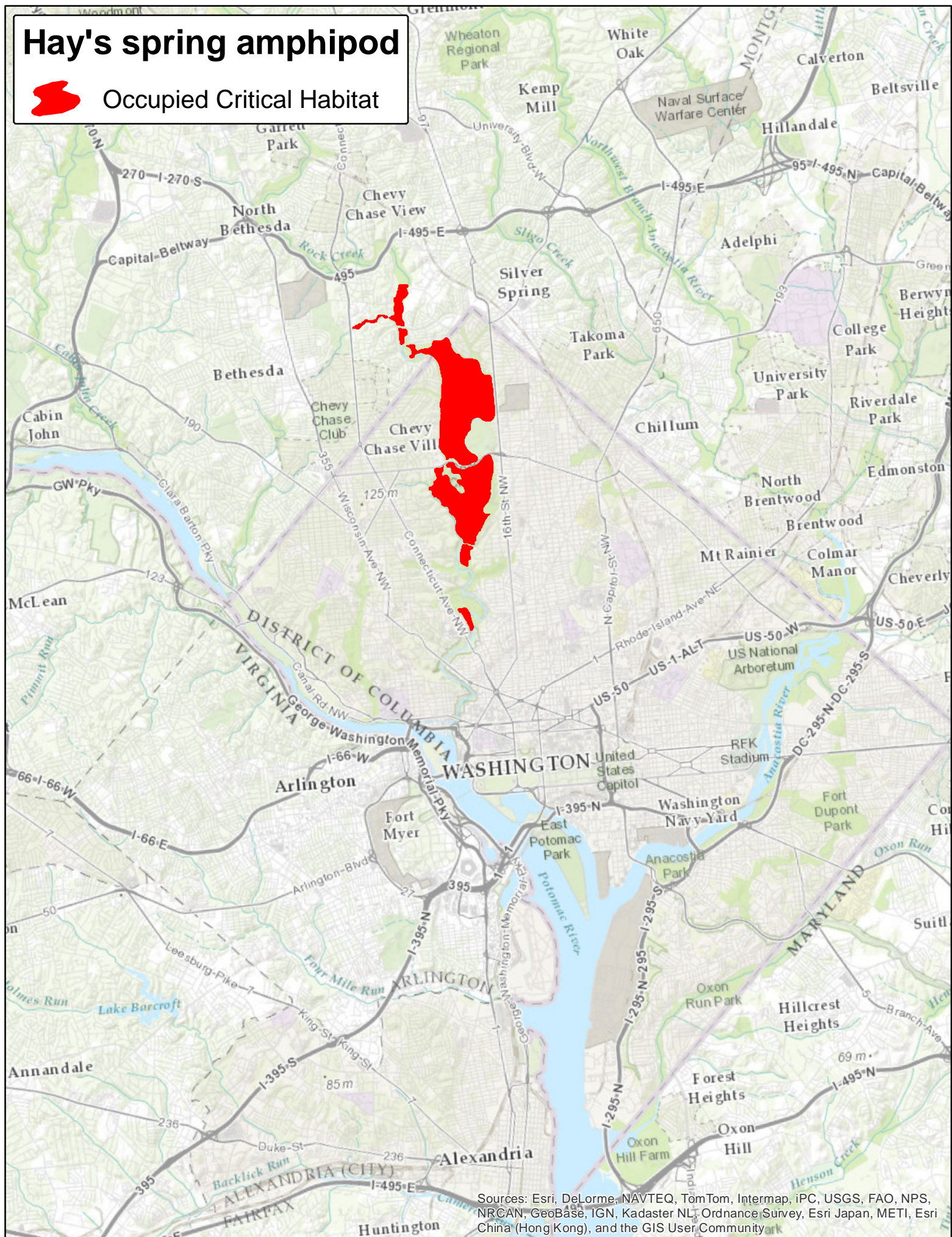
(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Hay's spring amphipod



Occupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

VII. Proposed Rule for the Roanoke Logperch (*Percina rex*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(e) *Fishes*

* * * * *

Roanoke Logperch (*Percina rex*)

(1) Critical habitat unit are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Roanoke Logperch, including:

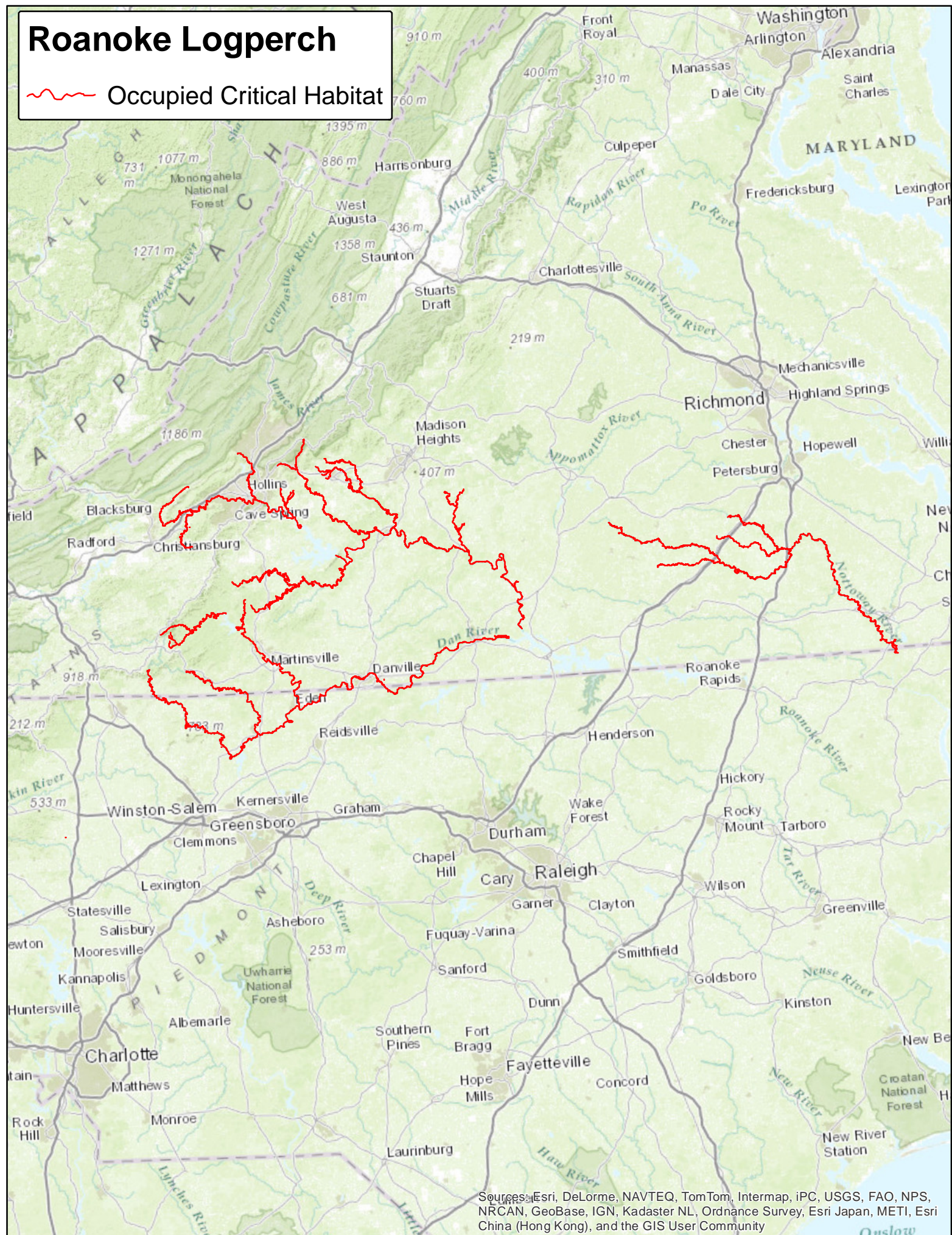
- (A) Stream and river systems with areas of shallow riffles;
- (B) Gravel or small cobble river substrate;
- (C) Deep pools with boulders;
- (D) Spawning water temperatures between 12-14°C.
- (E) Good water quality with low sediment levels;
- (F) Woody debris and tree-falls;
- (G) Riparian vegetation;
- (H) Adequate chironomid and caddisfly availability

(3) Critical habitat for the Roanoke Logperch does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

 Occupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

VIII. Proposed Rule for the Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(i) *Insects*

* * * * *

Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis*)

(1) Critical habitat units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Northeastern Beach Tiger Beetle, including:

- (A) Open sand flats;
- (B) Dynamic beaches at least 5 meters in width;
- (C) Sparse grassy areas
- (D) Intertidal wreck zones and tidal wreck materials;
- (E) Adequate substrate for burrowing and egg laying.
- (F) Adequate prey sources of amphipods, beach arthropods, flies, lice or fleas;

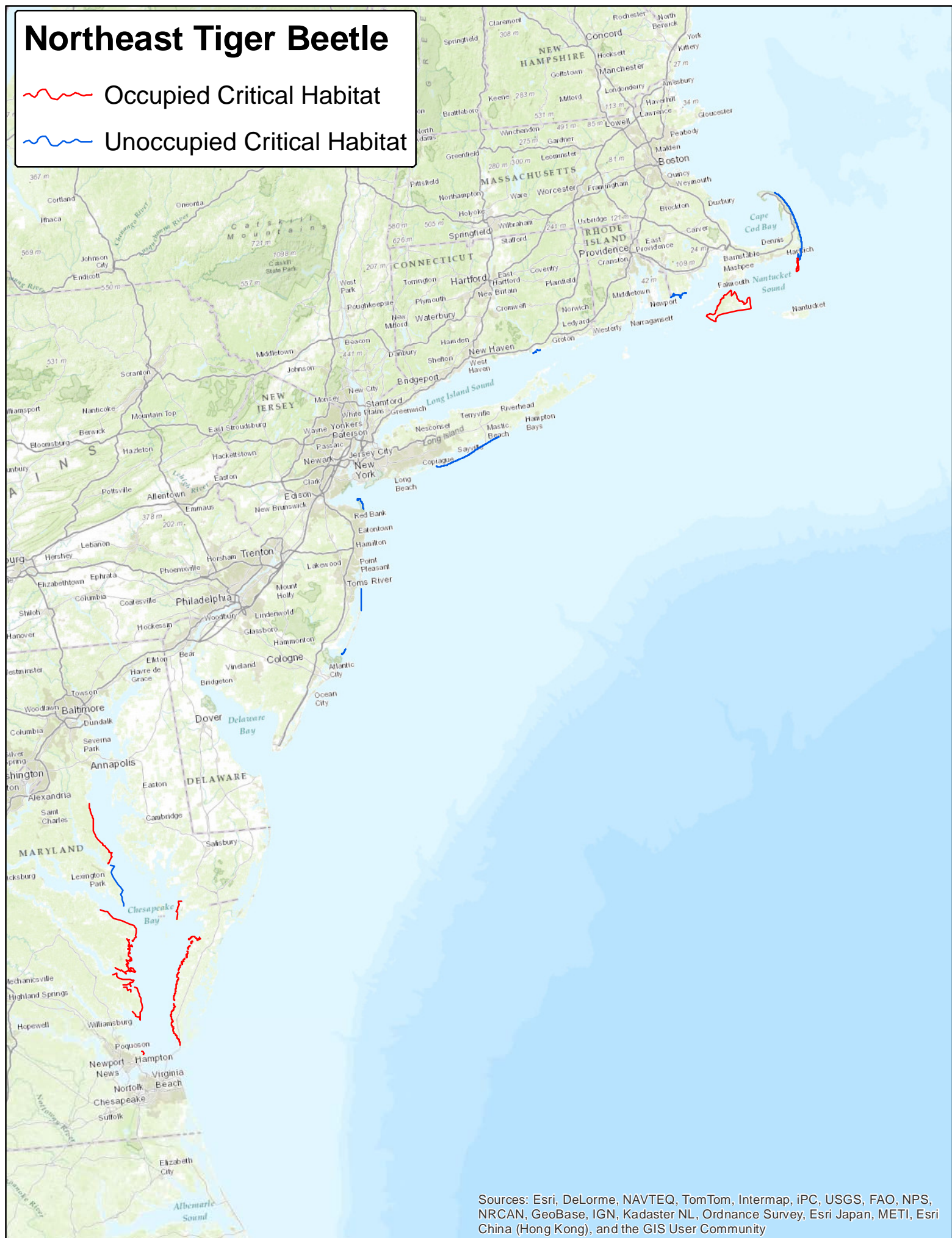
(3) Critical habitat for the Northeastern Beach Tiger Beetle does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Northeast Tiger Beetle

- Occupied Critical Habitat
- Unoccupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, IPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

IX. Proposed Rule for the Puritan Tiger Beetle (*Cicindela puritan*)

17.95 Critical habitat—fish and wildlife.

* * * * *

(i) *Insects*

* * * * *

Puritan Tiger Beetle (*Cicindela puritan*)

(1) Critical habitat units are depicted on the map below.

(2) Within these areas, are the physical and biological features essential to the conservation of Puritan Tiger Beetle, including:

- (A) Long and high bluffs with little or no vegetation
- (B) Red and yellow soils for burrowing.
- (C) Unmodified river beaches with scattered herbaceous vegetation
- (D) Adequate prey sources of amphipods, beach arthropods, flies, lice or fleas;
- (E) River wreck material;
- (F) Tidal wreck materials comprised of seaweed and biological detritus.

(3) Critical habitat for the Puritan Tiger Beetle does not include manmade structures (such as buildings, airport runways, roads, and other paved areas) and the land on which they are located existing within the boundaries of designated critical habitat.

(4) Data layers defining map units were created from a number of geospatial data layers. The maps for this species establish the boundaries of the critical habitat designation. Private land boundaries may not be exact due to mapping inconsistencies between land survey data, Geographic Information System (GIS) coordinates, and differing mapping layers provided. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site. You may obtain location information by contacting one of the Service offices, the addresses of which are listed at 50 C.F.R. § 2.2.

(5) Index map follows:

Puritan Tiger Beetle



Occupied Critical Habitat



Unoccupied Critical Habitat



Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, IPC, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and the GIS User Community

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