

Interim Core Map Documentation for Puritan Tiger Beetle

Version 1

Review Completed: February 2026

Core Map Developer: Center for Biological Diversity¹ (CBD)

Species Summary

Tiger beetles are a family of insects that are quick and voracious predators, capturing other invertebrates in a tiger-like manner (FWS 2025). The Puritan tiger beetle, brownish bronze with a metallic blue underside and narrow white lines on each wing, measures under half an inch in length. They can be found on sandy beaches and eroding cliffs along the Chesapeake Bay in Maryland and the Connecticut River in New England. The U.S. Fish and Wildlife Service (FWS) estimates that these two populations have been separate for thousands of years and as such, have developed significant genetic and ecological differences. Landcover categories within the core map area are included in **Table 1**. Landcover within the core map is predominantly open water, wood wetlands, and cultivated crops, which is consistent with the habitat of this species.

FWS (2025) states that the Chesapeake Bay populations contain two metapopulations—one in Calvert County, MD, on the western side of the Bay and one along the SassafRAS River of the eastern shore of the Bay. Each metapopulation consists of subpopulations that are spatially separate from each other but likely have some level of dispersal among them. There is likely no dispersal between the eastern and western metapopulations. In the Chesapeake Bay region, the Puritan tiger beetle larvae occupy only naturally eroding cliffs, where they develop in deep horizontal burrows in sandy deposits of non-vegetated portions of the bluff face or at the base of the cliffs. They are most abundant at sites where the bluffs are long and high with little or no vegetation and composed in part of sandy soil.

FWS (2025) states that only a few small populations remain in New England. These include one metapopulation consisting of four sites near Cromwell, CT, and on single site in Massachusetts. In New England, Puritan tiger beetles occur in the sand and gravel islands of the river where the beetle larvae develop in vertical burrows in suitable substrate.

FWS (2025) states that 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. The remaining Chesapeake Bay populations are highly susceptible to habitat loss or degradation due to shoreline development and bluff stabilization. Shoreline structures have been found to destroy the larval habitat directly or by promoting vegetation on cliff faces making the cliff unsuitable for the larvae. Natural threats include flooding, parasites and insect predators. Additional information is provided in **Appendix 1**.

¹ CBD sent the U.S. Environmental Protection Agency (EPA) the core map for this species before EPA released its mapping process document and example documentation. EPA modified the core map as described in this document and supplemented the documentation and supporting analysis for consistency with EPA's most recent documentation examples made available after CBD developed this core map.

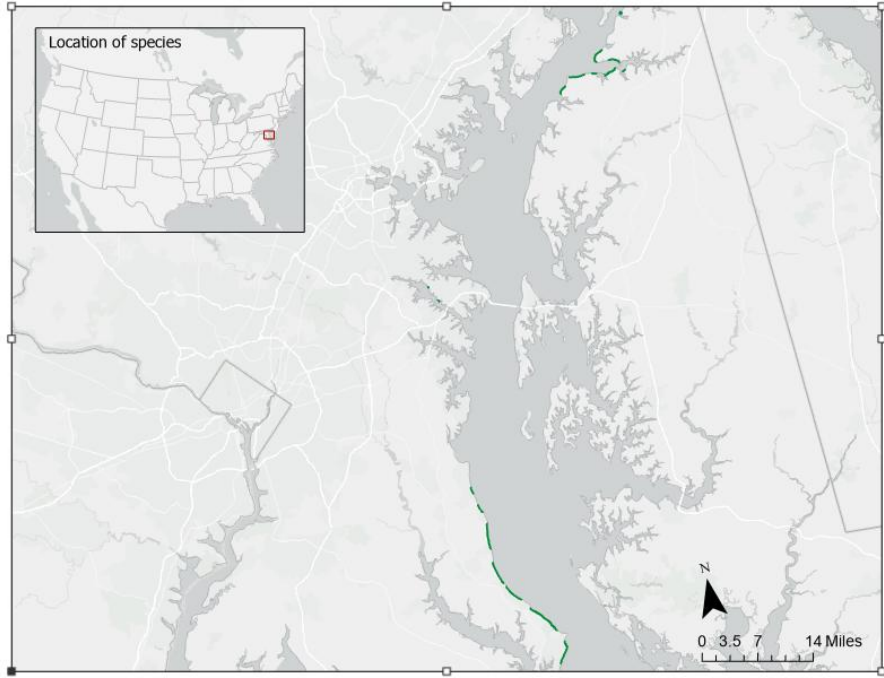


Figure 1a. Interim core map (1/2) for the Puritan tiger beetle.

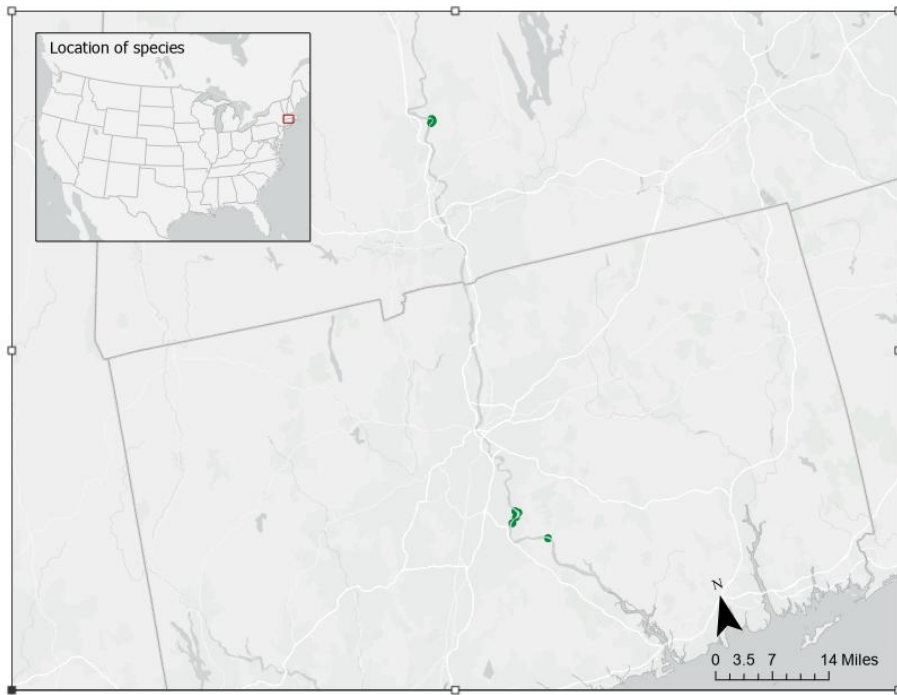


Figure 1b. Interim core map (2/2) for the Puritan tiger beetle.

Table 1. Percentage of Interim Core Map Represented by NLCD² Land Covers and Associated Example Pesticide Use Sites/Types.

Example pesticide use sites/types	NLCD Class/Value	% Area
Forestry	Deciduous Forest (41)	3%
Forestry	Evergreen Forest (42)	3%
Forestry	Mixed Forest (43)	8%
Agriculture	Pasture/Hay (81)	1%
Agriculture	Cultivated Crops (82)	11%
Mosquito adulticide, residential	Open space, developed (21)	4%
Mosquito adulticide, residential	Developed, Low intensity (22)	1%
Mosquito adulticide, residential	Developed, Medium intensity (23)	1%
Mosquito adulticide, residential	Developed, High intensity (24)	0%
Invasive species control	Woody Wetlands (90)	17%
Invasive species control	Emergent Herbaceous Wetlands (95)	5%
Invasive species control	Open water (11)	44%
Invasive species control	Grassland/herbaceous (71)	0%
Invasive species control	Scrub/shrub (52)	1%
Invasive species control	Barren land (rock/sand/clay; 31)	0%
Total Interim Core Map Acres		~ 7,862 acres

Description of Core Map

The core map for the Puritan tiger beetle is based on the species range, which includes two distinct regions—along the Chesapeake Bay in Maryland and along the Connecticut River in New England. The species is only found within the range and the range contains minimal unoccupied areas. There is no designated critical habitat for this species.

This core map will be used to develop pesticide use limitation areas (PULAs) that include the Puritan tiger beetle. This core map incorporates information developed by FWS and made available to the public; however, the core map has not been formally reviewed by FWS. This interim core map may be revised in the future to incorporate expert feedback from FWS. This interim core map has a “none” (1) best professional classification because it consists of the species’ range without additions or subtractions.

This core map does not replace or revise any range or designated critical habitat developed by FWS for this species.

² Dewitz, J., 2023, National Land Cover Database (NLCD) 2021 Products: U.S. Geological Survey data release, <https://doi.org/10.5066/P9JZ7AO3>

Evaluation of Known Location Information

There are four datasets with known location information for this species:

- Descriptions of locations provided by FWS
- Occurrence locations included in iNaturalist
- Occurrence locations included in the Global Biodiversity Information Facility (GBIF)
- Occurrence locations included in NatureServe

The developer evaluated these four sets of data to inform or support the core map. FWS provided the most refined descriptions of the occurrence information and confirmed that all known locations of extant populations are located within the range.

iNaturalist had 32 research grade observations, all of which occurred since 2008. Consistent with the species range, most of the observations were split between the eastern side of the Chesapeake Bay and its tributaries in Maryland and nine observations occurred surrounding the Connecticut River in Connecticut and Massachusetts. GBIF's occurrence data did not include any wild occurrences of the species. NatureServe included 12 documented areas, all of which were consistent with the location of the species range. **Appendix 1** includes more information on the available known location information.

Approach Used to Create Core Map

The developers compiled available information for the Puritan Tiger Beetle from FWS. The information compiled for the Puritan Tiger Beetle is included in **Appendix 1**. Influential information that impacted the development of the core map included:

- The species range is highly refined, following the rivers where the species is known to occur.
- There are 4 known populations identified in FWS documentation, all of which are within the species' range.
- Occurrence data from other sources are consistent with the species range.

The developers used the compiled information to identify the core map type. The developers compared known location data to the range and found that these known locations are consistent with the species range. Based on the narrow range that includes all occurrence data identified by FWS, the developers selected the range to use as the species core map. The developers used the ECOS species range for the Puritan tiger beetle.

References

- FWS. 1993. *Puritan Tiger (Cicindela puritana) Beetle Recovery Plan*. Northeast Region, U.S. Fish & Wildlife Service.
- FWS. 2019. *Puritan Tiger Beetle (Cicindela puritana) 5-Year Review: Summary and Evaluation*. Chesapeake Bay Field Office, U.S. Fish and Wildlife Service.
- FWS. 2025. *Puritan Tiger Beetle*. U.S. Fish & Wildlife Service. Available at: <https://www.fws.gov/species/puritan-tiger-beetle-cicindela-puritana>.
- Knisley, B., Gowan, C., & Fenster, M. 2017. Effects of off-highway vehicles on sandy habitat critical to survival of a rare beetle. *Insect Conservation and Diversity*, 11.

Appendix 1. Information Compiled for Species

1. Recent FWS Documents

- Puritan tiger beetle (*Ellipsoptera puritana*) 5-Year Review (2025) (available [here](#))
- Puritan tiger beetle (*Cicindela puritana*) 5-Year Review (2019) (available [here](#))
- Puritan tiger beetle (*Cicindela puritana*) 5-Year Review (2007) (available [here](#))
- Puritan tiger beetle (*Cicindela puritana*) Recovery Plan (1993) (available [here](#))

2. Background information on Species

- **Status:** Federally listed as threatened in 1990 (FWS, 2025)
- **Taxonomy**

A new taxonomic study has indicated that the genus *Cicindela* should be changed to *Ellipsoptera* and the new name for the Puritan tiger beetle should be *Ellipsoptera puritana*. However, the current regulation for this species uses the older name, and until that is formally changed in the Federal Register, FWS will continue to use the older name to be consistent with current regulations. (FWS 2019)
- **Resiliency, Resiliency, Representation**

For the most recent species assessment, FWS generally define viability as the ability of the species to sustain populations in natural ecosystems within a biologically meaningful timeframe. There are three metapopulations for this species, one in the Northeast and two in the Chesapeake Bay. In the Chesapeake Bay, the redundancy in the metapopulations has been retained as the subpopulations identified in 2007 are still present and a few new small areas containing beetles have been discovered. The geographic distribution is like that in 2007, with the exception that the Severn River discovery is much farther north than any other location, perhaps too far north to provide the potential for dispersal to other sites. Over the approximately 30 years that this species has been surveyed, most subpopulations have persisted. Whether this is long enough to demonstrate their viability is not clear. Certainly they have survived a wide range of weather conditions. Future sea level rise may destroy the beach habitat that they need, but may increase the amount of cliff erosion that they also need. Whether they will adapt to new conditions and use the lower portions of cliff faces as they do at high tide remains to be seen. (FWS 2019)
- **Habitat Description**

The Puritan tiger beetle is found in only two small regions, including the Connecticut River Valley in New England and along the Chesapeake Bay in Maryland. The Puritan tiger beetle populations in these two regions have probably been separated for thousands of years and as a result have developed significant genetic and ecological differences.(FWS 2019; FWS 2025)

Due to the nature of their life cycle, Puritan tiger beetle habitats are limited to sandy beaches along rivers and naturally eroding cliffs where there is little to no vegetation. In Maryland, the larvae occupy deep burrows after digging in sandy areas or non-vegetated portions of the bluff face or at the base of the cliffs. They are most abundant at sites where the bluffs are long and high with little or no vegetation.(FWS 2025)



Figure A-1. Puritan tiger beetle habitat, eroding sand cliffs (FWS 2025).

- **Relevant Life History Information:**

Knisley *et al.* (2017) provided evidence that increased vegetation has a negative effect on larval habitat and may explain the decline of populations at some sites, and that soil compaction and grain size were important determinants of larval habitat. Successful propagation of Puritan tiger beetle larvae occurred in 2016 and an Animal Care Manual with methods for propagation was developed (FWS 2019).

- **Relevant Pesticide Use Sites**

No available information on pesticide use sites is included in FWS documents

- **Threats**

Destruction or degradation of habitat remains the primary threat to the species, especially for the MD population (FWS 1993).

- **Delisting Criteria**

Delisting will be considered when:

1. A minimum of six large (500 – 1000+ adults) populations and their habitat are protected in perpetuity at current sites along both shores of the Chesapeake Bay.
2. Sufficient habitat between these populations is protected to support smaller populations, thereby providing an avenue for genetic interchange among large populations and ensuring a stable metapopulation structure.
3. A minimum of three metapopulations, at least two of which are large (500 – 1000+ adults), are maintained (at extant sites) or established within the species' historical range along the Connecticut River, and the habitat they occupy is permanently protected.

4. There exists an effective long-term program for site-specific management that is based on an adequate understanding of life history parameters, human impacts, factors causing decline, population genetics, and taxonomy (FWS 1993)

- **Recovery Actions**

1. A high priority is given to identifying additional private landowners who are willing to enter conservation easements for the protection and management of their Chesapeake Bay or Connecticut River shoreline habitats supporting Puritan tiger beetles.
2. FWS and its partners continue to implement management strategies (vegetation management in New England and the Chesapeake Bay and propagation/translocations in New England) using the principles of adaptive management through monitoring and research to improve population levels and habitat quality and quantity for this species at as many locations as feasible.
3. The species recovery group review the recovery criteria in the 1993 recovery plan considering progress on habitat protection, results of the 2016 PVA, and new information on threats, population numbers, and genetics.
4. The annual counts of Puritan tiger beetle populations be continued to allow further analysis of population trends.
5. The results of the soon to be completed genetic analysis of Puritan tiger beetle populations be used to determine how they may direct recovery in the future.
6. The potential effects of sea level rise on habitat suitability and the long-term viability of each metapopulation be evaluated. (FWS 2019)

3. Description of Species Range

They can be found on sandy beaches and eroding cliffs along the Chesapeake Bay in Maryland the Connecticut River in New England. FWS estimates that these two populations have been separate for thousands of years and as such, have developed significant genetic and ecological differences.(FWS 2019; FWS 2025)

The Chesapeake Bay populations contain two metapopulations – one in Calvert County, MD on the western side of the Bay and one along the Sassafras River of the eastern shore of the Bay. Each metapopulations consists of subpopulations that are spatially separate from each other but likely have some level of dispersal among them. There is likely no dispersal between the eastern and western metapopulations. In the Chesapeake Bay region, the Puritan tiger beetle larvae occupy only naturally eroding cliffs, where they develop in deep horizontal burrows in sandy deposits of non-vegetated portions of the bluff face or at the base of the cliffs. They are most abundant at sites where the bluffs are long and high with little or no vegetation and composed in part of sandy soil.(FWS 2019; FWS 2025)

In New England, only a few small populations remain. These include one metapopulation consisting of four sites near Cromwell, CT and on single site in Massachusetts. In New England, Puritan tiger beetles occur in the sand and gravel islands of the river where the beetle larvae develop in vertical burrows in suitable substrate.(FWS 2019; FWS 2025)

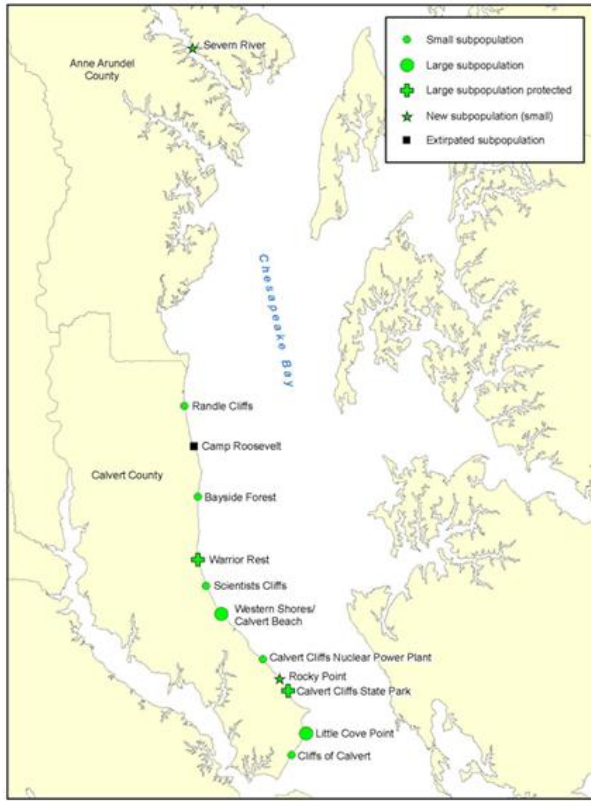


Figure A-2. Distribution of the Puritan tiger beetle on the Western Shore of the Chesapeake Bay (FWS 2019).

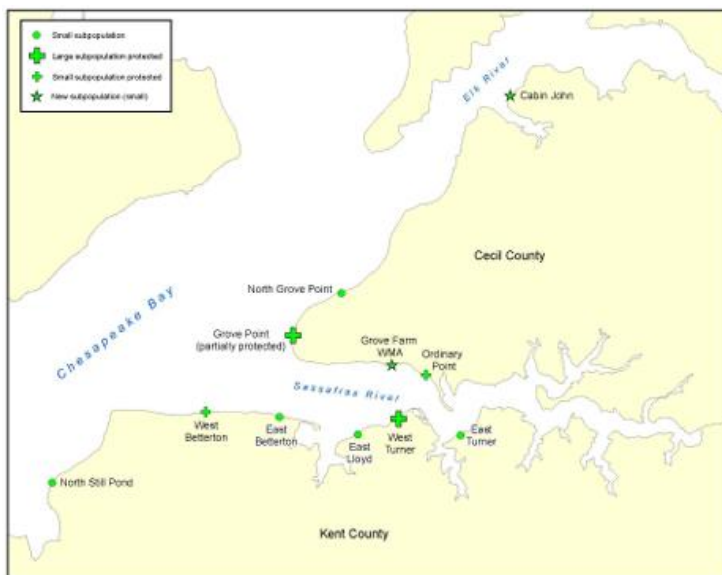


Figure A-3. Distribution of the Puritan tiger beetle on the Eastern Shore of the Chesapeake Bay (FWS 2019).



Figure A-4. Current and historical distribution of Puritan tiger beetles in New England (FWS 2019) .

4. Critical Habitat

There is no designated critical habitat for this species (FWS 2019; FWS 2025).

5. Known Locations

- Occurrences Described in FWS Documents: summarized above
- Occurrences Described in iNaturalist:
 - https://www.inaturalist.org/observations?order_by=observed_on&quality_grade=research&subview=map&taxon_id=700207
- Occurrences Described in NatureServe:
 - https://explorer.natureserve.org/Taxon/ELEMENT_GLOBAL.2.115516/Ellipsoptera_puritana

Collectively, the occurrence data did not support expanding the core map beyond the species range.