Critical Habitat for Aquatic Species

Indicator Names

- *Presence of Critical Habitat for Aquatic Species*
- *Number of Aquatic Species with Critical Habitat*

Indicator Category | **Ecological**

Subcategory | *Aquatic Life and Habitat*

Available in RPS Tool files for all lower 48 states

Indicator Description

Background

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend.[1] Under the ESA, a species is listed as endangered if it is in danger of becoming extinct in all or most of its geographical range, and threatened if it is likely to become endangered within the foreseeable future.[1]

When a species is proposed for listing under ESA, the US Fish and Wildlife Service (USFWS) considers whether there are geographic areas that contain essential features to conserve the species.[2] *Critical Habitat* is the specific habitat designated as necessary to support the recovery of species listed under the ESA.[2] Federal agencies are required to avoid destroying or adversely modifying areas with Critical Habitat designations.[2] State or local regulations may also provide protections to Critical Habitat.

What the Indicators Measure

These indicators measure the presence and diversity of species with Critical Habitat in a HUC12 subwatershed:*

- ***Presence of Critical Habitat for Aquatic Species*** denotes whether a HUC12 contains any Critical Habitat for fish, crustacean, and bivalve species (Figure 1). Expressed numerically as a value of "1" if Critical Habitat is present in the HUC12 or "0" if the HUC12 does not contain Critical Habitat.
- ***Number of Aquatic Species with Critical Habitat*** provides a count of the fish, crustacean, and bivalve species with Critical Habitat in the HUC12. Note that this indicator measures the number of species, not the number of individual organisms with Critical Habitat.

Relevance to Water Quality Restoration and Protection

The goals and actions of organizations involved in efforts to conserve endangered and threatened species can align with those of watershed managers. For example, recovery plans for endangered and threatened species can include the preservation of natural lands and restoration and protection of stream channels, shorelines, riparian buffers, and wetland areas.[4] The location of Critical Habitat areas may, therefore, be an important consideration for targeting watershed restoration and protection initiatives to coordinate and leverage resources across organizations while supporting the biological integrity of aquatic systems. Areas with Critical Habitat designations may also be explicitly highlighted for protection in watershed plans developed by citizen-based watershed groups or local governments.[5]

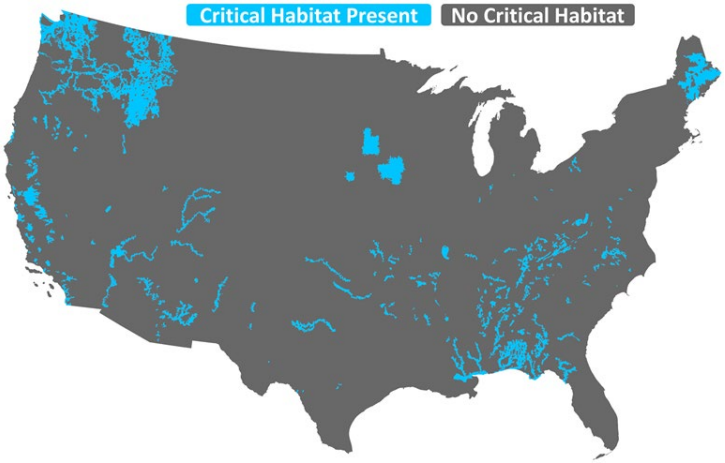

*Figure 1. Map of **Presence of Critical Habitat for Aquatic Species** in HUC12s across the contiguous US.*

Threatened and endangered species, and their Critical Habitat, have been highlighted as important factors for assessing the vulnerability of ecosystems and watersheds to future climate change and land use change.[6,7] For instance, vulnerability assessments completed by the US Forest Service for the intermountain west[6] and the Lolo National Forest[7] used Critical Habitat maps for native trout species to assign sensitivity scores to watersheds and guide management priorities.

HUC12s that contain Critical Habitat for one or more species may be higher priorities for follow-up resilience planning and management since they may support threatened or endangered species. Additional indicators, such as current land use, land use trends, and wildfire risk, can be included in such screenings to gain a more complete picture of the vulnerability of watersheds to change.

* HUC12s are subwatershed delineations in the National Watershed Boundary Dataset. HUC12s are referenced by their 12-digit Hydrologic Unit Code.

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Processing Method

These indicators are derived from Critical Habitat maps maintained by the USFWS in the Environmental Conservation Online System (ECOS).

Critical Habitat map layers were downloaded from ECOS in May 2021 and filtered to retain Critical Habitat delineations for aquatic species (i.e., fish, crustacean, and bivalve species). The filtered map layers were overlaid with HUC12 boundaries to determine the presence or absence of Critical Habitat in each HUC12 and the number of fish, crustacean, and bivalve species with Critical Habitat per HUC12. An example overlay map of Critical Habitat designations and HUC12 boundaries is provided in Figure 2.

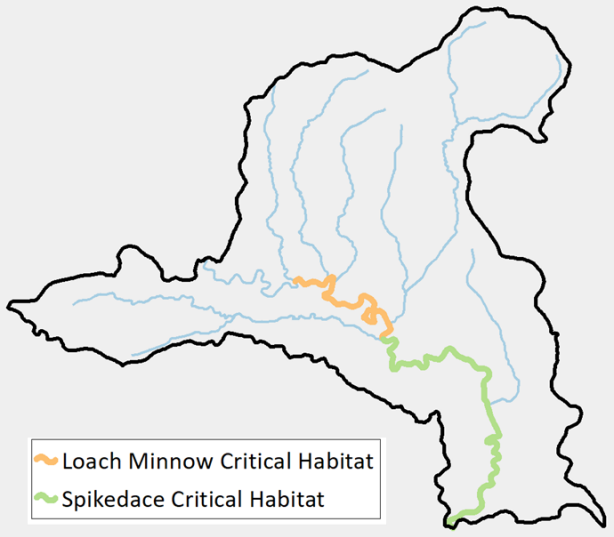

Figure 2. Map displaying an example HUC12 with Critical Habitat designations for two fish species.

Limitations

- These indicators do not reflect Critical Habitat for threatened and endangered species which are under the sole jurisdiction of National Marine Fisheries Service (NMFS). Readers interested in Critical Habitat for NMFS species can visit the NFS critical habitat website for more information.
- Critical Habitat may include areas that were not occupied by a species at the time of listing but are considered essential to its conservation. Therefore, HUC12s that contain Critical Habitat do not necessarily contain populations of the associated species.
- Critical Habitat designations might include areas that are high-quality refuges for threatened and endangered species, while other areas with Critical Habitat designation may be significantly impacted by high pollutant levels, altered streamflow and sediment regimes, or other human disturbances.
- Critical Habitat designations are made for species that are listed as threatened or endangered through the federal ESA. However, additional species may be present in a HUC12 that are also important for conservation.

Links to Access Data and Additional Information

HUC12 indicator data can be accessed within the EPA Restoration and Protection Screening (RPS) Tool, in downloadable data files, or as a web service. Visit the EPA RPS website for links to access the RPS Tool, HUC12 indicator database, and web service.

The Critical Habitat map layers used to calculate these indicators can be accessed from the USFWS ECOS website.

References

[1]USFWS. 2017. ESA Basics 40 Years of Conserving Endangered Species. USFWS Ecological Services Program.

[2]USFWS. 2017. Critical Habitat: What Is It?. USFWS Endangered Species Program.

[3]US EPA. 2018. Critical Source Area Identification and BMP Selection: Supplement to Watershed Planning Handbook. EPA Office of Water Nonpoint Source Management Branch. EPA 841-K-18-001.

[4]USFWS. 2021. Final Recovery Plan For Topeka Shiner (Notropis Topeka). USFWS Interior Regions 5 and 7.

[5]Applied Ecological Services. 2014. Long Run Creek Watershed-Based Plan.

[6]Smith, D., et al. 2017. A Spatially Explicit and Quantitative Vulnerability Assessment of Coldwater Fish Habitat and Riparian Corridors in the Intermountain West. US Forest Service Rocky Mountain Research Station.

[7]Wade, A., et al. 2016. Watershed Climate Change Vulnerability Assessment Lolo National Forest. US Forest Service Northern Region and Lolo National Forest. Publication Number R1-16-05.

[8]More, J., et al. 1997. Fish communities as indicators of environmental quality in the West River watershed. *Bulletin of the Yale School of Forestry and Environmental Studies*. 100: 178-196.

[9]Molye, P., et al. 1998. Evaluating the Biotic Integrity of Watersheds in the Sierra Nevada, California. *Conservation Biology.* 12(6): 1318-1326.