



Project Title: “Helping managers develop and implement a consistent method to prioritize conservation and identify climate adaptation strategies for Yellowstone cutthroat trout: identifying and ranking risks to mitigate stressors under anticipated changes in climate”

Headline Title (2-5 words): Managing Yellowstone cutthroat trout under climate change

Brief Summary (Abstract): State and federal partners and collaborators have developed criteria and a framework for prioritizing populations of Yellowstone cutthroat trout with respect to risk from climate change. We will apply this framework with population-specific ranking of limiting factors and climate risks to identify and prioritize conservation actions to enhance resilience under a changing climate and areas for potential reintroduction of Yellowstone cutthroat trout into streams historically occupied, that are likely more resilient to regional changes in climate.

Project Location: Idaho, Wyoming, Utah, Nevada, and Montana

Partners: This project is a collaboration among researchers, managers, and planners at the USGS Northern Rockies Science Center, the Wildlife Conservation Society, the Western Native Trout Initiative, the Yellowstone Cutthroat Trout Multistate Working Group, Trout Unlimited; funded by the Great Northern LCC. Submitted by National Park Service.

Background: Due to historic impacts from fish stocking, water diversion, and water management, genetically pure Yellowstone cutthroat trout occupy less than 28% of their historical range. In addition to current threats, anticipated changes in global and regional climate are likely to considerably alter existing thermal and hydrologic regimes. The growing concern for native salmonids such as Yellowstone cutthroat trout in a changing climate stems from their relatively narrow thermal tolerances and influences of climate-related attributes such as temperatures and stream flows on life-history patterns. Furthermore, recent research suggests that changing climatic conditions are likely to favor non-native species over Yellowstone cutthroat trout, thus increasing threats to extant populations. An imperative step in ensuring long-term persistence of Yellowstone cutthroat trout across its historic range is the development of a comprehensive conservation strategy that encompasses existing data regarding species distribution and status, current limiting factors, and potential threats of climate. Within this framework it is becoming increasingly important to identify and prioritize population-specific restoration and management actions, particularly given the limited amount of resources available, and evaluate these actions for their value as potential climate adaptation strategies.

Project Goals:

- 1) Rank individual threats to Yellowstone cutthroat trout populations by integrating local data within an existing framework successfully used for westslope cutthroat trout.
- 2) Identify areas that will likely be most resilient to climate change or climate change refugia and rank opportunities for reducing factors limiting range expansion and reintroduction across the historical range of Yellowstone cutthroat trout.



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- 3) Develop a comprehensive strategy to effectively and efficiently conserve Yellowstone cutthroat trout by merging information and decision rationales regarding population prioritization, ranked threats, and opportunities for species expansion or reintroduction.

Strategy Goals Implemented:

Goal 2, Strategy 2.2, Action 2.2.1 Use vulnerability assessments to design and implement management actions at species to ecosystem scales.

Goal 2, Strategy 2.1, Action 2.1.3 Identify species and habitats particularly vulnerable to transition under climate change

Climate Impacts Addressed: Impacts on fish species and aquatic habitats.

Status of Project Implementation: Project is on-going. The initial prioritization framework for river basins has been developed and reviewed by both geographic management unit (GMU) Teams and the full Yellowstone cutthroat trout Work Group. We have assisted the GMU Teams in setting prioritization criteria and together we have determined the appropriate geographic scale for prioritizing individual conservation populations. We have begun to prioritize individual conservation populations and want to continue and expand on that effort.

Project Outcomes:

- Prioritization framework will be developed with GMU Teams and then GMU Teams will set prioritization criteria and determine the appropriate geographic scale for prioritizing individual conservation populations.
- Each GMU Team will develop a set of prioritization criteria.
- The prioritization criteria developed by each GMU Team will be compared for consistency or differences and these will be presented to the full YCT Work Group to reconcile differences and adopt a consistent set of prioritization criteria.
- GMU Teams will then prioritize geographic areas for conservation. We anticipate that these geographic areas will initially occur at the 8-digit hydrologic unit codes (HUCs).
- Local biologists, managers, and researchers will then prioritize individual conservation populations (identified by the latest status assessment) within each identified geographic area, starting with the high priority geographic areas.
- Risks (threats) to individual populations will be initially evaluated using The Yellowstone Cutthroat Trout status assessment database and will be verified by managers for up-to-date information on factors limiting populations. Based on these threats, conservation actions will be identified to reduce these threats and these actions will be prioritized using prioritization criteria established by GMU Teams. The goal will be to secure or expand existing high priority conservation populations.
- Consideration will then be given to areas where additional conservation populations could be established that would help secure the future of this subspecies and prioritize these “new” conservation populations.



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- This process will be done iteratively until all geographic areas within the range and each conservation population has received some level of prioritization. Those areas or populations not rated during this process will be assumed to be of lesser priority.

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