

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Predicting Climate Change Impacts on River Ecosystems and Salmonids across the Pacific Northwest Combining Vulnerability Modeling, Landscape Genomics, and Economic Evaluations for Conservation

Discipline: Natural
Type of Project: Research
Funding Agency: USGS
Other Partners/Cooperators: University of Montana
Effective Dates: 9/1/2012 - 8/31/2017
Funding Amount: \$221,644 [FY13: \$117,500; FY12: \$104,164]

Investigators and Agency Representative:

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Project Abstract: The overall goal of this project is to determine effects of climate change on salmon and trout habitat and population vulnerability by linking satellite remote sensing of freshwater physical habitat complexity (including floodplains and wetlands) with dynamic, spatio-temporal models of population distribution, abundance, connectivity, and genomic diversity. A second goal is to provide novel web based tools for managers and decision makers to easily understand and visualize effects of climate change on river ecosystems and salmonid vulnerability. The tool includes economic evaluations of alternative scenarios of restoration and extirpation of keystone salmon and trout populations.

The objectives of this research include:

- (1) Identify riverscape genetic models that best predict gene flow and genomic diversity from riverscape features for each of four salmonid species.
- (2) Predict how projected climate change will fragment river systems and reduce population abundance, genetic diversity, & connectivity, using demogenetic simulations.
- (3) Combine demogenetic vulnerability with climate and habitat vulnerability to predict and map populations and ecosystems that are most vulnerable to climate change.

Outcomes with completions dates: September 16, 2017

Keywords: climate change, salmon habitat, trout habitat, USGS Northern Rocky Mtn Science Center, University of Montana