



Qualitative Assessment: Evaluating the Impacts of Climate Change on Endangered Species Act Recovery Actions for the South Fork Nooksack River, WA

Peer Review Charge Questions

Background Information:

The U.S. Environmental Protection Agency (EPA) Region 10 and EPA's Office of Research and Development and Office of Water have launched a Pilot Research Project to consider how projected climate change impacts could be incorporated into a Clean Water Act (CWA) 303(d) Temperature Total Maximum Daily Load (TMDL) and influence restoration actions in Washington's Water Resources Inventory Area (WRIA) 1 Endangered Species Act (ESA) Salmonid Recovery Plan. The Pilot Research Project uses a temperature TMDL being developed for the South Fork Nooksack River (SFNR) in Washington as the Pilot TMDL for climate change analysis. An overarching goal of the pilot research project is to ensure that relevant findings and methodologies related to climate change are incorporated into the SFNR Temperature TMDL.

The project is structured as a "Risk Assessment" in that a range of climate change impacts from the Intergovernmental Panel on Climate Change Scenarios are assessed, rather than a single prediction of climate change effects on stream temperature and the related CWA Cold-Water Temperature Water Quality Standard.

The Pilot Project consists of two separate research assessments:

- 1. Quantitative Assessment** –This assessment used Washington's QUAL2Kw + Shade water quality models and IPCC global climate change models to estimate future temperatures of the SFNR to evaluate the implications of climate change for the SFNR Temperature TMDL. It is a comparison of QUAL2Kw modeled stream temperatures, including riparian shading, with and without climate change for the 2020s, 2040s and 2080s. A range of climate change impacts from a high, medium and low scenario are analyzed for each time period.
- 2. Qualitative Assessment (Led by the Nooksack Indian Tribe)** - This assessment is a comprehensive analysis of climate change impacts on freshwater habitat and ESA Recovery of Pacific salmon in the SFNR. It also evaluates the effectiveness of restoration tools that address climate change impacts on Pacific salmon recovery. The objective of the assessment is to identify and prioritize climate change adaptation strategies or recovery actions for the SFNR that explicitly include climate change as a risk.

This Peer Review focuses on the Qualitative Assessment.

The primary research objectives for the Qualitative Assessment are:

1. Integrate the objectives of the CWA 303(d) TMDL provisions to protect and restore designated uses, which support the recovery goals of the ESA Salmonid Recovery Plan. Use the best available science from the Climate Science Programs under the United States Global Change Research Program.
2. Evaluate the prioritization of stream restoration actions in the South Fork on the basis of the watershed processes or functions they attempt to restore and their ability to ameliorate climate change effects on high stream flows, low stream flows, and high stream temperatures (for additional information, see the attached manuscript by [Beechie et al. 2012](#)).
3. Demonstrate moving from theory (literature) to practice (assessment framework) to support ESA Recovery Planning for Climate Change Adaptation as a proof-of-concept, rapid-prototype research project.
4. Ensure that relevant findings and methodologies related to climate change are incorporated into the SFNR Temperature TMDL.

The Pilot Research Project is structured as a stakeholder-centric community based process. Stakeholder and Tribal outreach and engagement is considered a critical element of this project. Workshops, Webinars and working Interdisciplinary Teams have been utilized throughout its life.

This Pilot Research Project is all about demonstrating how cutting-edge science can be applied in a real-world problem-solving context (actionable science) with the participation scientists, environmental practitioners and decision makers to support the co-production of knowledge for Climate Change Adaptation.

Charge Questions:

The objective of this peer review is to obtain expert feedback on the soundness of the methodology, as well as the soundness of the conclusions drawn from the data and analyses. In your review of this document, please provide written responses to the best of your ability to the following questions. Additional comments and recommendations for improving this document and associated methodology are also welcome.

Overall

Does the report satisfy the four primary research objectives (listed above) for the Qualitative Assessment?

Is the cited literature sufficiently comprehensive? Are there any key references that have been omitted?

Executive Summary

Does the executive summary adequately capture the major findings of the report? Are the summary statements adequately supported in the body of the report?

Section 1- Introduction

Does Section 1 provide sufficient background information to put the rest of the report into context with respect to purpose and use of the assessment?

Section 2 - Overview of the WRIA 1 Salmonid Recovery Plan

Does Section 2 provide sufficient background information on the WRIA 1 Salmonid Recovery Plan process and status to add additional context for the assessment?

Section 3 – Stakeholder Engagement

(Note: The results of the Qualitative Assessment have been presented to the WRIA 1 Management Team as research recommends for their consideration in the upcoming revision to the WRIA 1 ESA Salmon Recovery Plan. This section will be updated to reflect the outcome of this briefing.)

Does Section 3 provide sufficient chronological event outreach and engagement information to understand the management and social process that led to the development and implementation of the assessment?

Section 4 – Qualitative Assessment Methodology

Has the assessment methodology been adequately described so that someone previously unfamiliar with this method can understand the approach and interpret the results?

Section 5 – Qualitative Assessment

Are the methods used to evaluate the impacts to salmonids by climate risk, species and salmon recovery actions sufficiently described and analyzed to support the conclusions and recommendations (results) for climate-ready restorations actions in the SFNR?

Section 6 – Next Steps

(Note: This section will be updated to reflect the next steps for implementation that have transpired since the completion of this Draft-Final Qualitative Assessment on September 15, 2015.)

Please provide your written comments to me no later than **four weeks from receipt of the document**. Comments may be sent by regular mail to the address below, or by email to hok.virginia@epa.gov.

If you have any questions concerning the draft report or the charge, please contact me at 919.541.2815 or hok.virginia@epa.gov. We sincerely thank you for your input to our peer review process.

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