

US EPA ARCHIVE DOCUMENT

## EPA Region 10 Climate Change and TMDL Pilot Project South Fork Nooksack River, Washington

### Climate Change Pilot Project

**Place:** South Fork Nooksack River, Washington

**Problem:** Climate Change Risks to Salmonids

**Decision Framework:** Clean Water Act (CWA) 303(d) Total Maximum Daily Load (TMDL) Beneficial Uses and Endangered Species Act (ESA) Salmon Recovery Planning (see *Key Terms on page 2*)

#### Key Stakeholders and Collaborations:

- Nooksack Indian Tribe
- Lummi Nation
- Washington Department of Ecology
- Water Resource Inventory Area 1 Salmon Recovery Team
- University of Washington Climate Impacts Group
- Tetra Tech (EPA Contractor)
- U.S. Forest Service
- National Oceanic and Atmospheric Administration (NOAA) Fisheries
- U.S. Geological Survey

### Project Background

Global climate change has the potential for significant impacts on the nation's freshwater ecosystems. Stream temperature is projected to increase in most rivers under climate change scenarios due in part to increases in air temperature, while changing precipitation and snowmelt patterns could influence water levels and water flow. Increases in stream temperature and changes in stream hydrology could have substantial effects on cold water fish species such as salmon.

To help better understand the potential impact of climate change on achieving water quality and salmon recovery goals, the U.S. Environmental Protection Agency's (EPA) Region 10, Office of Research and Development, and Office of Water launched a collaborative pilot research project in the South Fork Nooksack River in Washington State. The project uses a temperature TMDL for the South Fork Nooksack River as a pilot for integrating climate change into a

watershed-specific plan for improving water quality. An overarching goal is to ensure that relevant findings and methodologies related to climate change inform the South Fork Nooksack River TMDL.

### Project Objectives

The following specific objectives have been identified for the pilot research project:

- Assess the potential impacts of climate change on stream temperature and stream flow for a temperature TMDL.
- Prioritize stream restoration actions under climate change for ESA Salmon Recovery Planning.
- Guide implementation of EPA's [National Water Program 2012 Strategy: Response to Climate Change](#).
- Support EPA's National Tribal Science Priorities for Climate Change and Integration of Traditional Ecological Knowledge.



Juvenile Chinook (*Oncorhynchus tshawytscha*)

Roger Tabor (USFWS)

## Project Methods

The pilot research project methods involve developing a quantitative and qualitative assessment to support the project goals. This project is structured as a stakeholder-centric process, with numerous opportunities for stakeholder engagement and capacity building.

## Quantitative Assessment

- Compare modeled stream temperature, including riparian shading, with and without climate change for the 2020s, 2040s, and 2080s.
- Compare to the CWA Coldwater Temperature Water Quality Standard for protecting salmonids.
- Use a risk assessment approach to provide risk managers with an understanding of potential climate change impacts on stream temperature and stream flow.

## Qualitative Assessment

- Comprehensively analyze freshwater salmon habitat for ESA salmon restoration in the South Fork Nooksack River under climate change.
- Create a prioritized list of strategies that support salmon restoration in the South Fork Nooksack River under climate change.
- Base the approach and method on *Restoring Salmon Habitat For A Changing Climate* (Beechie et al. 2012).

## Key Terms

The pilot project represents the integration of three key management programs.

### Total Maximum Daily Load (TMDL)

Under the CWA, if a waterbody does not meet the definition of clean water (as set by the state) because of one or more pollutants, the state must then determine the maximum amount of the pollutant(s) that the water body is allowed to receive and still meet state water quality goals. This maximum amount is called a TMDL.

### ESA Salmon Recovery Planning

The ESA requires states to develop and implement recovery plans for salmon species listed under the Act. Recovery plans identify actions needed to restore threatened and endangered species to the point that they are again self-sustaining elements of their ecosystems and no longer need protection.

### USGCRP Climate Science Programs

The U.S. Global Change Research Program (USGCRP) is a federal program that coordinates and integrates global change research across 13 government agencies to ensure that it most effectively and efficiently serves the nation and the world.



## Helpful Links

The Project Research Plan is published (electronically) and available on EPA's Web Site (NSCEP):

EPA Region 10 Climate Change and TMDL Pilot – Project Research Plan; February 12, 2013, EPA Publication EPA/600/R/13/028 [www.epa.gov/nscep/](http://www.epa.gov/nscep/)

Two project workshop agendas and presentations are available on EPA's Web site (ORD/NHEERL/WED) [www.epa.gov/wed/pages/whatsnew.htm](http://www.epa.gov/wed/pages/whatsnew.htm)

## For More Information

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This fact sheet is the first in a series of three fact sheets on this project. EPA anticipates that additional fact sheets will be released with project updates in summer 2014 and spring 2015.

