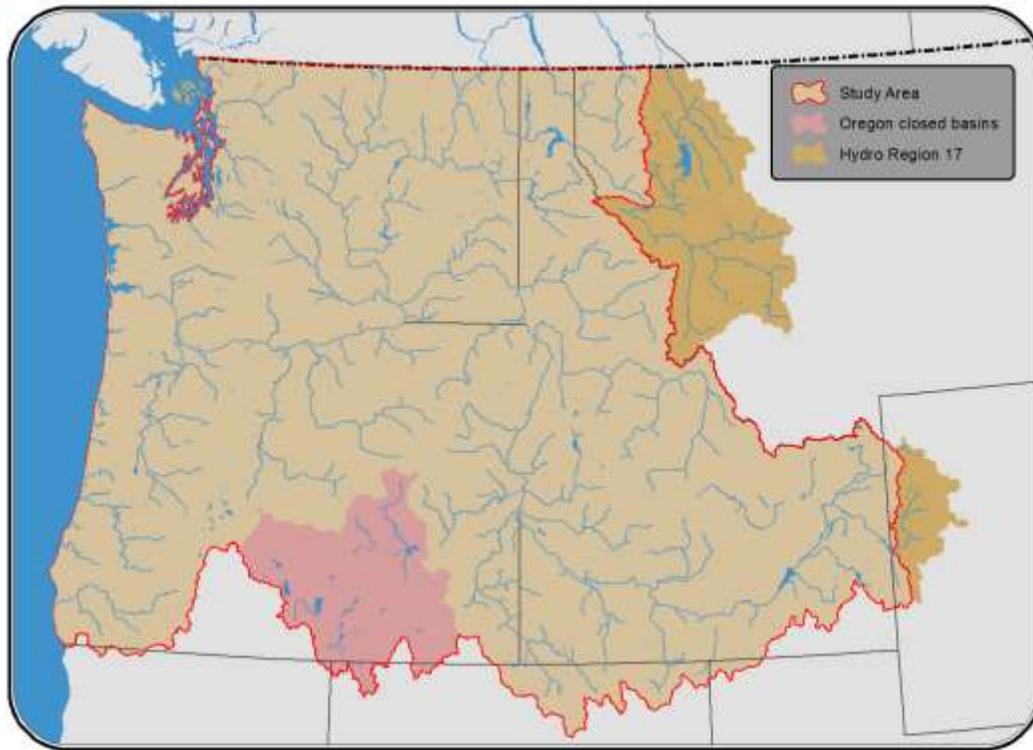


# Mapping Pacific Northwest Riparian Areas: Measuring Current Condition And Prioritizing For Climate Change Adaptation

## Scope of Work

This project extends the geographic scope of the Riparian Mapping Project currently funded by Washington Fish & Wildlife, Idaho Fish & Game, and the Great Northern Landscape Conservation Cooperative, to include areas from the Cascade Crest west to the Pacific Coast (Figure 1).



**Figure 1. Project extent.** The study area includes Western Washington and Oregon, the Columbia Basin, and the Northern Rockies, defined on the basis of watersheds. Specifically, the study area covers Water Resource Region 17, except for cataloguing units in Wyoming and Montana that do not extend into Idaho.

## This project has two primary objectives:

- I. To produce a base layer of riparian area and condition
- II. To prioritize riparian areas likely to increase biological resilience to climate change

Ultimately, this project is intended to act as a pilot for developing riparian area data layers for the WGA Crucial Habitat Assessment Tool.

## **I. Developing a base layer of riparian area and condition**

Using the Western Riparian Threats Assessment (WRTA) riparian datasets as a basis, we will generate a revised data layer based on USGS National Hydrography Dataset (High; 1:24,000) and 30 m DEM, that a) identifies riparian areas, and b) provides measures of riparian condition.

The output data products will be the following:

1. Raster layers providing attributes about the streamlines:
  - a. Unique attribute to link back to NHD 1:100k (ComID)
  - b. Stream gradient (slope) using a 250-500 m moving window
  - c. Strahler stream order
  - d. Functional units (roughly 500 m), based on confluence to confluence and slope classes
  - e. Upstream area
  - f. Mean upland (watershed) slope
  - g. Mean elevation
2. Raster layers providing attributes for the potential riparian areas:
  - a. Location of potential riparian areas (PRA)
  - b. Lateral condition - the proportion of human-modification within the PRA
  - c. Longitudinal – the degree of flow regulation as a ratio of the storage volume from National Inventory of Dams 2009 vs. mean annual “virgin” discharge (Vogel’s equation)
  - d. Upland – a summary of the RUSLE results from the WRTA

## **II. Prioritizing riparian areas likely to increase biological resilience to climate change**

We will implement the Riparian Climate Corridor module of the climate change integration framework developed as part of the WGA pilot project for the aridlands of Washington, Idaho, and Oregon. This framework described a coarse-filter approach to mapping areas anticipated to be particularly valuable in allowing wildlife to respond to future changes in climate. Specifically, it aimed to identify areas likely to facilitate range migrations and persistence in climate refugia for a wide range of climate-sensitive, dispersal-limited species.

Riparian corridors have been recognized as important areas for wildlife in a changing climate because they are likely to a) facilitate upward species range migrations (because they span elevation gradients), and b) provide climatic refugia (because they tend to be both relatively heterogeneous and buffered against warming). The Riparian Climate Corridor analysis aims to prioritize those riparian areas most likely to promote these processes. As rigorous methods for such prioritization have not yet been developed, we will test a range of potential criteria, such as spanning of climatic gradients important to range shifts, featuring low levels of solar insolation or other features that may buffer future warming, and exhibiting high levels of environmental heterogeneity that may provide climatic refugia. We will then apply these criteria to the

best available map of riparian areas within the project extent, producing a map of Northwest Riparian Climate Corridors.

Analysis steps will include:

1. Modifying the Western Riparian Threats Assessment's riparian layer as needed for prioritization analysis (e.g., coding riparian areas to reflect units of prioritization)
2. Testing possible riparian area prioritization criteria, such as:
  - a. Spanning of important climatic gradients (e.g. temperature, precipitation)
  - b. Connectivity
  - c. Low solar insolation
  - d. High environmental heterogeneity (e.g, geophysical, climatic, habitat)
  - e. Low human footprint
3. Mapping locations of riparian areas meeting selected prioritization criteria

Output data products will include:

1. Methods for prioritizing riparian areas for climate change adaptation
2. A map of Riparian Climate Corridors within the project extent (Figure 1).

## Project Budget

Project Component	Description	Amount
Salaries	Project coordination and analysis	\$2,070
	GIS analyst	\$4,400
Benefits	Project coordination and analysis	\$563
	GIS analyst	\$1,478
Contract	GIS analyst	\$8,510
Indirect Costs (17.5%)		\$2,979
<b>Total:</b>		<b>\$20,000</b>