Focal Fish Species

In order to support the long-term sustainability of the region's fishery resources, we collected a wide variety of fish distribution data for prioritization, from wide-ranging northwest flagship species to those found in a single sub-basin, or 4th-field HUC. This diversity of fish species was consciously selected in order to ensure that resulting prioritization schemes would address the needs of both widespread and locally endemic species.

Our initial list of potential fish included all salmon and steelhead species, evolutionarily significant units (ESUs) and distinct population segments (DPSs). Additional fish species were selected from state and federal listings of endangered, threatened, and candidate species (USFWS Washington Fish and Wildlife Office 2010; USFWS Idaho Fish and Wildlife Office 2010; Goodson et al. 2005; Idaho Governor's Office of Species Conservation; Desert Fish Habitat Partnership), as well as from the input of USFWS managers and staff. From the extensive list of fish species originally considered, several were not included in the final tool because of incomplete distribution data, including kokanee, Klamath Lake lamprey, and several species of chub. Additionally, we consciously excluded those species that primarily inhabit the mainstem of the Columbia River, such as white sturgeon. These were initially considered but later removed from consideration as we believed they may bias prioritization results affecting interior sub-basins. A total of 22 locally-endemic (Table 1) and 49 widespread fish species (Table 2), ESUs, DPSs, and sub-species[1] comprise the final list of 71 focal fishes.

For each focal fish species, sub-basins were given a value reflecting the relative importance of that sub-basin to that species. One difficulty of including such a wide variety of species is the variability in data on their distribution and status, and the scale at which that information is available. Given this difficulty, we grouped disparate fish species data into four data types, listed here in order of increasing complexity: presence/absence, population size, stream habitat density, and population-level probability of persistence (the units of analysis used for each fish can be seen in Table 1 and Table 2). These data types are described below. It is important to note that these values are only compared within, and not across, species (see the "Prioritization Process" PDF available on the "Data and Methods" tab of the Regional Aquatic Prioritization and Mapping Tool website for more information on how these scores are used in the prioritization process).

Locally endemic species distribution data was limited to presence or absence at the sub-basin level (NatureServe 2010). Due to concerns about the consistency of scale of linear bull trout distribution data (StreamNet 2010), we also used presence or absence of bull trout at the sub-basin level. Each sub-basin was accordingly identified as either containing or not containing occurrences of each locally endemic species or Bull trout (see Figure 1 for examples).

The U.S. Fish and Wildlife Service lamprey assessment process relied on participant input at regional meetings to estimate current population size ranges (2010a; 2010b). We assigned the median population size value to sub-basins containing lamprey populations (USFWS 2010b). For example, if the population size estimate for a sub-basin was identified as 1 – 50 adults, it was given a score of 25 (Figure 2).

[1] Throughout this paper the term "species" will be used to refer to all of these classification distinctions.

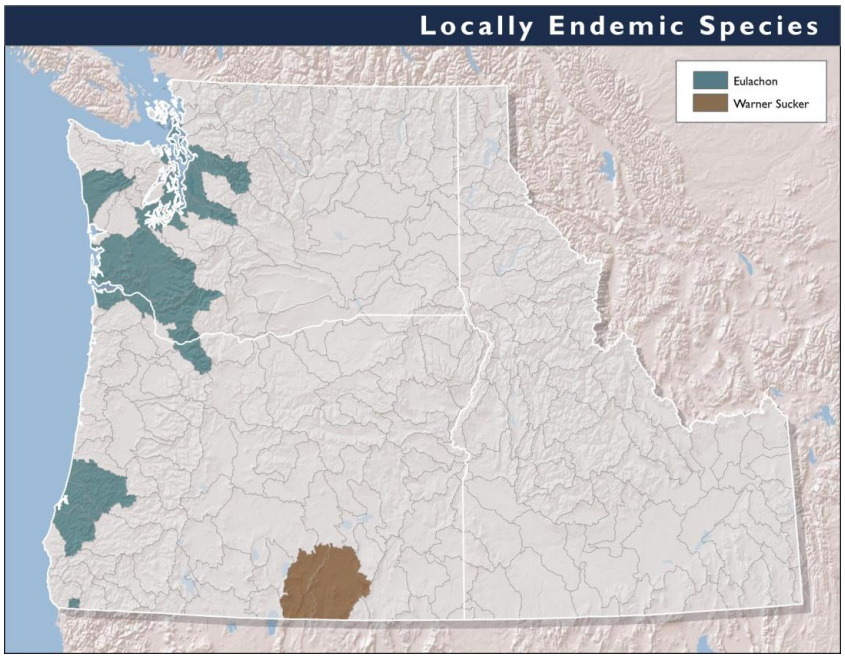

Figure 1. Presence and absence of eulachon and Warner sucker by sub-basin.

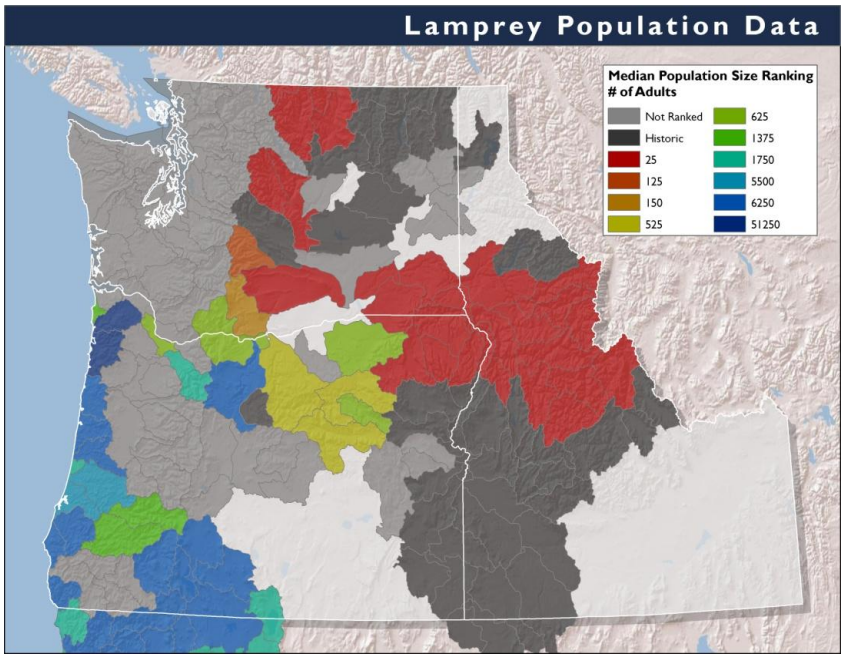

Figure 2. Median population size for Pacific lamprey by sub-basin.

We determined stream habitat density using linear habitat data for trout, salmon and steelhead (Figure 3) (StreamNet 2010). Current habitat in accessible streams was selected and used to calculate the density of stream length to sub-basin area. Trout stream habitat data were analyzed across the focal region, and salmon and steelhead data were limited to within their respective ESU or DPS boundaries (NOAA NMFS 2011). For salmon and steelhead, these data were often, but not always, identified by season (i.e., a stream reach might be identified as “spring” or “summer/fall” or have no seasonal

identification). We analyzed all species-level stream habitat, ignoring seasonal stream identification, for ESUs or DPSs without a seasonal designation. For those ESUs designated with a seasonal run (e.g., upper Columbia River spring Chinook), we analyzed only seasonally-identified stream habitat.

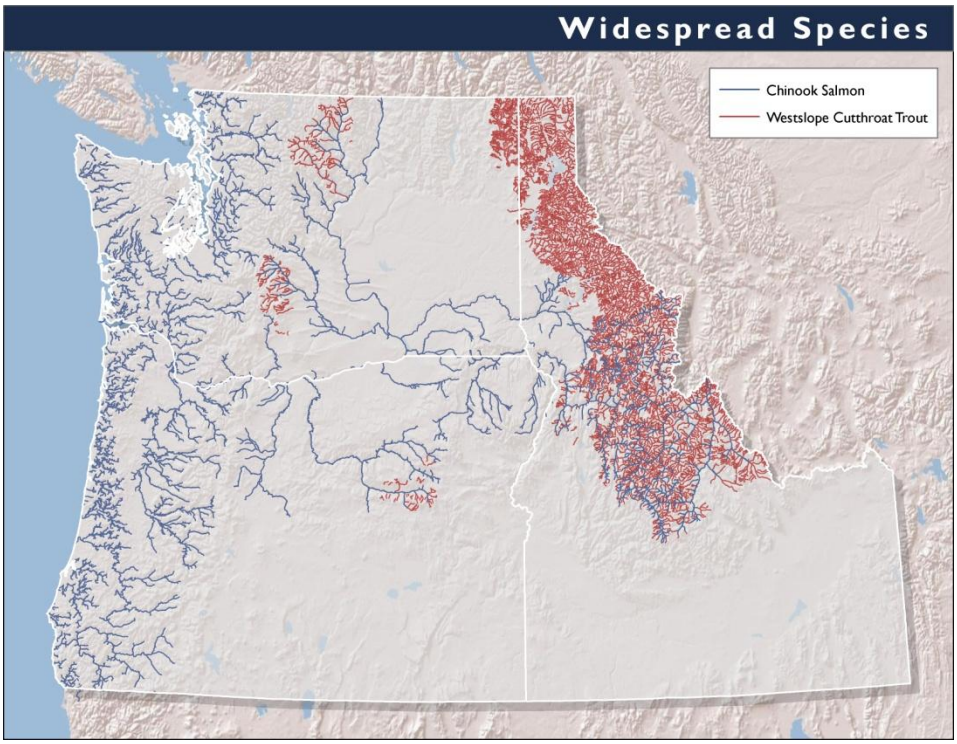

Figure 3. Examples of linear stream habitat data for Chinook and westslope cutthroat trout (StreamNet 2010).

To further value ESA-listed salmon ESUs and steelhead DPSs, we collected population-level probability of persistence scores from recovery plans when quantitative values were available (Figure 4; see Table 2 for ESUs and DPSs scored in this way) (Beamesderfer et al. 2011; Beamesderfer et al. 2010; Lower Columbia Fish Recovery Board 2010; ODFW 2010). We then assigned these to the relevant ESU and DPS population delineation spatial data ((NMFS Northwest Regional Office and NWFSC 2008a,b,c,d,e,f,g). The mean probability of persistence score of each population was assigned to the sub-basin containing that population (see example in Figure 5). In cases where more than one population existed in a sub-basin, the sub-basin was given the highest probability of persistence score.

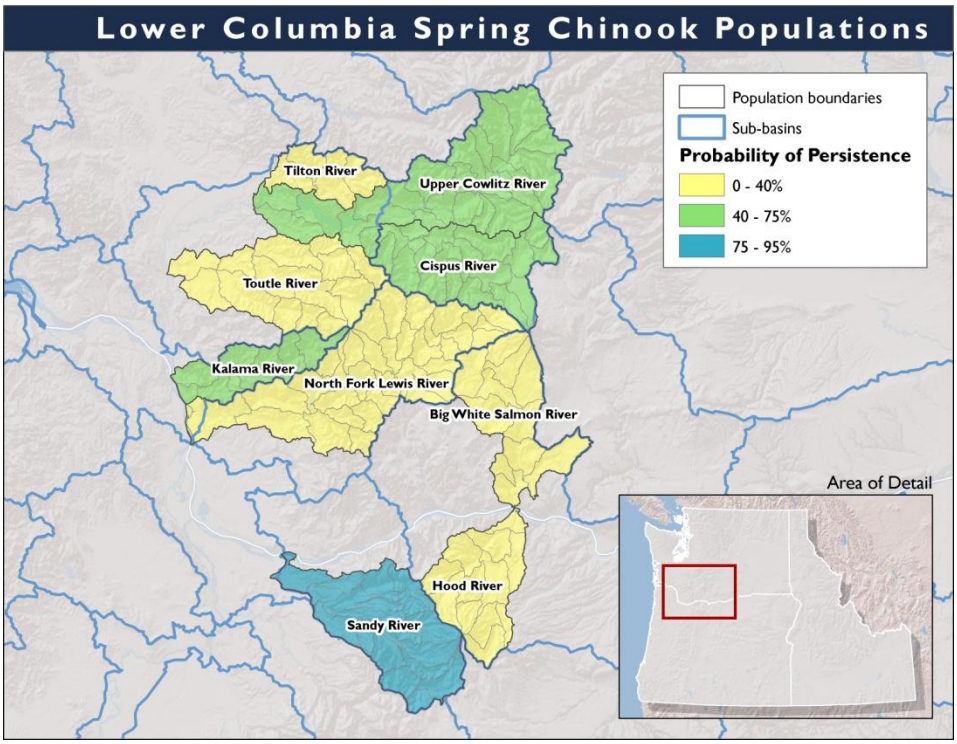

Figure 4. Probability of persistence ranges of lower Columbia River spring Chinook ESU populations, as published in lower Columbia River recovery plans (Beamesderfer et al. 2010; Lower Columbia Fish Recovery Board 2010).

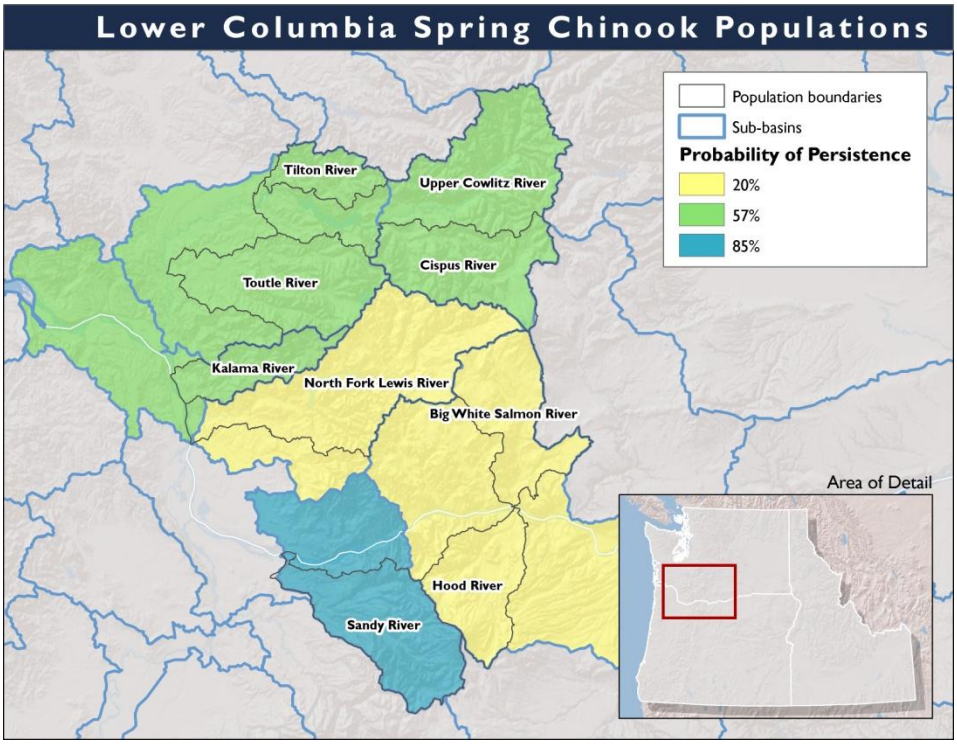

Figure 5. Sub-basin probability of persistence for the lower Columbia River spring Chinook ESU as classified in this assessment.

For more information on how these scores were incorporated into and analyzed within the prioritization tool, please see the "Prioritization Process" PDF available on the "Data and Methods" tab of the Regional Aquatic Prioritization and Mapping Tool website.

Table 1: Locally endemic focal fish species

Common Name	Scientific Name	Units
Burbot	*Lota lota*	Presence/absence
Chub, Alvord	*Gila alvordensis*	
Chub, blue	*Gila coerulea*	
Chub, Borax Lake	*Gila boraxobius*	
Chub, northern leatherside	*Lepidomeda copei*	
Chub, Oregon	*Oregonichthys crameri*	
Dace, leopard	*Rhinichthys falcatus*	
Dace, longnose	*Rhinichthys cataractae*	
Eulachon (smelt)	*Thaleichthys pacificus*	
Lamprey, Miller Lake	*Lampetra minima*	
Olympic mudminnow	*Novumbra hubbsi*	
pygmy whitefish	*Prosopium coulteri*	
Sculpin, margined	*Cottus marginatus*	
Sculpin, Paiute	*Cottus beldingii*	
Sculpin, Shoshone	*Cottus greenei*	
Sculpin, Wood River	*Cottus leiopomus*	
Sucker, Lost River	*Deltistes luxatus*	
Sucker, mountain	*Catostomus platyrhynchus*	
Sucker, shortnose	*Chasmistes brevirostris*	
Sucker, Warner	*Catostomus warnerensis*	
Whitefish, Bear Lake	*Prosopium abyssicola*	
Whitefish, Mountain[2]	*Prosopium williamsoni*	

[2] Although mountain whitefish is considered a widespread species, we included it with other locally endemic species because of the limited availability of distribution data for it, and the similarity of existing data to locally endemic data.

Table 2: Widespread focal fish species

Common Name	Scientific Name	DPS/ESU	Units
Pacific Lamprey	*Lampetra tridentata*		Median est. population
Chinook Salmon	*Oncorhynchus tshawytscha*	Deschutes River summer/fall	Habitat density
		Lower Columbia River fall	Probability of Persistence
		Lower Columbia River spring	Probability of Persistence
		Middle Columbia River spring	Habitat density
		Oregon Coast	Habitat density
		Puget Sound	Habitat density
		Snake River fall	Habitat density
		Snake River spring/summer	Habitat density
		Southern OR & Northern CA Coast	Habitat density
		Upper Columbia River spring	Habitat density
		Upper Columbia River summer/fall	Habitat density
		Upper Willamette River	Probability of Persistence
		Washington Coast	Habitat density
Chum Salmon	*Oncorhynchus keta*	Columbia River	Habitat density
		Hood Canal summer	Habitat density
		Pacific Coast	Habitat density
		Puget Sound/Strait of Georgia	Habitat density
Coho Salmon	*Oncorhynchus kisutch*	Lower Columbia River	Habitat density
		Olympic Peninsula	Habitat density
		Oregon Coast	Probability of Persistence
		Puget Sound/Strait of Georgia	Habitat density
		Southern OR/Northern CA	Habitat density
		Southwest Washington	Habitat density
Pink Salmon	*Oncorhynchus gorbuscha*	Even-year	Habitat density
		Odd-year	Habitat density
Sockeye Salmon	*Oncorhynchus nerka*	Baker River	Habitat density
		Lake Pleasant	Habitat density
		Lake Wenatchee	Habitat density
		Okanogan River	Habitat density
		Ozette Lake	Habitat density
		Quinalt Lake	Habitat density
		Snake River	Habitat density
Steelhead	*Oncorhynchus mykiss*	Klamath Mountains Province	Habitat density
		Lower Columbia River summer	Probability of Persistence
		Lower Columbia River Winter	Probability of Persistence
		Middle Columbia River	Habitat density
		Olympic Peninsula	Habitat density
		Oregon Coast	Habitat density
		Puget Sound	Habitat density
		Snake River Basin	Habitat density
		Southwest Washington	Habitat density
		Upper Columbia River	Habitat density
		Upper Willamette River	Habitat density
Bull Trout	*Salvelinus confluentus*		Presence/absence
Bonneville Cutthroat Trout	*Oncorhynchus clarki utah*		Habitat density
Lahontan Cutthroat Trout	*Oncorhynchus clarki henshawi*		Habitat density
Westslope Cutthroat Trout	*Oncorhynchus clarki lewisi*		Habitat density
Yellowstone Cutthroat Trout	*Oncorhynchus clarki bouvieri*		Habitat density

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Document last updated on May 30, 2012