

## **APPENDIX B**

### **CHART ASSESSMENT FOR THE PUGET SOUND STEELHEAD DPS**

#### **CHART Participants**

The CHART for this DPS consisted of the following NMFS biologists: Jeff Hard, Steve Leider, Randy McIntosh, Joel Moribe, Jim Myers, George Pess, Tom Sibley, Tim Tynan, and Amilee Wilson.

#### **DPS Description**

Steelhead populations can be divided into two basic reproductive ecotypes, based on the state of sexual maturity at the time of river entry (summer or winter) and duration of spawning migration (Burgner *et al.*, 1992). The Puget Sound DPS includes all naturally spawned anadromous winter-run and summer-run steelhead populations in streams in the river basins of the Strait of Juan de Fuca, Puget Sound, and Hood Canal, Washington, bounded to the west by the Elwha River (inclusive) and to the north by the Nooksack River and Dakota Creek (inclusive), as well as the Green River natural and Hamma Hamma winter-run steelhead hatchery stocks. Non-anadromous “resident” *O. mykiss* occur within the range of Puget Sound steelhead but are not part of the DPS due to marked differences in physical, physiological, ecological, and behavioral characteristics (71 FR 15666, March 29, 2006).

Stream-maturing steelhead, also called summer-run steelhead, enter fresh water at an early stage of maturation, usually from May to October. These summer-run fish migrate to headwater areas and hold for several months before spawning in the spring. Ocean-maturing steelhead, also called winter-run steelhead, enter fresh water from December to April at an advanced stage of maturation and spawn from March through June (Hard *et al.*, 2007). While there is some temporal overlap in spawn timing between these forms, in basins where both winter- and summer-run steelhead are present, summer-run steelhead spawn farther upstream, often above a partially impassable barrier. In many cases it appears that the summer migration timing evolved to access areas above falls or cascades that present velocity barriers to migration during high winter flow months, but are passable during low summer flows. Winter-run steelhead are predominant in Puget Sound, in part because there are relatively few basins in the Puget Sound DPS with the geomorphological and hydrological characteristics necessary to establish the summer-run life history. Summer-run steelhead stocks within this DPS are all small and occupy limited habitat.

Steelhead eggs incubate from one to four months (depending on water temperature) before hatching, generally between February and June. After emerging from the gravel, fry commonly occupy the margins of streams and side channels, seeking cover to make them less vulnerable to predation (WDFW, 2008). Juvenile steelhead forage for one to four years before emigrating to sea as smolts. Smoltification and seaward migration occur principally from April to mid-May. The nearshore migration pattern of Puget Sound steelhead is not well understood, but it is generally thought that

smolts move quickly offshore, bypassing the extended estuary transition stage which many other salmonids need (Hartt and Dell, 1986).

Steelhead oceanic migration patterns are also poorly understood. Evidence from tagging and genetic studies indicates that Puget Sound steelhead travel to the central North Pacific Ocean (Hartt and Dell 1986; Burgner *et al.*, 1992). Puget Sound steelhead feed in the ocean for one to three years before returning to their natal stream to spawn. They typically spend two years in the ocean, although, notably, Deer Creek summer-run steelhead spend only a single year in the ocean before spawning. In contrast with other species of Pacific salmonids, steelhead are iteroparous, capable of repeat spawning. While winter steelhead spawn shortly after returning to fresh water, adult summer steelhead rely on “holding habitat” – typically cool, deep pools – for up to 10 months prior to spawning (WDFW, 2008). Adults tend to spawn in moderate to high-gradient sections of streams. In contrast to semelparous Pacific salmon, steelhead females do not guard their redds, or nests, but return to the ocean following spawning (Burgner *et al.*, 1992). Spawned-out fish that return to the sea are referred to as “kelts.”

The Puget Sound steelhead DPS includes more than 50 stocks of summer- and winter-run fish (WDFW, 2002). Hatchery steelhead production in Puget Sound is widespread and focused primarily on the propagation of winter-run fish derived from a stock of domesticated, mixed-origin steelhead (the Chambers Creek Hatchery stock) originally native to a small Puget Sound stream that is now extirpated from the wild. Hatchery summer-run steelhead are also produced in Puget Sound; these fish are derived from the Skamania River in the Columbia River Basin.

Habitat utilization by steelhead in the Puget Sound area has been dramatically affected by large dams and other manmade barriers in a number of drainages, including the Nooksack, Skagit, White, Nisqually, Skokomish, and Elwha<sup>5</sup> river basins. In addition to limiting habitat accessibility, dams affect habitat quality through changes in river hydrology, altered temperature profile, reduced downstream gravel recruitment, and the reduced recruitment of large woody debris. Such changes can have significant negative impacts on salmonids (e.g., increased water temperatures resulting in decreased disease resistance) (Spence *et al.*, 1996; McCullough, 1999).

Many upper tributaries in the Puget Sound region have been affected by poor forestry practices, while many of the lower reaches of rivers and their tributaries have been altered by agriculture and urban development. Urbanization has caused direct loss of riparian vegetation and soils, significantly altered hydrologic and erosional rates and processes (e.g., by creating impermeable surfaces such as roads, buildings, parking lots, sidewalks etc.), and polluted waterways with stormwater and point-source discharges. The loss of wetland and riparian habitat has dramatically changed the hydrology of many streams, with increases in flood frequency and peak low during storm events and decreases in groundwater driven summer flows (Moscrip and Montgomery, 1997; Booth *et al.*, 2002; May *et al.*,

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<sup>5</sup> The Elwha dams are in the process of being removed, which will significantly change the Elwha River’s hydrology and allow steelhead and salmon access dozens of miles of historical habitat upstream.

2003). River braiding and sinuosity have been reduced through the construction of dikes, hardening of banks with riprap, and channelization of the mainstem. Constriction of river flows, particularly during high flow events, increases the likelihood of gravel scour and the dislocation of rearing juveniles. The loss of side-channel habitats has also reduced important areas for spawning, juvenile rearing, and overwintering habitats. Estuarine areas have been dredged and filled, resulting in the loss of important juvenile rearing areas. In addition to being a factor that contributed to the present decline of Puget Sound steelhead populations, the continued destruction and modification of steelhead habitat is the principal factor limiting the viability of the Puget Sound steelhead DPS into the foreseeable future. Because of their limited distribution in upper tributaries, summer-run steelhead may be at higher risk than winter-run steelhead from habitat degradation in larger, more complex watersheds.

### **Existing Salmon Critical Habitat Designations**

Critical habitat is currently designated for two DPSs of salmon that inhabit Puget Sound watersheds: Puget Sound Chinook salmon and Hood Canal summer-run chum salmon (70 FR 52630, September 2, 2005). These existing designations have extensive overlap with areas under consideration as critical habitat for Puget Sound steelhead. While the essential physical and biological features are similar for the three DPSs, watershed conservation values for steelhead may differ due to species-specific differences in population structure and habitat utilization.

### **Recovery Planning Status**

Recovery planning in Puget Sound is proceeding as a collaborative effort between NMFS and numerous tribal, state, and local governments and interested stakeholders. The Puget Sound Partnership is the entity responsible for working with NMFS to recover the listed Puget Sound Chinook salmon DPS, and the Hood Canal Coordinating Council is the regional board implementing the recovery plan for the Hood Canal summer chum salmon DPS. There is a good deal of overlap between the geographical area occupied by Puget Sound steelhead and these two salmon DPSs, both of which had critical habitat designated on September 2, 2005 (70 FR 52630). A technical recovery team (TRT) was convened in 2008 to identify the historically independent spawning populations of steelhead within, and viability criteria for, the Puget Sound steelhead DPS. In 2011 the TRT completed an initial draft assessment “Identifying Historical Populations of Steelhead Within the Puget Sound Distinct Population Segment” (Puget Sound Steelhead Technical Recovery Team, 2011 – see Figure B1) and has begun work on viability criteria for this DPS. Upon completion of the technical work from the TRT, we will develop a recovery plan for Puget Sound steelhead and will work directly with the two regional boards to augment implementation plans to include measures to recover Puget Sound steelhead. In preparing the critical habitat designation for Puget Sound steelhead we will review and incorporate as appropriate the information from these regional recovery plans as well as the ongoing population work by the TRT.

### **CHART Area Assessments**

The CHART assessment for this DPS addressed 18 subbasins containing 66 occupied watersheds. As part of its assessment the CHART considered the conservation value of each watershed in the context of the demographically independent populations (DIPs) within the three ecological zones/major population groups or “MPGs” (Northern Cascades, Central and South Puget Sound, and Olympic Peninsula) in Puget Sound identified by the Puget Sound TRT (2011). Information is presented below by USGS subbasin because they present a convenient and systematic way to organize the CHART’s watershed assessments for this DPS and their names are generally more recognizable because they typically identify major river systems.

#### **Strait of Georgia Subbasin (HUC4# 17110002)**

The Strait of Georgia subbasin is located in northern Puget Sound (near the U.S. Canada border) and contained in Skagit and Whatcom counties, Washington. The subbasin contains three watersheds occupied by this DPS and these watersheds encompass approximately 428 mi<sup>2</sup> (1,109 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 118 miles (190 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; Northwest Indian Fisheries Commission (NWIFC), 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing two winter-run populations (Drayton Harbor Tributaries and Samish River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B1 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that all of the occupied HUC5 watersheds in this subbasin were of medium conservation value to the DPS. Table B2 summarizes the CHART’s PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

#### **Nooksack Subbasin (HUC4# 17110004)**

The Nooksack subbasin is located in northern Puget Sound and contained in Skagit and Whatcom counties, Washington. The subbasin contains five watersheds occupied by this DPS these watersheds encompass approximately 795 mi<sup>2</sup> (2,059 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 324 miles (521 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing one winter-run population (Nooksack River) and one summer-run population (South Fork Nooksack River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B2 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either high

or medium conservation value to the DPS. Of the five HUC5s reviewed, three were rated as having high and two were rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

#### **Upper Skagit Subbasin (HUC4# 17110005)**

The Upper Skagit subbasin is located in northern Puget Sound and contained in Skagit and Whatcom counties, Washington. The subbasin contains five watersheds occupied by this DPS and these watersheds encompass approximately 999 mi<sup>2</sup> (2,587 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 167 miles (269 km) of occupied riverine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing two winter-run populations (Baker River and Skagit River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B3 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either high or medium conservation value to the DPS. Of the five HUC5s reviewed, four were rated as having high and one was rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

#### **Sauk Subbasin (HUC4# 17110006)**

The Sauk subbasin is located in northern Puget Sound and contained in Skagit and Snohomish counties, Washington. The subbasin contains four watersheds occupied by this DPS and these watersheds encompass approximately 741 mi<sup>2</sup> (1,919 km<sup>2</sup>). Fish distribution and habitat use data from identify approximately 156 miles (251 km) of occupied riverine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing one winter-run population (Sauk River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B4 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either high or medium conservation value to the DPS. Of the four HUC5s reviewed, three were rated as having high and one was rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Lower Skagit Subbasin (HUC4# 17110007)**

The Lower Skagit subbasin is located in northern Puget Sound and contained in Skagit and Snohomish counties, Washington. The subbasin contains two watersheds occupied by this DPS and these watersheds encompass approximately 447 mi<sup>2</sup> (1,158 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 210 miles (338 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing four winter-run populations (Baker River, Nookachamps Creek, Sauk River, and Skagit River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B5 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that both of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Stillaguamish Subbasin (HUC4# 17110008)**

The Stillaguamish subbasin is located in north-central Puget Sound and contained in Skagit and Snohomish counties, Washington. The subbasin contains three watersheds occupied by this DPS and these watersheds encompass approximately 704 mi<sup>2</sup> (1,823 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 351 miles (465 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing two summer-run populations (Deer Creek and Canyon Creek) and one winter-run population (Stillaguamish River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B6 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were all of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Skykomish Subbasin (HUC4# 17110009)**

The Skykomish subbasin is located in north-central Puget Sound and contained in King and Snohomish counties, Washington. The subbasin contains five watersheds occupied by this DPS and these watersheds encompass approximately 853 mi<sup>2</sup> (2,209 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 230 miles (370 km) of occupied riverine habitat in the watersheds (WDFW,

2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing one summer-run population (North Fork Skykomish River) and one winter-run population (Snohomish/Skykomish River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B7 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either high or medium conservation value to the DPS. Of the five HUC5s reviewed, three were rated as having high and two were rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Snoqualmie Subbasin (HUC4# 17110010)**

The Snoqualmie subbasin is located in north-central Puget Sound and contained in King and Snohomish counties, Washington. The subbasin contains two watersheds occupied by this DPS and these watersheds encompass approximately 504 mi<sup>2</sup> (1,305 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 199 miles (320 km) of occupied riverine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing one summer-run population (Tolt River) and one winter-run population (Snoqualmie River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B8 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that both of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Snohomish Subbasin (HUC4# 17110011)**

The Snohomish subbasin is located in north-central Puget Sound and contained entirely in Snohomish County, Washington. The subbasin contains two watersheds occupied by this DPS and these watersheds encompass approximately 278 mi<sup>2</sup> (720 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 215 miles (557 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Northern Cascades) containing two summer-run populations (North Fork Skykomish River and Tolt River) and three winter-run populations (Pilchuck River, Snohomish/Skykomish River, and Snoqualmie River) in this subbasin. After reviewing the best

available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B9 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that both of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Lake Washington Subbasin (HUC4# 17110012)**

The Lake Washington subbasin is located in south Puget Sound and contained in King and Snohomish counties, Washington. Lake Washington is a dominant feature in this subbasin. The subbasin contains four watersheds occupied by this DPS and these watersheds encompass approximately 619 mi<sup>2</sup> (1,603 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 202 miles (325 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Lake Washington contains approximately 40 mi<sup>2</sup> of lake habitat in these watersheds. Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Central and South Puget Sound) containing two winter-run populations (Cedar River and Lake Washington Tributaries) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B10 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either medium or low conservation value to the DPS. Of the four HUC5s reviewed, three were rated as having low and one was rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Duwamish Subbasin (HUC4# 17110013)**

The Duwamish subbasin is located in south Puget Sound and contained in King County, Washington. The subbasin contains three watersheds occupied by this DPS and these watersheds encompass approximately 487 mi<sup>2</sup> (1,261 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 178 miles (286 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Central and South Puget Sound) containing one winter-run population (Green River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map

B11 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that all of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

#### **Puyallup Subbasin (HUC4# 17110014)**

The Puyallup subbasin is located in south Puget Sound and contained in King and Pierce counties, Washington. The subbasin contains five watersheds occupied by this DPS and these watersheds encompass approximately 996 mi<sup>2</sup> (2,580 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 272 miles (438 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Central and South Puget Sound) containing two winter-run populations (Puyallup River/Carbon River and White River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B12 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that all of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

#### **Nisqually Subbasin (HUC4# 17110015)**

The Nisqually subbasin is located in south Puget Sound and contained in Pierce, Thurston, and Lewis counties, Washington (although the latter is not occupied by this DPS). The subbasin contains two watersheds occupied by this DPS and these watersheds encompass approximately 472 mi<sup>2</sup> (1,222 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 161 miles (259 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Central and South Puget Sound) containing one winter-run population (Nisqually River) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B13 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that both of the occupied HUC5 watersheds in this subbasin were of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Deschutes Subbasin (HUC4# 17110016)**

The Deschutes subbasin is located at the southern end of Puget Sound, most of it in Thurston County, Washington. The subbasin contains two watersheds occupied by this DPS and these encompass approximately 168 mi<sup>2</sup> (435 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 63 miles (101 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Central and South Puget Sound) in this subbasin. The Puget Sound TRT did not identify a steelhead DIP in this subbasin and noted that the Deschutes River was historically impassable to anadromous fish at Tumwater Falls. Winter steelhead were introduced into the Deschutes River when a fish ladder was installed at Tumwater Falls in 1954, but it is unclear if a naturally self-sustaining population exists (WDFW 2008). Despite these uncertainties, the Team noted that steelhead spawning in this watershed would likely be considered part of the listed DPS. After reviewing the best available scientific data for this subbasin (including the uncertainties about population status/structure in the Deschutes subbasin), the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B14 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that both of the occupied HUC5 watersheds in this subbasin were of low conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Skokomish Subbasin (HUC4# 17110017)**

The Skokomish subbasin is located at the southern end of Hood Canal, and most of it is in Mason County, Washington (although small portions of the subbasin – unoccupied by this DPS – also extend into Grays Harbor and Jefferson counties, Washington). The subbasin contains a single watershed (Skokomish River HUC5# - 1711001701) and encompasses approximately 248 mi<sup>2</sup> (642 km<sup>2</sup>). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Olympic Peninsula) containing one winter-run population (Skokomish River) in this subbasin. Fish distribution and habitat use data identify approximately 86 miles (138 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B15 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watershed in this subbasin was of high conservation value to the DPS. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Hood Canal Subbasin (HUC4# 17110018)**

The Hood Canal subbasin includes most of the drainages of Hood Canal proper, including those of the western Kitsap Peninsula. The subbasin includes portions of the following Washington counties: Clallam, Jefferson, Kitsap, and Mason. The subbasin contains seven watersheds occupied by this DPS and encompasses approximately 605 mi<sup>2</sup> (1,567 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 153 miles (246 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Olympic Peninsula) containing three winter-run populations (East, West, and South Hood Canal Tributaries) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B17 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either high or medium conservation value to the DPS. Of the seven HUC5s reviewed, four were rated as having high and three were rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Kitsap Subbasin (HUC4# 17110019)**

The Kitsap subbasin includes drainages of eastern Kitsap Peninsula as well as small, frontal drainages of southern and eastern Puget Sound up to Whidbey Island. The subbasin includes portions of the following Washington counties: Island, Jefferson, King, Kitsap, Mason, Pierce, Snohomish, and Thurston counties. The subbasin contains six watersheds occupied by this DPS and these encompass approximately 1,087 mi<sup>2</sup> (2,815 km<sup>2</sup>). Fish distribution and habitat use data identify approximately 260 miles (418 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). Preliminary analyses by the Puget Sound TRT (2011) have identified two ecological zones/MPGs (Olympic Peninsula and South Central Cascades) containing three winter-run populations (Strait of Juan de Fuca Lowland Tributaries, East Kitsap Peninsula Tributaries, and South Sound Tributaries) in this subbasin. After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B18 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. The CHART also determined that the occupied HUC5 watersheds in this subbasin were of either low or medium conservation value to the DPS. Of the six HUC5s reviewed, four were rated as having low and two were rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

### **Dungeness/Elwha Subbasin (HUC4# 17110020)**

The Dungeness/Elwha subbasin includes drainages to the eastern Strait of Juan de Fuca and includes portions of Clallam and Jefferson counties, Washington. The subbasin contains five occupied watersheds and encompasses approximately 828 mi<sup>2</sup> (2,145 km<sup>2</sup>). Preliminary analyses by the Puget Sound TRT (2011) have identified one ecological zone/MPG (Olympic Peninsula) containing four winter-run populations (Dungeness River, Elwha River, Strait of Juan de Fuca Lowland Tributaries, and Strait of Juan de Fuca Independent Tributaries) in this subbasin. Fish distribution and habitat use data identify approximately 144 miles (232 km) of occupied riverine/estuarine habitat in the watersheds (WDFW, 2010; NWIFC, 2011). After reviewing the best available scientific data for this subbasin, the CHART concluded that all of the occupied areas in this subbasin contain one or more PCEs for this DPS. Table B1 summarizes the total number of occupied reaches identified for each HUC5 watershed as containing spawning, rearing, or migration PCEs, as well as management activities that may affect the PCEs in the watersheds. Map B18 depicts the specific areas in this subbasin occupied by the DPS and under consideration for critical habitat designation. Of the five HUC5s reviewed in this subbasin, four were rated as having high and one (Sequim Bay) was rated as having medium conservation value. Table B2 summarizes the CHART's PCE/watershed scores and conservation value ratings, and Figure B2 shows the overall distribution of ratings by HUC5 watershed.

At the time PS steelhead were listed, the Elwha River was blocked at river mile 4.9 by the Elwha dam. The upper reaches of the river were thus not "occupied at the time of listing." In 2012 the Elwha dam was removed, providing access to the mainstem and tributaries up to Glines Canyon Dam at river mile 13.4. State and tribal biologists captured adult steelhead returning in 2012 and relocated them to tributaries in the newly open area. In addition, some wild steelhead migrated above the site of the former Elwha Dam. Because the Elwha River was not occupied at the time of listing, the CHART considered whether the blocked historical habitat above the dams (approximately 45 miles of river in the mainstem and tributaries, WDFW 2011; Olympic National Park 2012) may be essential for conservation of the DPS.

The CHART noted the significant amount of spawning habitat now available in the Elwha and its tributaries following dam removal (relative to other much smaller streams in the Strait of Juan de Fuca), the unique habitat protections afforded steelhead in Olympic National Park, and the high likelihood that these habitats will be able to support both summer- and winter-run life forms of steelhead. The summer-run form is a rare but important life history type in this DPS, but currently there is no extant summer-run population in the Olympic MPG. The Puget Sound TRT (2011) noted that a summer run may have been present historically in the Elwha River; however, it is likely that any such run was extirpated or the run residualized when the two Elwha River dams were constructed in the early 1900s. The historical distribution of summer-run steelhead in the Elwha River is not known, but it is possible that rapids and cascades in canyon areas may have provided an isolating mechanism for migrating winter and summer steelhead (especially during high spring flows). The Elwha is also the largest producer of steelhead in the Strait of Juan de Fuca (Olympic National Park 2005). Because the Strait is a major component of the Olympic MPG, and the Elwha provides extensive and unique

habitats to support viable populations of both life history types, the CHART considered the upper reaches of the Elwha River essential for conservation of the DPS.

### **Nearshore Marine Areas of Puget Sound**

As noted in previous rulemaking (70 FR 52630, September 2, 2005) the unique ecological setting of Puget Sound allowed us to identify and designate as critical habitat specific nearshore areas for Puget Sound Chinook and Hood Canal summer-run chum salmon. This nearshore area generally coincides with the maximum depth of the photic zone in Puget Sound and contains physical or biological features essential to the conservation of these two species (Washington Department of Fish and Wildlife (WDFW) and Point No Point Treaty Tribes, 2000; Puget Sound Nearshore Ecosystem Restoration Program 2003). However, unlike most other Pacific salmonids, steelhead appear to make only ephemeral use of nearshore marine waters. The species' lengthy freshwater rearing period results in large smolts that are prepared to move rapidly through estuaries<sup>6</sup> and nearshore waters to forage on larger prey in offshore marine areas. Although data specific to Puget Sound are limited, recent studies of steelhead migratory behavior strongly suggest that juveniles spend little time (a matter of hours in some cases) in estuarine and nearshore areas and do not favor migration along shorelines (Moore *et al.*, 2010a, Moore *et al.*, 2010b; Romer, 2010). In contrast, stream-type Puget Sound Chinook and Hood Canal summer-run chum salmon are known to make extensive use of nearshore areas in Puget Sound, spending from several days to several months in and adjacent to natal estuaries (WDFW and Point No Point Treaty Tribes, 2000; Redman *et al.*, 2005; Fresh, 2006). That well-documented behavior led us to designate specific nearshore areas as critical habitat for those two species (70 FR 52630, September 2, 2005). The data for steelhead, however, suggest the opposite conclusion.

Anecdotal reports suggest that juvenile steelhead may travel short distances in nearshore areas as they move between adjacent river mouths. There are similar reports of limited nearshore use by precocious steelhead (i.e., fish that are reproductively mature but have not reached their typical adult age and size). Although such behaviors could be important life history strategies for steelhead, it is uncertain whether and where such behaviors occur in Puget Sound. Therefore, given the best available information, the CHART members concluded they could not delineate specific foraging areas near shore in Puget Sound.

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<sup>6</sup> Because estuaries are a necessary migration corridor for steelhead, and estuaries are readily delineated, we consider them part of the HUC5 "specific areas" that contain essential features, as discussed in this report.

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**Table B1. Summary of Occupied Areas, PCEs, and Management Activities Affecting PCEs for the Puget Sound Steelhead DPS**

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential** (mi)	Management Activities***
			Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
Strait of Georgia	Bellingham Bay	1711000201	13.2	0.8	5.5		C, I, U
Strait of Georgia	Samish River	1711000202	29.3	7.7	22.4		A, C, U
Strait of Georgia	Birch Bay	1711000204	11.6	2.1	23.9		F, U
Nooksack	Upper North Fork Nooksack River	1711000401	17.9	0.4	15.3		F, R
Nooksack	Middle Fork Nooksack River	1711000402	16.2		1.3		F, I, R
Nooksack	South Fork Nooksack River	1711000403	45.7		34.7		C, F, R
Nooksack	Lower North Fork Nooksack River	1711000404	64.1	1.0	15.9		A, F, G
Nooksack	Nooksack River	1711000405	48.2	11.1	53.8		A, C, F
Upper Skagit	Skagit River/ Gorge Lake	1711000504	2.1		4.0		D, F, R
Upper Skagit	Skagit River/ Diobsud Creek	1711000505	18.3		13.8		F, R
Upper Skagit	Cascade River	1711000506	20.3		18.5		F

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential** (mi)	Management Activities***
			Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
Upper Skagit	Skagit River/ Illabot Creek	1711000507	37.9	1.3	11.4		F, R
Upper Skagit	Baker River	1711000508	7.4	22.4	12.2		D, F, R
Sauk	Upper Sauk River	1711000601	24.0	8.4	16.1		F, R
Sauk	Upper Suiattle River	1711000602	5.3		6.8		F, R
Sauk	Lower Suiattle River	1711000603	30.3	1.8	5.6		F, R
Sauk	Lower Sauk River	1711000604	44.1	0.3	10.9		F
Lower Skagit	Middle Skagit River/ Finney Creek	1711000701	53.9	25.8	48.1		A
Lower Skagit	Lower Skagit River/ Nookachamps Creek	1711000702	4.7	24.7	52.4		A, C, W, U
Stillaguamish	North Fork Stillaguamish River	1711000801	75.4	8.4	53.8		F, R
Stillaguamish	South Fork Stillaguamish River	1711000802	73.7	7.6	56.6		F, R
Stillaguamish	Lower Stillaguamish River	1711000803	5.1	29.1	41.6		F, U, W
Skykomish	Tye And Beckler Rivers	1711000901	26.7	1.9	4.5		F, R

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential** (mi)	Management Activities***
			Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
Skykomish	Skykomish River Forks	1711000902	38.4	3.3	23.5		A, F, U
Skykomish	Skykomish River/ Wallace River	1711000903	28.1	4.5	16.6		A, F
Skykomish	Sultan River	1711000904	9.8		0.4		D, F, U
Skykomish	Skykomish River/ Woods Creek	1711000905	34.1	0.8	37.1		A, F, G
Snoqualmie	Middle Fork Snoqualmie River	1711001003	25.8	8.6	37.0		A, F
Snoqualmie	Lower Snoqualmie River	1711001004	27.4	32.0	68.2		A, F
Snohomish	Pilchuck River	1711001101	45.4	0.9	19.4		A, D, F, S
Snohomish	Snohomish River	1711001102	1.4	18.0	134.9		C, F, U
Lake Washington	Cedar River	1711001201	22.6	4.6	16.4		C, D, F, I, R, U
Lake Washington	Lake Sammamish	1711001202	12.7	5.1	23.7		F, R, U
Lake Washington	Lake Washington	1711001203			61.5		F, R, U
Lake Washington	Sammamish River	1711001204			56.3		F, R, U
Duwamish	Upper Green River	1711001301			26.2		D, F
Duwamish	Middle Green River	1711001302	11.8	0.0	29.3		A, D, U
Duwamish	Lower Green River	1711001303	46.3	12.5	53.2		C, I, U

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential** (mi)	Management Activities***
			Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
Puyallup	Upper White River	1711001401	16.3	14.5	17.1		D, F, I
Puyallup	Lower White River	1711001402	29.1	19.0	27.2		A, D, I, U
Puyallup	Carbon River	1711001403	42.5		13.2		A, F
Puyallup	Upper Puyallup River	1711001404	23.5	8.8	13.2		D, F
Puyallup	Lower Puyallup River	1711001405	10.7	0.3	36.2		C, U
Nisqually	Mashel/ Ohop	1711001502	21.2	17.2	29.7		A, D, U
Nisqually	Lowland	1711001503	25.7	5.9	61.5		A, U
Deschutes	Prairie1	1711001601	19.3		16.9		A, F, G
Deschutes	Prairie2	1711001602	21.2		6.0		A, F, G
Skokomish	Skokomish River	1711001701	49.5	2.8	35.9		C, D, F, U
Hood Canal	Lower West Hood Canal Frontal	1711001802			5.4		C, F, R, U
Hood Canal	Hamma Hamma River	1711001803	4.4		0.0		C, F
Hood Canal	Duckabush River	1711001804	4.4	1.7	3.2		C, F
Hood Canal	Dosewallips River	1711001805	9.1	3.3	2.2		C, F, R
Hood Canal	Big Quilcene River	1711001806	4.5	0.9	1.6		C, F
Hood Canal	Upper West Hood Canal Frontal	1711001807	9.5	2.8	22.8		C, F, U
Hood Canal	West Kitsap	1711001808	32.9	9.0	35.6		A, F, U

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Primary Constituent Elements (PCEs)			Unoccupied but may be essential** (mi)	Management Activities***
			Spawning/ Rearing PCEs (mi)	Rearing/ Migration PCEs (mi)	Migration/ Presence PCEs (mi)*		
Kitsap	Kennedy/ Goldsborough	1711001900	23.7		94.9		A, F, U
Kitsap	Puget	1711001901	13.9		67.5		A, G, U
Kitsap	Prairie3	1711001902	2.6		18.0		G, U
Kitsap	Puget Sound/ East Passage	1711001904			3.4		C, U
Kitsap	Chambers Creek	1711001906			16.8		C, U
Kitsap	Port Ludlow/ Chimacum Creek	1711001908	10.8		10.5		A, B, F, U
Dungeness/ Elwha	Discovery Bay	1711002001	13.3	0.1	1.7		A, C, F
Dungeness/ Elwha	Sequim Bay	1711002002	3.6	0.1	5.3		C, F, U
Dungeness/ Elwha	Dungeness River	1711002003	24.7		33.6		C, F, I, R, S, U
Dungeness/ Elwha	Port Angeles Harbor	1711002004	23.0	0.7	30.2		F, U
Dungeness/ Elwha	Elwha River	1711002007	4.8		2.6	90.2 <sup>s</sup>	D, F

\* Some streams classified as “Migration/Presence PCEs” may also include rearing or spawning PCEs, but the GIS data are still undergoing review to confirm additional habitat use types.

\*\* These watersheds contain unoccupied habitat that historically supported spawning and rearing PCEs. The CHART determined that these habitat areas/watersheds may be essential for conservation of the ESU.

\*\*\* This list is not exhaustive. It is intended to highlight key management activities affecting PCEs in each watershed. Activities identified are based on the general categories described by Spence *et al.* (1996) and summarized previously in the “Special Management Considerations or Protection” section of this report. Coding is as follows: F= forestry, G = grazing, A = agriculture, C = channel/bank modifications such as boat ramps, bulkheads, rip rap, diking and/or dredging, R = road building/maintenance, U = urbanization, S = sand and gravel mining, M = mineral mining, D = hydroelectric dams, I = irrigation impoundments and withdrawals, T = river, estuary, and ocean traffic, W = wetland loss/removal, B = beaver removal, X = exotic/invasive species introductions, H = forage fish/species harvest. Primary sources for this information were the CHART and reports by Berry *et al.* (2001), Kerwin (1999a), Kerwin (1999b), WSCC (1999), WSCC (2000), Kerwin (2001), Beamer *et al.* (2000), Washington State Department of Natural Resources (2001), Haring (2002), Smith (2002), Kuttel (2003), and Fresh *et al.* (2004).

§ Watershed contains unoccupied habitat (classified as “Potential” habitat in GIS data from WDFW) above Elwha and Glines Canyon dams that the CHART determined was essential for conservation of this DPS.

**Table B2. Summary of CHART Scores and Ratings of Conservation Value for Habitat Areas Occupied by the Puget Sound Steelhead DPS**

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Strait of Georgia	Bellingham Bay	1711000201	1	1	1	1	1	2	7	Moderate HUC5 score. Limited amount of PCEs, but creeks here are lowland, rain-driven systems, that are very distinct from glacially influenced systems like the Nooksack River. Part of the Northern Cascades (South Salish Sea) Major Population Group (MPG), which is the largest and most diverse in this DPS.	Medium	
Strait of Georgia	Samish River	1711000202	2	2	2	1	2	2	11	Moderate HUC5 score. This HUC contains a large portion of the PCEs in the Samish River DIP. It is lowland, rain-driven system that is very distinct from glacially influenced systems like the Nooksack River. Also, while the adjacent Nooksack and Skagit River steelhead populations appear to be steadily declining the Samish River steelhead escapement trend has been stable or increasing at times during recent years. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Strait of Georgia	Birch Bay	1711000204	1	1	1	2	1	3	9	Moderate HUC5 score. Limited amount of PCEs, but creeks here are lowland, rain-driven systems, that are very distinct from glacially influenced systems like the Nooksack River. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	
Nooksack	Upper North Fork Nooksack River	1711000401	2	2	2	1	2	2	11	Moderate HUC5 score. PCEs support an important (North Fork Nooksack) winter-run population that historically may have numbered in the tens of thousands of steelhead, but are not as extensive in this HUC5 as in others supporting this population. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	
Nooksack	Middle Fork Nooksack River	1711000402	1	1	2	1	2	2	9	Moderate HUC5 score. PCEs support an important (North Fork Nooksack) winter-run population that historically may have numbered in the tens of thousands of steelhead, but are not as extensive in this HUC5 as in others supporting this population. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Nooksack	South Fork Nooksack River	1711000403	3	1	2	3	2	3	14	High HUC5 score. PCEs are extensive and support an important (North Fork Nooksack) winter-run population that historically may have numbered in the tens of thousands of steelhead. This HUC5 also supports spawning habitat for one of the few summer-run populations (South Fork Nooksack) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	
Nooksack	Lower North Fork Nooksack River	1711000404	3	1	2	3	2	3	14	High HUC5 score. PCEs are extensive and support an important (North Fork Nooksack) winter-run population that historically may have numbered in the tens of thousands of steelhead. This HUC5 also supports one of the few summer-run populations (South Fork Nooksack) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Nooksack	Nooksack River	1711000405	3	1	2	3	3	3	15	High HUC5 score. PCEs are extensive and support an important (North Fork Nooksack) winter-run population that historically may have numbered in the tens of thousands of steelhead. This HUC5 also supports one of the few summer-run populations (South Fork Nooksack) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Upper Skagit	Skagit River/ Gorge Lake	1711000504	1	3	3	1	3	2	13	High HUC5 score. High quality PCEs support an important and diverse summer- and winter-run population (Mainstem Skagit) that historically may have numbered in the tens of thousands of steelhead. Currently it remains one of the predominant steelhead populations in Puget Sound. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Upper Skagit	Skagit River/ Diobsud Creek	1711000505	2	3	3	1	3	2	14	High HUC5 score. High quality and extensive PCEs support an important and diverse summer- and winter-run population (Mainstem Skagit) that historically may have numbered in the tens of thousands of steelhead. Currently it remains one of the predominant steelhead populations in Puget Sound. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	
Upper Skagit	Cascade River	1711000506	2	3	3	2	2	2	14	High HUC5 score. High quality and extensive PCEs support an important and diverse summer- and winter-run population (Mainstem Skagit) that historically may have numbered in the tens of thousands of steelhead. Currently it remains one of the predominant steelhead populations in Puget Sound. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Upper Skagit	Skagit River/ Illabot Creek	1711000507	3	3	3	2	3	2	16	High HUC5 score. High quality and extensive PCEs support important and diverse summer- and winter-run populations (Mainstem Skagit and Sauk River) that historically may have numbered in the tens of thousands of steelhead. The Mainstem Skagit remains one of the predominant steelhead populations in Puget Sound. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Upper Skagit	Baker River	1711000508	2	1	1	2	1	3	10	Moderate HUC5 score. PCEs likely supported historically important runs of summer- and winter-run populations. Extensive habitat still remains, but dams in the upper portion of the watershed have diminished the quality, quantity, and potential of PCEs. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Sauk	Upper Sauk River	1711000601	3	3	3	2	2	3	16	High HUC5 score. High quality and extensive PCEs. The Sauk River was historically considered an excellent steelhead stream and principal spawning habitat for the Skagit River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	
Sauk	Upper Suiattle River	1711000602	1	3	3	1	2	2	12	Moderate HUC5 score. PCEs are more limited in this watershed relative to other adjacent watersheds in the Sauk River. The Sauk River was historically considered an excellent steelhead stream and principal spawning habitat for the Skagit River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Sauk	Lower Suiattle River	1711000603	3	3	3	1	2	2	14	High HUC5 score. High quality and extensive PCEs. The Sauk River was historically considered an excellent steelhead stream and principal spawning habitat for the Skagit River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	High
Sauk	Lower Sauk River	1711000604	3	2	3	1	2	3	14	High HUC5 score. Extensive PCEs. The Sauk River was historically considered an excellent steelhead stream and principal spawning habitat for the Skagit River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Lower Skagit	Middle Skagit River/ Finney Creek	1711000701	3	2	3	3	3	3	17	High HUC5 score. Extensive PCEs support important and diverse summer- and winter-run populations (Mainstem Skagit, Sauk River, and Baker River) that historically may have numbered in the tens of thousands of steelhead. Currently the Mainstem Skagit remains one of the predominant steelhead populations in Puget Sound. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Lower Skagit	Lower Skagit River/ Nookachamps Creek	1711000702	3	1	2	3	3	3	15	High HUC5 score. Extensive PCEs support important and diverse summer- and winter-run populations (Mainstem Skagit, Sauk River, and Baker River) that historically may have numbered in the tens of thousands of steelhead. Currently the Mainstem Skagit remains one of the predominant steelhead populations in Puget Sound. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Stillaguamish	North Fork Stillaguamish River	1711000801	3	2	2	3	2	3	15	High HUC5 score. Extensive PCEs support one of the few naturally sustained steelhead populations with likely minimal hatchery influence. This HUC5 also supports spawning habitat for one of the few summer-run populations (Deer Creek) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	
Stillaguamish	South Fork Stillaguamish River	1711000802	3	2	2	3	2	3	15	High HUC5 score. Extensive PCEs. This HUC5 also supports spawning habitat for one of the few summer-run populations (Canyon Creek) in this DPS. Historically, Canyon Creek was identified as having a relatively good-sized run of steelhead. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Stillaguamish	Lower Stillaguamish River	1711000803	3	1	2	3	2	3	14	High HUC5 score. PCEs support one winter-run population and two summer-run populations. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Skykomish	Tye And Beckler Rivers	1711000901	1	3	3	0	0	1	8	Moderate HUC5 score. PCEs are more limited in this watershed relative to other adjacent watersheds in the Skykomish River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	Medium	
Skykomish	Skykomish River Forks	1711000902	3	3	2	3	2	3	16	High HUC5 score. Extensive and high-quality PCEs also support spawning habitat for one of the few summer-run populations (North Fork Skykomish) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Skykomish	Skykomish River/ Wallace River	1711000903	3	2	2	3	2	3	15	High HUC5 score. PCEs support a winter-run population and one of the few summer-run populations (North Fork Skykomish) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Skykomish	Sultan River	1711000904	1	1	2	1	2	2	9	Moderate HUC5 score. PCEs are much more limited in quantity and quality in this watershed than in other adjacent watersheds in the Skykomish River system. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	Medium	
Skykomish	Skykomish River/ Woods Creek	1711000905	2	3	2	3	2	3	15	High HUC5 score. PCEs support a winter-run population and one of the few summer-run populations (North Fork Skykomish) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Snoqualmie	Middle Fork Snoqualmie River	1711001003	3	2	2	2	2	2	13	High HUC5 score. Extensive PCEs are believed to have historically sustained large runs of steelhead. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	
Snoqualmie	Lower Snoqualmie River	1711001004	3	2	2	3	3	3	16	High HUC5 score. Extensive PCEs are believed to have historically sustained large runs of steelhead. This HUC5 also supports spawning habitat for one of the few summer-run populations (Tolt River) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Snohomish	Pilchuck River	1711001101	3	2	2	2	2	3	14	High HUC5 score. Extensive PCEs and historically reported to be a good producer of winter-run steelhead. Age structure of the Pilchuck River winter-run may include a higher proportion of 3-year ocean fish. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Snohomish	Snohomish River	1711001102	3	1	2	3	3	3	15	High HUC5 score. Extensive PCEs support multiple winter-run populations as well as one of the few summer-run populations (Tolt River) in this DPS. Part of the Northern Cascades (South Salish Sea) MPG, which is the largest and most diverse in this DPS.	High	High
Lake Washington	Cedar River	1711001201	2	2	2	1	1	2	10	Moderate HUC5 score. Significant manmade hydrological changes have affected this watershed. A substantial resident <i>O. mykiss</i> population exists in the Cedar River, but the relationship between the existing resident population and the historical anadromous population remains unclear. However, this HUC5 is considered to have the best and most extensive habitat of the Lake Washington subbasin tributaries and the resident <i>O. mykiss</i> contribution to steelhead production may be determined to be important for the Central and South Puget Sound Major Population Group.	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Lake Washington	Lake Sammamish	1711001202	1	1	1	0	0	2	5	Very low HUC5 score and very poor quality PCEs. Significant development and manmade hydrological changes have affected this watershed. Moreover, it is not clear to what degree steelhead utilized tributaries in this HUC5.	Low	
Lake Washington	Lake Washington	1711001203	1	0	1	0	1	2	5	Very low HUC5 score and very poor quality PCEs. Significant development and manmade hydrological changes have affected this watershed, as reflected in one of the lowest estimates of intrinsic potential habitat productivity in the entire DPS. Moreover, it is not clear to what degree steelhead utilized tributaries in this HUC5 (although it does provide a rearing/migration corridor for the Medium-valued Cedar River watershed/population).	Low	Medium
Lake Washington	Sammamish River	1711001204	1	1	1	0	1	2	6	Very low HUC5 score and very poor quality PCEs. Significant development and manmade hydrological changes have affected this watershed. Moreover, it is not clear to what degree steelhead utilized tributaries in this HUC5.	Low	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Duwamish	Upper Green River	1711001301	1	1	2	2	1	2	9	Moderate HUC5 score. Winter-run steelhead were historically present in considerable numbers in the Green River and the winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS (and the highest for this MPG). This HUC5 also may have supported a historical, native summer-run population.	High	
Duwamish	Middle Green River	1711001302	1	2	1	2	2	2	10	Moderate HUC5 score. Winter-run steelhead were historically present in considerable numbers in the Green River and the winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS (and the highest for this MPG).	High	High

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Duwamish	Lower Green River	1711001303	3	1	1	2	2	2	11	Moderate HUC5 score. Extensive mainstem and tributary PCEs. Winter-run steelhead were historically present in considerable numbers in the Green River and the winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS (and the highest for this MPG).	High	High
Puyallup	Upper White River	1711001401	2	2	2	1	2	2	11	Moderate HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	
Puyallup	Lower White River	1711001402	3	1	2	1	2	2	11	Moderate HUC5 score and extensive PCEs. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS.	High	High
Puyallup	Carbon River	1711001403	2	2	2	1	2	2	11	Moderate HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Puyallup	Upper Puyallup River	1711001404	2	1	2	1	2	2	10	Moderate HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS.	High	
Puyallup	Lower Puyallup River	1711001405	2	0	1	1	2	2	8	Moderate HUC5 score. The two winter-run populations occupying this HUC5 have some of the highest estimates of intrinsic potential habitat productivity for the entire DPS.	High	High
Nisqually	Mashel/ Ohop	1711001502	2	2	2	1	2	2	11	Moderate HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS.	High	
Nisqually	Lowland	1711001503	3	2	2	3	2	2	14	High HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS. Extensive PCEs include a substantial and rare estuary (Nisqually Delta) within the range of this DPS.	High	High
Deschutes	Prairie1	1711001601	1	1	1	0	0	0	3	Very low HUC5 score. Considerable uncertainty regarding demographically independent population structure.	Low	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Deschutes	Prairie2	1711001602	1	1	1	0	0	0	3	Very low HUC5 score. Considerable uncertainty regarding demographically independent population structure.	Low	Low
Skokomish	Skokomish River	1711001701	3	1	2	1	2	3	12	Moderate HUC5 score. This HUC5 supports the only extant spawning habitat for the Skokomish River winter-run population. Extensive PCEs include the largest intact estuary in Hood Canal and overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	
Hood Canal	Lower West Hood Canal Frontal	1711001802	0	3	2	1	1	2	9	Moderate HUC5 score and limited amount of – but high-quality – PCEs. The CHART determined that there were no Low conservation value areas in Hood Canal’s unique ecological setting.	Medium	
Hood Canal	Hamma Hamma River	1711001803	1	2	1	1	1	2	8	Moderate HUC5 score. Limited amount of PCEs. Focus of recent steelhead supplementation/rebuilding efforts.	High	
Hood Canal	Duckabush River	1711001804	1	2	2	1	1	2	9	Moderate HUC5 score. Limited amount of PCEs, yet some of the highest for the watersheds supporting the West Hood Canal Tributaries winter-run population. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Hood Canal	Dosewallips River	1711001805	1	2	2	1	1	2	9	Moderate HUC5 score. Limited amount of PCEs, yet some of the highest for the watersheds supporting the West Hood Canal Tributaries winter-run population. PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat..	High	
Hood Canal	Big Quilcene River	1711001806	1	1	1	1	1	2	7	Moderate HUC5 score. PCE quantity is limited in this HUC5. The CHART determined that there were no Low conservation value areas in Hood Canal's unique ecological setting.	Medium	
Hood Canal	Upper West Hood Canal Frontal	1711001807	1	2	2	1	1	2	9	Moderate HUC5 score. PCEs are limited but distributed among a substantial number of independent tributaries in this HUC5. The CHART determined that there were no Low conservation value areas in Hood Canal's unique ecological setting.	Medium	
Hood Canal	West Kitsap	1711001808	2	2	1	1	2	3	11	Moderate HUC5 score. Creeks here are lowland, rain-driven systems, that are very distinct from glacially influenced systems prevalent throughout much of the DPS range. The highest estimate of intrinsic potential habitat productivity in the Hood Canal portion of this MPG.	High	

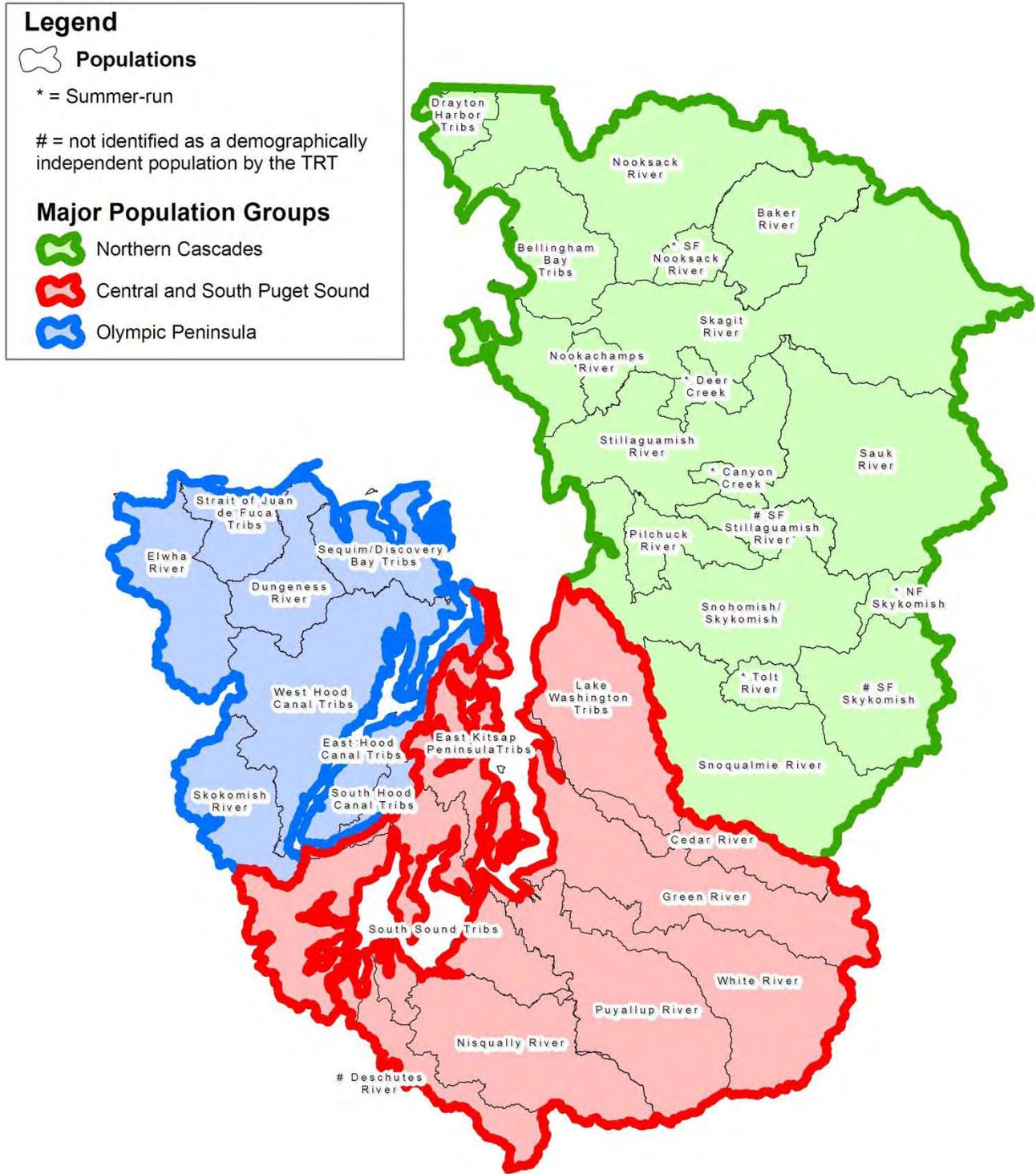
Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Kitsap	Kennedy/ Goldsborough	1711001900	3	2	1	1	1	2	10	Moderate HUC5 score. Extensive PCEs; creeks here are lowland, rain-driven systems, that are very distinct from glacially influenced systems prevalent throughout much of the DPS range.	Medium	
Kitsap	Puget	1711001901	2	1	1	1	1	3	9	Moderate HUC5 score. Creeks here are lowland, rain-driven systems, that are very distinct from glacially influenced systems prevalent throughout much of the DPS range.	Medium	
Kitsap	Prairie3	1711001902	1	0	1	0	0	2	4	Very low HUC5 score. Very limited PCE quantity and quality, and considerable uncertainty regarding demographically independent population structure.	Low	
Kitsap	Puget Sound/ East Passage	1711001904	0	0	0	1	0	0	1	Very low HUC5 score. Extremely limited PCE quantity and quality. Also, there is considerable uncertainty regarding population structure of steelhead occupying this HUC5.	Low	
Kitsap	Chambers Creek	1711001906	1	0	1	0	1	2	5	Low HUC5 score. Very limited PCE quantity and quality, and considerable uncertainty regarding demographically independent population structure.	Low	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Kitsap	Port Ludlow/ Chimacum Creek	1711001908	1	1	1	0	0	2	5	Low HUC5 score. Very limited PCE quantity and quality and considered the least important of the three HUC5s supporting the Strait of Juan de Fuca Lowland Tributaries population.	Low	
Dungeness/ Elwha	Discovery Bay	1711002001	1	2	1	2	1	2	9	Moderate HUC5 score. Although PCEs are limited in this HUC5, it is considered the most important of the three HUC5s supporting the Strait of Juan de Fuca Lowland Tributaries population. Steelhead in one tributary of this HUC5 (Snow Creek) have been intensively monitored and give insights into the dynamics of small populations throughout the DPS. Resident fish here are also known to generate anadromous offspring.	High	
Dungeness/ Elwha	Sequim Bay	1711002002	0	2	1	0	0	2	5	Low HUC5 score. Of the three HUC5s supporting the Strait of Juan de Fuca Lowland Tributaries population, this HUC5 was considered of intermediate importance in part due to its close proximity to higher conservation-value HUC5s to the west (e.g., the Dungeness River).	Medium	

Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Dungeness/ Elwha	Dungeness River	1711002003	3	2	2	2	1	3	13	High HUC5 score. This HUC5 supports the only extant spawning habitat for the Dungeness River winter-run population. This population has the second highest estimate of intrinsic potential habitat productivity for this MPG. Extensive PCEs also overlap a FEMAT Tier 1 key watershed for fish populations/habitat.	High	
Dungeness/ Elwha	Port Angeles Harbor	1711002004	3	2	2	1	1	3	12	Moderate HUC5 score. Extensive PCEs are distributed among a number of independent tributaries in this HUC5.	High	

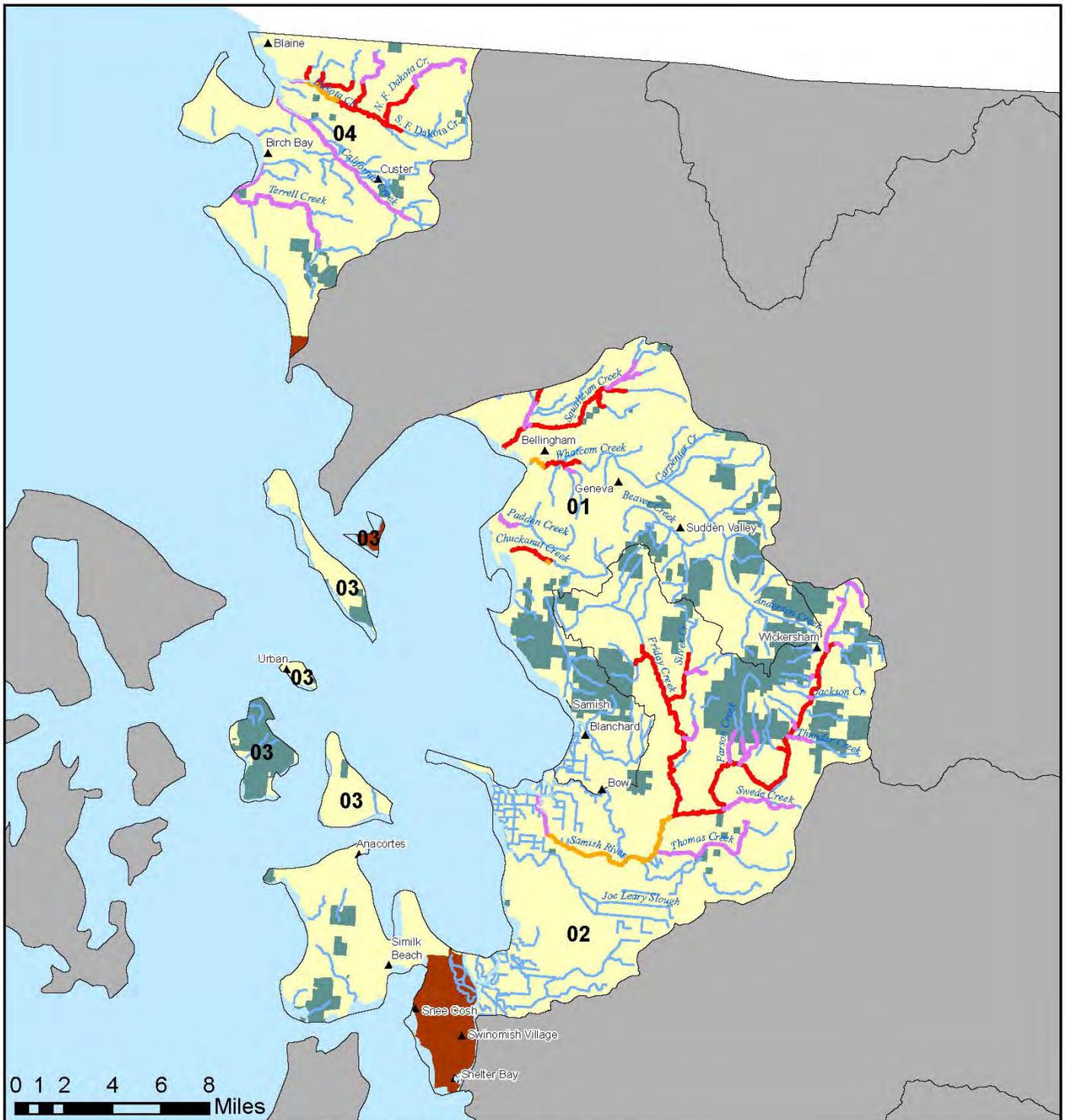
Subbasin	Watershed	Area/ Watershed (HUC5) Code	Scoring System (factors)						Total HUC5 Score (0-18)	Comments/Other Considerations	CHART Rating of HUC5 Conservation Value	Rating of Connect- ivity Corridor
			1	2	3	4	5	6				
Dungeness/ Elwha	Elwha River	1711002007	1	2	2	2	2	3	12	Moderate HUC5 score. The winter-run population occupying this HUC5 has one of the highest estimates of intrinsic potential habitat productivity for the entire DPS (and the highest for this MPG). Historical areas now accessible to steelhead in Indian and Little Creeks overlap with a FEMAT Tier 1 key watershed for fish populations/habitat. The CHART determined that areas above both Elwha dams are essential for conservation of the DPS, noting the significant amount of additional spawning habitat relative to other much smaller streams in the Strait of Juan de Fuca, as well as the high likelihood that these habitats will likely be able to support both a winter-run and the rarer summer-run life forms of steelhead.	High	

**Figure B1.** Populations and Major Population Groups (see Puget Sound Technical Recovery Team 2011) Identified In the Range of Watersheds Occupied by Puget Sound Steelhead





**Maps B1 through B18.** Puget Sound Steelhead DPS – Habitat Areas Under Consideration for Critical Habitat Designation



**Puget Sound Steelhead Distribution**  
 Strait Of Georgia Subbasin 17110002

**Map B1**

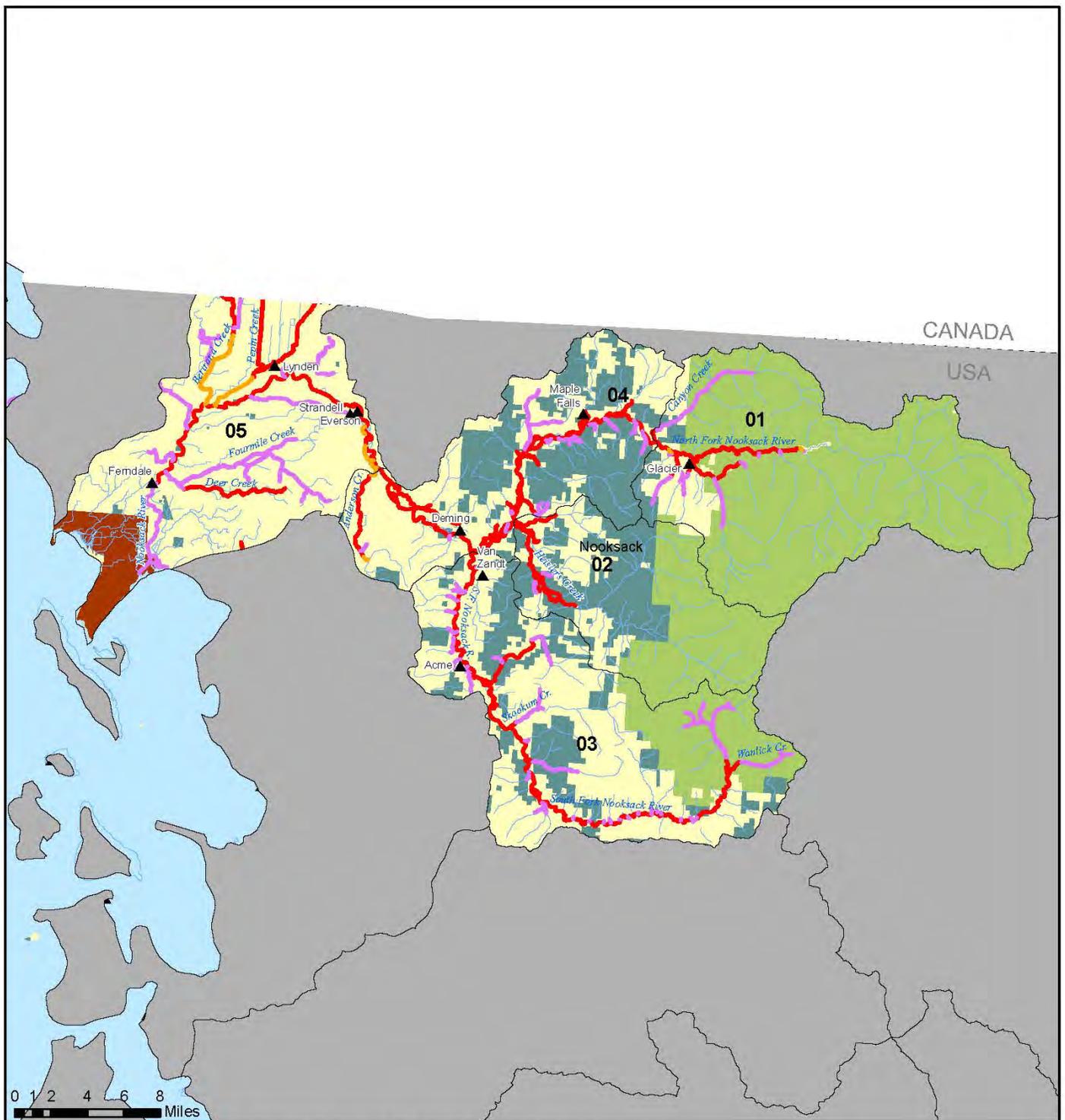


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

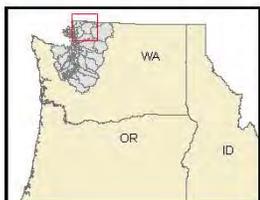
- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



### Puget Sound Steelhead Distribution

Nooksack Subbasin 17110004

## Map B2

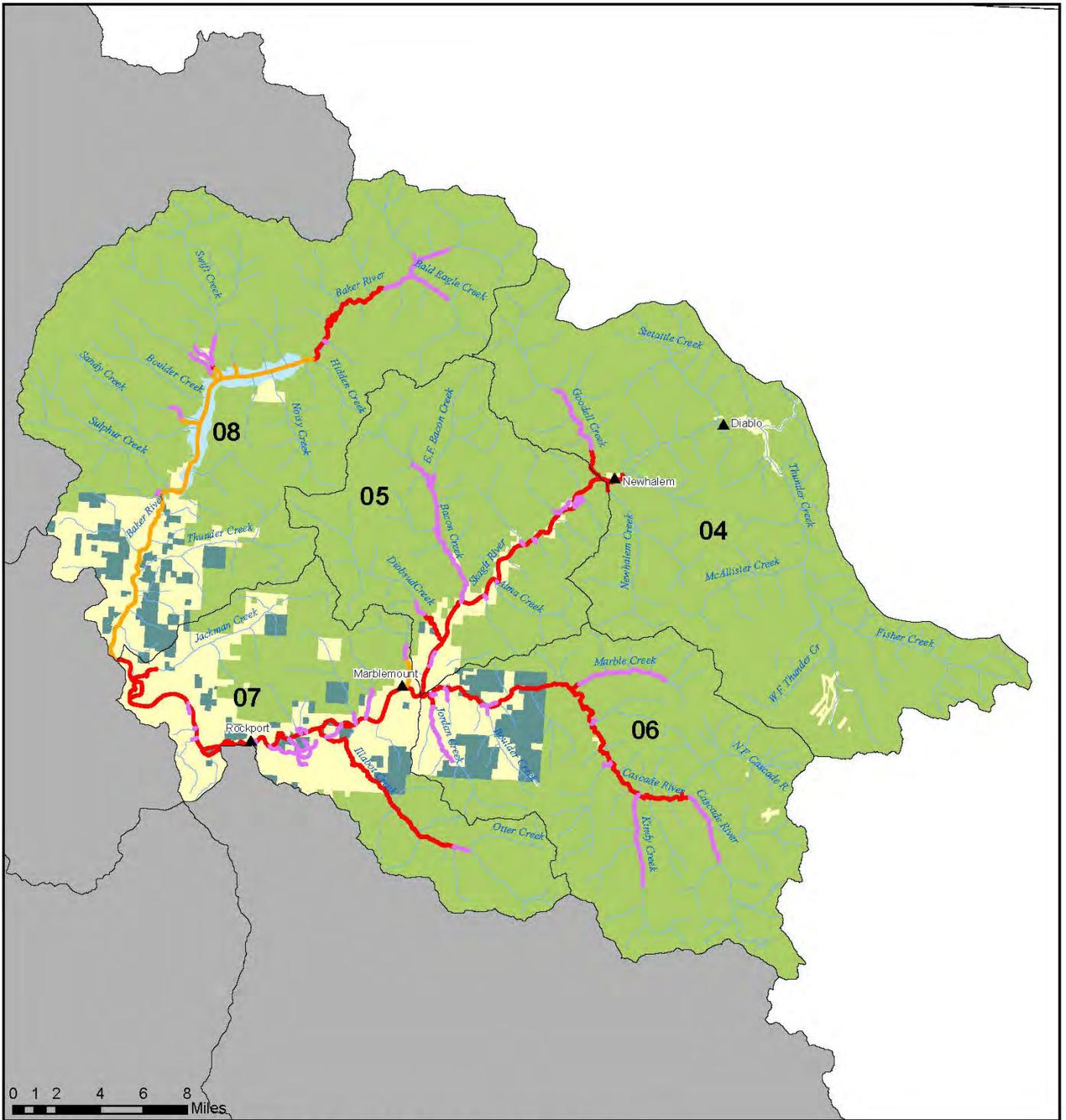


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

### Legend

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
Upper Skagit Subbasin 17110005

**Map B3**

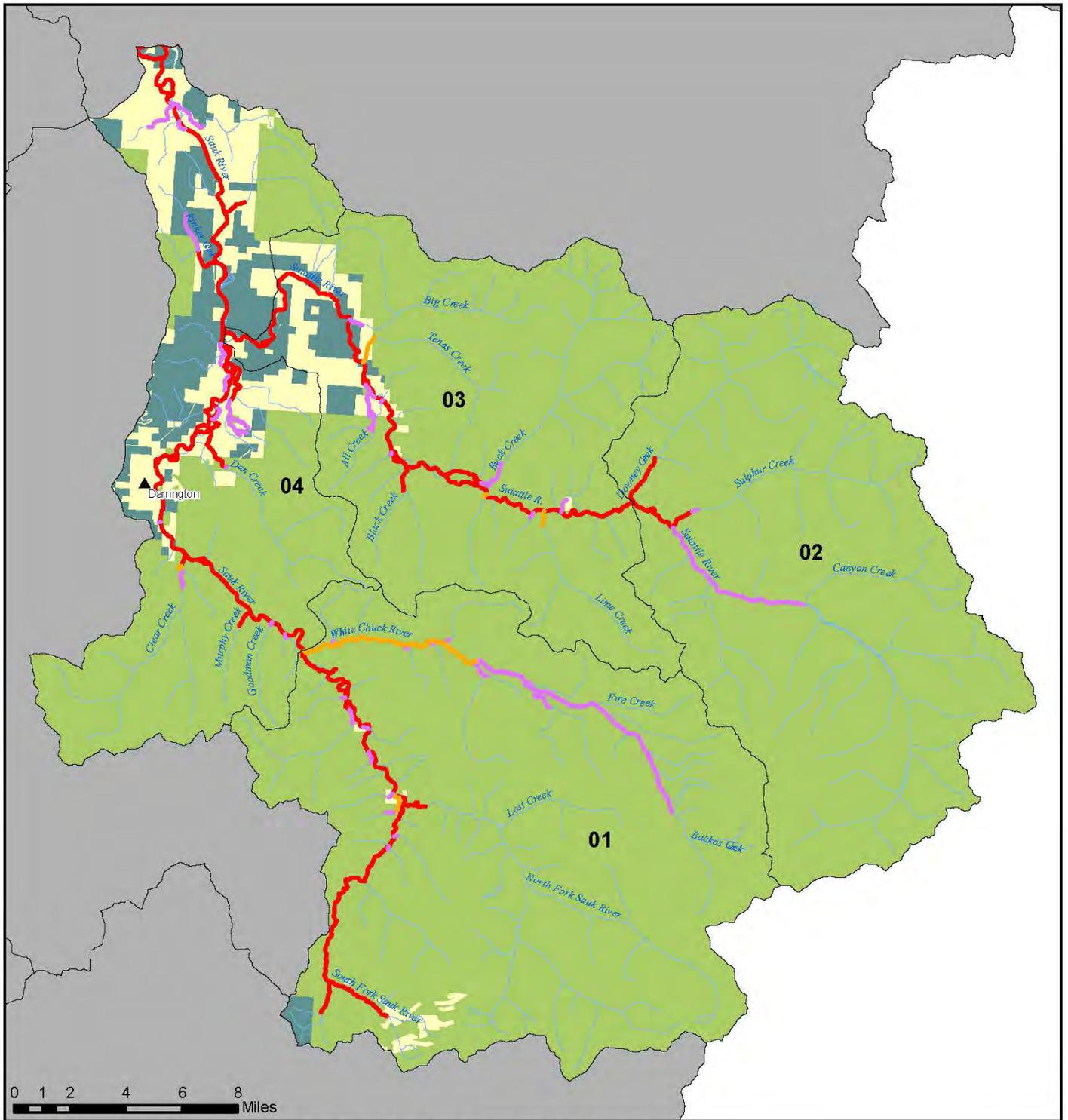


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
Sauk Subbasin 17110006

**Map B4**

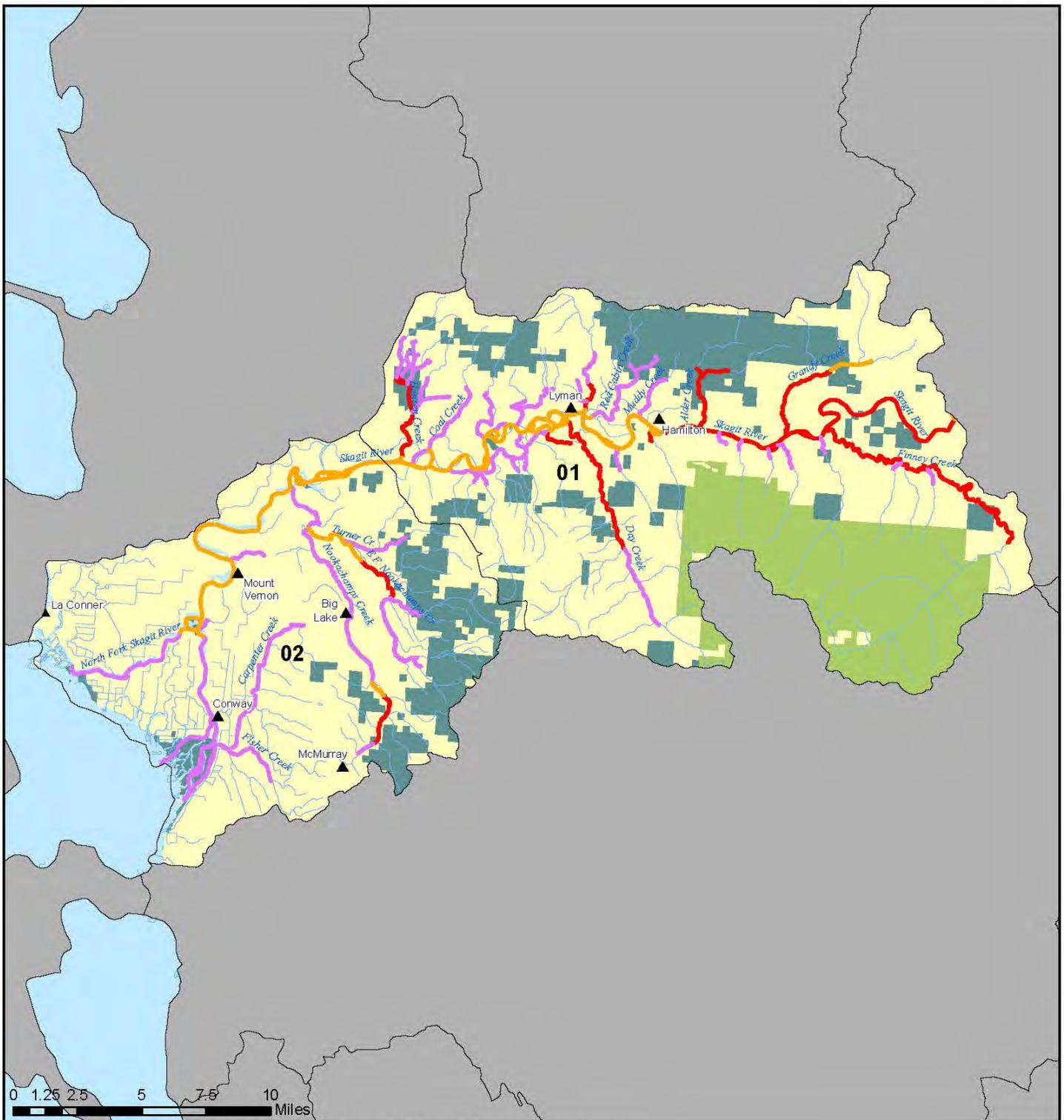
**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
Lower Skagit Subbasin 17110007

**Map B5**

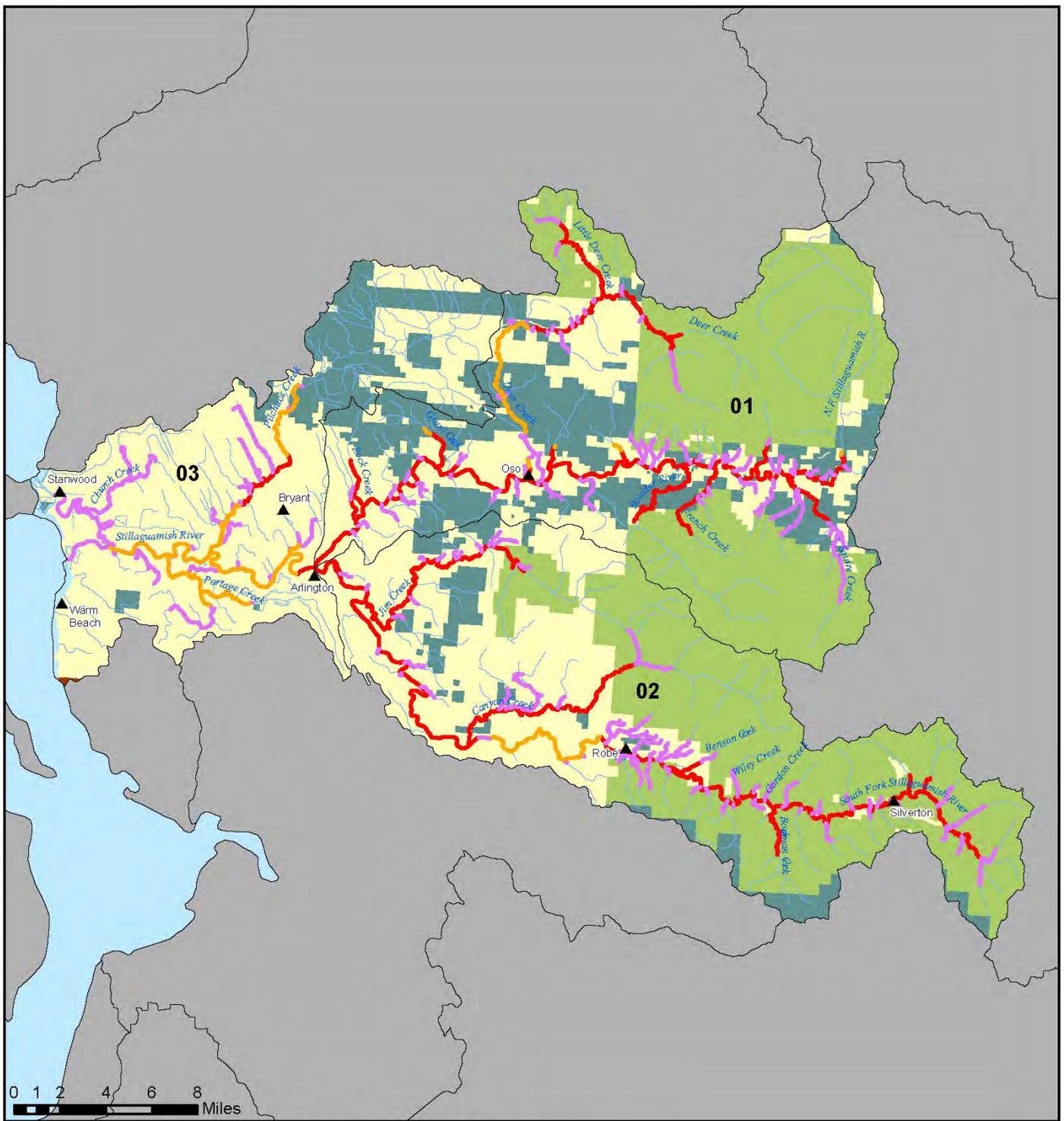


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
 Stillaguamish Subbasin 17110008

**Map B6**

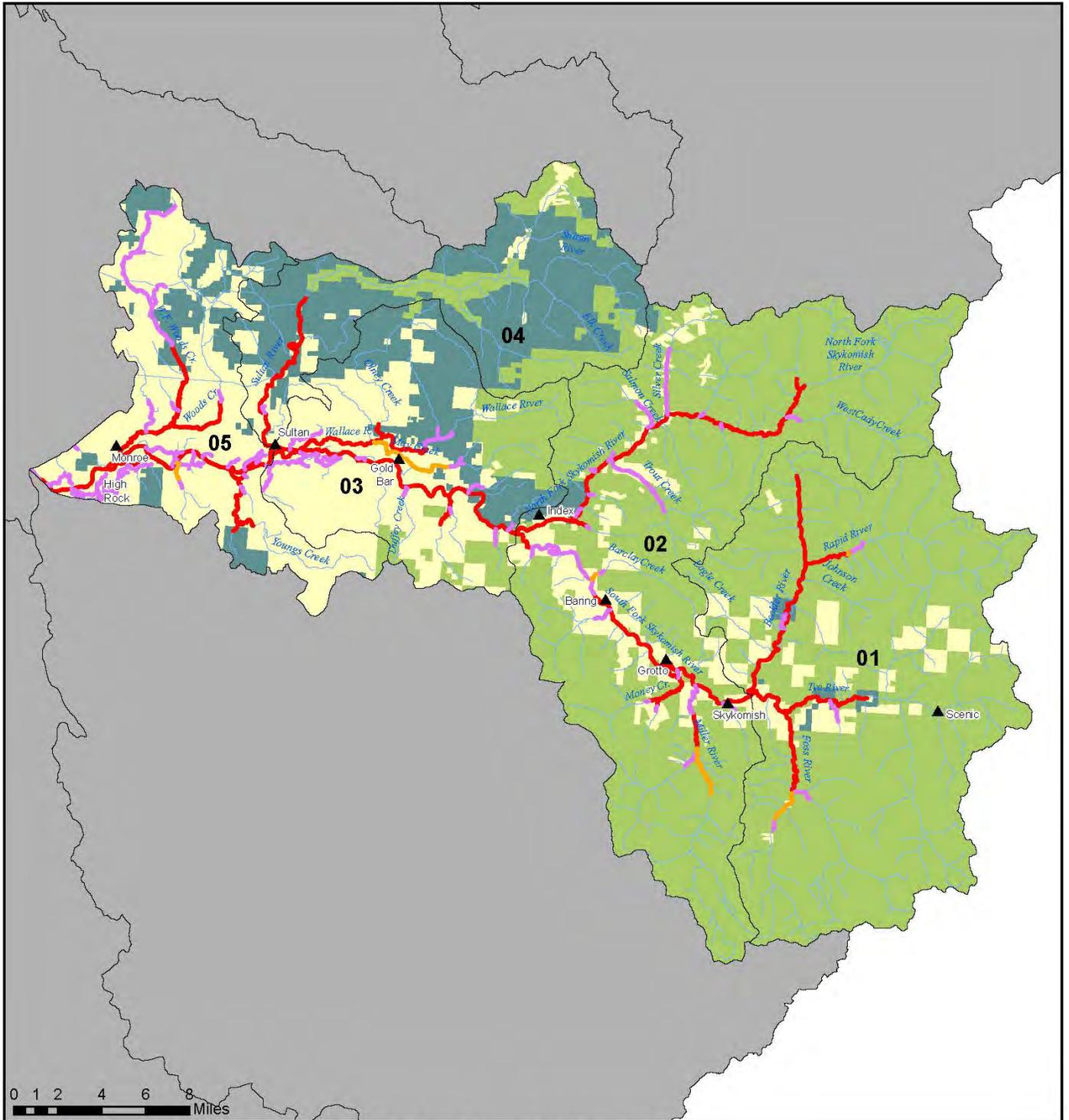


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
 Skyskomish Subbasin 17110009

**Map B7**

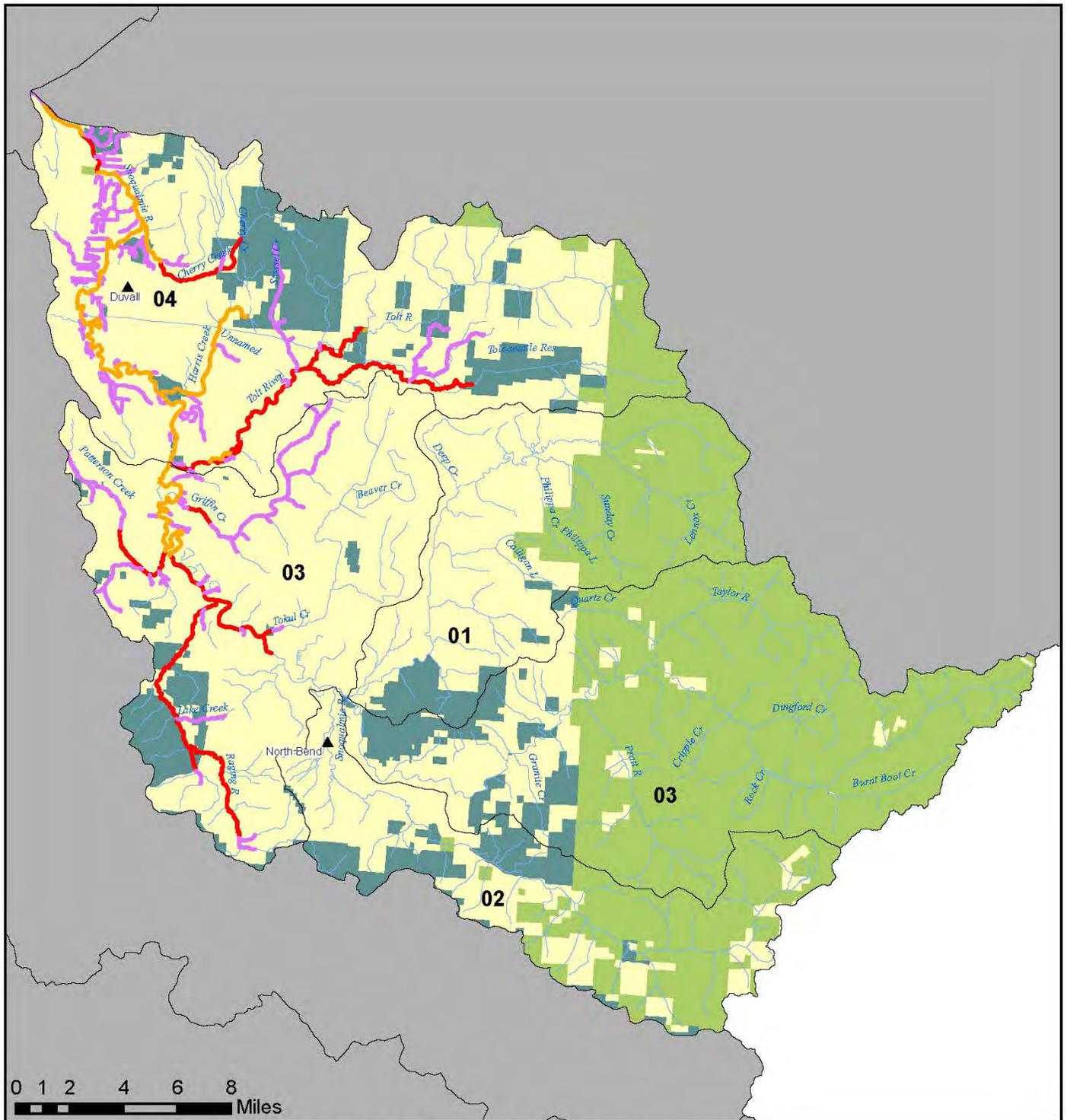


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
Snoqualmie Subbasin 17110010

**Map B8**

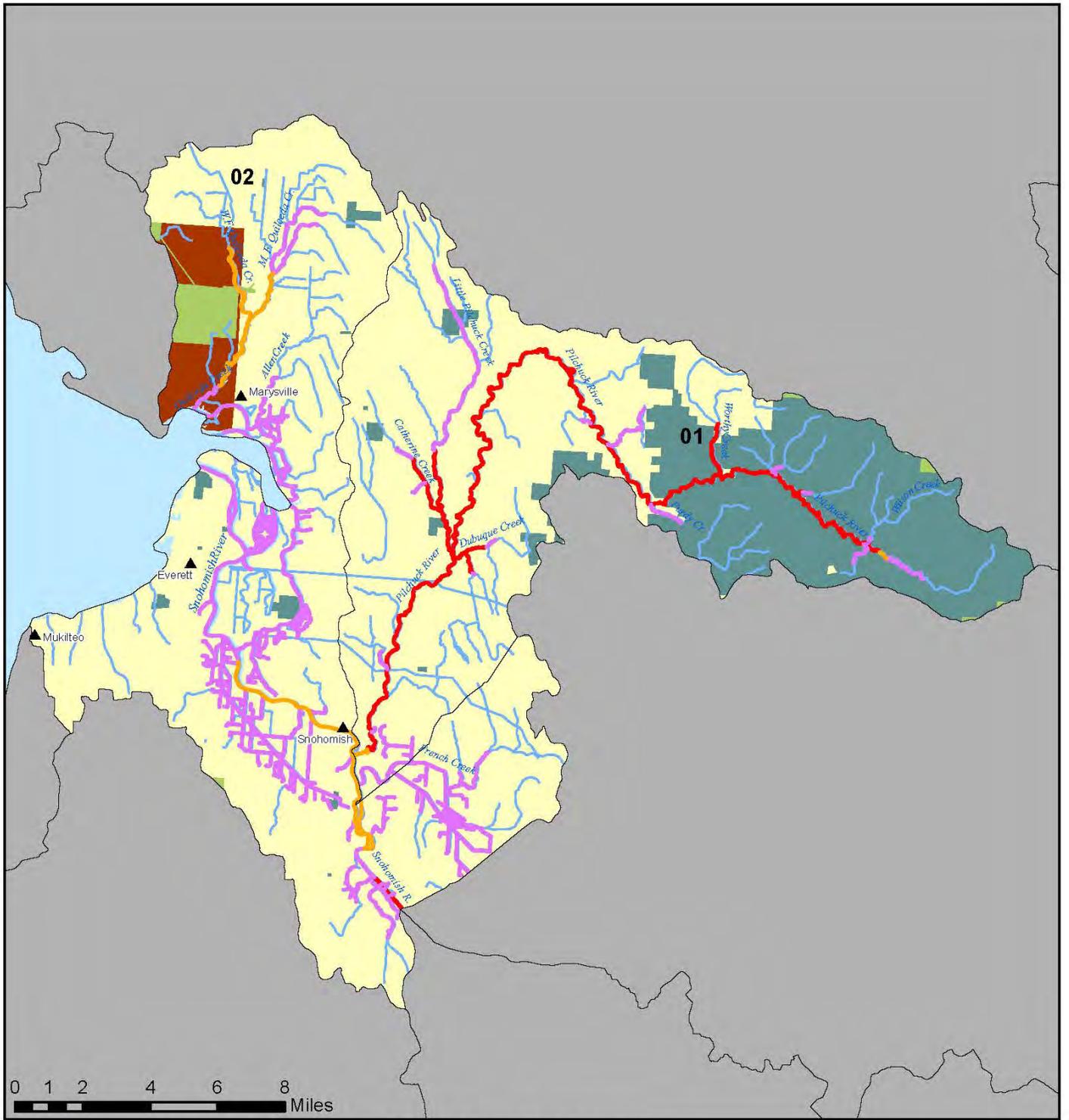


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal

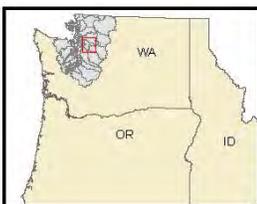


**Puget Sound Steelhead Distribution**  
Snohomish Subbasin 17110011

**Map B9**

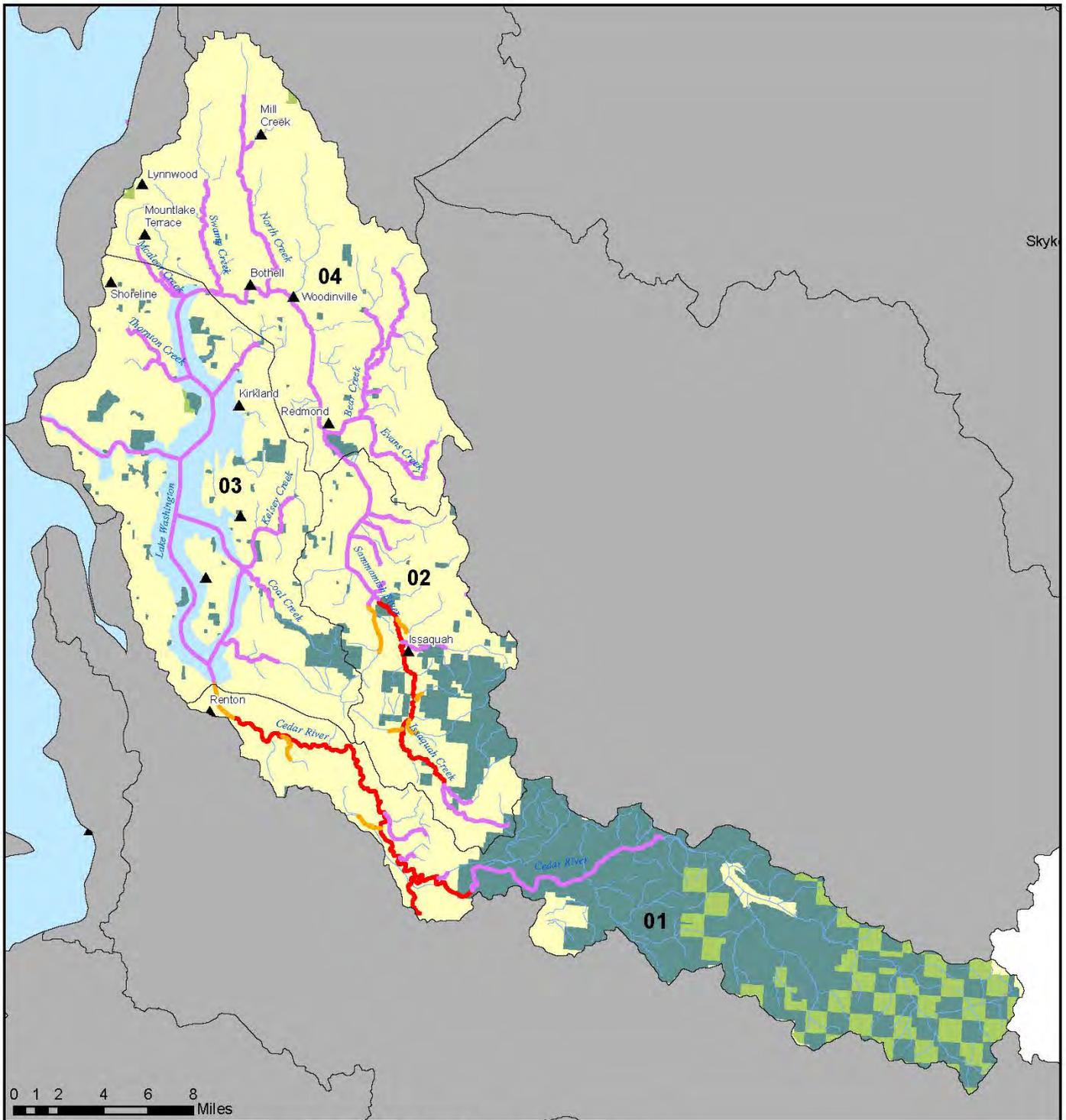
**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
 Lake Washington Subbasin 17110012

**Map B10**

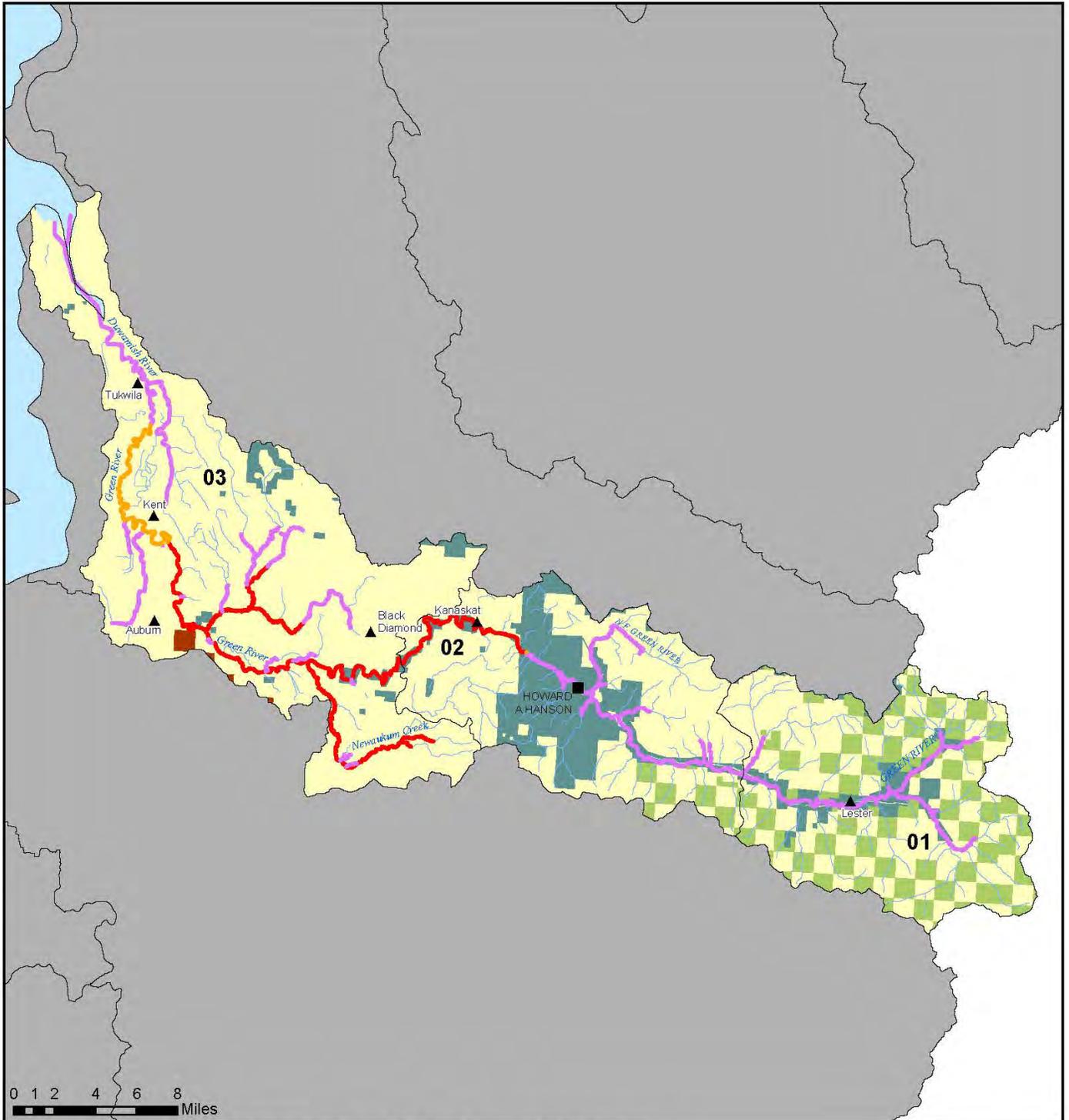


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

**Legend**

- |                       |               |
|-----------------------|---------------|
| ▲ Cities              | □ Watersheds  |
| ~ Streams (1:100,000) | ■ Private     |
| — Spawning/Rearing    | ■ Federal     |
| — Rearing/Migration   | ■ State/Local |
| — Migration/Presence  | ■ Tribal      |



### Puget Sound Steelhead Distribution

Duwamish Subbasin 17110013

## Map B11

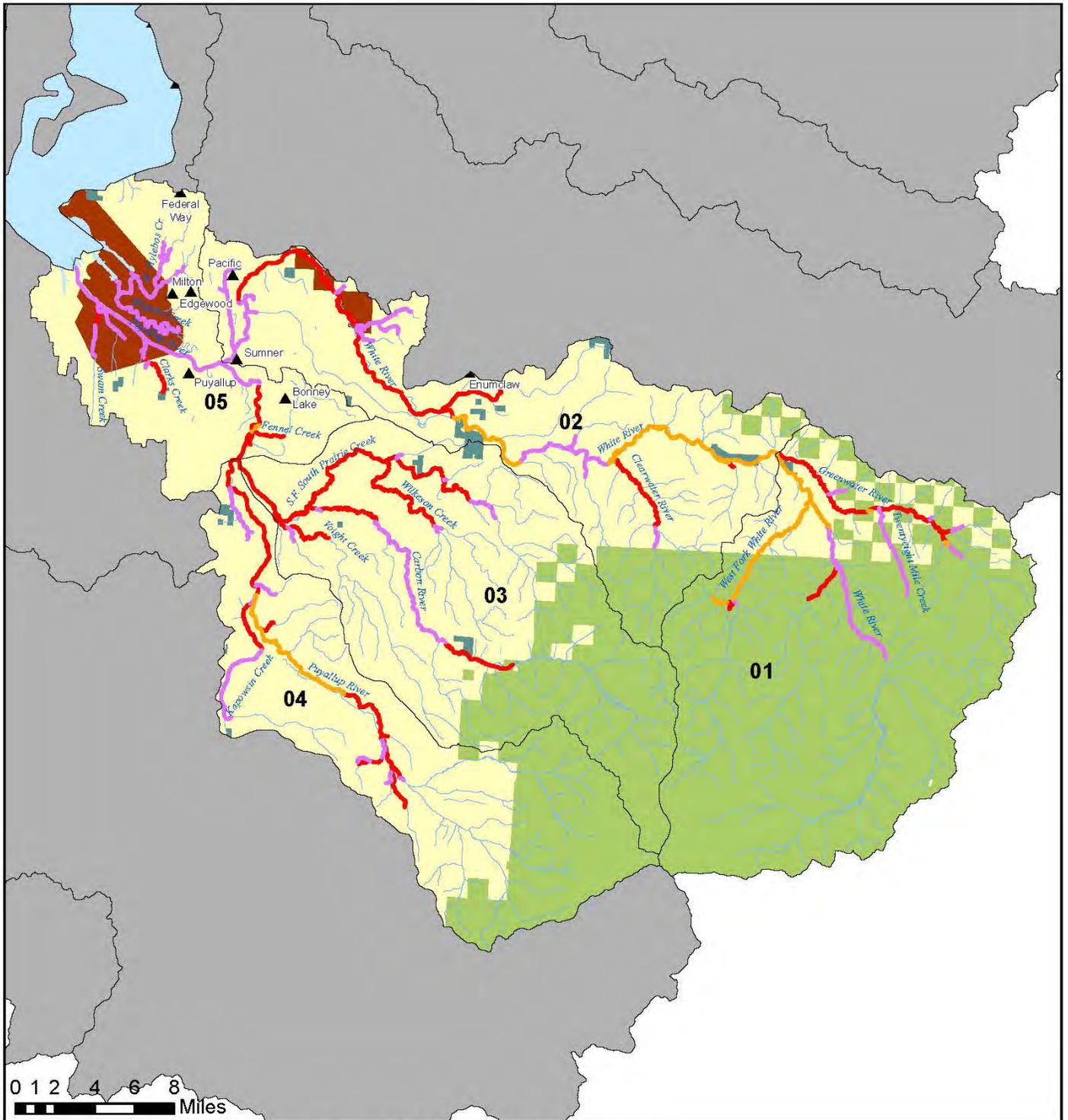


The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

### Legend

- ▲ Cities
- Dams/Barriers
- ~ Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



**Puget Sound Steelhead Distribution**  
Puyallup Subbasin 17110014

**Map B12**

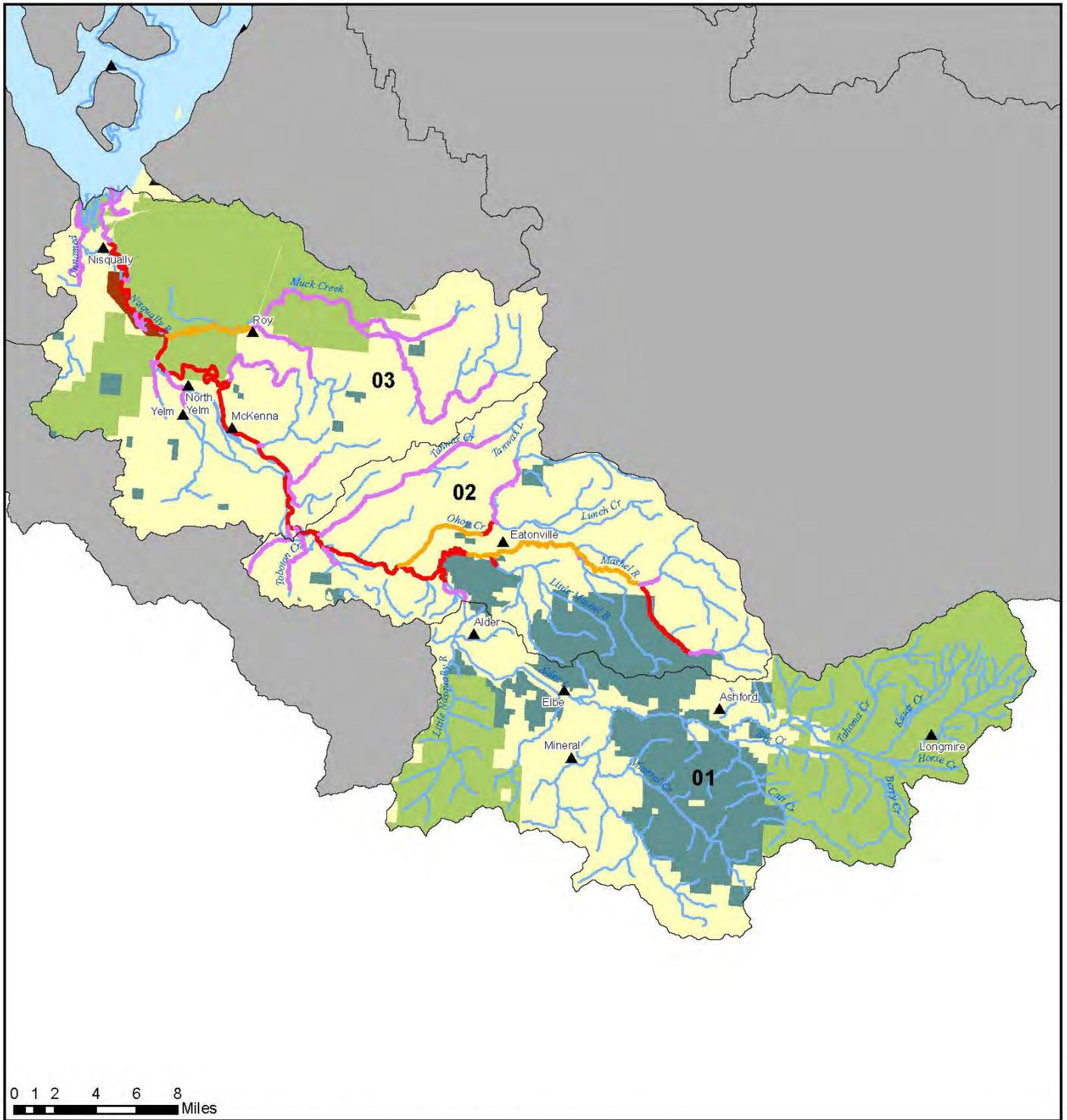
**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
Nisqually Subbasin 17110015

**Map B13**

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
Deschutes Subbasin 17110016

**Map B14**

**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
 Skokomish Subbasin 17110017

**Map B15**

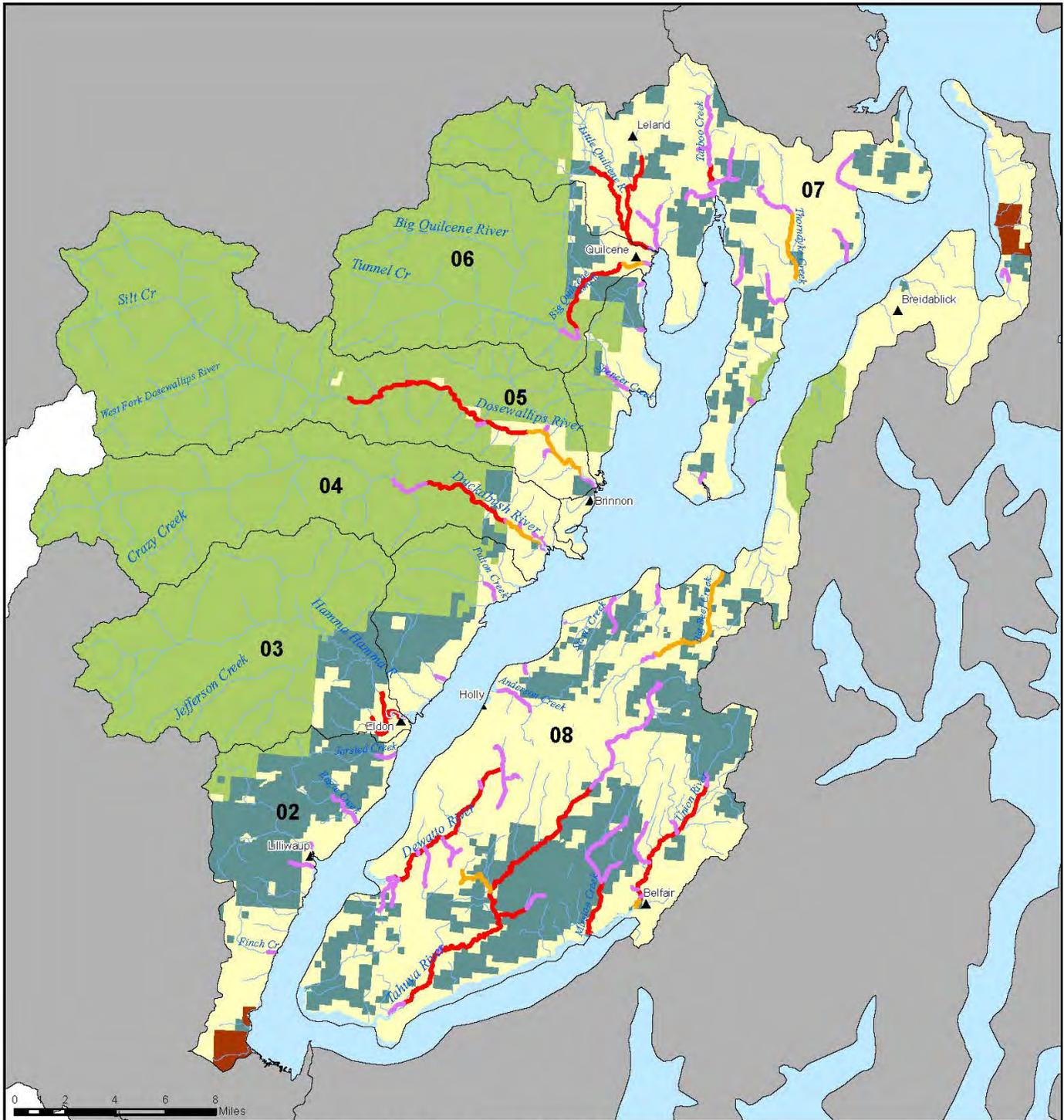
**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
Hood Canal Subbasin 17110018

**Map B16**

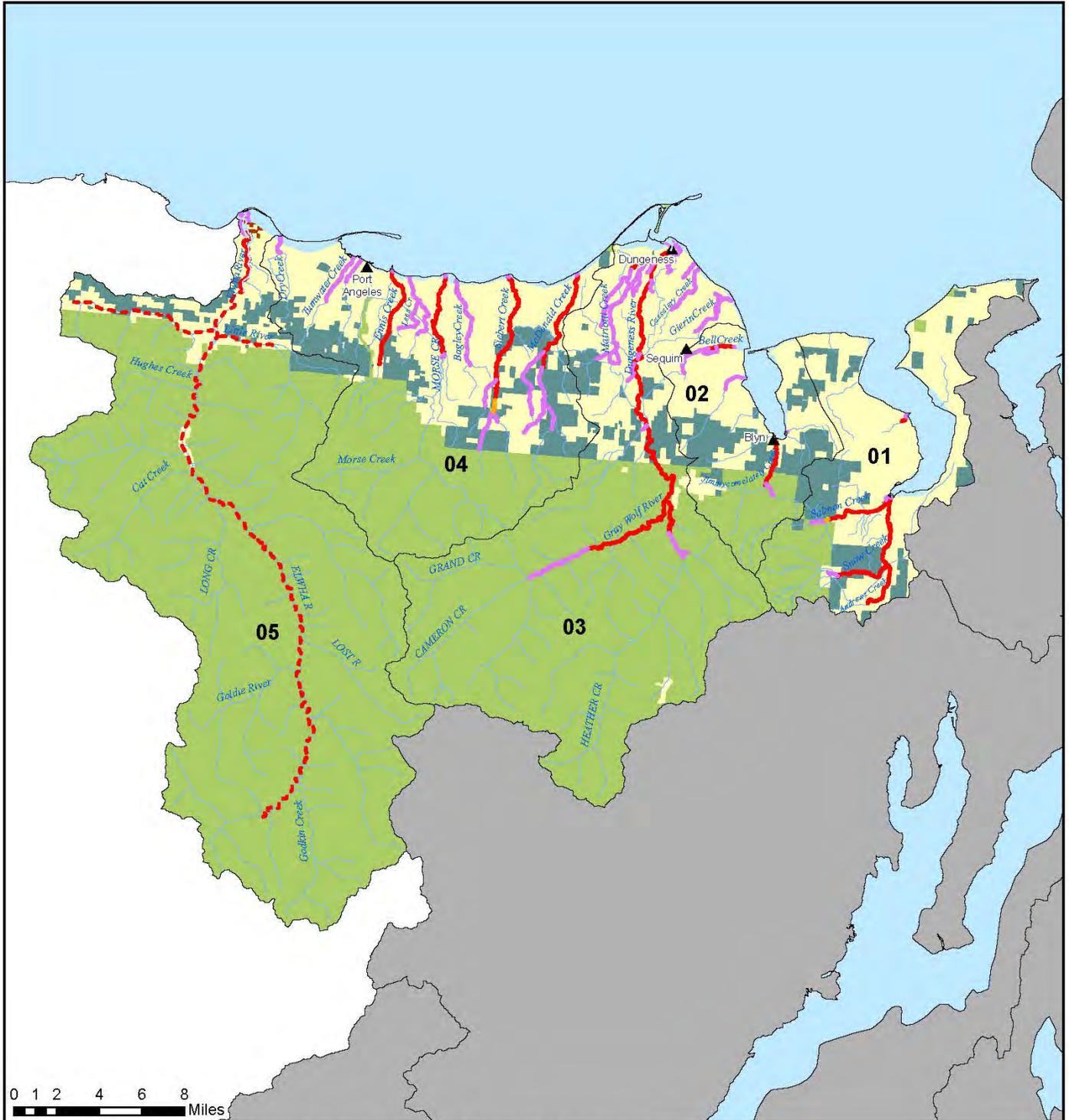
**Legend**

- ▲ Cities
- Streams (1:100,000)
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only



**Puget Sound Steelhead Distribution**  
 Dungeness-Elwha Subbasin 17110020

**Map B18**

**Legend**

- ▲ Cities
- ~ Streams (1:100,000)
- - - Unoccupied, Essential for Conservation
- Spawning/Rearing
- Rearing/Migration
- Migration/Presence
- Watersheds
- Private
- Federal
- State/Local
- Tribal



The watershed code is the subbasin number with the two digit watershed code appended to the end (i.e., Subbasin = 1711007, watershed = 171100701)

Note: This map is for general reference only

## Appendix C. CHART Conclusions Regarding ESA Section 7 Leverage

Table C1 identifies, for each DPS, those watersheds that met the following “low leverage” profile identified by NMFS habitat biologists:

- less than 25 percent of the land area in federal ownership
- no hydropower dams, and
- no consultations likely to occur on instream work.

We chose these attributes because federal lands, dams and instream work all have a high likelihood of consultation and activities undergoing consultation have a potential to significantly affect the physical and biological features of salmon and steelhead habitat. Where federal lands are involved any activity occurring there must undergo a section 7 consultation if it may affect the species or the designated critical habitat. Salmon and steelhead habitat can be significantly affected by many activities occurring on federal lands, including grazing, timber harvest, roadbuilding, and mining. Dams generally are either federally operated or federally permitted by the U.S. Army Corps of Engineers (COE) or by the Federal Energy Regulatory Commission, triggering section 7 consultation. Dam operation can significantly affect salmon and steelhead in many ways, including by impeding passage, inundating habitat and changing flow and temperature regimes. Instream work generally requires a permit from the COE. Instream work can significantly affect salmon and steelhead habitat in a number of ways, including by reducing channel complexity, increasing flows, diminishing connectivity between the stream channel and floodplain, and increasing sediment. Other types of activities also impact salmon and steelhead habitat, but their potential leverage was not deemed as predictable as those used in the above low leverage profile.

The table below includes the CHART’s assessment as to whether the watershed was in fact likely to be “low leverage,” and the CHART’s conclusion as to whether excluding a “low leverage” watershed would significantly impede the conservation of the DPS. These findings were obtained via discussions with each CHART during meetings conducted in the spring/summer of 2011 and were subsequently used in the agency’s draft ESA 4(b)(2) analysis (NMFS, 2012b).

### *References*

NMFS, 2012a. Designation of Critical Habitat for Lower Columbia River Coho Salmon and Puget Sound Steelhead: Draft Economic Analysis. NMFS Northwest Region Report. October 2012.

NMFS, 2012b. Designation of Critical Habitat for Lower Columbia River Coho Salmon and Puget Sound Steelhead: Draft 4(b)(2) Report. NMFS Northwest Region Report. October 2012

**Table C1. Summary of CHART Conclusions Regarding Possible ESA Section 7 Leverage**

DPS	Watershed Name	Watershed Code	Conservation Value Rating		Likely to be Low Leverage?	Comments
			Benefit of designating watershed	Benefit of designating connectivity corridor		
<b>Lower Columbia River Coho Salmon</b>	Beaver Creek/ Columbia River	1708000302	Medium	na	No	CHART determined that consultations were likely to yield significant leverage in this HUC5 due to several recent U.S. Army Corps of Engineers consultations in this watershed.
<b>Lower Columbia River Coho Salmon</b>	Green River	1708000505	High	na	No	CHART determined that consultations were likely to yield significant leverage in this HUC5, noting that despite there being less than 25% Federal lands in the HUC5, Federal lands are located adjacent to a significant number of stream reaches used as spawning habitat.
<b>Lower Columbia River Coho Salmon</b>	South Fork Toutle River	1708000506	High	na	No	CHART determined that consultations were likely to yield significant leverage in this HUC5, noting that despite there being less than 25% Federal lands in the HUC5, Federal lands are located adjacent to a significant number of stream reaches used as spawning habitat.
<b>Puget Sound Steelhead</b>	Chambers Creek	1711001906	Low	na	No	CHART determined that consultations were likely to yield significant leverage in this HUC5, noting the presence of the Garrison Springs Hatchery dam (non-hydropower) and potential consultations associated with it.

## **Appendix D. CHART Conclusions Regarding Areas Under Consideration for Exclusion from Critical Habitat**

The CHARTs considered whether excluding particular areas from critical habitat designation would significantly impede conservation (see NMFS 2012) of the lower Columbia River coho and Puget Sound steelhead DPSs. The CHARTs considered each areas alone and in combination with other areas eligible for economic exclusion. In considering whether exclusion of areas on economic grounds would significantly impede conservation, the CHARTs also assumed that certain military areas and HCP areas would be excluded for other reasons. In making this determination, the CHARTs considered such factors as the role the particular areas play in the conservation of the population(s), the uniqueness or importance to the population(s), any recovery planning emphasis on the area, and similar considerations. Table D1 contains the CHART conclusions for each DPS.

The CHARTs also assessed whether the combined exclusions would result in the extinction of either DPS. They concluded that this would not be the case for the following reasons:

- The habitat areas considered for exclusion are not concentrated on specific populations or major population groups. Instead they are well distributed throughout, and representative of, the major population groups for each DPS.
- The few cases where an entire watershed was proposed for exclusion (due to economic impacts) all involved habitat areas that the CHARTs deemed to be of low conservation value.
- Most stream reaches proposed for exclusion are short (amounting to less than 10 miles per watershed) and occur in a checkerboard pattern wherein excluded reaches are interspersed with reaches proposed for designation as critical habitat.
- The proposed HCP and Indian land exclusions involve stream reaches that are already co-managed for salmonid conservation. In addition, the HCP exclusions in particular may provide an incentive to other landowners to seek conservation agreements with NMFS.

### *References*

NMFS. 2012. Designation of Critical Habitat for Lower Columbia River Coho Salmon and Puget Sound Steelhead: Draft 4(b)(2) Report. NMFS Northwest Region Report. October 2012.

**Table D1. Summary of CHART Conclusions Regarding Areas Under Consideration for Exclusion from Critical Habitat**

DPS	Watershed Name	Watershed Code	Conservation Value Rating		CHART Determination re: Whether Exclusion Would Significantly Impede Conservation
			Benefit of designating watershed	Benefit of designating connectivity corridor	
<b>Lower Columbia River Coho Salmon</b>	Abernethy Creek	1709000704	Low	na	No – Low conservation value reflects low numbers of fish and limited PCEs in this HUC5. Adjacent HUC5s have much greater conservation value to the Clackamas River population of coho salmon.
<b>Puget Sound Steelhead</b>	Lake Sammamish	17110001202	Low	na	No – Low conservation value reflects low numbers of fish and limited PCEs in this HUC5. The nearby Cedar River HUC5 is the most important of the four watersheds supporting the Lake Washington population of steelhead.
<b>Puget Sound Steelhead</b>	Lake Washington	17110001203	Low	Medium (Cedar River HUC5 is upstream)	No – Low conservation value reflects low numbers of fish and limited PCEs in this HUC5. The adjacent Cedar River HUC5 is the most important of the four watersheds supporting the Lake Washington population of steelhead.
<b>Puget Sound Steelhead</b>	Sammamish River	17110001204	Low	na	No – Low conservation value reflects low numbers of fish and limited PCEs in this HUC5. The nearby Cedar River HUC5 is the most important of the four watersheds supporting the Lake Washington population of steelhead.
<b>Puget Sound Steelhead</b>	Puget Sound/ East Passage	17110001904	Low	na	No – Low conservation value reflects low numbers of fish and limited PCEs in this HUC5. Other HUC5s (e.g., Green River and Puyallup River watersheds) have much greater conservation value to steelhead in the Central and South Puget Sound major population group.