

**ASSESSMENT OF IMPACTS TO CRITICAL HABITAT FOR  
Columbia River Bull Trout or Coastal Puget Sound Bull Trout**  
Designation Effective: November 17, 2010

**COE reference:** [add reference number](#)

**Applicant:** [add applicant name](#)

**Primary Constituent Elements  
From 50 CFR Part 17, 70 FR 562212-311**

The primary constituent elements determined essential to the conservation of bull trout (*Salvelinus confluentus*) are:

(1) Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.

**Existing Conditions:** [describe conditions in project area](#)

**Effects to PCE:** [describe effects from project to PCE.](#)

(2) Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including, but not limited to permanent, partial, intermittent or seasonal barriers.

**Existing Conditions:** [describe conditions in project area](#)

**Effects to PCE:** [describe effects from project to PCE.](#)

(3) An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

**Existing Conditions:** [describe conditions in project area](#)

**Effects to PCE:** [describe effects from project to PCE.](#)

(4) Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.

**Existing Conditions:** [describe conditions in project area](#)

**Effects to PCE:** [describe effects from project to PCE.](#)

(5) Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.

**Existing Conditions:** [describe conditions in project area](#)

**Effects to PCE:** *describe effects from project to PCE.*

(6) Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12 percent) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions.

**Existing Conditions:** *describe conditions in project area*

**Effects to PCE:** *describe effects from project to PCE.*

(7) A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, they minimize departures from a natural hydrograph.

**Existing Conditions:** *describe conditions in project area*

**Effects to PCE:** *describe effects from project to PCE.*

(8) Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

**Existing Conditions:** *describe conditions in project area*

**Effects to PCE:** *describe effects from project to PCE.*

(9) Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass; inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present.

**Existing Conditions:** *describe conditions in project area*

**Effects to PCE:** *describe effects from project to PCE.*

**Determination of Effect:**

**Conservation Measures:**