

BC's Coast Region: Species & Ecosystems of Conservation Concern

Bull Trout (*Salvelinus confluentus*)

Global: G3, Provincial: S3, COSEWIC: E, BC List: Blue, Identified Wildlife



Lacustrine/Adfluvial Adults (spawners)



Resident Adult

Notes on *Salvelinus confluentus*: This member of the family Salmonidae (“salmon, true trout, char and whitefishes”), is not actually a trout, but a char. Until recent advances in DNA analysis, this species was considered to be the same as Dolly Varden. While genetically distinct, the two species can and do hybridize and have overlapping distributions. Bull Trout occur in several forms including: Anadromous (sea-run), fluvial (resident) and lacustrine/adfluvial (migrate between large bodies of freshwater to tributaries to spawn).

Description

Length 20-40 cm (anadromous and adfluvial individuals can attain larger size e.g. 60 cm+, while resident fluvial individuals are generally smaller - sometimes <20 cm). This species of char is noted for its long body and elongated head and jaws. Non-spawning colouration is olive-green to bluish-grey dorsally lightening to a white belly. Light yellow, orange, red or pink spots with pale cream or pinkish halos are distributed from below the lateral line up to the dorsal fin. Generally the brighter pigment spots (orange and red) are below the lateral line while paler yellow and pink spots cover the dorsal area. When in spawning condition, especially on males, pigmentation becomes enhanced on the belly (ventral area becomes bright red) and the lower jaw becomes distinctly hooked upwards. Spotting can become brighter and white leading edge on anal and pelvic fins more distinct on both sexes.

Diet

Adults consume a range of invertebrates (aquatic and terrestrial insects, mollusks, crustaceans) as well as vertebrates (other fish, amphibians, even ducklings, rodents and snakes). Juveniles and fry mainly consume invertebrates (aquatic and terrestrial insects, mollusks, crustaceans).

Look's Like?

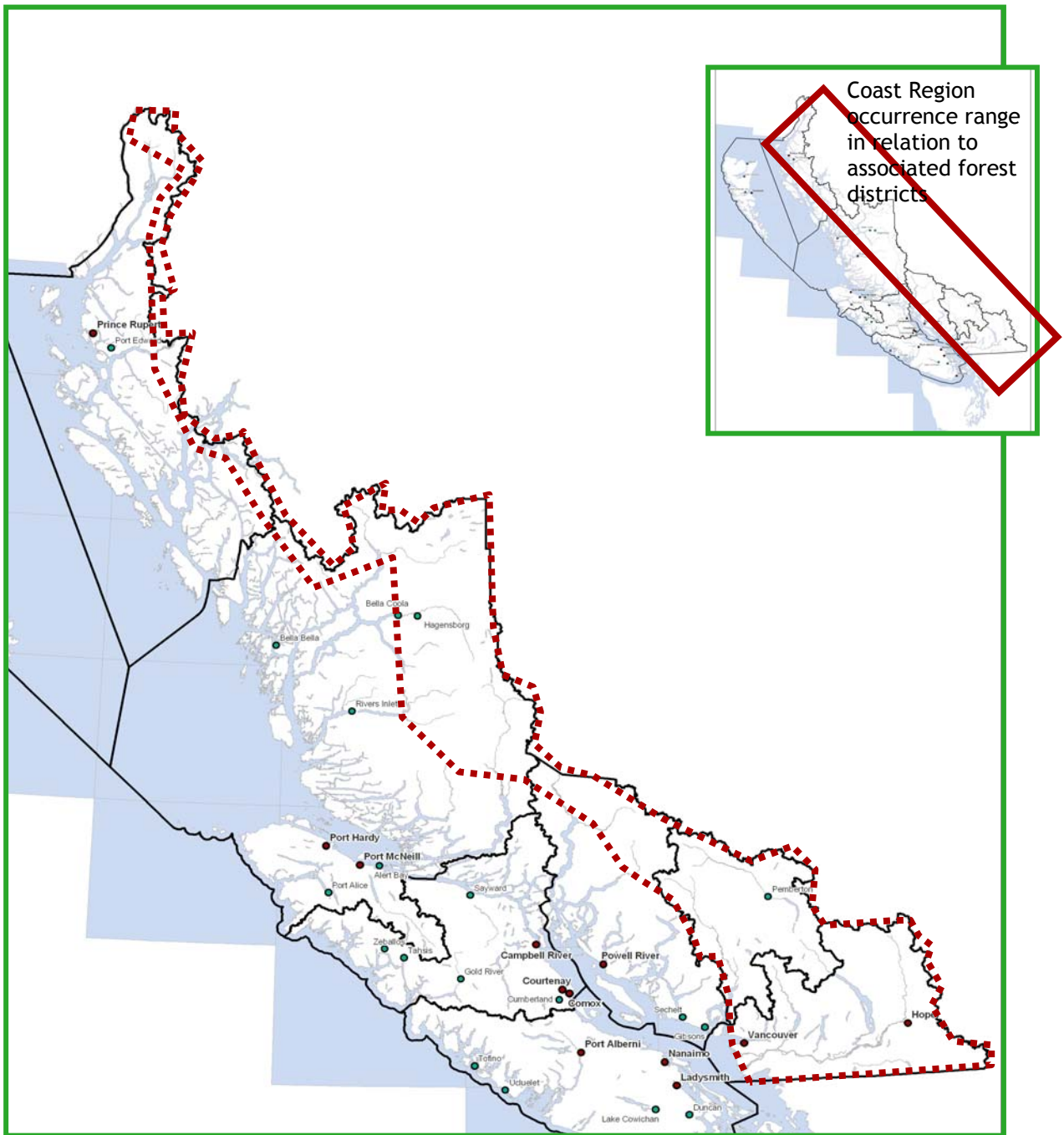
In the field, this species may be hard to differentiate from Dolly Varden. However there are some morphological differences. Bull Trout have a somewhat larger, broader head and flattened appearance (when viewed head to the tail). Dolly Varden have black spots on the dorsal fin and the upper jaw line (maxillary bone) is somewhat shorter. The snout is less pointed than that of Bull Trout. Examination by individuals experienced with both species and or DNA analysis is recommended.



Dolly Varden Char

Distribution

Elevations: 0 to >1500 m. Distributed throughout watersheds on both sides of the Cascades and Continental Divide in western North America; overlapping in many instances with Dolly Varden Char. On the Coast Region, Bull Trout are generally known from the mainstem of, and tributaries to major river systems along the North, Central and South Coast areas including the Homathko, Klenaklini, Bella Coola, Dean, Skeena, Nass, Squamish, Fraser, Pitt and Coquihalla. Distribution along the coast narrows northward.



Bull Trout (*Salvelinus confluentus*), potential occurrence range for the Coast Region

Habitat Preferences

Bull Trout are associated with cool fast flowing waters with high water quality, diverse habitat features (e.g. streambeds with a wide range of medium to large coarse substrate, large woody debris accumulations and good mix of riffles and pools). This species is adept at colonizing small, high gradient step-pool systems (>20% gradient in some cases) often considered too steep to support other fish species.



Bull Trout are associated with watersheds with exceptional water quality and moderated instream temperatures.

Critical Features

This species has lower threshold tolerances for higher water temperatures, compared to other species such as Coastal Cutthroat and Rainbow Trout. Watersheds with high water quality, stable thermal refugia (such as deep lakes and coldwater tributaries no warmer than 15°C), provide an optimal mix of habitat for all phases of this species life history.

Seasonal Life Cycle

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			Optimal incubation temperature 2-4°C. Eggs hatch late winter-early spring, fry emerge from gravel April-May				Spawning late summer-early fall at temperatures between 5-9°C				

Fish are sexually mature between 4-7 years of age, can live up to 12 years and may spawn annually or bi-annually with mix of four or more year classes, though one or two year classes may dominate.

Threats

- ◆ Physical destruction and alteration of flow and temperature regimes from clearing, logging, water diversions, mining and road development.
- ◆ Direct and sub-lethal mortality from migration through turbines and excess oxygen conditions (“super saturation”) in outflows from hydro-electric facilities.
- ◆ Increased seasonal low flows and water temperature from removal of instream and riparian cover.
- ◆ Increased sedimentation and infilling of spawning substrate from increased runoff and erosion due to land clearing, road development and hydro diversions and impoundments.
- ◆ Permanent or temporary barriers preventing or inhibiting fish from migrating between spawning and overwintering sites. This restricts access to usable habitats and/or leads to increased extinction risk by isolating gene flow between populations within a watershed or watersheds.
- ◆ Toxic discharges or leachate from mine tailings
- ◆ Hybridization and or loss of genetic fitness/competition for limited food resources with introduced species such as Lake or Brook Trout.

Conservation & Management Objectives

- ◆ Assess habitat suitability and incorporate management objectives as set out in “Accounts and Measures for Managing Identified Wildlife - Accounts V. 2004. Bull Trout *Salvelinus confluentus*”.
- ◆ Inventory and monitor using methodology setout in the RISC “Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures.” Ensure small, high gradient coldwater refugia systems are incorporated into survey efforts.

Specific activities should include:

- ◆ Numerous populations must be maintained (along with associated habitat complexity) across this species range to ensure overall species viability and persistence. This species life history, dispersal patterns and genetic variability does not show a great deal of exchange between populations or likelihood of recolonization from local extirpations.
- ◆ Maintain riparian forest integrity (e.g. buffer widths >30m, especially mature structural stages, up to 500m around spawning zones). This is critical for maintaining the integrity of instream habitat complexity and water quality for the complete life history of this species.
- ◆ Maintenance of large woody debris recruitment is essential as a critical feature for instream habitat for this species (cover, thermal refugia, sediment trapping and storage).
- ◆ Direct road development and other potential hydrological disruptions away from suitable habitat through appropriate land use planning including lowered densities of roads per km² and reduction in number of stream crossings.
- ◆ Clear-span crossings are preferred. Culvert crossings should be a minimum 2 m diameter with open bottoms with natural substrate, no longer than 30 m and should not have large drops that would impede small mammal (or fish) movement. On long culverts that are dark in the middle, consider the use of grates that will allow light and rain to enter.
- ◆ Protection of surface and sub-surface hydrological interactions (e.g. protection of the hyporheic or groundwater - streambed interface zones and groundwater sources) are critical as groundwater influence appears to be a major factor in spawning habitat preferences and success.
- ◆ Undertake control and management of introduced exotic or invasive species fish species (e.g. Brook Trout), that may outcompete or hybridize with local Bull Trout populations.
- ◆ Reduce sediment entry and minimize loading of contaminants into ground and surface waters.
- ◆ Encourage stewardship amongst private forest landowners, the general public and through land use decision making and associated maintenance activities.
- ◆ Increase awareness about the sensitivity and value of healthy coldwater aquatic ecosystems that support Bull Trout and other native salmonid species.

This species is listed under the Federal Species at Risk Act (SARA) and is Identified Wildlife under the Forest and Range Practices Act. This species is also subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species is also governed under other provincial and federal regulations including the Fish Protection Act and Federal Fisheries Act and potentially Regional and local municipal bylaws.

Content for this Factsheet has been derived from the following sources

- Baxter, James S. 1997. [Internet] Evidence for natural hybridization between Dolly Varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*) in a northcentral British Columbia watershed. *Can. J. Fish. Aquat. Sci.* 54: 421-429
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- Wikipedia the Free Encyclopedia [Internet] [Last updated August 4 2010]. Bull Trout, *Salvelinus confluentus*.

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