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BULL TROUT



THE ENDANGERED SPECIES ACT (ESA) ECOLOGY OF BULL TROUT

The U.S. Fish and Wildlife Service (USFWS) listed the bull trout (*Salvelinus confluentus*) as threatened under the Endangered Species Act (ESA) in 1999. This summary sheet provides basic information on bull trout.

Until recently, the bull trout was considered an inland form of Dolly Varden (*Salvelinus malmo*), an anadromous trout found in coastal streams. In 1978, biologists determined that bull trout was a separate species. However, as it is very difficult to differentiate between the two species by appearance alone, they are often referred to together as native char.

Bull Trout Life Cycle

Bull trout can live up to ten years, sexually maturing after four. Spawning every year or every other year, they require particularly silt-free gravel bars for their redds (nests for eggs). While even slight levels of silt can decrease egg survival, spawning success is even more sensitive to temperature. Although adults can withstand water temperatures up to 64° F, eggs do best with temperatures of no more than 36° F. In fact, temperatures above 46° F can reduce bull trout egg survival by at least 75 percent. Because of diverse adaptation techniques, the life cycle of bull trout is quite varied. They are known to exhibit four distinct life history forms:

- Adfluvial bull trout rear from one to four years in their natal stream and then migrate to lakes.
- Fluvial bull trout mature in their natal streams much like their adfluvial counterparts but move to large streams and rivers after maturation.
- Resident bull trout live in their natal streams, small tributaries at high elevations, year round and are generally smaller in size.
- Anadromous bull trout rear in natal streams and migrate to marine environments to mature.

There are two main complicating factors in minimizing negative effects on the species. Firstly, bull trout are highly mobile. One fish was shown to have moved from the Snohomish River to the Skagit River and another from the Skagit River to the Nooksack River. Presumably this mobility has allowed bull trout exhibiting a variety of life history forms to interbreed. While this interbreeding helps maintain viable and diverse populations throughout the fish's range, this trait makes studying and documenting bull trout very difficult for scientists. Secondly, migratory and resident forms of bull trout may be present in a single stream. The result of this is that bull trout habitat from the stream's headwaters to its mouth must be protected in order to protect the species.

Range and Adaptation

The bull trout is a member of the North American salmon family, which includes salmon, trout, whitefish, char, and grayling. The bull trout is one of four species of char native to western North America. The primary range of bull trout includes most of the interior and some coastal river drainages of the Pacific Northwest, from northern California to southeast Alaska. In the Puget Sound region bull trout have a wide distribution with 35 subpopulations in the Coastal/Puget Sound area. Nineteen of these are found in the Puget Sound Basin. Bull trout coexists with other trout and salmon by using slightly different re-

sources for food and shelter. While the diet of an adult bull trout consists largely of other fish, they have been known to eat frogs, snakes, mice and ducklings when provided a suitable opportunity. This varies considerably from salmon that eat mainly a diet of macro-invertebrates and small fish.

Trout and salmon in North America tend to prefer cold, clear waters, and the bull trout is exceptional for its demand for especially cold water. Bull trout prefer habitats that include cold waters (<59° F) of headwater streams and rivers and lakes connected to natal streams.

Factors of Decline

The general habitat requirements of the bull trout have come to be known as the four C's. Cold water, clean water, complex habitat structure, and connected habitats. Together these allow for movement that supports the trout through their various life history stages.

Scattered distribution and demands for cold, clear waters make bull trout especially susceptible to the standard formula for extinction:

- Fragment the population (construction of dams, fish barriers, and a history of targeted extermination);
- Degrade the habitat (increase sediment in spawning areas, remove vegetation which shades the streams, and lower in-stream flows); and
- Introduce natural and/or human-oriented catastrophic events (flooding or landslide events, extensive development, and temperature fluctuations).

ESA Status of Puget Sound Bull Trout Populations

Coastal/Puget Sound populations of bull trout were listed as threatened under the Endangered Species Act (ESA) in 1999. Given the varied life history strategies of bull trout and the amount of unknown information regarding the species, USFWS assumes the presence of bull trout everywhere in their historical range unless proven otherwise. Current watershed planning in response to the chinook listing as threatened will support conservation of multiple species, including bull trout. However, the specific and more stringent habitat needs of the bull trout may in some circumstances increase the rigor of the protection implemented by USFWS. Each of King County's major watersheds is known to provide habitat for a distinct population of bull trout; these subpopulations are important to the long-term survival of the larger Coastal/Puget Sound bull trout population.

Easy Ways You Can Help

There are many small and effective ways that citizens can help maintain the 4C's of habitat important to the bull trout:

- Wash your car at a car wash or on a lawn, so harmful runoff doesn't go directly into the streams.
- Pick up after your pet. Pet waste contaminates streams, and is a leading cause of urban stream pollution.
- Conserve water. Turn off water when you brush your teeth, wash your hands, or wash dishes.
- Use pesticides and herbicides wisely, or where possible, not at all.
- Participate in volunteer events that plant trees to shade and stabilize stream corridors, salvage native plants for streambank restoration projects, and increase the availability and quality of fish habitat.

Websites

U.S. Fish and Wildlife, Region 1: <http://www.r1.fws.gov/>

Bull Trout Foundation: <http://www.bulltrout.org/pages/btf.html>

Salmon Information Center: <http://www.salmoninfo.org>

For More Information

U.S. Fish and Wildlife Service 360-753-9440

Salmon Information Center Hot Line 1-877-SALMON-9