

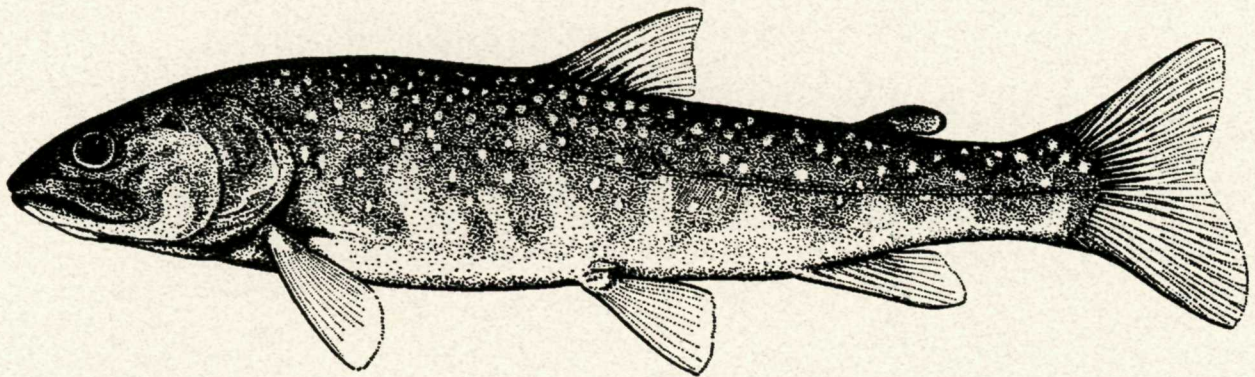


Research Links

A Forum for Natural, Cultural and Social Studies

Bull Trout and Aquatic Ecosystem Integrity

Two conservation initiatives in the Crown of the Continent Ecosystem



Bull trout are native charr in Alberta

Kevin Van Tighem

Bull trout (*Salvelinus confluentus*) is a species of concern in Alberta. Both its abundance and distribution have been substantially reduced over the past century. Fitch (1994) estimates that bull trout in the Oldman River watershed now occupy barely 30% of their historic range, largely because of habitat fragmentation and angler overharvest.

Bull trout are a native charr, capable of thriving in the relatively unproductive environments that typify streams draining the Rocky Mountains. A number of adaptations enable them not only to successfully exploit headwater drainages, but also to grow to very large size, sometimes exceeding 5 or 10 kilograms. No other salmonid, native or introduced, can consistently attain such large sizes in these drainages.

Bull trout spawn in September in cold, clean headwater streams, particularly in areas where upwelling ground water in the streambed gravel provides a relatively stable thermal regime and prevents anchor ice from forming in the winter. However, headwater streams in the Rocky Mountains are subject to pronounced spring floods that move a great deal of stream bed material each year. Consequently, large bull trout have an advantage over smaller members of the species because they can excavate deep redds in gravels of large diameter, rather than having to spawn in finer material that is more likely to be scoured away during flood events. Fall spawning also helps because there is time for eggs to develop and fry to hatch before the next year's floods.

Headwater streams may contain resident populations of small bull trout, but primary production is too low to support large fish. In most bull trout populations, a considerable proportion of the population grows slowly in headwater streams for four to six years, then migrates downstream into large lakes or rivers where it adopts a predatory lifestyle and begins to grow more rapidly. An aggressive feeding strategy enables

these fish to optimize their food intake, but also makes them highly vulnerable to anglers. These and several other characteristics make bull trout a valuable indicator species for the health of running-water ecosystems in the Rocky Mountain region.

BULL TROUT AND ECOSYSTEM INTEGRITY

For bull trout to thrive and persist, they require:

- a stable, high-quality groundwater regime in headwater drainages
- clean, cold stream water, low in fine sediments that would clog spawning gravels
- uninterrupted access from downstream reaches to headwater spawning streams
- an informed and responsible human angling population

Declining bull trout populations have been linked (Fitch 1994, Rieman and McIntyre 1993) to:

- disruption of groundwater regimes due to excessive road construction and logging in headwater drainages
- increased sedimentation from the same sources and inappropriate riparian live-stock grazing regimes
- on-stream dams, culvert placements under roads and other artificial barriers to fish passage that fragment stream systems
- excessive harvest of large spawners by anglers

Given the importance of bull trout in aquatic ecosystems, Waterton Lakes National Park (WNLP) has placed a high priority on its recovery

— continued on page 6 —