

The Flathead Watershed - A Bull and Cutthroat Trout Stronghold

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The Flathead Watershed is one of the most biodiverse aquatic ecosystems in North America, home to free-flowing rivers and pristine lakes such as the upper Flathead River and Lake System. Waters within this system are of exceptional quality and are unmatched in North America for the ecological and genetic diversity of aquatic organisms that live and thrive there. The upper Flathead River and Lake System has long been recognized as a range-wide stronghold for important native fish populations, including two hallmark native fish species which are considered the lifeblood of the Flathead Valley because of their evolutionary history within this dynamic aquatic ecosystem. Bull trout (*Salvelinus confluentus*), listed as a threatened species under the U.S. Endangered Species Act, and westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) have persisted in the Flathead system for over 14,000 years, surviving and adapting to extreme catastrophic events, such as fire, drought, flooding, and glaciations, and more recently human development.

Life History Diversity

The Flathead River and Lake System is cold, clear, complex, and connected, making it ideal for sensitive species such as bull trout and westslope cutthroat trout. These fish require the coldest water temperatures of any native northwest salmonid; clean stream bottoms for spawning and rearing; and complex habitats built from the connections between river, lake, and headwater streams which support annual spawning and feeding migrations. While bull trout are migratory, westslope cutthroat trout will either remain in their home stream for life, or migrate throughout the Flathead system. Migratory fish grow to maturity in the lakes or rivers and then travel up to 250 km upriver to spawn in their home stream that contains clean gravel, cold groundwater recharge, and protective cover. Juveniles will stay here for 1–4 years and then move to river or lake environments where they grow to maturity and complete their life cycle. These unique behaviors protect and sustain the genetic diversity of these fish populations, which are critical for the persistence of native species in a landscape undergoing tremendous change.

A Landscape Undergoing Change

Despite being recognized as one of the last remaining strongholds for native bull trout and westslope cutthroat trout, major changes in the Flathead River and Lake System such as habitat destruction, introduction of non-native invasive aquatic species, overfishing, and flow disruption by dam operations are threatening fish populations.

Opossum shrimp (*Mysis relicta*) became well established in the Flathead Lake during the 1980s, which resulted in an increase in the abundance of nonnative lake trout (*Salvelinus namaycush*) and dramatic decline in bull and cutthroat trout populations in the early 1990s. Due to the invasion and establishment of nonnative lake trout from Flathead Lake, the bull trout is vanishing from the lakes on the western slopes of the Continental Divide, including those within majestic Glacier National Park, to the point that their survival is in jeopardy.

In addition, introduced nonnative rainbow trout have caused widespread hybridization with native westslope cutthroat trout and recent research has shown that the mixing of the rainbows' genes into native trout populations will threaten the natives' long-standing adaptations to local conditions. Human activity such as dam construction and proposed upstream mining also modify natural river and lake systems by changing flow patterns and volume, as well as degrade habitat and threaten native river biodiversity.

Compounding these issues is climate change, which is expected to increase water temperatures, flooding and disturbance events throughout the system.

Source: John Fraley, 2009



Source: Mike Ready, 2009



Source: USGS



Source: Mike Ready, 2009



The upper Flathead is a range-wide stronghold for threatened bull trout (left) and nonhybridized westslope cutthroat trout (right)

Biologists are working diligently to address the challenges facing the native fish species within the Flathead River and Lake System to maintain and restore critical populations and habitats for future generations to appreciate and enjoy. Conservation and recovery programs aim to sustain natural habitats that provide the ideal setting for strong, robust native fish populations. Reducing interactions with introduced, nonnative species is essential to these efforts and suppression/eradication programs are currently underway to minimize these threats. With the help of biologists, managers, and all stakeholders working together in the Flathead River and Lake System, native bull and westslope cutthroat trout will be given the opportunity to thrive again and adapt to rapid changes, as they have for hundreds of generations.

Source: Noah Clayton



Clint Muhlfeld with westslope cutthroat trout at Lake McDonald in Glacier National Park

Dr. Muhlfeld's research in the Flathead and Crown of the Continent Ecosystem has focused on various aspects of aquatic ecology, fisheries biology, and conservation of native aquatic biota.