

Bull Trout in Alberta

Excerpt from [Aquatic Ecosystems: The Elbow River](#) (Kananaskis Environmental Education Program, n.d.)

The introduction of species that are not native to Alberta can upset the balance of an ecosystem. When a non-native species is introduced to a new ecosystem which may not contain a natural predator, it is often the case that it can become an invasive species. Invasive species are those that can out-compete native species and may actually inhibit the ability of native species to survive in an ecosystem.

In 1940, brook trout (*Salvelinus fontinalis*), a species of fish native to Ontario, were introduced into the Elbow River drainage basin as stocked fish for sport-fishing. According to Trout Unlimited Canada, a non-governmental conservation organization, non-native fish species, brook trout in particular, are out-competing the native species of bull trout (*Salvelinus confluentis*) and westslope cutthroat trout (*Oncorhynchus clarkii lewisii*) in Quirk Creek, a major tributary of the Elbow River. In 1996, 94% of fish collected in Quirk Creek were brook trout. Few brook trout are seen in the Elbow River itself above Bragg Creek. This may be due to the cold temperatures in the Elbow River limiting their activity, but brook trout do much better in the shallower and warmer tributaries such as Quirk Creek, where native species have been adversely affected.

Brook trout reproduce at the same time and place as bull trout, so both species are attempting to occupy the same niche within their habitat, putting them in direct competition with each other. One of the reasons brook trout are able to out-compete native species is because they are able to reproduce as early as 18 months old, while slower growing bull trout rarely reach sexual maturity before 5 years of age. Earlier maturity may result in populations of brook trout overcrowding a habitat, resulting in a population of individuals that is stunted in size.

Elbow Lake, the headwaters for the Elbow, was historically stocked with brook trout by humans. Currently the biomass in Elbow Lake has been skewed from a few large individuals to many small individuals; what has been observed there is that there are no large size fish (stunting). Often in historically fishless high mountain lakes the addition of a fish species changes the dynamic of the ecosystem. An introduction of a top predator can lead to the removal the native predator insects that are present, because they are being consumed by the introduced species. This can cause a trophic cascade: take out the large bugs, then the medium, and so on until it takes out the grazer bugs. Essentially there is a large population feeding on a very small resource and to compensate the population will stunt their growth so they can maintain a large population size. Now algal blooms are being seen, which is uncommon in high mountain lakes, which could be due to the removal of grazer insects that may be a limiting factor for the algae. The ecosystem may be “out of balance” because the brook trout that have been introduced there.