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Fish

Fish are important for many people, as food, sport and pleasure. The fish found in the Battle River area have provided us in the past with important commercial fisheries and still provide sport to this day. You may think that the size of Stoney Creek means it's inhospitable to fish, but if you keep your eyes open you may be surprised. Large species, such as the Northern Pike and White Sucker, can be found in the southernmost reaches of the Camrose Creek where it meets Driedmeat Lake. Other smaller species, such as the Brook Stickleback, Fathead Minnow and Lake Chub, occupy the shallow reaches of the creek that extend right into the city. To view these minnow species it is important to know their spawning time as that will be when they are most abundant and most active. It may also be important to bring a net and a jar to view them closely before putting them back from where they came.



Fishing at driedmeat lake in 1912...all these fish were caught in 3 hours of fishing...largest one is 30 inches

Fish are fully aquatic vertebrates that occupy the rivers, lakes, streams, creeks and bogs of Alberta. Fish are used by commercial fishermen, sport fishermen, and nature observers. Fish also play a valuable role in their ecosystem as food for humans and native wildlife species. They can also be voracious predators, feeding on invertebrates, other fish, amphibians, and even small mammals. There are 51 native species of fish in Alberta, and about 8 introduced species¹. Of these, 31 species may be found in the Aspen Parkland region, 19 of which are found in the Battle River basin. Five species are found in stretches of the Stoney Creek will be profiled.

Fish Management

Fisheries management has played an important role in regulating fish stocks and populations to ensure the preservation of gamefish and non-gamefish species. Some of the limitations put on fishing include: time of year, how big and how many fish one may keep, as well as how you are allowed to catch fish. There are also stocking initiatives to take pressure off of native fish populations, which by introducing greater diversity and

opportunity, expand fishing grounds rather than concentrate them on limited sources. Although this practice does take pressure off native populations and offers recreational and sport fishers the ability to catch more, hatcheries are not the answer to preserving our native species. The lack of genetic variety in hatchery populations can potentially wipe out wild gene pools, making them more susceptible to disease, which is a common problem in hatcheries ².

Common Fish of the Battle River Region

There are several categories of fish found in Alberta, but they can be divided into two simple groups: game fish and non-game fish. Game fish include most of the Salmoniformes (eg. salmon and trout), sturgeon, goldeye, mooneye, lake whitefish, burbot, walleye, perch and northern pike. Non-game-fish make up the majority of the fish species of Alberta. These include the minnows (small fish, not young fish), suckers, carp, and sculpins.

Northern Pike

The first species is the Northern Pike, *Esox lucius*, an exciting game fish that can be caught in Driedmeat Lake. They are usually large and slender fish with green backs that spot down to a white belly. Their dorsal fin is on the tail end of their body, rather than in the center as with most other game fish. These 'slough sharks' can grow up to 133 cm and weigh up to 50 lbs., but most are a lot smaller depending on the environment. The Northern Pike is the most widely distributed game fish, found all across Canada and the Northern Hemisphere extending into Europe and Asia. They are vicious predators that prefer relatively shallow, weedy and clear waters in which to ambush their prey. They feed on crustaceans, fish, insects, frogs, and sometimes ducklings, mice and muskrats.¹ They spawn in the early spring in shallow marshes with lush vegetation. They remain attached to vegetation for roughly three weeks, and when released, measure around 1 cm, but at the end of their first year can measure up to 28 cm¹. These fish can tolerate fairly low oxygen levels, which accounts for their wide distribution and large populations, as this usually allows them to survive in places where winterkill will usually cause a die off of other species.

In the past, there used to be a well established spawning run of Northern Pike in Stoney Creek, but this has been eliminated since the Mirror Lake Spillway in Camrose has blocked upstream access³. Farley (1932) also notes that Driedmeat Lake used to be a productive sport fishery that was actively fished. One could bring in up to 12 good catches in a day, but in 1972, the pike numbers had reached an all time low due to winter oxygen depletion. Today, pike numbers fluctuate greatly.



Northern Pike, Esox lucius

Northern Pike, Esox lucius



White Sucker

The most abundant fish in the Battle River watershed is the White Sucker, *Catostomus commersoni*. The White Sucker has a brownish black back that fades into a white belly with brown fins. Their face is smooth and their mouth is a small tube on the bottom of their head. They can grow up to 76cm and weigh 17.5 kg and can be found across Canada down to New Mexico and Georgia¹. They are found in a variety of habitats, from deep lakes to shallow rivers, and are tolerant to a variety of conditions. Much like the Northern Pike, it can be found all over Alberta except in the mountains. The spawning season begins in mid-May and lasts until early July and is usually done in creeks, but in many lakes in Alberta they will spawn on the beach when necessary. The white sucker is a bottom feeder, eating crustaceans, insect larvae and eggs, molluscs and algae. As young, they feed mostly on plankton¹. These fish are even more tolerant to low oxygen levels so they will occur even where pike do not, and the only other fish are small minnow and stickleback species³. They have the capability to quickly occupy newly formed water bodies, and can often be found far up a tributary a great distance from their source, where rapid eutrophication eliminates competition and predators, which leads to a dramatic dominance of the white sucker populations.



Fathead Minnow

The smaller Fathead Minnow, *Pimephales promelus* is olive to straw yellow in color, and the breeding males have a pronounced head with little hard tubercles on the front of their face. Their maximum length is estimated at 9 cm and they are found in central Alberta to Quebec, to northeast Mexico. Although they are likely introduced into the central Alberta locations, their native range being the Rocky mountains¹.

They can often be found in large numbers in muddy creeks, ponds and lakes and usually accompany Brook Sticklebacks. They spawn from June until August, in quiet, shallow waters, where they feed on algae, zooplankton, insect larvae and crustaceans¹. These minnows are an important component of the diet of many piscivorous (fish eating) fish and birds. These fish are common throughout Alberta in small water bodies where other fish species are absent, and are even found in small intermittent tributaries and isolated stretches of water. The fathead minnow and Brook stickleback can indicate declining water quality if their populations increase while other populations decrease (meaning that oxygen content is declining).

Lake Chub

Another minnow species is the Lake Chub, *Couesius plumbeus*. It has a dark green back that blends into silver sides and belly, and mature males will often have a distinct orange patch behind their first fin. This minnow can reach a maximum length of 22cm, but the average size is between 5 and 6 cm. They are found throughout Alberta and across Canada in lakes, rivers and small creeks where they are usually fairly abundant¹. The spawning season begins in June and lasts until mid-August. Like most minnows, they feed on insect larvae, zooplankton, crustaceans and algae and are a key component to the diet of larger fishes and birds. Unlike the other fish mentioned, the Lake Chub is usually found in cleaner reaches of streams and lakes, having a lower tolerance for oxygen-depleted waters than the Fathead minnow or the Brook Stickleback. Creation of migration barriers can potentially decrease the populations of these fish due to low water situations and oxygen depletion.



Lake Chub

Brook Stickleback

The final small species is the Brook Stickleback, *Culea inconstans*, and although it may look like a minnow species, it is actually from a different family, the Sticklebacks. They are a dark olive color with small pale patches and unlike the minnow species, the stickleback lacks scales. In front of their rear top fin is a row of 5 or 6 small spines, which are likely used as a predatory deterrent. Like minnows, their maximum size is around 9cm, with an average length of 5 cm. They can be found throughout all of Alberta, and right across Canada and the northern United States. They are frequently the most abundant fish in lakes and streams and can be found virtually anywhere. They are a very tolerant fish that is usually associated with the Fathead Minnow, and can occupy small creeks, bogs, beaver ponds and even small prairie pools¹. There is record of these fish being caught up in tornado winds and being deposited in pools in farmers fields, and other reports have found them surviving in underground streams¹. The spawning season occurs between late spring and early summer and is interesting to observe. The males build nests out of grasses and other pond debris in which the female lays her eggs. He then guards the eggs until they begin to hatch into young fingerlings (young fish). They feed mostly on small aquatic insects and their larvae as well as crustaceans, but are a common food source for larger aquatic invertebrates such as the diving beetle and dragonfly larvae, as well as birds, muskrats and water shrews¹.



Brook Stickleback, Culea inconstans,

Threats to Fish

There are many factors that may limit population growth or distribution of fish in the Battle River basin, but by far the largest limiting factor is water depth and oxygen availability. As we've seen in four of the five species of fish found around here, they are all adapted to low levels of oxygen, so nature has found a way to cope with the stresses of oxygen depletion for these species. There are a number of other threats to the fish as well, including sport and commercial fishing, pollution, flow regulation, and siltation.

Commercial and sport fishing does not have a large impact on the Stoney Creek because there is very little opportunity to catch game fish, but in Driedmeat Lake, there have been productive sport fisheries in the past focussed largely on Northern Pike. Christiansen (1977) noted that the fishing centered around the weir in the spring of the year and notes from Farley (1932) indicate that there would be around 35 boats there on the weekend, and a single fisherman could bring in 12 large pike in a single day. This location is producing some fish.

Pollution in the Stoney Creek and Battle River has increased over time as the human population grew. Influenced by industrial and agricultural development, the aquatic habitat is receiving greater amounts of nutrient inflow by runoff or effluents, and the effects are compounded by low flows in the area which leave the wastes concentrated and their effects potentially more lethal.

Flow regulation and alteration poses a risk because it may alter or block spawning and migration runs, which cuts off population sources, creating isolated environments. Structures such as weirs and dams can separate populations and alter the depth of water. These areas are more susceptible to oxygen depletion during the winter and concentration of nutrients that lead to aquatic plant proliferation, which in turn depletes oxygen. These types of environments favor species such as the Fathead Minnow and Brook Stickleback which are adapted to living with vegetation and low oxygen levels, but the larger species require larger amounts, and their worst enemy in the past has been winterkill. Winterkill is the depletion of oxygen in the winter that occurs when the lake is not deep enough to cycle the available oxygen and it becomes a lethal environment. Christiansen (1977) noted that this has been a serious problem in the past in Driedmeat Lake where thousands of Northern Pike and White Suckers have been found dead in the spring. Weir placement in the Stoney Creek has eliminated upstream spawning access to northern pike and white suckers, and the same has been noted for the Driedmeat Lake weir, but only at certain water levels³.

Siltation is a product of land clearing and cultivation along the water's edge. Coupled with livestock grazing and other agricultural activities near the water, the stability of the riverbank decreases, and during peak flow season, much of the riverbank is eroded and washed away into the river drastically increasing the turbidity. This causes problems for species in the lower reach of the Battle River that rely on rocky environments such as the Iowa Darter and Longnose Dace. It also poses threats to spawning fish as their exposed eggs could become suffocated by settling silt.

Protection and Awareness

Fish conservation has been an issue in Alberta for quite some time. There has been plenty of effort in preserving fish stocks by creating and operating hatcheries throughout Alberta that stocked areas with trout, walleye, and other desirable game fish, but the lack of genetic diversity emphasized the importance of taking care of wild populations. New efforts to conserve this great resource are necessary. Since the second half of the century, Alberta Fish and Wildlife has expanded its conservation practices to deal with modern problems. Other organizations such as Cows and Fish operate to involve the public in education on riparian areas, or those areas associated with streams and rivers. They work on educating agricultural and livestock producers about ecological processes and functions of a healthy riparian area⁴, which is a healthy environment for fish. There are also other programs such as the yellow fish road project that educates children about a town's local waterways, emphasizing the effects of dumping waste down drains. This project involves painting of yellow fishes on sewer drains to remind others where the waste water goes (City of Camrose Website). The best way to get involved is to pick up a copy of the fishing regulations, learn the limits and rules, and go enjoy the experience of fishing. Once you get hooked, you will find that the catch is always worth the wait.

Species lists

Fish of the Battle River Basin (Christiansen, 1977)

lake whitefish

northern pike

goldeye

mooneye

longnose dace

lake chub

fathead minnow

emerald shiner

spottail shiner

quillback

shorthead redhorse sucker

longnose sucker

white sucker

burbot

trout-perch

brook stickleback

iowa darter

yellow perch

walleye

Fish of the Aspen Parkland

Joynt, A., Sullivan, M. G. 2003. Fish of Alberta. Lone Pine Publishing.
Edmonton AB

Scientific Name Common Name

<i>Acipenser falvescens</i>	Lake Sturgeon
<i>Hoidon alosoides</i>	Goldeye
<i>Hoidon tergisus</i>	Mooneye
<i>Notropis atherinoides</i>	Emerald Shiner
<i>Pimephales promelus</i>	Fathead Minnow
<i>Phoxinus neogdeus</i>	Finescale Dace
<i>Platygobio gracilis</i>	Flathead Chub
<i>Conesius plumbeus</i>	Lake Chub
<i>Rhinichthys cataractae</i>	Longnose dace
<i>Phoxinus eos</i>	Northern red-belly dace
<i>Margariscus margarita</i>	Pearl Dace
<i>Notropis blennius</i>	River Shiner
<i>Notropis hudsonius</i>	Spot-tail Shiner
<i>Salvelinus fontinalis</i>	Brook Trout
<i>Coregonis artedi</i>	Cisco
<i>Coregonis clupeaformis</i>	Lake Whitefish
<i>Oncorhynchus mykiss</i>	Rainbow Trout

<i>Salmo trutta</i>	Brown trout
<i>Salvelinus confluentus</i>	Bull Trout
<i>Percopsis omiscomaycus</i>	Trout-Perch
<i>Lota lota</i>	Burbot
<i>Culaea incostans</i>	Brook Stickleback
<i>Pungitius pungitius</i>	Nine-Spined Stickleback
<i>Gasterosteus aculeatus</i>	Three-Spined Stickleback
<i>Cottus ricei</i>	Spoonhead Sculpin
<i>Etheostoma exile</i>	Iowa Darter
<i>Stizostedion canadense</i>	Sauger
<i>Stizostedion vitreum</i>	Walleye
<i>Perca flavescens</i>	Yellow Perch
<i>Exos lucius</i>	Northern Pike
<i>Carpionodes cyprinus</i>	Quillback
<i>Catostomus catostomus</i>	Longnose sucker
<i>Catostomus commersoni</i>	White sucker
<i>Catostomus platyrhynchus</i>	Mountain sucker
<i>Moxostoma anisurum</i>	Silver redhorse
<i>Moxostoma macrolepidotum</i>	Shorthead redhorse

