

Lower Tawatinaw/Little Pine Watershed Assessment

For Crooked Creek Conservancy Society of Athabasca



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Introduction

Little Fish Consulting Ltd was contracted to conduct an aquatic health assessment of the lower Tawatinaw River and Little Pine Creek watersheds. Twenty-nine locations (fig. 1) were assessed for basic aquatic habitat parameters such as watercourse type, water stage, temperature, dissolved oxygen, substrate composition, in stream cover, bank slope and stability, aquatic and riparian vegetation, potential to support fisheries, areas of environmental concern and suggested remediation.

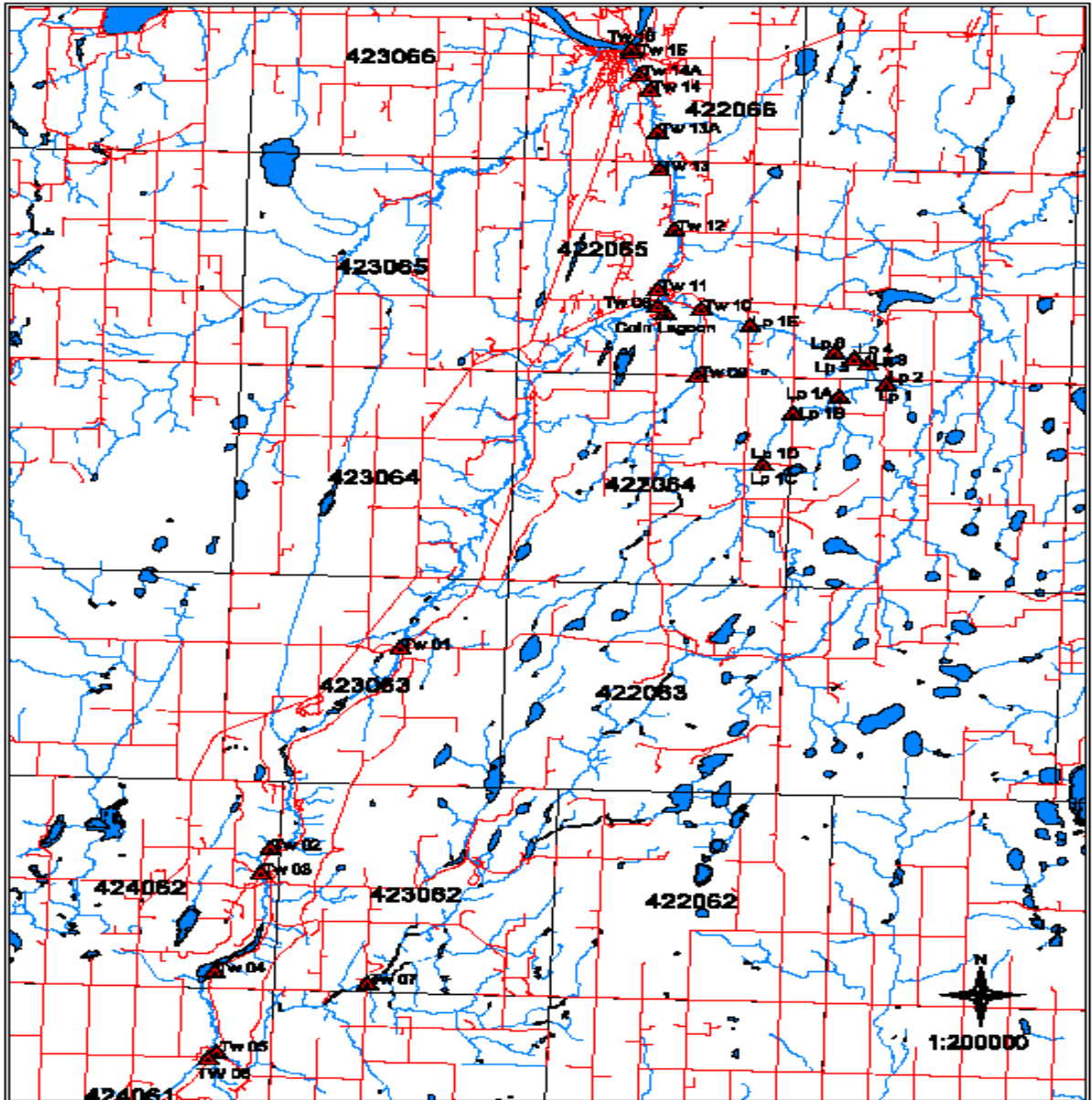


Figure 1. The Tawatinaw Watershed with the 29 survey points (red triangles)

Discussion

Annual flow is very important to the long-term viability of a river system. A decrease in mean annual flow indicates year after year there is less water flowing through the river. Flows for the Stoney Creek (adjacent watershed to the Tawatinaw) were plotted from 1982 to 2009 (Environment Canada, 2010), (fig. 1.). The Stoney watershed exhibited a steady decline in flow from 1982. It is very likely that the Tawatinaw exhibited the same decline in flow.

A long-term decline in flow translates into the river becoming shallow, drying up in some areas, overall warming of the water and a decline in fish habitat quality. Some causes for the decline of flow in the Tawatinaw are: lack of precipitation, increase in average temperature for the region (more evaporation), loss of tributary stream connection (culvert crossings, diversion ditches, filling of channels), and loss of mainstem connection (cattle, beaver, bridge and culvert crossings).

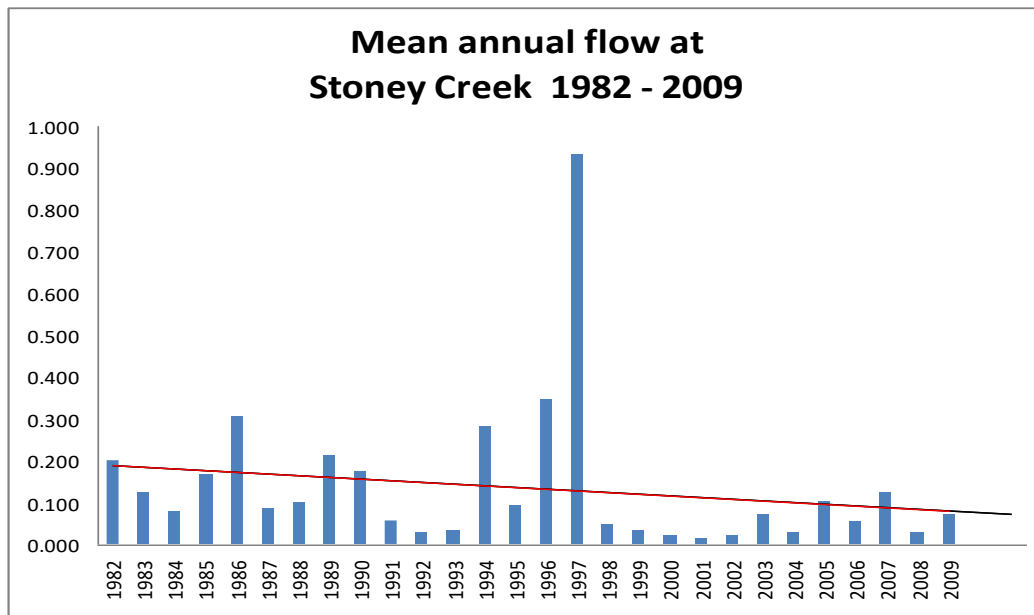


Figure 1. Mean annual flows from Stoney Creek.

http://www.wsc.ec.gc.ca/hydat/H2O/index_e.cfm?cname=main_e.cfm

A river system with declining flows is more susceptible to other effects. The recovery time from additional stressors will be longer if in drought conditions for a number of years. This short survey identified problem areas that coupled with lower flows indicates more water quality and quantity challenges for the Tawatinaw River basin.

There were three dominating problem areas in the watershed: Cattle (in stream and riparian effects), road crossings (culverts and bridges) and all-terrain vehicles operating in/on the stream bed. By far the most destructive of these were cattle induced, where there was complete loss of riparian and aquatic vegetation, the stream banks and bed were trampled and flattened and manure in the watercourse (excessive nutrients).

The removal of vegetation limits the ability of the stream to remain cool (no shade) and removes the natural ability of the stream to filter nutrients and other organic matter. Widening and shallowing of the stream bed and banks from trampling reduces flow, increases turbidity and allows the stream to increase in temperature. The deposition of manure releases nutrients that in the presence of warmer waters can produce algae and increase oxygen consumption downstream which affects the water quality for fisheries.

Numerous culvert and bridges cross tributaries and the mainstem of the Lower Tawatinaw/Little Pine watershed. Many culverts are partially blocked, hanging, or undersized and are contributing to erosion and sedimentation. Many larger culverts have degraded and would not be suitable for fish passage. All these problems limit the ability of fish to spawn and return to the Athabasca River or to reside in the Tawatinaw.

Bridges ranged in quality from good to poor with some are in need of a structural inspection (may pose a safety risk to the public). Common bridge problems observed were: deposition of sediments from bridge decks and edges, ditching of roads to bridges (and culverts) sometimes was directly into the stream, bridge support structures were cracked and concrete and rust were falling into the stream channel, bridge deck slabs had gaps between releasing sediment and could possible catch a child or bicycle tire.

ATV use is common in the watershed. The establishment of the Trans-Canada Trail has provided opportunities for trail riding for many kilometres in the watershed. Unfortunately, some riders have gone into the stream itself to ride. The damage to bed, banks and vegetation is severe in these cases. By operating quads and dirt-bikes in the stream channel sediments are released, spawning beds are destroyed and fish are not likely to use these areas again. Trail officials may need to be involved to protect the stream and educate trail users.

The Tawatinaw/Little Pine watershed has many pristine reaches as well. The watershed has the ability to recover if the problem areas are identified and addressed.

Potential solutions should include:

- off-site watering for cattle and fencing a set back from the stream to allow riparian areas to recover
- periodic culvert and bridge inspection, with follow up maintenance and repair of issues
- closure of trails that directly enter the watercourse or riparian areas as well as signage to educate riders

All solutions will cost money and time from all stakeholders to be successful.

Stakeholder groups such as area residents, the Athabasca River Keepers, Tawatinaw River Keepers, the Trans-Canada Trail Society, Athabasca County and the local livestock producers need to meet share ideas and concerns.

Appendix 1

Little Pine Creek and Tawatinaw River Assessment Data