Draft Beaver Management Plan for Winter River

Current version dated March 2016

Beaver are one of the few animals which modify their habitat to meet their needs. This rodent creates its desired habitat of one or more of ponds by building dams on streams. The large pond provides an area of water around the beaver's lodge, thus acting like a moat and reducing access by predators. The other smaller dams and associated ponds make it easier for the beavers to float pieces of trees and tree branches to their feed pile, which is located adjacent to the lodge. The beaver can feed on the bark with less possibility of predation from under the ice during the winter. In creating the dam and associated ponds, the beavers create wetland habitat that is desired by many other species. These include such animals as waterfowl, amphibians, invertebrates and other birds and mammals which need marshes. However, these dams block the passage of fish up the streams. This blockage is put in place when the dam is being actively maintained by beaver. However, even after beavers leave an area, their dams can continue to block fish movement for years to come.

PEI does not have the same high volume spring freshets that are found in N.B. and N.S. which are helpful in washing out older beaver dams in those provinces. For many fish species in the Winter River, including American Eels, Rainbow Smelts, Gaspereau, sea run Brook Trout, and in the past Atlantic Salmon, part of their life is spent at sea and they must return to fresh water for the remainder. For most of these species they return to fresh water to spawn, while for eels, they migrate to sea to spawn in the Caribbean. Beaver dams can prevent spawning by these species, which already face challenges from man-made barriers, including inadequate fish passage structures.

Normally it is important to have both wetland and faster flowing stream habitat in a system. The ratio of the slower flowing streams and impoundments (lentic) and the faster flowing (lotic) habitat can often be used to describe a river system. Large deviations from the ideal ratio can exclude some species from using the habitat. In order to accommodate the largest number of species, there must be careful management of the watercourse, especially any impoundments, including those created by beavers. At present there are two large human constructed impoundments on the river, each equipped with fish passage facilities. Officer's Pond has a surface area of 25 hectares and a total wetland of 36.8 hectares. Hardy's Pond has a surface area of 7.8 hectares and a total wetland area of 14.2 hectares. There are also other smaller human constructed impoundments within the watershed.

Critical Factors for Winter River

There are two critical factors impacting fish habitat and therefore fish abundance on Winter River, water quality and water quantity.

1. Water Quality

Two of the key measures of water quality which are of concern in this watershed are temperature and dissolved oxygen. For Brook Trout the optimal temperature range is up to 18°C. Trout seek cool springs at 20°C and exhibit problems at 22°C. They will not survive at 23°C and above. At high temperatures when trout try to find cooler water, they can become concentrated in springs, where they are more prone to predation and disease transmission. Ponds having slow moving, shallow water become warmer than adjacent streams. In 2013, temperatures recorded in both Hardy's Pond and Officer's Pond exceeded 25°C. In 2014 temperatures in Officer's Pond exceeded 25°C again. The two factors of temperature and dissolved oxygen are linked. As the temperature of water rises, its ability to contain oxygen diminishes. Generally, trout require a minimum dissolved oxygen level of 5 mg/L. Optimum oxygen levels are 7-10 mg/L, depending on temperature. In the summer of 2011, oxygen levels were recorded between 5 and 6 mg/L for extended periods of

time. Beaver dams on the system, and hence an increase in the lentic waters exacerbate the problem of high temperature/low oxygen level.

2. Water Quantity

The quantity of water flowing in the system is lower than would normally be the case for other rivers. This is because the City of Charlottetown draws approximately 18 million liters of water per day from this watershed. The upper limit of ground water extraction established by several governments around the world is 50% of the normal recharge rate for the system. Two wellfields located at the upper reaches of the river, the Brackley pumping station and the Union Road pumping station, extract up to 117%[1] and 79%[2] of recharge respectively. It has been stated by the provincial government that the overall extraction falls below the 50% level for the entire watershed and is still within the permitted levels. Limits based on groundwater recharge do a reasonably good job of protecting overall levels within the aquifer, but they don't adequately address changes in stream flow. Thus, a newer water extraction policy based on allowable reductions to stream flow during summer has been developed.

In 2001, the water stopped flowing through the fishway at Hardy Mill Pond and the stream was dry below the pond. The pond became anaerobic, killing all aquatic animals in the pond that could not move upstream to seek refuge in springs. In 2011, the branch from the Brackley pumping station dried up between Brackley Point Road and Union Road. Water flow leaving Hardy's pond was so low at this time that the fishway did not function. Beaver dams would exacerbate these problems as fish could be blocked from seeking cooler water at springs and the beaver ponds would further warm the water and increase evaporation. Large sections of the Brackley branch have gone dry in the past five years, including 3.7km of stream length in 2015. The City of Charlottetown is not required to meet the conditions of the current water extraction policy due to a grandfather clause, but they should be working towards improving the situation in future.

Current situation

The Winter River was once identified as a prime Atlantic Salmon angling site, but salmon are no longer present. Fish populations of other species in the river have been severely depleted. A contributing factor is no doubt a limited amount of juvenile rearing habitat, due to compromised water quality and quantity. Another factor is likely the inability of sea run species to ascend the river to find spawning sites. There was evidence of many large, unused beaver dams which were still blocking fish passage. Work is being carried out to restore the stream and increase spawning habitat, but because the river is already so impacted by the large impoundments, efforts must be made to ensure all water courses are kept open to fish passage. The man-made dams are equipped with fishways, but it will be necessary to remain vigilant ensuring that no new blockages are created.

It appears that most of the beaver were trapped in the fall/winter of 2010/2011. Two beaver were trapped from a new dam and lodge located several hundred meters above Officers Pond. All of the colony was trapped from the lodge located near the head of Hardy's Pond. In the summer of 2012 it was found that a new dam had been constructed at the head of Hardy's dam and an old lodge about 200m above this was being used. All inactive dams have since been removed from the river. During the summer/fall of 2013, beaver continually rebuilt a dam at the headwater of Hardy's Pond. In 2014, a beaver and dam was removed between Officers Pond and Hardy's, while a second beaver was collected near the lodge in Hardy's Pond. Three active beaver dams were found so far this fall on the river between Union pumping station and Officer's Pond.

[1] Based on 2001 extraction levels.
[2] Based on 2013 extraction levels.

Proposed Plan

In the management plan developed in 1995 by the Fish and Wildlife Division for Hardy's Pond, it was recommended that no beaver colonies be permitted in the pond. It is assumed that the same rational would apply to Officer's Pond. It is further proposed, that no beaver be allowed anywhere on the main branch of the Winter River, as the dams would impede fish movement and further jeopardize the water quality and quantity problems. Beaver will be allowed on side branches from the river.

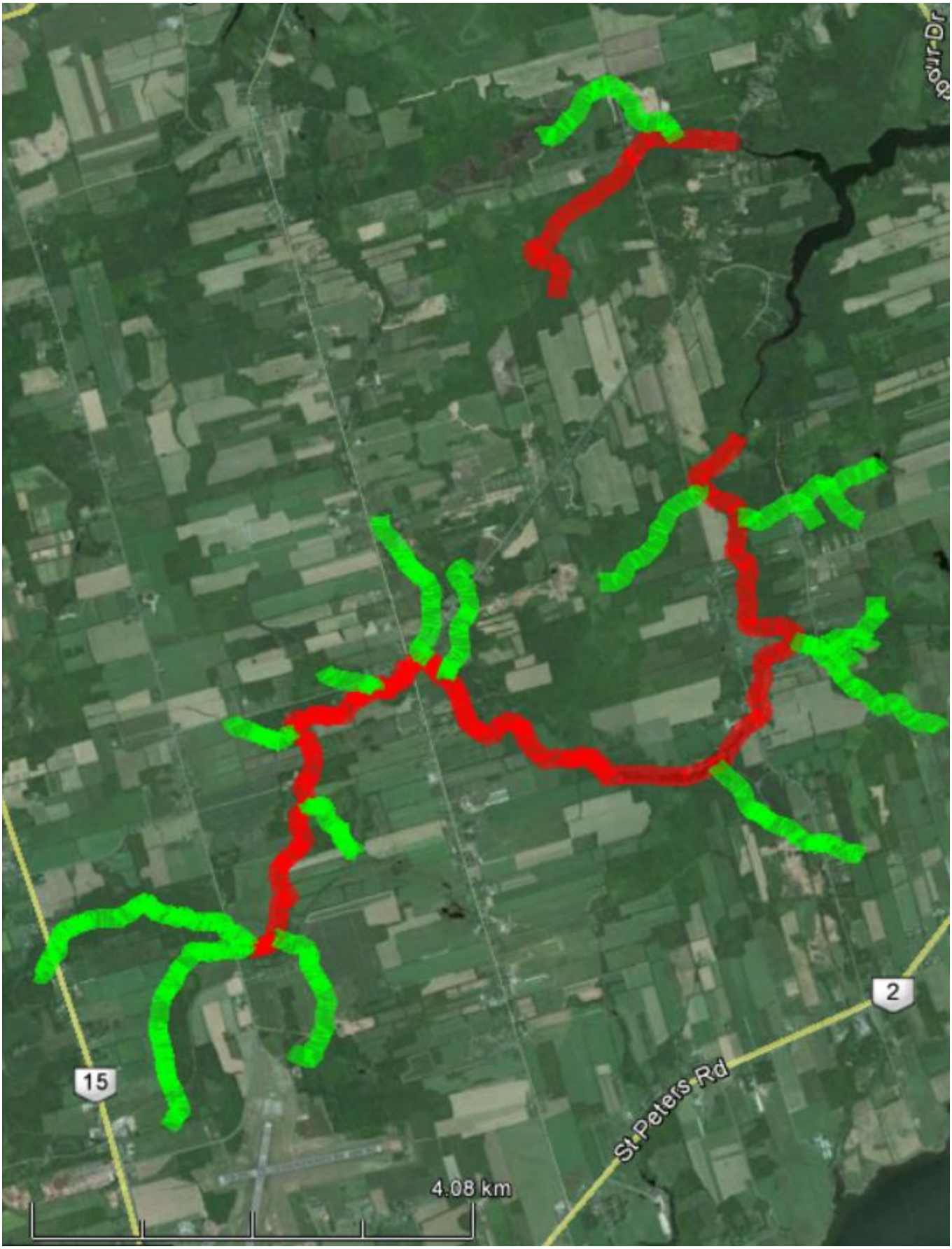
Beaver free zones will be monitored during critical times of the year, especially during fall when fish are spawning and beavers are building dams. This monitoring will be conducted by staff if available, and with volunteers.

If beavers move into the defined beaver free zone in the spring, every effort will be made to have them trapped as early as possible while the pelts are of higher value. If beaver move in during summer, there will be an assessment about whether they pose an immediate problem, and thus must be trapped, or if trapping can be delayed until the regular trapping season.

Future refinements of the plan

Given our current level of knowledge, the above proposed plan will function as our working beaver management plan, until such time as we are able to refine the plan based on additional information. A fish management plan will be created based on stream surveys and assessments of where fish are spawning, and which branches are most used by fish, especially young of the year. Upon completion of the fish management plan, this beaver management plan may be modified by adding certain side branches of the Winter River to be beaver free and/or designating certain stretches of the main branch of the river as possible habitat for beavers. As we progress toward watershed management plans for other sub watersheds flowing into Tracadie Bay, beaver management plans will be added for those areas as well.

In the attached map, beaver free zones are indicated with red coloring, and zones where beaver will be allowed are colored in green.



Red = Beaver free **Green = Beavers allowed**