

Riparian Assessment of the Callander Bay Watershed

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Introduction

This study was conducted for the North Bay-Mattawa Conservation Authority (NBMCA), Source Water Protection Program. Its purpose was to investigate and document physical land use characteristics of the watersheds entering into Callander Bay and to identify potential sources of phosphorus and other nutrients that could be contributing to poor water quality.

Methods

The North Bay-Mattawa Conservation Authority (NBMCA) supplied current and historical data that pointed to abnormally high levels of phosphorus at certain locations in the watersheds that drain into Callander Bay, which helped to focus the investigation. To narrow down the search for field assessment sites, Google Earth was studied to look for land use patterns indicating where disturbances could be occurring due to commercial or private uses of the land. The best means of site access was determined with Google Earth, Map Source (GPS mapping program), and trial and error. Where waters were deep enough, a canoe provided the best access to the riparian zones for investigation. Some investigations were carried out on foot and later, once the creeks were frozen and there was a good cover of snow, snowshoes provided access into areas where normal foot travel was difficult.

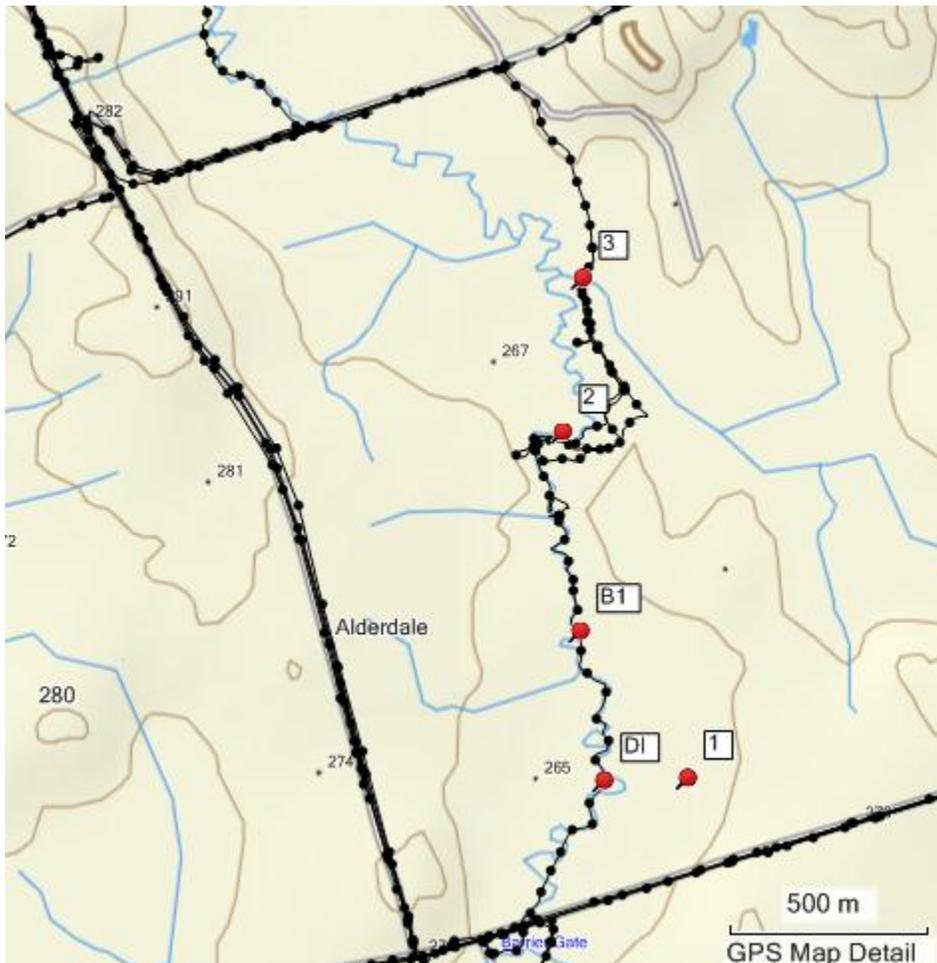
Photographs were taken of the current land use and/or the riparian condition and a GPS waypoint of the photo location where possible. Also, a written description of the condition of the site and the potential affect of the disturbance on the riparian environment was recorded in the field. If a GPS location was not taken in the field, one was added on Map Source, so that a collection of all the data points could be accessed in one electronic file.

Once the most obvious sites for study were exhausted, further investigations focused on areas where travel was more difficult, and where land use patterns typically associated with phosphorus release were not present, giving a balanced view of the creeks in their natural state and providing opportunities to find sources of phosphorus that may have been missed.

Results

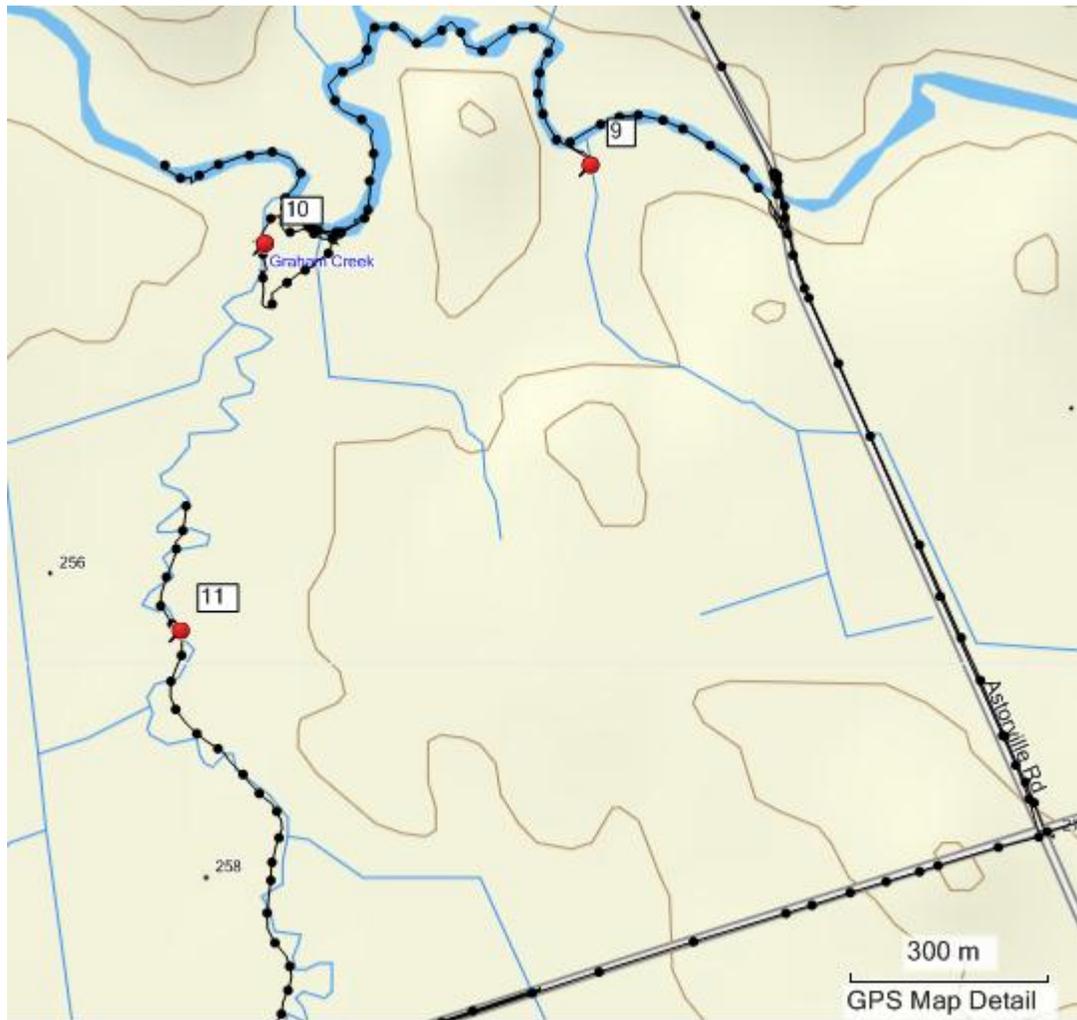
All investigated sites have been organized and mapped by date in this report. Each day, several sites were visited, covering a large area. This required the production of one to four maps per day, in order to present the waypoints at a usable scale. The waypoints on the maps correspond to the excel spreadsheet, which lists and describes the photos taken at each location. Each map is described below in the order it appears in the excel spreadsheet.

12-1



Graham Creek was accessed by canoe from Chiswick line, just east of Alderdale Road. Tile drainage (located at D1) was found to be entering into the creek only meters from its bank, creating an erosive channel. Photographs were taken at locations D1 and 1. A beaver dam was located at location B1. At location 2, there was no way of continuing due to the thickness of the alders. Signs of cattle grazing and excrement were found at the waters edge near location 2, and near location 3 at the confluence of another creek that enters into Graham Creek from the southeast.

Oct 23-1



Access to Graham Creek was gained from the Wasi River at Astorville Road. Travelling up the creek from its mouth, a home-made bridge was found on a first order creek at location 9 with some erosion. At location 10, there was evidence of cattle grazing and excrement at the mouth of Graham Creek. At location 11, some of the most significant erosion was seen with steep-sided banks completely denuded of vegetation and with no buffer of any kind along the field above the embankment. The canoe was taken out at River Road.

Recommendations

Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to reduce direct and indirect sources of phosphorus from entering the water column.

Oct 23-2



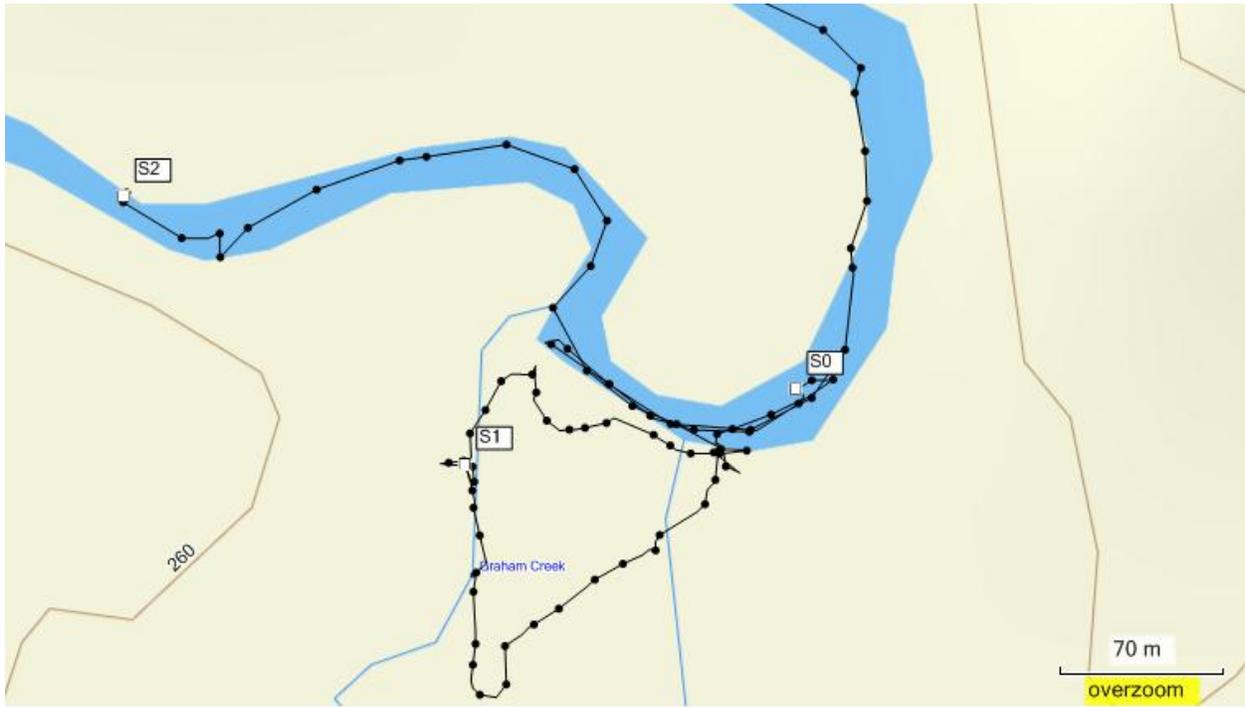
Photos were taken at location 4, where nutrient saturated water was running from a horse paddock along Alderdale Road. Two hundred meters north from this runoff, a culvert channels water across the road to the east, eventually joining Graham Creek at location 7. There was no distinct channel from the road as the water naturally fans out over the forest floor. At location 8, the municipality has been dumping organic material from ongoing dredging along Memorial Park Road. There was no evidence that any of this loose material is making its way into Graham Creek. There was erosion from cattle grazing at location 5, and tile drainage at location 6. At location 7a, proper fencing was in place to keep the cattle out of the creek, leaving the bank in much better condition than at location 5.

Oct 23-3



This section of the Wasi River was accessed by canoe from the Edmond Street bridge. The banks of this section of the river appeared fairly natural and had good tree cover. At location 12, several pictures show the river following the abandoned rail line. A significant series of rapids was portaged by following part of the old abandoned rail line. No degradation of the river banks could be found between Edmond Street and the rail trestle at Wasi Road.

Oct 23-sampling locations



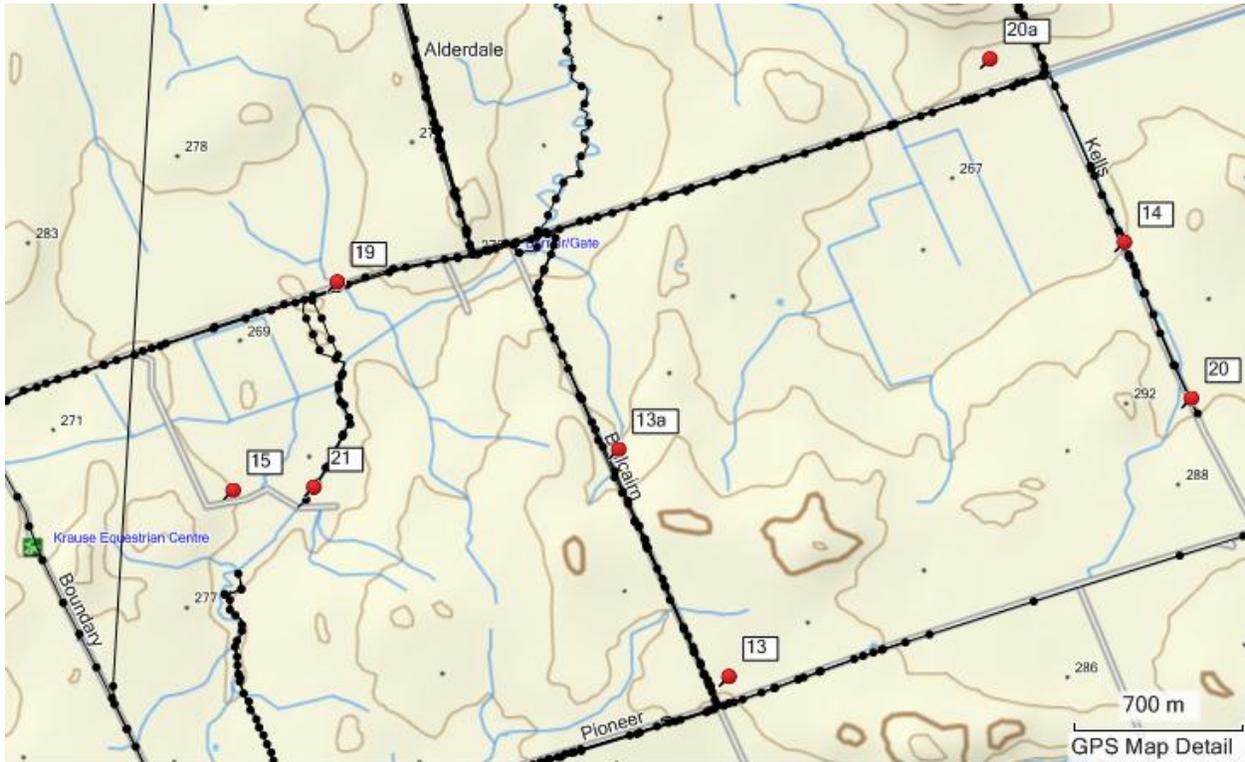
These sample sites follow the point sequence as requested in the excel spreadsheet file sent to me Oct.19, 2012. (Sample_sites_along_Wasi_R_fall_2012.xlsx). Results from these samples show a significant rise in the Total Phosphorus at location S2, just downstream of the confluence of Graham Creek and the Wasi River.

Nov. 2-1



At location 17, photos were taken of a significant cattail marsh buffering the runoff from the sheep farm to the north before flowing under the railway line and into the Wasi River. There was no sign of nutrient rich water coming from the farm at this time. At location 18, photos were taken of the forest on the south side of the Wasi River where it appeared that cattle have been grazing in the woodlot. Across the bridge to the east, this same woodlot was fenced and showed signs of grazing in the past.

Nov 2-2

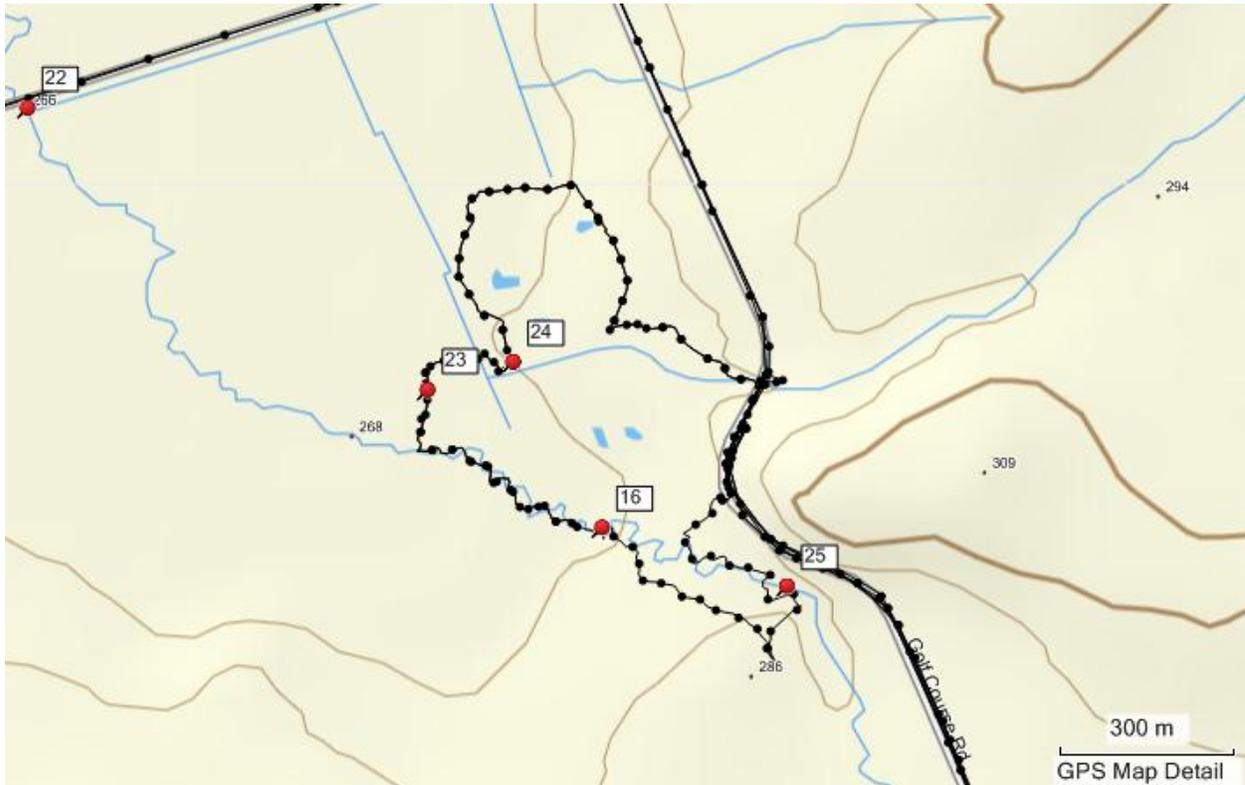


From Memorial Park Drive, Graham Creek was channelized south toward location 19, and appeared well vegetated for most of its reach. At location 19 on Chiswick Line, looking northwest, there was recent clearing of vegetative cover (alders) close to Graham Creek (photos 9-10). No significant erosion can be seen along Graham Creek to the south of Chiswick Line up to location 21. At location 13, at the corner of Pioneer Road and Belcain Road, there were cows walking in open surface water at this point. This appears to be surface water with no significant flow in any direction from here. At location 13a, photo (16) shows dairy cattle on the farm occupying Belcain Road and Chiswick Line to the north. It was difficult to determine whether there was fencing keeping cattle out of the creeks from any vantage point. On Kells Road, between Pioneer Road and Chiswick Line, an unnamed creek that joins Graham Creek comes close to the road at location 20. Beef cattle were seen up stream of location 20 to the southwest. There was lots of evidence that cattle have been in the water further along Kells Road at location 14, where this unnamed creek comes down onto the floodplain. At this point, there was pooling of the unnamed creek (photos 17-18) where the cattle have been grazing in the black ashes and red maples. Behind the farm at location 15, there was a large effluent containment tank and beef cattle in the bush lot behind. This was investigated from the south on Nov 14 (map Nov 14-1).

Recommendations

It would be wise to determine how the containment of wash water and manure is handled on the dairy cattle operation on the corner of Belcain Road and Kells Road. Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to reduce direct and indirect sources of phosphorus from entering the water column.

Nov 2-3

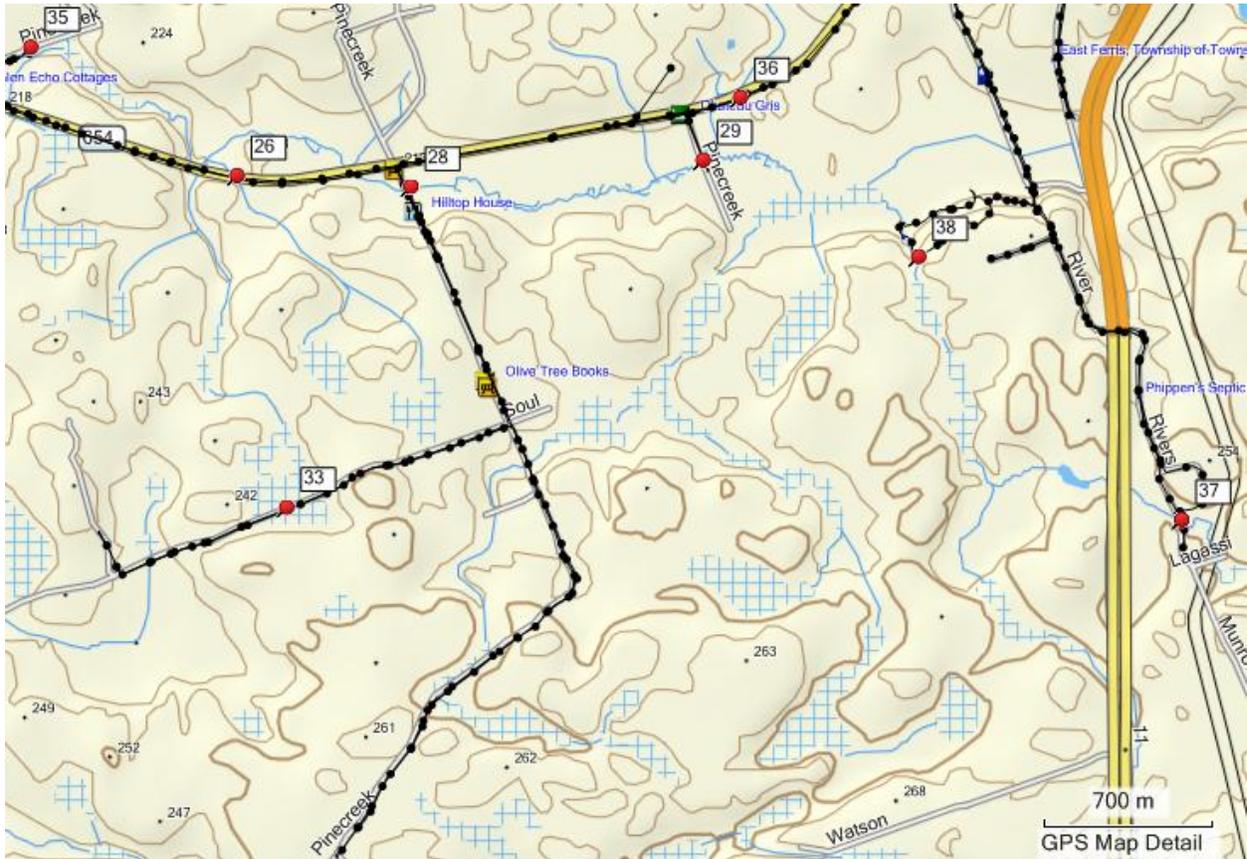


Chiswick Creek was entered from Golf Course Road, just south of Clear Springs Golf Course. Before Chiswick Creek entered the golf course, there was a very natural series of waterfalls, rapids and well vegetated sections at location 25. At location 16, Chiswick Creek is only vegetated by grass, completely devoid of other natural vegetative cover, and mowed right up to the edge of the water. Another creek that joins Chiswick Creek across the golf course from the east, is naturally vegetated before the culvert at Golf Course Road. Once on the golf course though, this creek has been straightened and vegetated in a similar fashion as Chiswick Creek. There doesn't appear to be any erosion along any of these sections.

Recommendations

A natural vegetative buffer should be encouraged to create a natural break along these grassed sections of creek, to reduce the amount of inorganic phosphorus entering the watercourse directly. This would also encourage stability at the bank/water interface and reduce the chance that soil born phosphorus enters the water environment during the spring freshet.

Nov 8-1

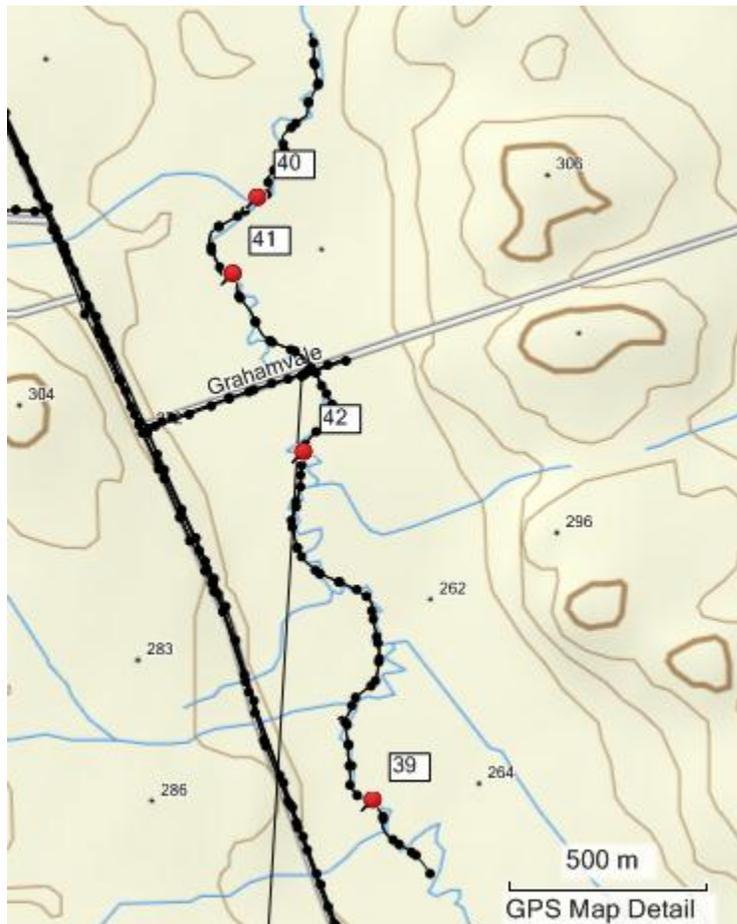


Windsor Creek at location 29, flows across a private driveway and was well vegetated on both banks. At location 38, Windsor Creek comes down off of the highlands where there was no evidence of erosion of any kind. From location 36, cows and sheep were seen to the north, but, it was difficult to tell if they were properly fenced from the creek or if there was enough of a buffer on each bank. At location 28, where a new culvert was installed, there was erosion downstream. More investigation of the interior upland of Windsor Creek, east and west of Pinecreek Road South was conducted on December 12, 2012 (see map Dec 12-1 and waypoints 66-71). At location 35, horses can be seen in the field through the gate to the east, where Windsor Creek is located. This field at location 35, was accessed from the east on December 3, 2012 (see Dec 3-1). Windsor Creek was also checked further upstream, at Rivers Road and location 37, where there was good vegetative cover on both banks before and after crossing highway 11.

Recommendations

Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to relieve direct and indirect sources of phosphorus from entering the water column.

Nov 8-2



South of Grahamvale Road, Graham Creek looked very well vegetated on both banks at location 42. At location 39, cattle were clearly grazing at the edge of the creek and in the adjoining forest. This is the same property where grazing in Graham Creek was seen from Memorial Park Drive to the south. To the north of Grahamvale Road, Graham Creek was well fenced from the horses. There are beaver dams at locations 40 and 41. At location 41, though, where the difference in height of the water level from upstream to downstream was more than a meter, there was significant erosion around both edges of the dam where the water was racing through and eroding the fields on both sides.

Recommendations

Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to relieve direct and indirect sources of phosphorus from entering the water column.

Nov 8-3



Windsor Creek was entered near Bayview Camp Road in order to access the mouth of Windsor Creek and check the channel at this point. Windsor Creek was well vegetated in this reach between location 27, and the mouth where it enters Callander Bay. There are some old structures (docks) along the channel close to the lake, but, no significant erosion.

Nov 14-1

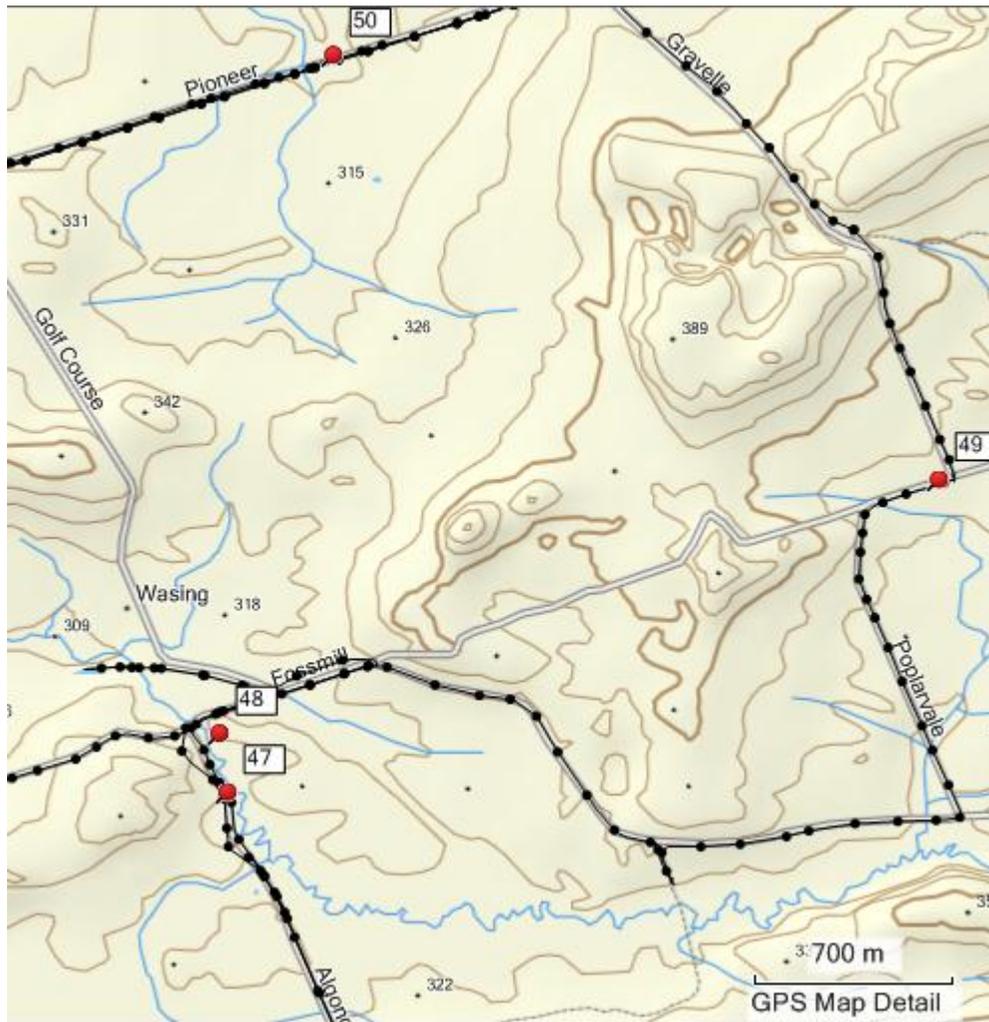


Graham Creek was accessed on foot from Pioneer Road. At location 46, the map shows a creek where tile drainage has caused erosion at the edge of the field and entering Graham Creek. At location 45, it was difficult to tell if the beef cattle are in the creek to the west. Directly across the stream from location 45, where an unnamed creek enters Graham Creek from a cattle and horse paddock to the west, a large amount of organic material and rip rap has been dumped recently.

Recommendations

Further inspection is required to determine if there is severe erosion occurring where this unnamed creek enters Graham Creek at location 45.

Nov 14-2



The Wasi River was fenced from the beef cattle at location 47, along Algonquin Road. At location 49, looking south along Poplarvale Road, a tractor was spreading manure onto the field (photos 4-5). Photographs taken from Pioneer Road at location 50, show a field grazed on one side and not on the other (Photo 6).

Recommendations

Manure management (application) techniques that minimize nutrient runoff should be encouraged.

Further investigation of the cattle containment and waste management practises in place on the farm where grazing animals are present to the south of location 50.

Nov 14-3



Significant grazing and associated erosion was seen at location 51, on the west bank of the Wasi River. This was accessed from Beach Road to the east.

Recommendations

Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to keep direct and indirect sources of phosphorus from entering the water column.

Nov 14-4



A canoe was used to access waterfront properties on Wasi Lake where significant algal blooms could be seen on Google Earth. No obvious cause for the algal blooms was seen along the shoreline. The Wasi River downstream was investigated by canoe up to location 53, then, searched on foot as far as a farm bridge to the north. There was no significant sign of erosion or problems along this stretch of shoreline.

Recommendations

It might be useful to check the river banks between the bridge and River Road since there is a farm property off of Mallard Haven Road, and to monitor private waste treatment systems using this shoreline.

Nov 15-1

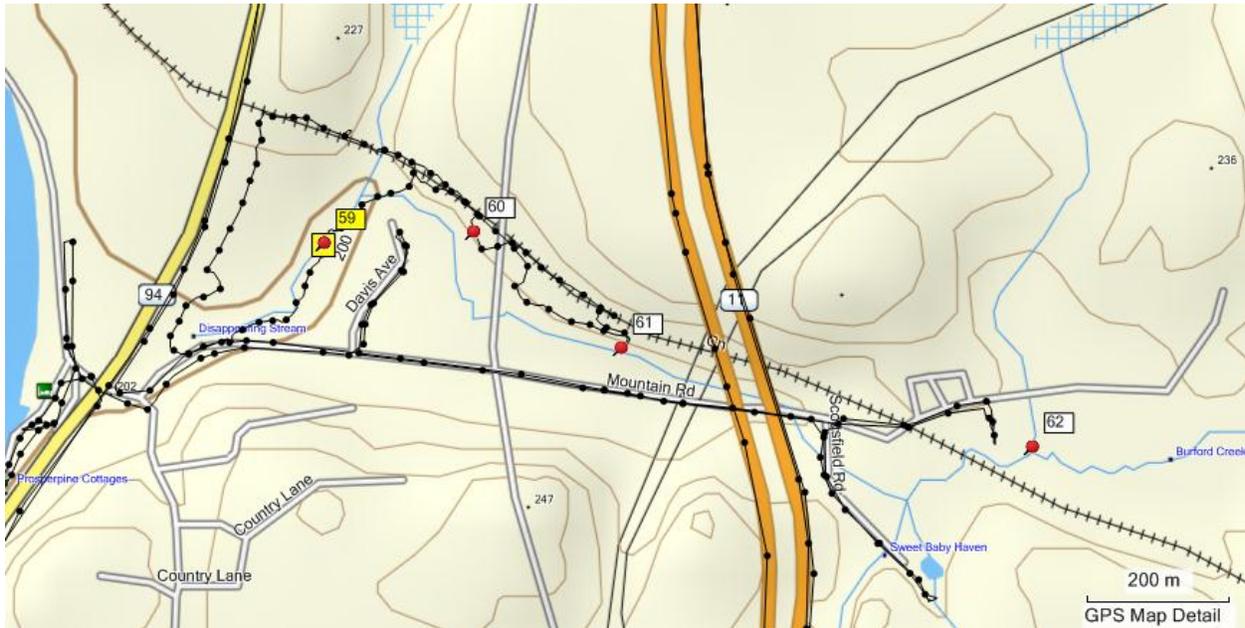


Putting the canoe in at the rail trestle along Wasi Road, the Wasi River was investigated along this section of meandering floodplain. No significant signs of erosion were found up to the bridge on the Callandar Bay road. There were some undercut banks and a few places where animals were frequenting the shoreline. I noticed a strong oily odour as soon as near the bridge over hwy 11. At location 58, there is a peculiar seepage coming from the bank on the north side of the Wasi River.

Recommendations

Monitor the seepage at location 58.

Nov 15-2



Burford Creek was investigated from Mountain Road. Walking up Burford Creek near hwy 11, there was a lot of erosion of the creek banks behind the housing development near location 59 on Davis Ave. Where the creek came under the highway at location 61, it had well vegetated banks and a natural course. On the east side of the highway, there didn't appear to be any significant erosion.

Recommendations

Stabilizing the banks in certain spots along the creek could reduce the loss of soil and potential for phosphorus from residential activities.

Dec 3-1

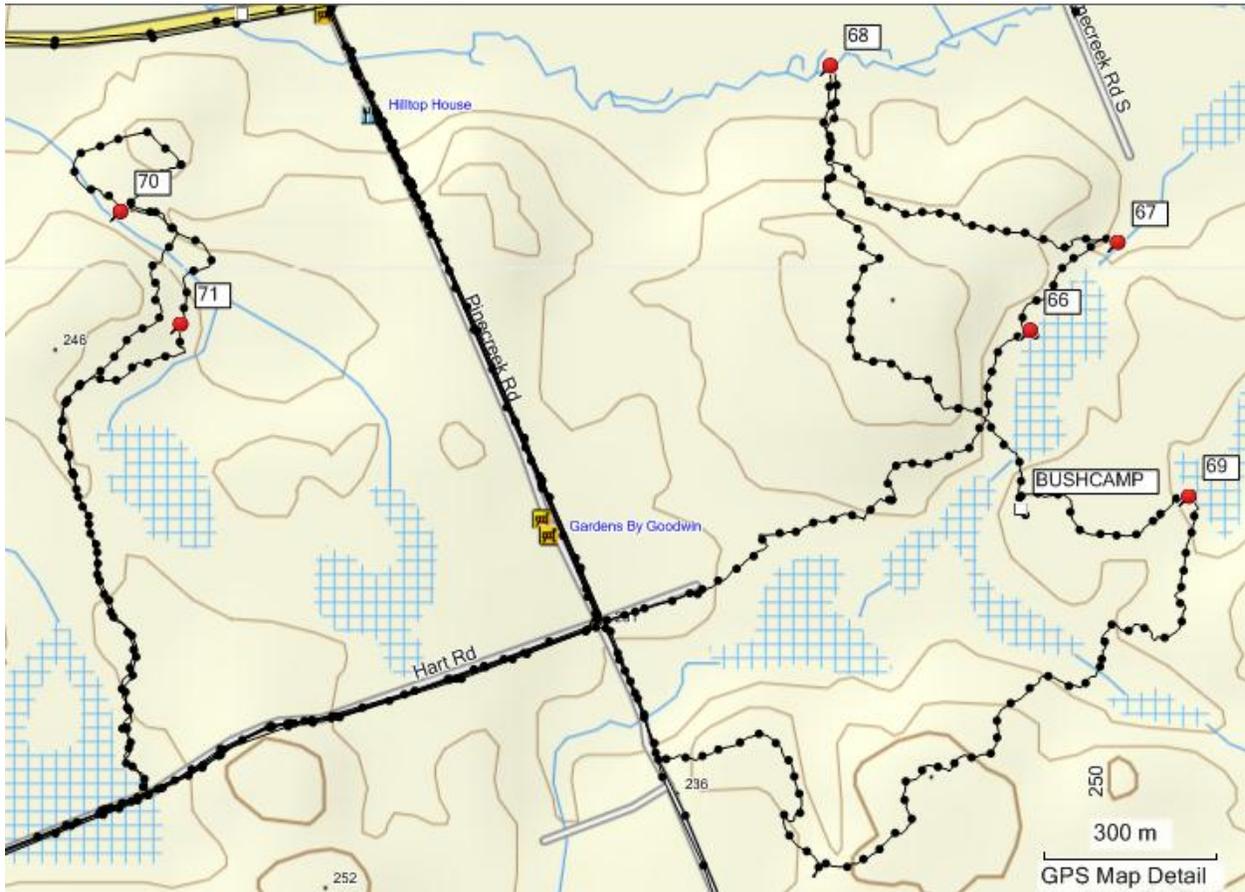


The horse paddock on Windsor Creek was accessed from Pinecreek Road North, as shown on the map. Significant erosion was seen near the bridge that crosses the Windsor Creek at location 63. Upstream at locations 64 and 65, Windsor Creek was well vegetated and had a natural course.

Recommendations

Proper fencing to keep livestock out of the creek and re-establishment of native vegetation along the banks will help to keep direct and indirect sources of phosphorus from entering the water column.

Dec 12-1



In an effort to find the source of significant phosphorus loading in Windsor Creek at the highway 654 bridge as signified by the data, some fairly inaccessible areas were investigated. The area to the east of Pinecreek and Soul Roads has no road access except for the snowmobile trail. On snowshoes, it was possible to walk along the wetland areas without getting wet. There are fields around the hunt camp in this area, but, no evidence of any direct creek degradation leading to the release of phosphorus. The creek that feeds into Windsor Creek from the highlands at Hart Road, was investigated on snowshoes, north, to locations 70 and 71, without any significant evidence of erosion being found.

Recommendations

Since there are a considerable number of blinds in the area of locations 66-69, and a significant number of users apparent, it might be worthwhile to check how the camp and visitors to the area deal with the waste water from the camp.