

5494, 5500 and 5510 Boundary Road

Environmental Impact Statement

Fisheries Component

Prepared for:

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List of Acronyms and Definitions

- DFO – Department of Fisheries and Oceans Canada
EIS – Environmental Impact Study
ESA – *Endangered Species Act*
FIA - Fisheries Impact Assessment
GPS – Global Positioning System
 NAD 83: North American Datum 1983
 UTM: Universal Transverse Mercator
LIO- Land Information Ontario
MNRF –Ministry of Natural Resources and Forestry
MTO – Ministry of Transportation of Ontario
NHIC - Natural Heritage Information Centre
OSAP – Ontario Stream Assessment Protocol
SNC – South Nation Conservation
SAR- Species at Risk (provincial and federal listed endangered and threatened species)
SARA - *Species at Risk Act* (Federal)
SARO - Species at Risk in Ontario

SRANK DEFINITIONS

- S1** Critically Imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province
S2 Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 Apparently Secure; uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 Secure; Common, widespread, and abundant in the nation or state/province.
? Inexact Numeric Rank—Denotes inexact numeric rank.
SNA Not Applicable, A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#B Breeding
S#N Non-Breeding

SARA STATUS DEFINITIONS

- END** Endangered: a wildlife species facing imminent extirpation or extinction.
THR Threatened: a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.

SC Special Concern, a wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

SARO STATUS DEFINITIONS

END Endangered: A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's ESA.

THR Threatened: A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

SC Special concern: A species with characteristics that make it sensitive to human activities or natural events.

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1.0 INTRODUCTION

Day & Ross Inc. is proposing to construct a truck transport facility and warehouse facility at 5494, 5500, and 5510 Boundary Road in Navan. The site is in part of Lot 1, Concession 9 in the City of Ottawa, former Township of Gloucester (Figure 1). It is bordered by Boundary Road on the east, is approximately 1 km to the south of Highway 417 and extends roughly 415 m to the west of Boundary Road (Figure 2). This development includes numerous loading docks with parking spaces for 141 cars, 55 tractors and 134 trailers. Bowfin Environmental Consulting (Bowfin) was retained by Day and Ross to review the project through the lens of the *Fisheries Act*. On August 28, 2019, the most recent *Fisheries Act* came into force. The updated Act returned to wording from the earlier version. It prohibits the following:

- Death of Fish (Section 34.4)
- Harmful alteration, disruption, or destruction of Fish Habitat (Section 35)
- Ministerial powers to ensure the free passage of fish or the protection of fish or fish habitat with respect to existing obstructions (Section 34.3)

There are several potential fish habitats on site; mostly confined to the perimeter and may have been created when fill was brought in by a previous landowner. Other features included a roadside ditch along Boundary Road (connected to the Simpson Municipal Drain) and two features in the adjacent lands (Figure 2). All of these features are part of the Upper Bear Brook portion of the Bear Brook sub-watershed, which itself is part of the South Nation River watershed. In addition, three offline ponds were noted in the site. As these are artificial waterbodies not connected to waterbodies containing fish at any time of the year, they are not protected under the *Fisheries Act*.

The Fisheries and Oceans Canada (DFO) website currently indicates that any activity or projects that may affect fish habitat needs to be reviewed by DFO unless there is a Standard Code of Practice or if measures to protect fish and fish habitat can be followed (as outlined on their website). The proposed work includes the realignment of watercourses and a reduction in the typical 30 m buffer established by the province in the Natural Heritage Reference Manual (MNR, 2010). The re-alignments are not covered by the exemptions. The reduction of buffers does not need to be reviewed, by DFO, provided that no negative impacts to fish habitat (i.e. thermal changes) stem from this reduction. The following report provides a review of Bowfin's findings and an assessment on the potential to affect fish and fish habitat, including fish species at risk.

Figure 1: General Location of Study Area

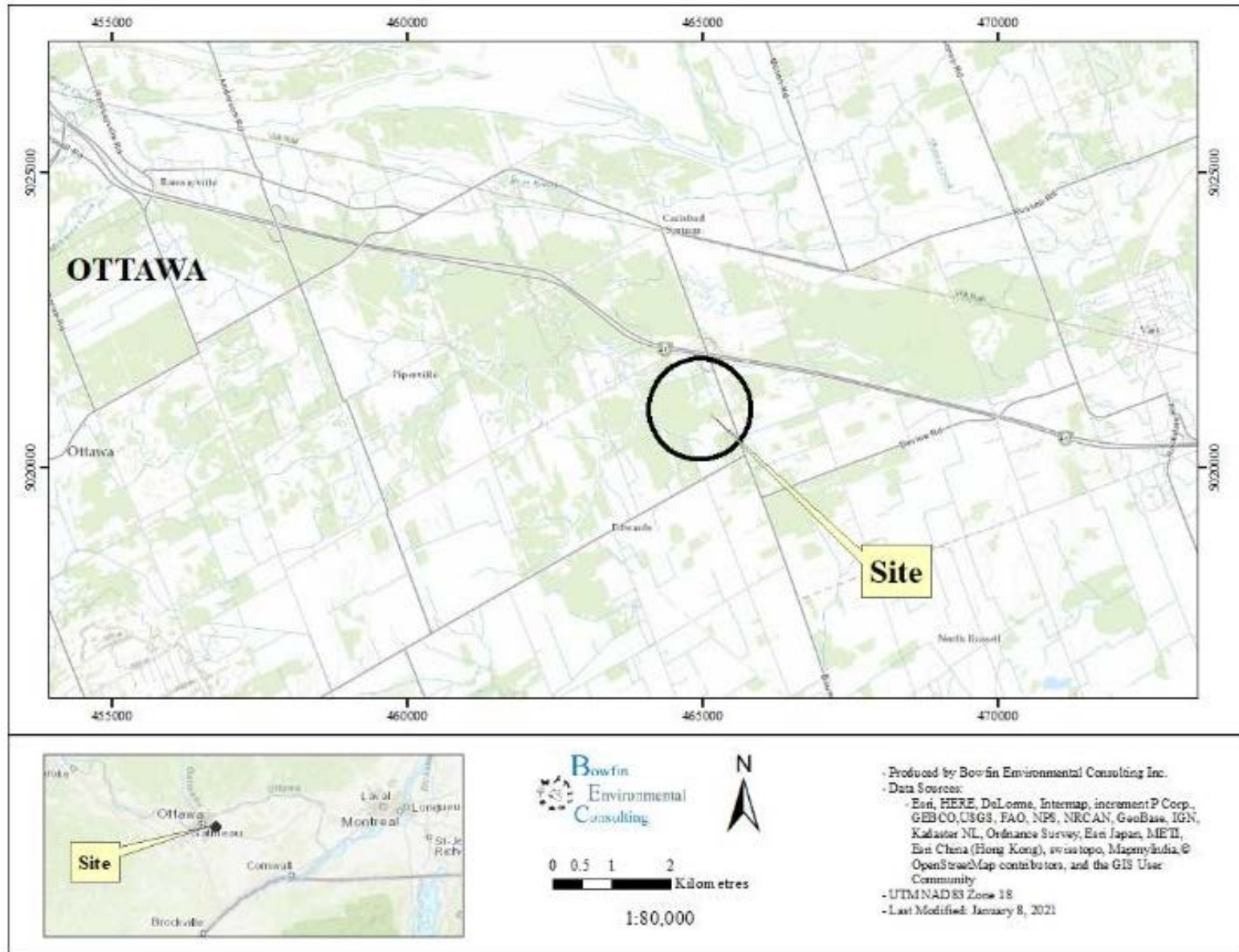
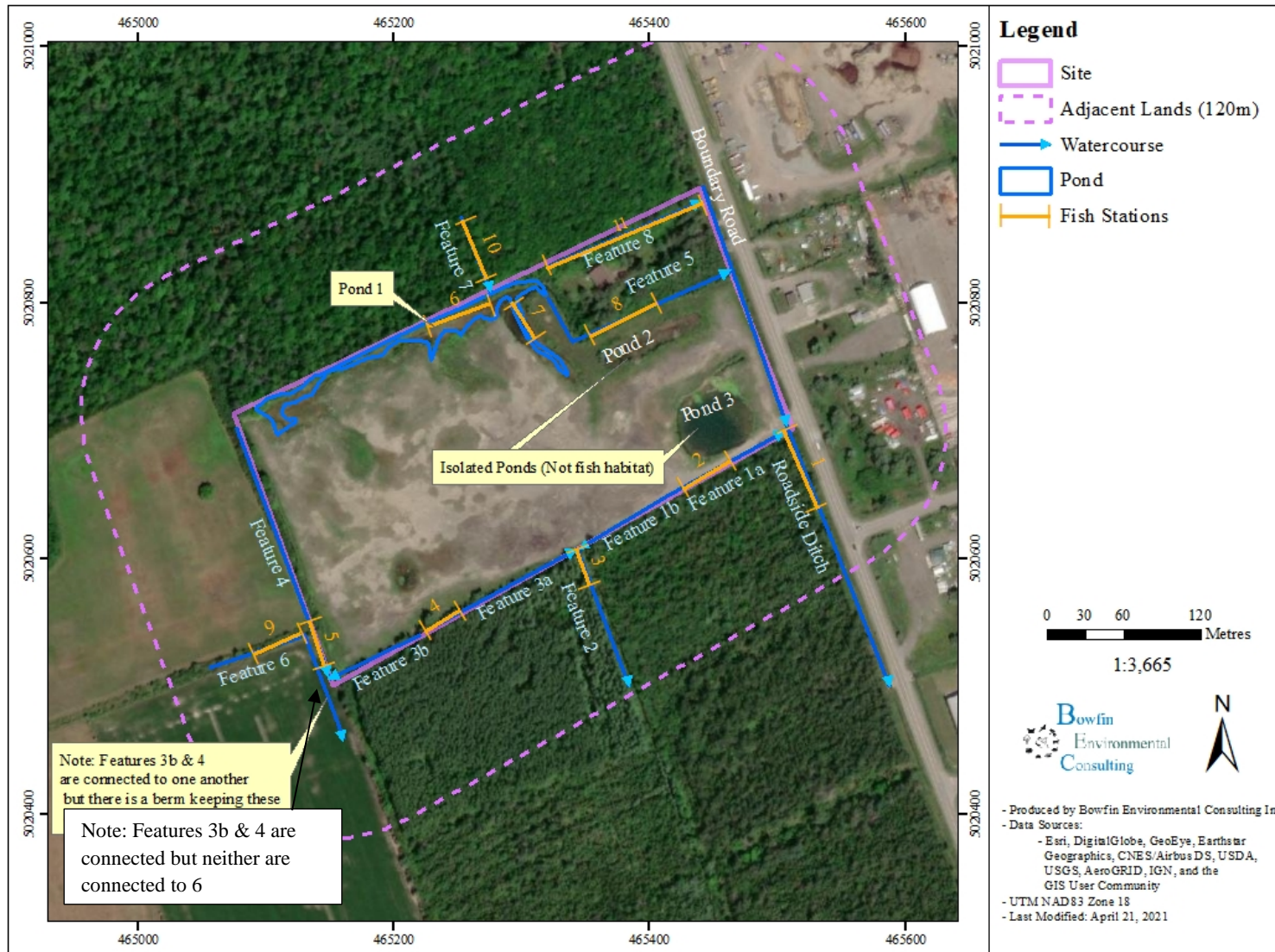


Figure 2: Study Area and Sampling Sites



2.0 METHODOLOGY

Work undertaken for the completion of this project included a background review of existing information and field investigations.

2.1 Review of Background Review

A search through available records and available consulting reports was made to gather existing information on the fish habitat and community within the project area. The following web sources were analyzed: Land Information Ontario (LIO), Natural Heritage Information Centre (NHIC), Species at Risk (limited to fish species protected under provincial or federal legislation), and DFO Aquatic Species at Risk Distribution 2019 (on-line). The review also included a summary of fish species found in Simpson Municipal Drain by Kilgour and Associates (2014).

2.2.1 Study Area

The field visit focused on the watercourses located on site and in the adjacent lands (120 m). Eleven stations were created to capture information on the fish habitat and communities (Figure 2). The background review and consideration for the potential for species at risk (SAR) included a larger study area (± 5 km). It is noted that there are isolated ponds on-site that are not connected to any watercourse and are not considered fish habitat under the *Fisheries Act*.

2.2.2 Fish Habitat Description

To assess the potential impacts to fish habitat, fish communities or fish species at risk (SAR) the aquatic habitats within the study area were assessed based on the point observation technique used by *Ontario Stream Assessment Protocol* (Stanfield, 2013) and the Ministry of Transportation of Ontario (MTO)'s *Environmental Guide for Fish and Fish Habitat October 2006* (MTO, 2006). The channel morphology was described using evenly spaced transects upon which data was recorded from evenly spaced observation points. The data collected included: channel width, wetted width, bankfull depth, water depth, substrate size, morphological units, and in-stream cover. Summaries of this information are available below.

2.3 Fish Community Sampling

Fish community sampling was performed to document the use of the site by fish during the spring and summer of 2020, as well as the spring of 2021 for feature 8. The community was sampled using dip netting, hoop nets, and backpack electrofishing. The fish were identified, counted, measured [fork length (FL)/total length (TL) as appropriate], and released. The transect length, approximate width, volts, current and effort were also recorded.

3.0 Results

3.1 Project Location

The proposed subject site consists of an approximately 200 m by 400 m plot located on part of Lot 1 Concession 9 on Ottawa River in the Geographic Township of Navan, City of Ottawa (Latitude 45.338753 and Longitude -75.442709; UTM NAD83 18N 465314E 5020678N). It appears that the site consists of fill that raised the land and created ditches around the perimeter. These features did not always drain properly, resulting in division of flow. This is identified by splitting the drains to “a” and “b”. The features are labelled as:

- Boundary Road west ditch (referred to herein as Roadside Ditch) drain south into Simpson Municipal Drain roughly 200 m downstream. Station 1 provides information on this feature.
- Feature 1 is found along the southeast perimeter of the site, to the east of HDF 2. One part of HDF 1 (HDF 1a) inclines towards the roadside ditch, the other (HDF 1b) towards HDF 2. HDF 1a and 1b were frozen and snow covered on April 7, 2020. There was <2 cm or no water on April 12, 2021. There was no sorting of substrate, and the features were choked with vegetation. Both are a swale.
- Feature 2 travels from the perimeter of the site, south to Mitch Owens Road (roughly 530 m downstream). This feature also receives water from the treed swamp surrounding it. Station 3 provides information on this feature.
- Feature 3 is the southwest perimeter ditch. Like feature 1, this was split into two with only the lower 20 m of feature 3a directing water to feature 2. The rest of feature 3a was separated by gradient changes in the ditch which were not overtopped even in early April. Feature 3b inclines towards feature 4. Feature 3a and 3b were frozen and snow covered on April 7, 2020. All but the lower 20 m of feature 3a is not fish habitat as it was isolated or connected for feature 4 (feature 4 is also isolated). Station 4 (on 3a) provides information on this part of the perimeter drain.
- Feature 4 is found along the west edge of the site. This feature had many barriers to fish movement in the form of small soil berms throughout the northern portion. It was also a dead end on the downstream side, resulting in a deeper pool that was not connected to the other features. This was not fish habitat. Station 5 provided information on this part of the perimeter drain.
- Feature 5 is situated along the north side of the site. The west side consists of ponds (labelled as Ponds) and the remainder is a ditch that is connected to the Roadside Ditch.

The ponds were created by the fill activities on-site. One portion of the ponds branched south approximately 80 m into the site. This branch was seasonally separated from the other ponds by a soil berm. Stations 6 and 7 were situated in the upstream ponds and Station 8 in the channel.

- Feature 6 was entirely offsite, but within 120 m of the site. It flowed between agricultural fields from west to east and then veered south towards Mitch Owners Road (± 580 m). Station 9 provided information on this feature.
- Feature 7 was in the forested area to the north. It was more of a swale, without defined banks. There was no connection to Feature 5 or the ponds, its flow percolated through the banks (not downstream exit could be seen). It is not fish habitat. Station 10 provided information on this feature.
- Feature 8 was in the forested area to the north-east, by the house located on site. Just like feature 7, it was a swale, without defined banks or sorting of substrate. The fall leaf-litter remained in place. There was no connection to the roadside ditch as there is a soil berm located between the two features. It is not fish habitat (no fish captured in spring 2021). Station 11 provided information on this feature.

Most features (except for features 3b, 4 and 8) lead to Simpson Municipal Drain. Features 3b, 4 and 8 are isolated and **do not contribute flow to any downstream habitat**.

3.2 Background Information

Simpson Municipal Drain originates on Mitch Owen's Road, directing flows east to the west Boundary Road ditch at which points it turns north and continues with that road ditch. Roughly 200 m south of this project, the municipal drain veers to the east and eventually reaches Bear Brook via Shaw's Creek (>8 km downstream) (Figure 3). This sub-watershed is part of the South Nation River watershed.

There was available fish information for Simpson Municipal Drain, Shaw's Creek, and Bear Brook. The information for Simpson Municipal Drain was from the report entitled Fish and Fish Habitat Risk Assessment for the Simpson Municipal Drain at 100 Entrepreneur Crescent by Kilgour & Associates (2014) and from the Aquatic Resource Area (ARA) data on LIO. The information on Shaw's Creek and Bear Brook were from the Aquatic Resource Area (ARA) data on LIO. The available background information listed a total of 6 fish species in Simpson Municipal Drain, two in Shaw's Creek, and 29 in the section of Bear Brook. A list of species available for the three watercourses is available in Table 1.

There is no thermal regime mentioned for Simpson Municipal Drain, but Shaw's Creek is listed as a cool water stream and Bear Brook is listed as warmwater.

There are no known occurrences of aquatic (fish or mussel) species at risk listed in the consultant's report or on LIO. This is supported with the DFO Aquatic Species at Risk Map (on-line mapping accessed March 31, 2020) (Appendix A).

Figure 3: Map of the Watercourses Surrounding the Site.

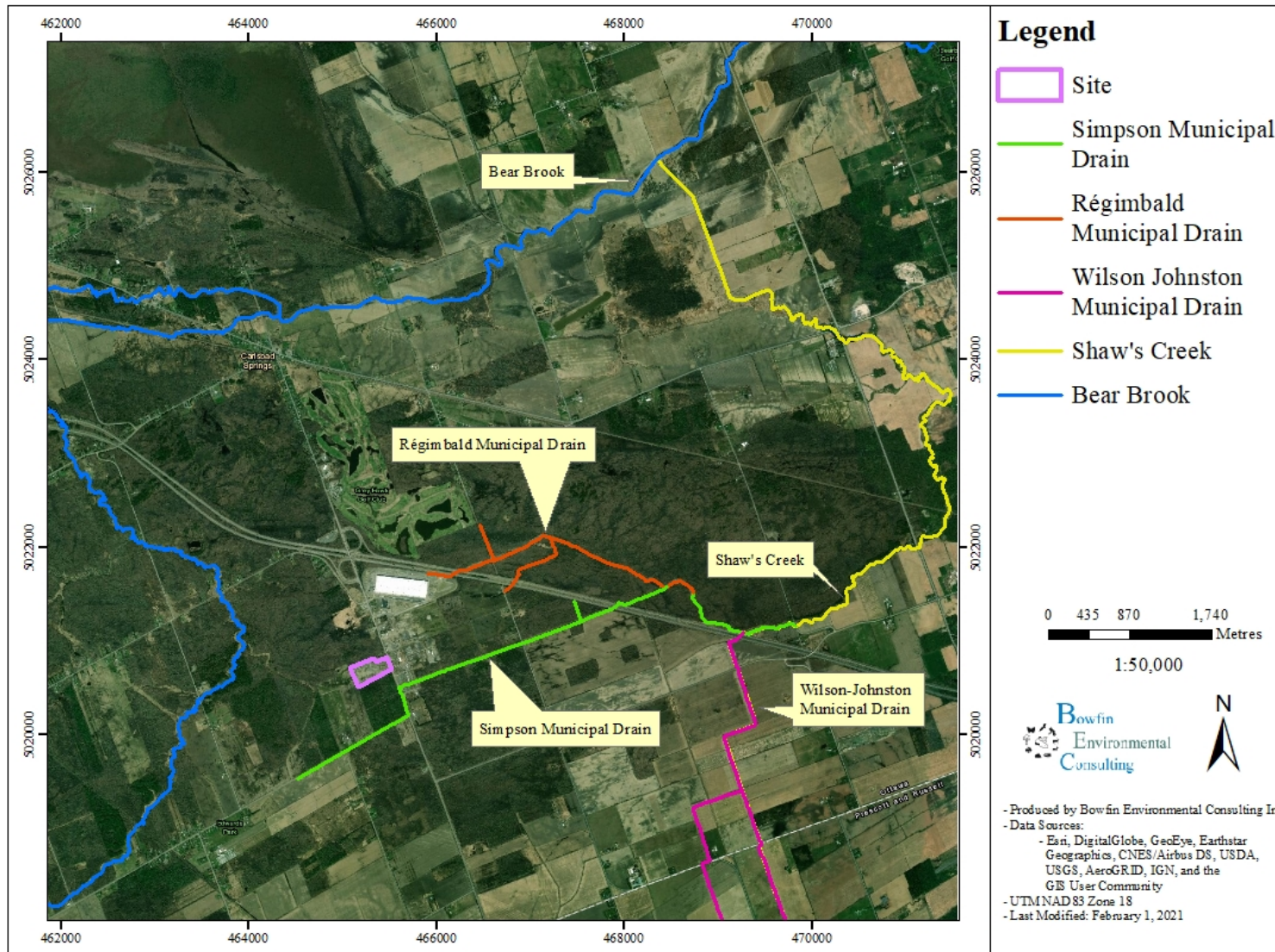


Table 1: Historical Fish Community in Simpson Municipal Drain, Shaw’s Creek and Bear Brook

Species Name	Scientific Name	Trophic Class	Thermal Regime	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Present in Simpson Municipal Drain	Present in Shaw’s Creek	Present in Bear Brook	References
Central Mudminnow	<i>Umbra limi</i>	invertivore	cool	S5	no status	no status	X		X	OMNRF, 2014
Creek Chub	<i>Semotilus atromaculatus</i>	invertivore/ carnivore	cool	S5	no status	no status	X		X	OMNRF, 2014
Pumpkinseed	<i>Lepomis gibbosus</i>	invertivore/ carnivore	warm	S5	no status	no status	X	X	X	OMNRF, 2014
White Sucker	<i>Catostomus commersonii</i>	invertivore/ detritivore	cool	S5	no status	no status			X	OMNRF, 2014
Redhorse	<i>Moxostoma</i>	N/A	N/A	N/A	no status	no status			X	OMNRF, 2014
Fallfish	<i>Semotilus corporalis</i>	invertivore/ carnivore	cool	S4	no status	no status			X	OMNRF, 2014
Johnny Darter	<i>Etheostoma nigrum</i>	invertivore	cool	S5	no status	no status			X	OMNRF, 2014
Common Carp	<i>Cyprinus carpio</i>	invertivore/ detritivore	warm	SNA	no status	no status			X	OMNRF, 2014
Northern Pike	<i>Esox lucius</i>	carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Brassy Minnow	<i>Hybognathus hankinsoni</i>	planktivore / detritivore	cool	S5	no status	no status			X	OMNRF, 2014
Bluntnose Minnow	<i>Pimephales notatus</i>	detritivore	warm	S5	no status	no status			X	OMNRF, 2014
Rosyface Shiner	<i>Notropis rubellus</i>	Invertivore/ detritivore/ herbivore	warm	S4	no status	no status			X	OMNRF, 2014
Johnny Darter/	<i>Etheostoma nigrum/</i>	insectivore	cool	S5/S4	no status	no status			X	OMNRF, 2014

Species Name	Scientific Name	Trophic Class	Thermal Regime	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Present in Simpson Municipal Drain	Present in Shaw's Creek	Present in Bear Brook	References
Tessellated Darter	<i>Etheostoma olmstedi</i>									
Banded Killifish	<i>Fundulus diaphanus</i>	invertivore/ planktivore	cool	S5	no status	no status			X	OMNRF, 2014
Stonecat	<i>Noturus flavus</i>	invertivore/ carnivore	warm	S4	no status	no status			X	OMNRF, 2014
Walleye	<i>Sander vitreus</i>	invertivore/ carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Trout-Perch	<i>Percopsis omiscomaycus</i>	Invertivore/ carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Blacknose Shiner	<i>Notropis heterolepis</i>	invertivore/ herbivore	cool	S5	no status	no status			X	OMNRF, 2014
Northern Redbelly Dace	<i>Chrosomus eos</i>	invertivore/ planktivore	cool	S5	no status	no status			X	OMNRF, 2014
Fathead Minnow	<i>Pimephales promelas</i>	detritivore/ invertivore	warm	S5	no status	no status	X		X	OMNRF, 2014, Kilgour & Associates, 2014
Brook Stickleback	<i>Culaea inconstans</i>	planktivore / invertivore	cool	S5	no status	no status	X		X	OMNRF, 2014
Rock Bass	<i>Ambloplites rupestris</i>	invertivore/ carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Smallmouth Bass	<i>Micropterus dolomieu</i>	invertivore/ carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Logperch	<i>Percina caprodes</i>	invertivore	warm	S5	no status	no status			X	OMNRF, 2014

Species Name	Scientific Name	Trophic Class	Thermal Regime	SRank	ESA Reg. 230/08 SARO List Status	SARA Schedule 1 List of Wildlife SAR Status	Present in Simpson Municipal Drain	Present in Shaw's Creek	Present in Bear Brook	References
Mimic Shiner	<i>Notropis Volucellus</i>	invertivore/ herbivore	warm	S5	no status	no status			X	OMNRF, 2014
Brown Bullhead	<i>Ameiurus nebulosus</i>	invertivore/ herbivore/ carnivore	warm	S5	no status	no status			X	OMNRF, 2014
Yellow Perch	<i>Perca flavescens</i>	Invertivore/ carnivore	cool	S5	no status	no status			X	OMNRF, 2014
Golden Shiner	<i>Notemigonus crysoleucas</i>	invertivore/ herbivore	cool	S5	no status	no status		X	X	OMNRF, 2014
Spotfin Shiner	<i>Cyprinella spiloptera</i>	invertivore/ herbivore	warm	S4	no status	no status			X	OMNRF, 2014
Finescale Dace	<i>Chrosomus neogaeus</i>	Invertivore/ planktivore	cool	S5	no status	no status	X			Kilgour & Associates, 2014
	Represents a species present in the respective watercourse									

(Coker et al., 2001; Eakins, 2018; MEC, 2008; OMNRF, 2014; MTO, 2006; Page et al., 2013; RVCA, 2016; Scott & Crossman, 1973)

Status Updated: January 20, 2021

3.3 Site Visit Summary

Four fish habitat/community visits took place in 2020. On the first visit, the South Nation Conservation (SNC) website indicated that there was a flood warning status in the watershed, indicating higher than normal water levels. On the other three visits, SNC indicated that there was a level 2 low water status in the watershed, indicating lower than normal water levels. However, significant rainfall (>15 mm) occurred in the week prior to the July 23 and 24 visits which could have resulted in higher than normal water levels during the summer visits. A list of dates and ambient conditions during the field visit is provided in Table 2.

Table 2: Summary of Dates and Times of the Site Investigation

Date	Time (h)	Staff	Air Temperature (Min-Max) °C	Cloud Cover (%) Beaufort Wind Scale [Descriptor (scale)]	Total Rainfall from 7 Previous Day (mm)	Purpose
April 7, 2020	1030-1500	M. Lavictoire S. Lafrance	7.0 (-0.4-12.5)	Clear sky Wind: light air (1) to light breeze (2)	2.7	- Fish Community Sampling
July 23, 2020	1100-1200	C. Fontaine S. Lafrance	23.0 (16.0-27.4)	Overcast Wind: light breeze (2)	20.0	- Fish Community Sampling
July 24, 2020	1000-1215	M. Lavictoire S. Lafrance	27.0-29.0 (14.6-30.8)	Clear sky Wind: light air (1)	20.0	- Fish Community Sampling
July 29, 2020	0745-1100	M. Lavictoire	21.0-25.0 (16.9-28.3)	Clear sky Wind: light breeze (2) changing to Cloudy Wind: light breeze (2)	9.0	- Fish Habitat Description
April 12, 2021	0855-0920	M. Lavictoire	13.0 (8.5-18.6)	Partially Cloudy Wind: moderate breeze (4)	0.0	-Fish Habitat Description
April 13, 2021	1135-1230	S. Lafrance A. Quinsey	14.0 (8.6-18.4)	Partially Cloudy Wind: light breeze (2)	0.0	- Fish Sampling -Fish Habitat Description

M. Lavictoire – Michelle (Nunas) Lavictoire – B. Sc. Wildlife Resources and M.Sc. Natural Resources
S. Lafrance – Sophie Lafrance – B.Sc. Biology and Graduate Certificate in Ecological Restoration
C. Fontaine - Cody Fontaine – Fish and Wildlife Technologist
A. Quinsey – Al Quinsey – B.Sc Env. Biologist

*Min-Max Temp Taken From: Environment Canada. National Climate Data and Information Archive. Ottawa International Airport. Available <http://climate.weatheroffice.gc.ca/> [April 20, 2021]

3.4 Fish Habitat Summary

The entire site was flat, and the features did not flow, even during the early spring. All were poorly constructed, or simply the result of the on-site fill, resulting in gradient barriers. Because of this, some features were split to show which ones were connected to one another in terms of possible fish movement. A total of eleven stations were established (Figure 2), at least one for every feature present on site or in its adjacent lands (120 m).

Roadside Ditch (west side of Boundary Road – tributary to Simpson’s Drain further downstream, direct fish habitat)

This is the west road ditch of Boundary Road. Roughly 200 m downstream of the site, this road ditch meets Simpson’s Municipal Drain.

Station 1

Station 1 was located on Roadside Ditch and was 65 m in length. The average channel width was 1.2 m and the average bankfull height 19 cm. The average spring wetted width and depth were 1.1 m and 9 cm, respectively. The station was dry during the summer visit.

The substrate consisted primarily of fines and the stream morphology was a glide. The in-water cover throughout the station was provided mostly by aquatic vegetation (cattails and purple loosestrife), with some overhanging vegetation. The top of the banks was fully vegetated (purple loosestrife, Canada goldenrod, cow vetch, American hog-peanut, bird’s-foot trefoil, glossy buckthorn, and narrow-leaved meadowsweet). There was some glossy buckthorn and trembling aspen on the west bank. Much of the station contained no or poor canopy cover.

During the April 7, 2020 visit, the station was electroshocked over an area of approximately 72 m² for 648 seconds. A total of 5 central mudminnow were captured (size range: 30 – 50 mm). The electrofishing effort was of 9 s/m². No sampling took place during the summer as the station was dry (July 29, 2020).



Photo 1: Roadside Ditch, upstream of station 1, looking downstream (April 7, 2020)



Photo 2: Roadside Ditch, upstream of station 1, looking downstream (July 29, 2020)

Feature 1 (southeast perimeter swale)

Feature 1 was the portion of the perimeter on the south side of the site, east of Feature 2. It was not graded properly and only the eastern 100 m was connected to the Roadside Ditch (1a). The remainder was mostly dry with a few pockets of very shallow water on April 7, 2020 (1b). In 2021 (April 12, 2021), a review of this area found only a few centimeters of water in the upstream end of 1a and no water within the vegetation in 1b. 1b did not provide fish habitat.

Station 2

Station 2 was located on feature 1a and was 40 m in length. The average channel width was 2.2 m and the average bankfull height 12 cm. The average spring wetted width and depth were 1.7 m and 11 cm, respectively. The station was dry during the summer visit.

The substrate consisted primarily of fines and the stream morphology was standing water. The in-water cover throughout the station was provided by aquatic vegetation (reed canary grasses, cut-leaved water horehound, lakebank sedge, purple loosestrife, smartweed, broad-leaved cattail, and cow vetch). The top of the banks was fully vegetated (reed canary grass, water horehound, lakebank sedge, purple loosestrife, smart weed, broad-leaved cattails, willow, speckled alder, and glossy buckthorn). Much of the station contained areas of no canopy cover on the north side but was entirely shaded by the dense woody vegetation on the south and inside the channel by the dense common reed.

The area was not fished in the spring because it was covered in snow and ice during the sampling visit. A few days later, when the water melted, it was confirmed to be connected to the Roadside Ditch without any barriers to fish movement along the first 100 m. No sampling took place during the summer as the station was dry (July 29, 2020).



Photo 3: Feature 1a, downstream of station 2, looking upstream (April 4, 2020)



Photo 4: Feature 1a, upstream of station 2, looking downstream (July 29, 2020)

The remaining section (labelled as 1b) could direct flow towards feature 2 but it was already dry by April 7, 2020 and as such does not provide fish habitat (Photo 5).



Photo 5: Feature 1b, looking upstream from downstream (April 7, 2020)

Feature 2 (Offsite and connected to the north ditch of Mitch Owens Road to the south)

Feature 2 had a north to south direction and was situated entirely offsite but connected to the perimeter drain. The distance to Mitch Owens Road ditch was ± 530 m. Direct fish habitat.

Station 3

Station 3 was located on feature 2, ending at the perimeter ditch and was 30 m in length. The average channel width was 3.7 m and the average bankfull height 25 cm. The average spring wetted width and depth were 5.1 m and 28 cm, respectively. The station was dry during the summer visit. Portions of the channel were ice covered on April 7, 2020.

The substrate consisted primarily of fines and the stream morphology was a glide. The in-water cover consisted of leaf litter, and large and small woody debris. There was also overhanging vegetation providing some cover. The banks were fully vegetated with trees (red maple and green ash), shrubs (speckled alder and glossy buckthorn) and herbs (purple loosestrife, sensitive fern, broad-leaved cattail, narrow-leaved and tall meadowsweet, and lakebank sedge). Most of the station contained little to no canopy cover.

During the April 7, 2020 visit, the station was electroshocked over an area of approximately 153 m² (1274 seconds). The electrofishing effort was of 8 s/m². A total of 4 central mudminnow

(size range: 28 – 100 mm) and one brook stickleback (45 mm) were captured. In addition, 3 central mudminnows were observed but not captured. No sampling took place during the summer as the station was dry (July 29, 2020)



Photo 6: Feature 2, upstream of station 3, looking downstream (April 7, 2020)



Photo 7: Feature 2, upstream of station 3, looking downstream (July 24, 2020)

Feature 3 (Portion of 3a was connected to Feature 2; 3b to Feature 4)

Feature 3a ran along the southwest perimeter of the site and measured 130 m long.

Approximately 20 m of the downstream portion of feature 3a was connected to feature 2 and is considered fish habitat. But gradient issues made it that the rest of the feature was not connected to any other watercourse, even during the early spring, making this portion an isolated waterbody that is not fish habitat.

Station 4

Station 4 was located on feature 3a, alongside the southeast perimeter of the site in the section that was not fish habitat. The station was 40 m in length. The average channel width was 2.6 m and the average bankfull height 15 cm. The station was dry during the summer visit.

The substrate consisted primarily of fines and the stream morphology was a glide. The in-water cover throughout the station was provided by overhanging vegetation, aquatic vegetation, and small wooded debris. The top of the banks was fully vegetated (speckled alder, glossy buckthorn, willow, lakebank sedge, sensitive fern, purple loosestrife, glossy buckthorn, grasses, and horsetail). The left bank was a treed swamp (willow, red maple). Much of the station had complete canopy cover.

The area was not sampled in the spring. Even during the first visit only the downstream 20 m was accessible to fish. The remaining 110 m is not considered fish habitat due to its lack of connectivity with feature 2. No sampling took place during the summer as the station was dry (July 29, 2020).



Photo 8: Feature 3a looking upstream from its connection with Feature 2 (April 7, 2020)



Photo 9: Feature 3a, upstream of station 4, looking downstream (July 24, 2020)

Feature 3b also ran along the southwest perimeter of the site and measured 80 m. This feature contained some water in the spring but was only connected to Feature 4. That feature was isolated from all fish bearing watercourses. No stations were created.



Photo 10: Feature 3b, downstream of station 4, looking upstream (May 17, 2020)

Feature 4 (Isolated, not fish habitat)

Feature 4 was the west perimeter drain and measured 210 m long. The feature was not connected to any other watercourse as it flowed towards the southwest corner of the site where it ended in a ponded area. No connections to other waterbodies, even during the spring, makes this an isolated waterbody that is not fish habitat.

Station 5

Station 5 was located on feature 4, alongside the west perimeter of the site, and was 50 m in length. The average channel width was 3.1 m and the average bankfull height 18 cm. The spring average wetted width and water depth was 2.1 m and 26 cm, respectively. The station was dry during the summer visit.

The substrate consisted primarily of fines and the stream morphology was standing water, with a few pools. The in-water cover throughout the station was provided by terrestrial and aquatic vegetation (purple loosestrife, reed canary grass, grasses, purple clover, bird's-foot trefoil, cow vetch, and willows). The top of the banks was fully vegetated (wild carrot, cow vetch, bird's-foot trefoil, sow thistle, glossy buckthorn, trembling aspen, willow, purple loosestrife). Much of the drain had no canopy cover but some had complete cover from the willows growing within the channel.

The area was not sampled in the spring as it was covered in snow. It was then found that it is not fish habitat due to its lack of connectivity with any other features.



Photo 11: Feature 4, downstream of Station 5, looking upstream (May 17, 2020)



Photo 12: Feature 4, downstream of station 5, looking upstream (July 29, 2020)

Feature 5 (connected to the Roadside Ditch)

Information was collected from within the ponded areas (stations 6 and 7) and from the ditched portion of this habitat (station 8). The entire feature was 450 m long and flowed into the Roadside Ditch.

Station 6 (upper pond along edge of forest)

Station 6 was located on the Ponds of Feature 5 and was 50 m in length. The average channel width was 7.6 m and the average bankfull height 23 cm. The spring wetted width and depth were 13.0 m and 50 cm, respectively, and the summer wetted width and depth were 4.1 m and 4 cm, respectively. During low water, this area becomes an area with isolated pools of shallow water, subjected to thermal impacts.

The substrate consisted primarily of fines and the stream morphology was a pool. The in-water cover consisted of aquatic vegetation (algae, water plantain, water plant, grasses, and softstem bulrush) and large woody debris. The banks were mostly vegetated (burweed, stonewort, Joe-pye-weed, wild carrot, sensitive fern, purple loosestrife, broad-leaved cattail, willow, and eastern cottonwood). The cottonwood was young (regenerating) and did not provide canopy cover. Most of the station contained little to no canopy cover.

This station was not sampled in the spring as it shared fish habitat with station 8 and is considered fish habitat (see species list from station 8). In the summer, this station was dip

netted. One central mudminnow (36 mm) and approximately 60 common shiners (size range: 15-30 mm) were captured. Several other small minnows were observed but not captured.

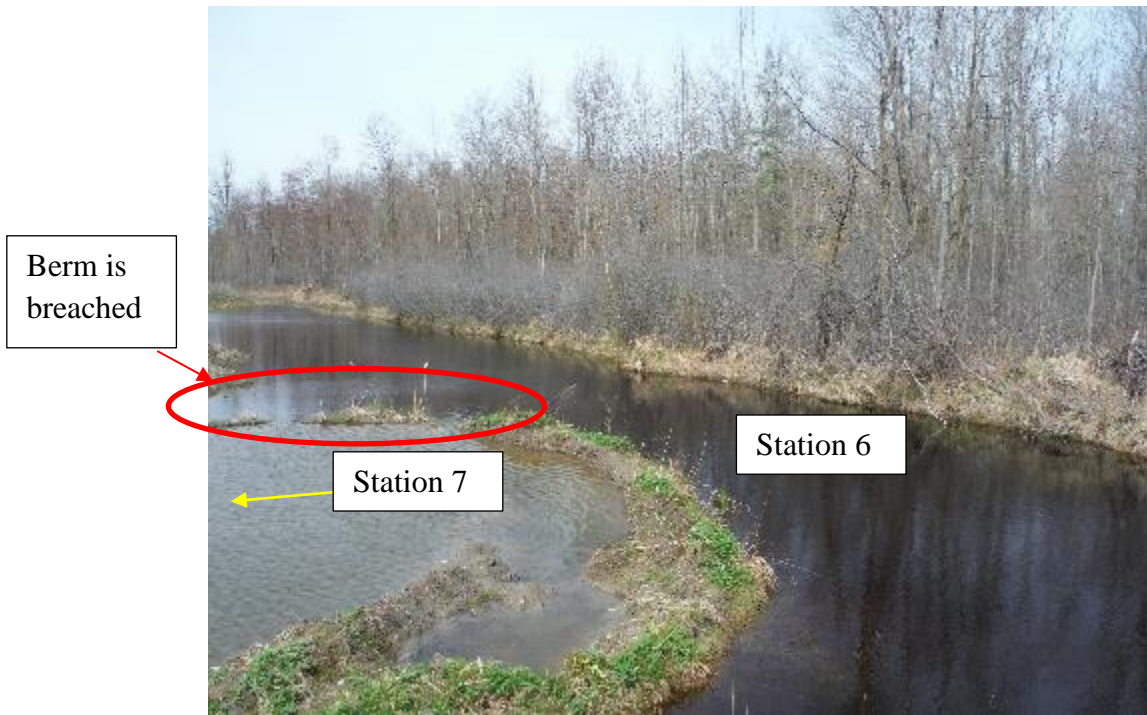


Photo 13: Feature 5 (upper ponds), downstream of station 6, looking upstream (May 17, 2020)



Photo 14: Feature 5 (upper ponds), downstream of station 6, looking upstream (July 24, 2020)

Station 7 (pond perpendicular to rest of feature)

The entire pond was 75 m in length and Station 7 was placed in the permanent habitat (northern 35 m). The average channel width was 10.9 m and the average bankfull height 46 cm. The spring wetted width and depth were 7.0 m and 80 cm, respectively. In the summer, the southern 44 m in length of the pond was dry. The remainder had a summer average wetted width and depths of 6.7 m and 33 cm, respectively. A seasonal barrier to fish movement was found on the northern edge of this pond. This berm was overtopped during the spring. In the summer, the soil berm created a seasonal barrier and was 49 cm high (Photo 13).

The substrate consisted of fines and the stream morphology was a pond. The in-water cover consisted of aquatic vegetation (softstem bulrush, narrow-leaved cattail, purple loosestrife, stonewort, common reed, water plantain, and woolgrass). The banks were mostly vegetated (willow, common reed, wild carrot, sensitive fern, common vetch, narrow-leaved cattails, and purple loosestrife). The station contained no canopy cover.

This station was not sampled in the spring as it shared fish habitat with station 8. The station was sampled in the summer using two hoop nets. Two central mudminnows (length 76 and 90 mm) and three pumpkinseeds (size range: 86 to 89 mm) were captured. A brook stickleback (approximately 15 mm in size) was observed in the water and a painted turtle was also captured in the nets.

Table 3: Feature 5 in the Ponds, Station 7 – Summer Catch

Species Name	Scientific Name	No. of fish (size range, mm)
		Spring
Central Mudminnow	<i>Umbra limi</i>	2 (76-90)
Brook Stickleback	<i>Culaea inconstans</i>	1 (15)
Pumpkinseed	<i>Lepomis gibbosus</i>	3 (86-89)
Effort		2 hoop nets
Total No. Species		3
Total No. Individuals		6



Photo 15: Feature 5 (pond), downstream of station 7, looking southwest (April 7, 2020)



Photo 16; Feature 5 (pond), downstream of station 7, looking south (July 24, 2020)

Station 8 (ditch)

Station 8 was located along the northeast perimeter and was 55 m in length. The average channel width was 2.0 m and the average bankfull height 18 cm. The spring average wetted width and water depth was 2.4 m and 17 cm, respectively. The station was dry in the summer.

The substrate consisted primarily of fines and the hydrological flow was a glide. The in-water cover consisted of aquatic vegetation (narrow-leaved cattail, and purple loosestrife). The top of the banks was mostly vegetated with grasses and shrubs (goldenrod, cow vetch, willows, Manitoba maple, and sensitive fern). Most of the station contained areas of good canopy cover.

During the April 7, 2020 visit, the station was electroshocked over an area of approximately 134 m² (819 seconds). The electrofishing effort was of 6 s/m². A total of 15 fish were captured, representing 3 species: central mudminnow, creek chub, and brook stickleback (Table 4). No sampling took place during the summer as the station was dry (July 29, 2020).

Table 4: Feature 5, Station 8 – Spring Catch

Species Name	Scientific Name	No. of fish (size range, mm) Spring
Central Mudminnow	<i>Umbra limi</i>	12 (40 – 97)
Creek Chub	<i>Semotilus atromaculatus</i>	1 (105)
Brook Stickleback	<i>Culaea inconstans</i>	2 (48 – 53)
	Effort	6 s/m²
	Total No. Species	3
	Total No. Individuals	15



Photo 17: Feature 5 (ditch), downstream of station 8, looking upstream (April 7th, 2020)



Photo 18: Feature 5 (ditch), upstream of station 8, looking downstream (July 29, 2020)

Feature 6 (agricultural ditch, direct fish habitat)

Information was collected from an agricultural ditch flowing towards and then parallel to the site boundary for about 45 m before flowing another 580 m to Mitch Owens Road.

Station 9

Station 9 was a few meters west of the study area and was 43 m in length. The average channel width was 2.0 m and the average bankfull height 18 cm. The spring average wetted width and water depth was 1.9 m and 21 cm (range: 20-23 cm), respectively. The station was dry in the summer.

The substrate consisted primarily of fines and the hydrological flow habitat consisted of glide. The in-water cover consisted mostly of aquatic vegetation (purple loosestrife), with some overhanging vegetation (goldenrod, reed canary grass, willow, glossy buckthorn). The top of the banks was fully vegetated with grasses and shrubs (goldenrod, reed-canary grass, willow, glossy buckthorn, and trembling aspen). Most of the station contained areas of poor canopy cover. There was erosion throughout the station.

During the April 7, 2020 visit, the station was electroshocked over an area of approximately 82 m² (856 seconds). The electrofishing effort was of 10 s/m². A total of 39 fish were captured, representing 3 species: central mudminnow, brassy minnow and brook stickleback (Table 3). No sampling took place during the summer as the station was dry (July 29, 2020).

Table 5: Station 9 – Spring Catch

Species Name	Scientific Name	No. of fish (size range, mm) Spring
Central Mudminnow	<i>Umbra limi</i>	32 (34 – 106)
Brassy Minnow	<i>Hybognathus hankinsoni</i>	1 (54)
Brook Stickleback	<i>Culaea inconstans</i>	6 (40 – 43)
	Effort	10 s/m²
	Total No. Species	3
	Total No. Individuals	39



Photo 19: Feature 6, downstream of station 9, looking upstream (April 7th, 2020)



Photo 20: Feature 6, downstream of station 9, looking upstream (July 29, 2020)

Feature 7 (ephemeral swale, not fish habitat)

Information was collected from a shallow ephemeral swale without defined banks located immediately north of the site, in the forest. There was no connection with Feature 5 (flow went through the bank, not exit location was found).

Station 10

Station 10 was in the woodlands north of the study area and was 50 m in length. The spring average wetted width and water depth was 1.1 m and 5 cm (range: 4-7 cm), respectively. The station was dry in the summer.

The substrate consisted primarily of soil (no sorting) and the hydrological flow consisted of glide. The in-water cover consisted of leaf litter. The top of the banks was mostly vegetated with trees and shrubs. The station had good canopy cover overall.

During the April 7, 2020 visit, the station was fished using a dipnet over an area of approximately 55 m² (50 dipnets). No fish were seen or caught. No sampling took place during the summer as the station was dry (July 29, 2020).



Photo 21: Feature 7, upstream of station 10, looking downstream (April 7th, 2020)



Photo 22: Feature 7, looking downstream at the connection with the ponds (April 7, 2020)

Feature 8 (ephemeral swale, not fish habitat)

Information was collected from a shallow ephemeral swale without defined banks located north-east of the site, in the forest. There was no connection with the roadside ditch (disconnected by a blockage of a soil between this feature and the ditch, >120 cm long). The channel was not continuous, with another length of 165 cm of soil holding back water further upstream.

Station 11

Station 11 was in the woodlands north-east of the study area and was 120 m in length. The spring average wetted width and water depth was 1.4 m and 5 cm (range: 2-13 cm), respectively. The station has not been visited in the summer but would likely be dry.

The substrate consisted primarily of soil (no sorting) and the hydrological flow consisted of standing water (held back by the humps of soil). The in-water cover consisted of leaf litter. The top of the banks was mostly vegetated with trees and shrubs. The station had good canopy cover overall.

During the April 13, 2021 visit, the station was fished using a dipnet over an area of approximately 120 m² (over 50 dipnets). No fish were seen or caught.



Photo 23: Downstream of the station, looking at the standing water (April 12, 2021)



Photo 24: Looking upstream at the soil berm separating the feature from the roadside ditch (April 12, 2021)

5.0 EIS – Analysis of Potential to Impact the Natural Features

It is understood that the following will take place:

- Access to the site will be from Boundary Road. The construction of the will require:
 - Installation of a properly designed and sized culvert to allow fish access.
 - Potential for minor clearing of vegetation along road ditch and in the road ditch itself.

- Construction of warehouse/trucking site.
 - All permanent disturbances are to be a minimum of 15 m from the new habitat (to be created/relocated along the north), and from the existing perimeter ditches.
 - Clearing of woody vegetation may be required for the realignment of Feature 5.
 - Water quantity and quality reaching all of the features (even the non-fish habitat) will remain the same through the creation of an infiltration berm.
 - The infiltration berm will be situated within the 15 m buffer and is acceptable as this is a mitigation measure to protect water quality. It could also be vegetated with native species appropriate for the site and functions.
 - A dry pond will be situated within the 15 m buffer from the road ditch of Boundary Road. This is also acceptable provided that the outlet of the facility is designed to prevent fish from entering the facility and to prevent erosion of the road ditch.

Based on the background review and site investigations it has been noted that there is no potential for fish/mussel SAR.

5.1 Impact Assessment Methods

The assessment of the potential impacts is completed by analyzing the impact of the activities associated with the development of the long-term care facility (listed in section above) using four different criteria:

1. Area affected may be:
 - a. local in extent signifying that the impacts will be localized within the project area
 - b. regional signifying that the impacts may extend beyond the immediate project area.

2. Nature of Impact:
 - a. negative or positive
 - b. direct or indirect

3. Duration of the impact may be rated as:
 - a. short term (construction phase, 1-2 years)
 - b. medium term (3-4 years)
 - c. long term (>4 years).
 - d. permanent

4. Magnitude of the impact may be:
 - a. negligible signifying that the impact is not noticeable
 - b. minor signifying that the project's impacts are perceivable and require mitigation
 - c. moderate signifying that the project's impacts are perceivable and require mitigation as well as monitoring and/or compensation
 - d. major signifying that the project's impacts would destroy the environmental component within the project area.

5.2 Evaluation of Potential Impacts to Fish and Fish Habitat

This assessment focused on the potential of the development to impact the fish habitat. The features and which ones were considered fish habitat is summarized in Table 6. In short, there were eight features identified, plus one road ditch and several isolated ponds. All habitats that were not connected to downstream fish bearing habitat [1b, 3a (upper portion), 3b, 4, 8 and the isolated ponds] do not need a reviewed under the *Fisheries Act*. These are discussed in the headwater drainage feature report and it is noted here that only the isolated ponds will be altered. Other features [1a, 2, and 3a (lower section)] will remain in place and will receive the same quality and quantity of water via an infiltration berm. Feature 8 will not be impacted. The use of the infiltration berm facilitates review of the headwater impacts, as it prevents changes pre- and post-construction to these existing features. Of the remaining features four (the road ditch and features 1a, 5 and 6) are direct seasonal fish habitat (forage fish). Feature 7 provides contributing flow as its water drains through a sand berm into Feature 5. Feature 8 is unlikely to provide any contributing flow as it was ponded with little water on April 12, 2021 and disconnected from the road ditch by soil.

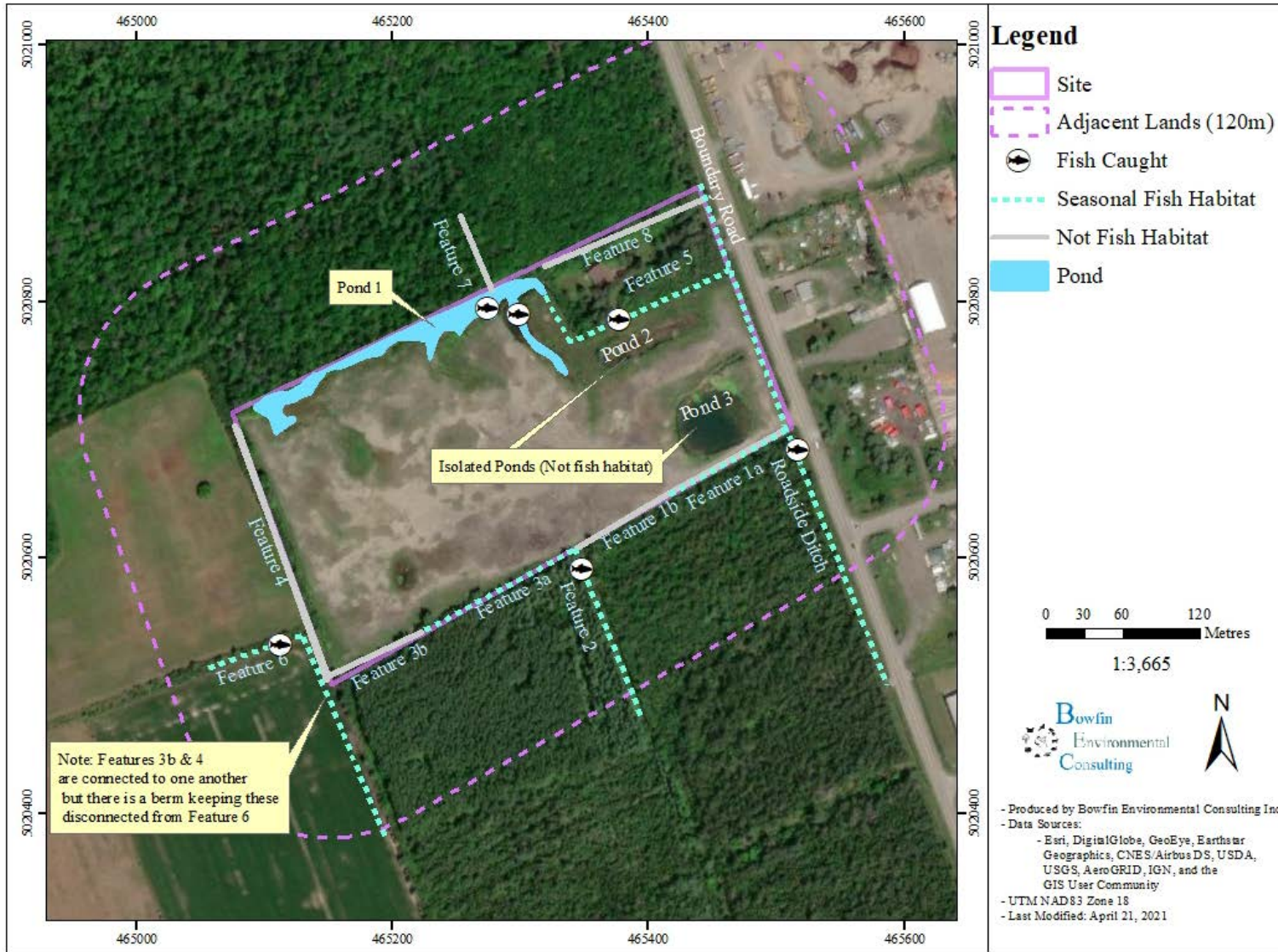
Table 6: Summary of Findings

Feature	Contributes Water to	Fish Habitat	Species	Flow Condition	Direct Impacts	Indirect Impacts	Bought Forward (Fisheries)
Boundary Road West Ditch	Simpson Municipal Drain	Direct	Forage	Seasonal, standing water	Culvert	Reduced setback and work within 30 m of HWM	Yes
Feature 1a	Boundary Road Ditch	Direct	Forage	Seasonal, standing water	None	Reduced setback and work within 30 m of HWM	Yes
Feature 1b	N/A	N/A	N/A	Dry	N/A	N/A (see headwater report)	No (see Headwater Report)
Feature 2	Simpson Municipal Drain	Direct	Forage	Seasonal, standing water	None	Start (u/s end) of channel will have reduced setback and work within 30 m of HWM	Yes
Feature 3a	Lower 20 m – Feature 2	Direct	Forage	Seasonal, standing water	None	Reduced setback and work within 30 m of HWM	Yes
	Remainder isolated	Indirect	N/A	Ephemeral, pockets of standing water	None	Reduced setback and work within 30 m of HWM	No (see Headwater Report)
Feature 3b	N/A	Not Fish Habitat – Isolated	N/A	Seasonal, isolated, standing water	None	N/A (see headwater report)	No (see Headwater Report)
Feature 4	N/A	Not Fish Habitat – Isolated	N/A	Seasonal, isolated, standing water	None	N/A (see headwater report)	No (see Headwater Report)
Feature 5 and Pond	Boundary Road Ditch	Direct	Forage, Pan	Seasonal, isolated, standing water	Realigned and piped	Reduced setback and work within 30 m of HWM	Yes

Proposed Development of 5494 and 5510 Boundary Road

Feature	Contributes Water to	Fish Habitat	Species	Flow Condition	Direct Impacts	Indirect Impacts	Bought Forward (Fisheries)
Feature 6	Simpson Municipal Drain	Direct	Forage	Seasonal	None	Reduced setback and work within 30 m of HWM but impacts intercepted by Feature 4	Yes (offsite)
Feature 7	Feature 5	Indirect	N/A	Ephemeral flow	None	None	No (offsite)
Feature 8	None (not connected to road ditch)	Not fish habitat	None	Standing water	None	None	No
Isolated Ponds	None – isolated	Not Fish Habitat – isolated	N/A	N/A	N/A	N/A	No

Figure 4: Summary of Features



Potential Impacts to fish and fish habitat

Based on the list of work activities provided, it is likely that this concept plan would be acceptable to DFO, though offsetting may be required for the relocation of the pond and feature 5.

- New culvert on the road side ditch, needs to be properly designed and allow fish passage.
- A reduced setback of from 30 m to 15 m for all features is acceptable, especially given the existing conditions that has fill up to the edge of all features.
- Properly designed and constructed stormwater treatment facilities (infiltration drains and dry pond) to ensure that the water reaching the fish habitat remains the same in quantity and quality, and
- Relocation of Feature 5 (including its ponds).
 - Design of this habitat is pending.
 - It is noted that the current configuration of the habitat is not desirable as the shallow hot water in the summer is likely resulting in fish traps.

No Request for review is required for the setback reduction from 30 m to 15 m if:

- Fish habitats on-site (road ditch, 1a, and 5) and those offsite (2 and 6) continue to receive the same water quantity and quality.
- If possible complete the work within 30 m of the watercourse during the normal in-water timing window (work between July 1 and March 14, inclusive). This way if there is an accident or malfunction there is less risk to fish.
- The proper erosion and sediment control measures are installed and maintained prior to any clearing of vegetation within **30 m** of the watercourse and until the banks are stabilized (>80% revegetated).
- The stormwater management facility and septic treatment systems are designed and installed as appropriate with an outlet that does not allow fish access to the facility.

Recommended Avoidance and Mitigation Measures

Note: this is to be updated once more information is available on design.

Planning

- Submit a Request for Review to DFO prior to completing any works that affect the fish habitat (road ditch, Feature 1a, 2, 5 (including the connected ponds)).
- Ensure that slow spring velocities (1:2 year) through the new road ditch culvert allow fish passage.
- Ensure that the same quantity and quality of water continues to reach the same waterbodies post-construction as pre-construction.
- Minimize clearing of vegetation within 30 m from the normal high-water mark.

- Any placement of rip rap for the new culvert or outlet of the dry pond etc., will to consist of rock that is clean and free of fines.
- The placement of the rip rap will occur during the normal in-water timing window (July 1-March 14, inclusive). It is recommended that it take place during the low-water period.
- Construction of the outlet drain from the dry pond to the road ditch, is to be scheduled to occur during dry conditions (if a rain event is scheduled to occur, then work is to be postponed) and designed to prevent fish from accessing the stormwater facility.
- Clearly demarcate work areas within the riparian habitat in the field.
- All works associated with the relocation of fish habitat must occur during the in-water work window (July 1 to March 14, inclusive). This is to prevent impacts to fish habitat downstream. These works are to be scheduled outside of rain events.
- Erosion and sediment control measures will be installed prior to the clearing of vegetation within 30 m of a watercourse.
- Suspend any activities that cause muddy environments during periods of heavy rains.
- A 15 m buffer is to be established between the edge of pavement and the existing fish habitats.
- The septic systems are to be properly designed and installed.
- Consider planting the infiltration berm with native herbaceous or woody species.

Erosion and Sediment Control

- An erosion and sediment control plan will be developed by contractor and implemented prior to any work within 30 m of the watercourse.
 - Provide regular maintenance to the erosion and sediment control measures during construction. Contractor shall be responsible for ensuring that the erosion and sediment control measures are maintained and will monitor the water clarity downstream of the work site throughout the day and during rain events. Water quality is to meet the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. Monitoring for visible plumes outside of the work area is to be undertaken.
 - At a minimum, the erosion and sediment control plan will include the installation of sediment fencing along the top of banks where vegetation clearing and/or soil disturbance will occur within 30 m of any channel prior to the removal of vegetation.
 - Additional materials (*i.e.* rip rap, filter cloth and silt fencing) will be readily available in case they are needed promptly for erosion and/or sediment control.
- Any stockpiles of soil or fill material will be stored as far as possible from the channel and protected by silt fencing (minimum 30 m).
- The sediment fencing will not be removed until the bank is stabilized (*i.e.* >80% revegetated or covered with an erosion control blanket).

- All equipment working within 30 m of the water will be well maintained, clean and free of leaks.
- Where banks/riparian area (area within 30 m of channel) have been stabilized by seeding and/or planting, monitor the revegetation to ensure that the vegetation becomes fully established.
- Where possible, limit clearing of vegetation to trimming and leave the stump and lower 60 cm of the tree trunk in place (for shoreline stabilization).
- It is recommended that owner completes additional monitoring of the erosion and sediment control measures and of the water quality during any works in or within 30 m of the Pharmacy Drain and during the removal of the unnamed drain (assuming that its removal is approved).

Fish and Fish Habitat Protection

- All material introduced for any temporary measures will be fully removed from the water at the completion of the work.
- Any work planned for existing fish habitat (i.e. Feature 5 and its ponds, culvert on road ditch) will be completed in an isolated area and in the dry (i.e. install cofferdams and pump out water, if needed). A fish salvage by a biologist or fisheries technician is to take place during this work.
- Once plans for any dewatering of existing fish habitat are made, then these will be reviewed by a biologist familiar with fish and the *Fisheries Act*.

Contaminant and Spill Management

- Machinery entering the work area should be free of mud to minimize the introduction of invasive plant species (special note to ensure that Common Reed is not spread).
- All equipment working in or near the water should be well maintained, clean and free of leaks. Maintenance on construction equipment such as refueling, oil changes or lubrication would only be permitted in designated area located at a minimum of 30 m from the shoreline in an area where sediment erosion control measures and all precautions have been made to prevent oil, grease, antifreeze or other materials from inadvertently entering the ground or the surface water flow.
- Emergency spill kits will be located on site. The crew will be fully trained on the use of clean-up materials to minimize impacts of any accidental spills. The area would be monitored for leakage and in the unlikely event of a minor spillage the project manager would halt the activity and corrective measures would be implemented. Any spills would be immediately reported to the MOECC Spills Action Centre (1800 268-6060).
- No construction debris will be allowed to enter the watercourse.
- Following the completion of construction, all construction materials will be removed from site.

Activity	Area	Nature	Duration	Magnitude
15 m buffer along all existing and relocated features	Local	Indirect, neutral (because of existing conditions)	Permanent	Low (because of existing conditions)
Installation of new culvert (properly designed to allow fish passage)	Local	Direct, Negative	Permanent	Negligible – Requires DFO review
Installation of infiltration berm	Local	Direct, Positive	Permanent	Negligible - mitigation measure
Relocation of Feature 5 and its ponds	Local	Direct, Negative and positive (existing ponds are a fish trap)	Permanent	To be determined following design DFO review required

6.0 CONCLUSIONS AND RECOMMENDATIONS

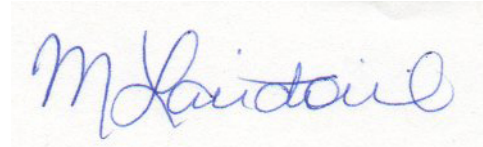
This assessment focused on evaluating the significance of the waterbodies found and their value as fish habitat. A preliminary assessment of the potential impacts and a list of draft avoidance and mitigation measures are provided. These will need to be amended once the detailed design is available.

The existing conditions are such that the site is heavily disturbed by the fill brought in by others. There were eight features identified, plus one road ditch and several isolated ponds. Of these the only fish habitat (seasonal, forage fish) that will be impacted are Feature 5 and the Boundary Road west ditch. Indirect impacts stem mostly from the reduction of setback from the traditional 30 m to 15 m. Since this buffer will be naturalized (from the existing fill conditions) this would be an improvement over the existing. The same quantity and quality of water is to be directed to all features (non-fish and fish habitat) post-construction as pre-condition. The installation of a new culvert on the road side ditch can be designed and installed in a way that promotes fish passage and avoids a HADD. The design for the relocation of Feature 5 will need to consider fish habitat.

I trust that this report will meet your requirements. Should you have any questions or comments, please contact the undersigned.

Sincerely,

Bowfin Environmental Consulting Inc.



Michelle Lavictoire,
Biologist / Principal

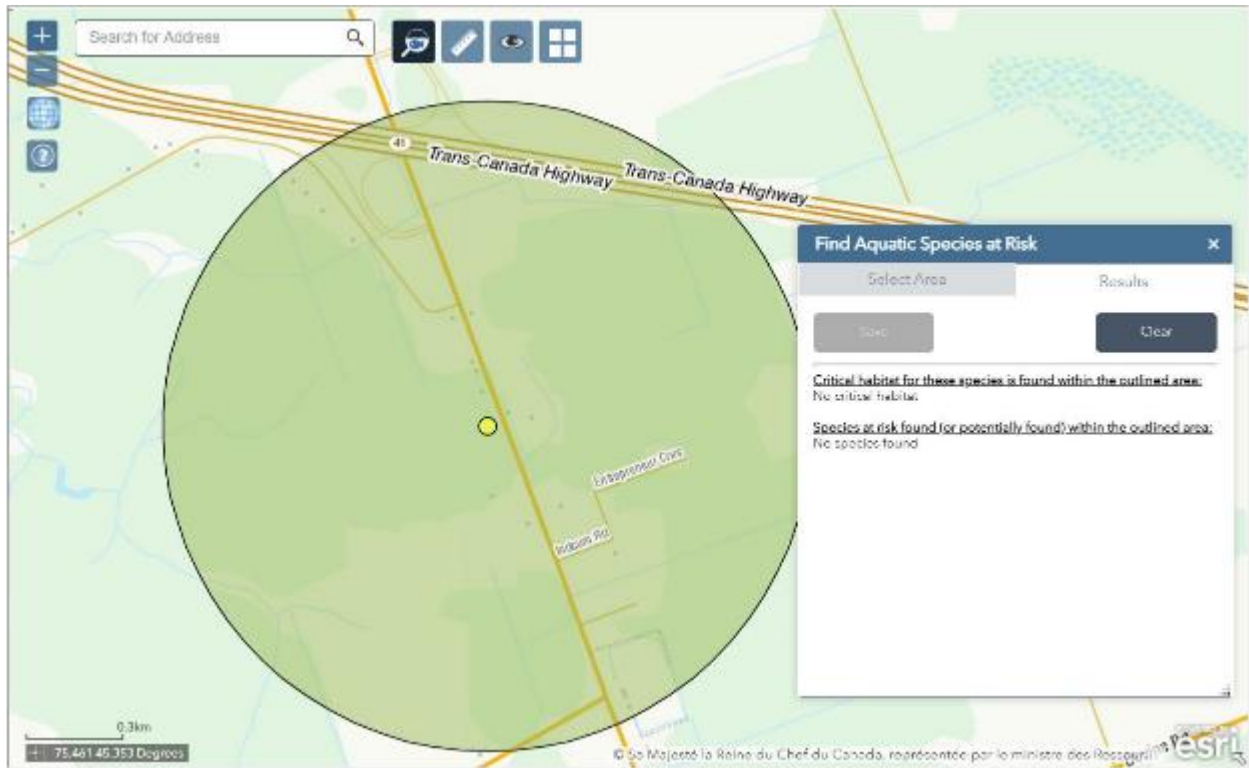
7.0 REFERENCES

- Coker, G.A., Portt, C.B., & Minns, C.K. (2001). Morphological and Ecological Characteristics of Canadian Freshwater Fishes. *Canadian Manuscript Report of Fisheries and Aquatic Sciences 2554*. 89pp.
- Eakins, R.J. (2018). Ontario Freshwater fishes life history database. Retrieved September 26, 2018 from: <http://www.ontariofishes.ca>
- Gervais, R and C. Katopodis (2015). Draft Fish Swimming Performance User Guide. Katopodis Ecohydraulics Ltd. May 31, 2015. 54pp.
- Kilgour & Associates. (2014). Fish and Fish Habitat Risk Assessment for the Simpson Drain at 100 Entrepreneur Crescent. ii + 13pp and appendix 1-1.
- OMNR (2010). Natural Heritage Reference Manual for policy 2.3 of the Provincial Policy Statement.
- Ontario Ministry of Natural Resources. (2014). Land Information Ontario
- Page, L.M, Espinosa-Pérez, H., Findley, L.T., Gilbert, C.R., Lea, R.N., Mandrak, N.E., Mayden, R.L., & Nelson, J.S. (2013). *Common and Scientific Names of Fishes from the United States, Canada, and Mexico*, 7th edition. American Fisheries Society. Special Publications 34.
- MTO (2006). *Environmental Guide for Fish and Fish Habitat, Section 5: Sensitivity of Fish and Fish Habitat*. Ministry of Transportation Ontario

Scott W.B. & Crossman E.J. (1973) *Freshwater Fishes of Canada*. Bulletin 184. Fisheries Research Board of Canada, Ottawa.

Stanfield, L. (editor). (2013). *Ontario Stream Assessment Protocol*. Version 9.0. Fisheries Policy Section. Ontario Ministry of Natural Resources. Peterborough, Ontario. 505 pp.

Appendix A: DFO Species at Risk Mapping



Accessed on January 26, 2021