Headwater Drainage Features Assessment Report
37 Wildpine Court, Stittsville, Ottawa, Ontario

Draft Report

December 11, 2020

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

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List of Acronyms and Abbreviations

CVC – Credit Valley Conservation
ELC – Ecological Land Classification
HDFA – Headwater Drainage Features Assessment
KAL – Kilgour & Associates Ltd.
MVCA – Mississippi Valley Conservation Authority
OSAP – Ontario Stream Assessment Protocol
OWES – Ontario Wetland Evaluation
TRCA – Toronto and Region Conservation Authority

1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by Wildpine Trails Inc. to provide a Headwater Drainage Features Assessment (HDFA) report for 37 Wildpine Court in Stittsville, Ottawa, Ontario (herein "the Site"; Figure 1). This HDFA report provides a detailed description of the single headwater drainage feature on the Site. A headwater drainage feature is a non-permanently flowing drainage feature that may not have a defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales, and connected headwater wetlands, but do not include rills or furrows (Toronto and Region Conservation Authority (TRCA) and Credit Valley Conservation (CVC), 2014). Based on this definition, the Site only contains one headwater feature which is a headwater wetland. A headwater wetland is a wetland that is connected downstream through surface flow (TRCA and CVC, 2014). The wetland on the Site is part of the Stittsville Wetland complex (not a provincially significant wetland) and is connected downstream to Poole Creek via surface flow. Poole Creek is not considered a headwater drainage feature because it is a permanently flowing feature. As such, this HDFA report provides information on the headwater wetland's aquatic and riparian habitat and the presence of biota along with appropriate management options for the feature (TRCA & CVC, 2014).

1.1 Property Information

The Site is approximately 2 hectares (ha) and is zoned *R3XX[1046] – Residential Third Density Zone* and is therefore intended for residential development. At the time of writing this report, the Site was dominated by wooded areas including those part of the Stittsville Wetland complex. The Site also contained open lawn space, a paved cul de sac, a single detached home with a separate garage and shed, a small portion of Poole Creek, and regulated floodplain of Poole Creek.

The Site is surrounded by:

- A shopping plaza, a stormwater management pond, and the Stittsville Wetland complex to the north;
- Poole Creek and the Stittsville Wetland complex to the east;
- A residential community on Wildpine Court to the south; and
- A residential community on Ravenscroft Court to the west.

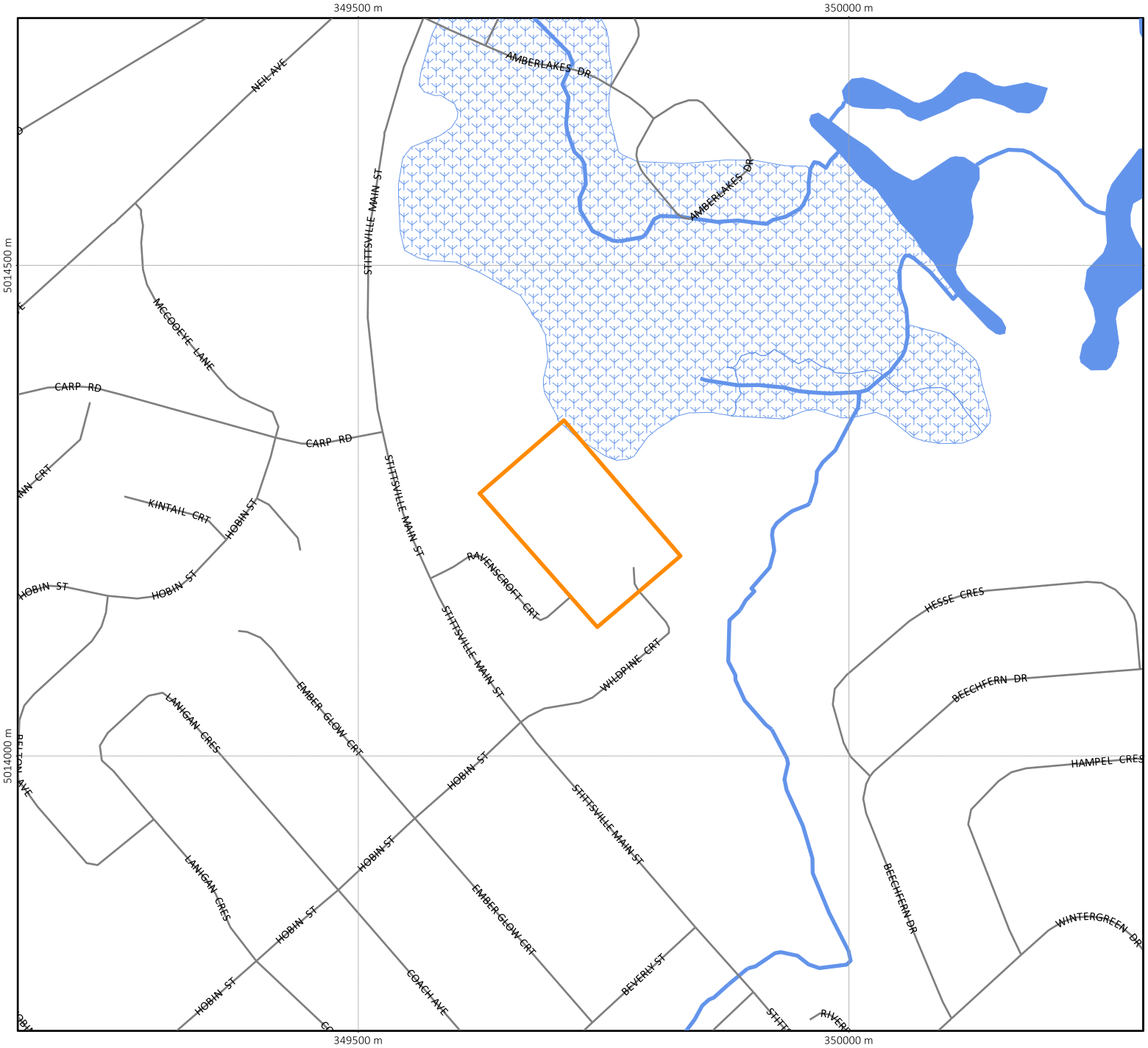

Figure 1 Map showing location context for the Site

Legend

Property Lines

Surface Water Features
(Ontarion Basemap)

Water Course

Wetland

N

0 100 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-09

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2.0 METHODS

Survey methods for the headwater wetland on the Site followed the "Standard" survey type for HDFAs (TRCA & CVC, 2014; Table 1).

Table 1 Data requirements for the Standard survey type for Headwater Drainage Features Assessments

Survey Type	Sensitivity, Feature Form, and Flow	Mandatory Data Requirements		Additional Data Requirements for HDF Alterations	
		Flow Condition	Riparian	Fish and Fish Habitat	Terrestrial Assessment
Standard	Sensitive species/habitat possible and/or ill-defined form, intermittent flow likely	Ontario Stream Assessment Protocol (OSAP) S4.M10 (Headwaters)	OSAP S4.M10 (Headwaters)	OSAP S3.M1	Marsh Monitoring Protocol for Amphibians; Ecological Land Classification; Ontario Wetland Evaluation System (for wetlands ≥ 0.5 ha)

Table Notes: Adapted from Toronto and Region Conservation Authority and Credit Valley Conservation (2014)

Site investigations were performed in the spring and summer of 2020 to perform anuran (frog and toad) surveys, delineate the wetland's boundaries, characterize surface water levels in the spring and summer, and document vegetation communities (Table 2). The Standard survey type for HDFAs calls for an assessment of fish habitat using OSAP S3.M1; however, since the wetland did not contain any open water or permanent standing water, fish sampling was not conducted. The adjacent Poole Creek is known to contain a variety of fish species (e.g., MVCA, RVCA, & SNC, 2019; MVCA, 2009).

Table 2 Summary of site investigations

Date	Purpose
2020-05-05	Anuran survey #1.
2020-05-21	Anuran survey #2.
2020-05-22	Delineate the wetland's boundaries and characterize surface water levels and vegetation during spring conditions.
2020-06-03	Delineate the wetland's boundaries and characterize surface water levels and vegetation during spring conditions (continued).
2020-06-19	Anuran survey #3.
2020-06-23	Confirm wetland boundaries with Mississippi Valley Conservation Authority (MVCA).
2020-07-15	Investigate the wetland's surface water levels and vegetation during summer conditions.

2.1 Anuran Surveys

Aural anuran surveys were performed following the Marsh Monitoring Program (Bird Studies Canada et al., 2008). This protocol calls for multiple survey stations at a site to capture spatial and habitat variability. Accordingly, surveys were performed from two stations ("MMP-1" and "MMP-2" on Figure 2) adjacent to the wetland on the Site. The Marsh Monitoring Program advises that each station be visited a minimum of three times at night, no less than 15 days apart, during the spring and early summer.

Following this protocol, the timing of the three anuran surveys is based on nighttime air temperature:

- Early breeders (Wood Frog, Western Chorus Frog, Spring Peeper): above 5°C;
- Mid-season breeders (Mink Frog, American Toad, Gray Treefrog): above 10°C; and
- Late breeders (Green Frog, Bullfrog): above 17°C.

Three rounds of anuran surveys were performed and began one half hour after sunset and ended before 1:00 am on evenings with appropriate temperatures and light winds.

Any additional observations of amphibians were recorded during other visits to the Site. Rocks, fallen wood, and other debris were turned over to check for salamanders throughout the broader field campaign.

Figure 2 Map showing the locations of anuran survey stations for the Site

Legend

Property Lines

Wildlife Survey Stations

Anurans

N

0 50 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
Printed on: 2020-12-11

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2.2 Wetland Delineation

The boundaries of the wetland on the Site were delineated following techniques used in the Ontario Wetland Evaluation System (OWES; MNR, 2014). Wetland boundaries on the Site were determined in the field based on plant species composition and soils, and via desktop using aerial imagery and elevation mapping. A biologist from MVCA visited the Site with KAL biologists to review the wetland's boundaries and agreed with KAL's delineation. Since this wetland was previously evaluated and scored using OWES (did not rank as provincially significant), a wetland evaluation was not performed.

2.3 Ecological Land Classification

Vegetation communities on the Site were characterized following Ecological Land Classification (ELC; Lee et al., 1998). This method results in a standardized description of each vegetation community, giving information on dominant plant species and soils.

2.4 Surface Water Levels

Surface water levels in the wetland were qualitatively assessed by conducting walking surveys of wetland on the Site during the spring and summer. This involved confirming whether the wetland contained standing surface water, if it was surface-damp, or if the soil surface was dry.

3.0 RESULTS

3.1 Anuran Surveys

No anurans were observed during evening aural surveys (Table 3) or during other site visits.

Table 3 Results of anuran surveys for the headwater wetland on the Site

Date	Air Temperature (°C)	Wind (Beaufort Scale)[1]	Cloud Cover (%)	Precipitation	Anuran Species Observed
2020/05/05	8	1 to 2	5	None	None
2020/05/20	19	0	5	None	None
2020/06/19	25	1	5	None	None

Table Notes: [1]The Beaufort Wind Force Scale is an empirical measure that relates wind speed to observed conditions at sea or land. The scale is as follows: **0**: calm, smoke rises vertically, wind speed <1km/hr; **1**: light air, smoke drift indicates wind direction, leaves and wind vanes are stationary, wind speed = 1.1-5.5km/hr; **2**: light breeze, wind felt on exposed skin, leaves rustle, wind vanes begin to move, wind speed = 5.6-11km/hr, **3**: gentle breeze, leaves and small twigs constantly moving, light flags extended, wind speed = 12-19km/hr.

3.2 Wetland Delineation

The boundaries of the wetland on the Site, as determined through field and desktop methods and in consultation with MVCA, are shown in Figure 3. The boundaries of the wetland were clear in the field based on the transition between wetland and upland vegetation and elevational change. The upland edge at the wetland boundary is comprised of a considerable amount of fill material that has since naturalized with vegetation. The total wetland area on the Site is approximately 0.6 ha and consists of several types

of wetland: meadow marsh, cattail marsh, deciduous thicket (low shrub) swamp, mixed swamp, and deciduous swamp.

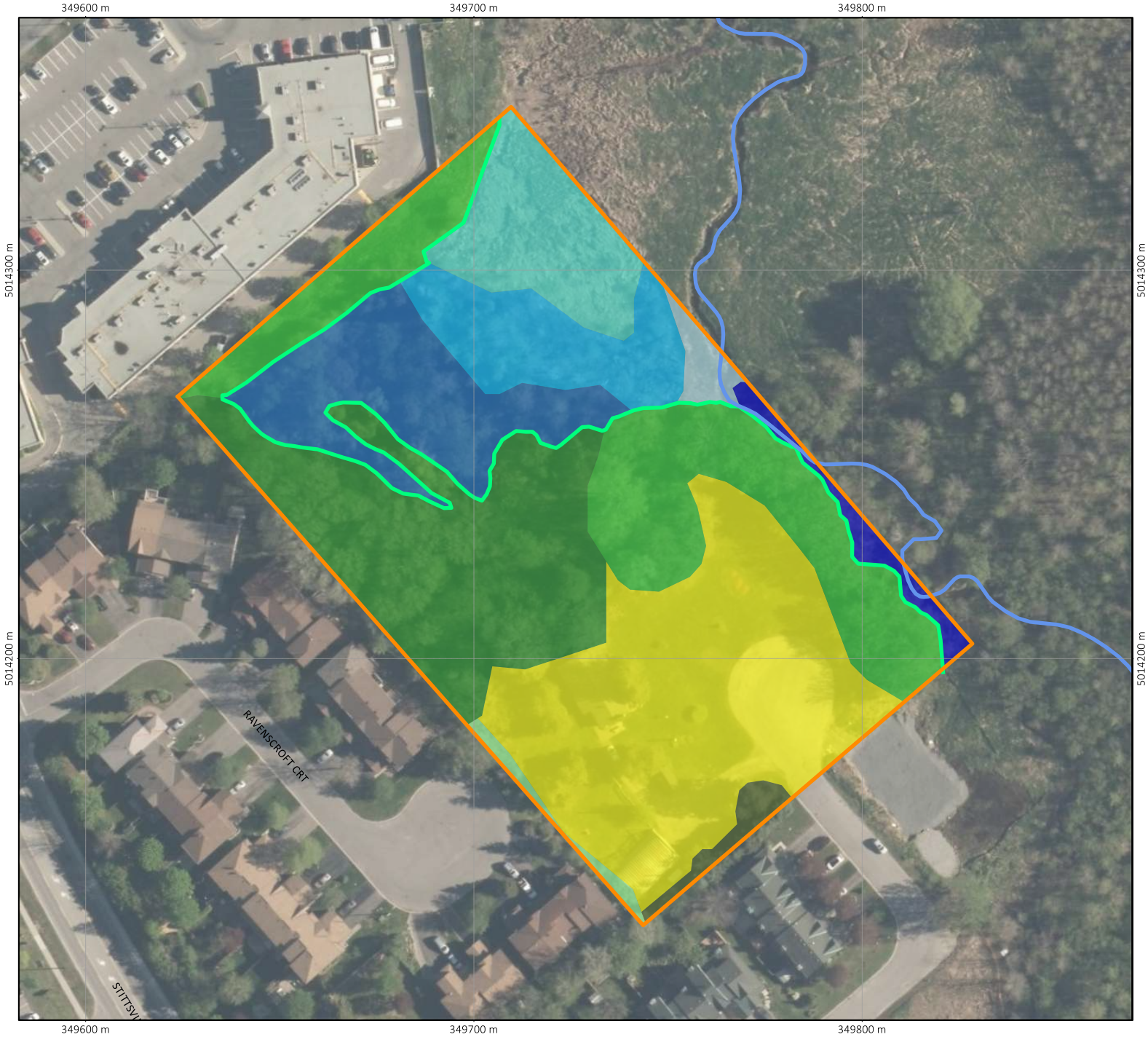

Figure 3 Map showing the boundaries and Ecological Land Classification for the portion of the headwater wetland that falls on the Site

Legend

Property Lines

Aquatic Habitat

Poole Creek

Wetland Boundary

ELC

FODM11

FODM4-5

FODM9-5

Cedar Hedge

Lawn

MASO1-4

MAS3-1

SWT3-2

SWM4-1

SWD6

N

0 50 m

Map File: 37 Wildpine34
MTM Zone 9
(NAD 83)
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3.3 Ecological Land Classification

Five distinct vegetation communities were delineated within wetland on the Site using ELC (Figure 3). Each wetland community and the dominant vegetation therein are described below. On the Site, the wetland is fully bounded by terrestrial forest ecosites including Dry – Fresh Manitoba Maple Deciduous Forest (FODM4-5) and Fresh – Moist Bitternut Hickory Deciduous Forest (FODM9-5; Figure 3).

3.3.1 Maple Organic Deciduous Swamp Ecosite (SWD6)

The SWFD6 ecosite makes up the treed corridor of Poole Creek along the eastern edge of the Site (Figure 4). Note that SWD6 is typically used to describe organic swamps dominated by Red Maple (*Acer rubrum*), Silver Maple (*Acer saccharinum*), and/or Freeman's Maple (*Acer freemanii*). However, this swamp is dominated by Manitoba Maple (*Acer negundo*) followed by Crack Willow (*Salix fragilis*). The dominant shrub species is Speckled Alder (*Alnus incana*) and ground cover is dominated by Spotted Jewelweed (*Impatiens capensis*).

Figure 4 Photo of the Maple Organic Deciduous Swamp Ecosite (SWD6) within the headwater wetland on the Site

3.3.2 Cattail Organic Shallow Marsh Type (MAS3-1)

The northeastern corner of the Site consists of the MAS3-1 community and is dominated by a near-homogenous cover of Broad-leaved Cattail (*Typha latifolia*; Figure 5).

Figure 5 Photo of the Cattail Organic Shallow Marsh Type (MAS3-1) within the headwater wetland on the Site

3.3.3 Reed Canary Grass Organic Shallow Marsh Type (MASO1-4)

The riparian corridor of Poole Creek north of the SWD6 ecosite on the Site consists of meadow marsh dominated by Reed Canary Grass (*Phalaris arundinacea*; Figure 6).

Figure 6 Photo of the Reed Canary Grass Organic Shallow Marsh Type (MASO1-4) within the headwater wetland on the Site

3.3.4 Willow Organic Thicket Swamp Type (SWT3-2)

Southwest of the MAS3-1 community is a thicket (tall shrub) swamp dominated by Peachleaf Willow (*Salix amygdaloides*) followed by Glossy Buckthorn (*Rhamnus frangula;* Figure 7).

Figure 7 Photo of the Willow Organic Thicket Swamp Type (SWT3-2) within the headwater wetland on the Site

3.3.5 White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1)

The northwestern to southeastern edge of the headwater wetland on the Site is a treed swamp co-dominated by Black Ash (*Fraxinus nigra*), Eastern White Cedar (*Thuja occidentalis*), and Manitoba Maple (Figure 8). The understory is dominated by Glossy Buckthorn and the ground cover is dominated by Spotted Jewelweed.

Figure 8 Photo of the White Cedar – Hardwood Organic Mixed Swamp Type (SWM4-1) within the headwater wetland on the Site

3.4 Surface Water Levels

Throughout the spring, vegetation communities within the wetland on the Site had either shallow standing water or were surface damp. The SWM4-1 community was the wettest and contained scattered lower-lying pockets with a maximum water depth of approximately 20 cm. The MAS3-1, MASO1-4, and SWT3-2 communities were dry in the summer while the SWD6 and SWM4-1 communities were still surface damp.

4.0 CLASSIFICATION

Information obtained regarding anuran presence, aquatic and terrestrial habitat, and hydrology was used to apply the appropriate classification to the wetland by identifying the functions the feature provides (TRCA & CVC, 2014; Table 4). The hierarchical functions ranking for each classification type ranges from (lowest to highest): limited, contributing, valued, and important functions.

Table 4 Summary of functional classifications for the headwater wetland on the Site

Classification Type	Functions Ranking	Notes
Hydrology	Valued	Wetland with intermittent standing surface water; hydrologically connected to Poole Creek.
Riparian Conditions	Important	The feature type is a wetland.
Fish and Fish Habitat	Contributing	No spawning/rearing, feeding, cover, refuge, or migration habitat or habitat for at-risk fish species within the wetland. Likely contributes allochthonous materials to downstream fish-bearing habitat in Poole Creek.
Terrestrial Habitat	Valued	Wetland habitat but no evidence of breeding amphibians. Presence of fish in Poole Creek likely prevents amphibian presence in the wetland on the Site. May provide "stepping stone" habitat (e.g., stop-over to higher quality habitat) or suitable habitat for feeding or hydration for low mobility amphibians.

5.0 MANAGEMENT RECOMMENDATIONS

The functions rankings (classifications) identified for the hydrology, riparian conditions, fish habitat, and terrestrial habitat of the wetland form the basis of the management recommendation for the feature (Table 4; Figure 9; TRCA and CVC, 2014). .

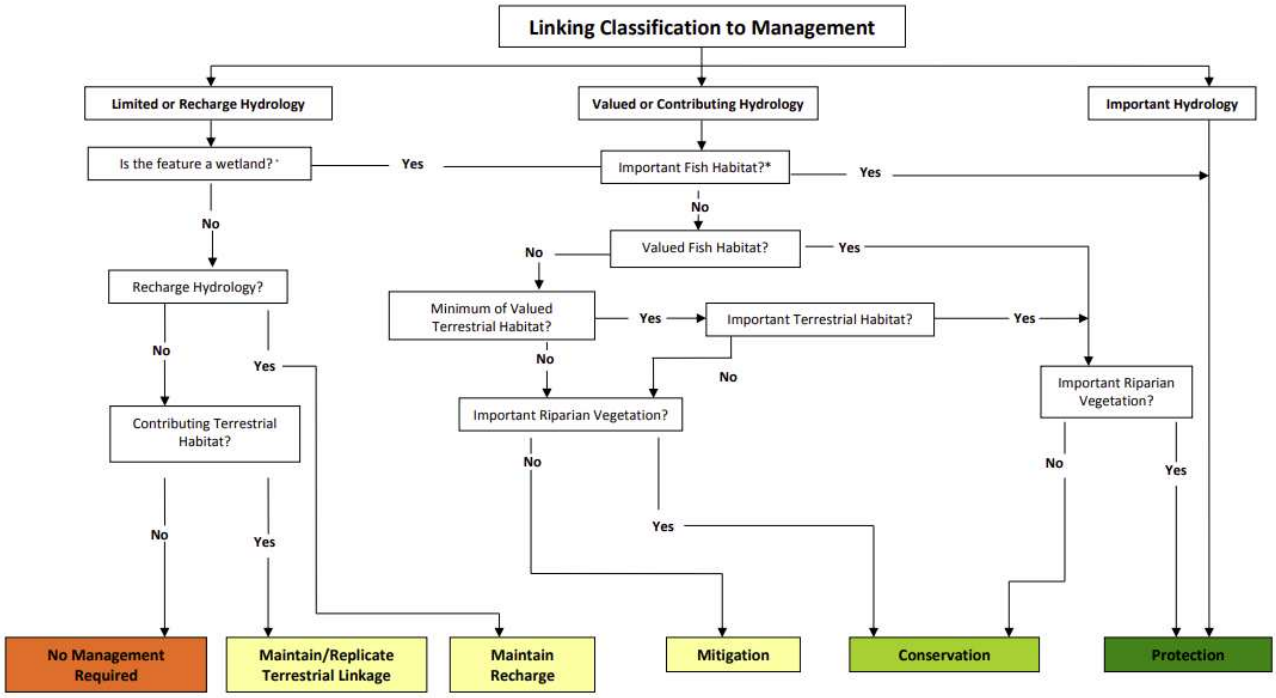

Figure 9 Flow chart providing direction on management options based on the wetland's classifications adapted from TRCA and CVC (2014)

The management recommendation for the wetland on the Site is **Conservation**. Conserving the wetland includes (TRCA & CVC, 2014):

- Maintaining and/or enhancing the feature;
- Restoring hydrological and riparian and terrestrial habitat functions that may have been lost due to the historical placement of fill along the wetland's edge, as feasible;
- Maintaining catchment flows (e.g., maintaining onsite flows through low impact development and/or natural design techniques and/or stormwater management design);
- Designing and locating the onsite stormwater management system such that impacts to the wetland (e.g., sediment loading, temperature changes) are avoided; and
- Maintaining a development setback from the wetland to prevent impacts to the feature.

Ontario Regulation 153/06 of the *Conservation Authorities Act* (1990) prohibits or restricts development and site alterations near wetlands to prevent flooding, erosion, and other hazards. A permit will be required from MVCA if site alteration is to occur within 30 m of the wetland.

The "top edge of the fill" that had been on the Site is generally situated ≤15 m beyond the current wetland edge (Figures 10 and 11). Portions of the Site beyond 15 m from the wetland edge are located within an artificially raised tableland and are indistinct from the hydrology, riparian, or terrestrial habitat functions of areas >30 m from the wetland. The 15m buffer adjacent to the wetland encompasses the transition zone from upland to wetland and should be protected accordingly. The natural character of this area,

however, has been significantly degraded. This area should be reserved as a setback from the wetland and be subject to an enhancement program including the removal of invasive species and accumulated trash, and the planting of native species that are typical of transition areas between wetland and upland habitats.

Figure 10 Photo of fill and rubble on the edge of the wetland on the Site

Figure 11 Map showing the "top edge of fill" mark around the wetland on the Site

Legend

Property Lines

Aquatic Habitat

Poole Creek

Wetland Boundary

Top Edge of Fill

N

0 50 m

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6.0 CLOSURE

This report was prepared for exclusive use by Wildpine Trails Inc. and may be distributed only by Wildpine Trails Inc. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

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Senior Review

7.0 LITERATURE CITED

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