

**NATURAL ENVIRONMENT
TECHNICAL REPORT**
(A type of Environmental Impact Assessment)

**McGee Pit Expansion
Licence # 624971**

**Prepared for:
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ECOLOGICAL SERVICES

Rob Snetsinger

A handwritten signature in black ink, appearing to read 'Rob Snetsinger', written in a cursive style.

January 13, 2026

Karson Holdings McGee Pit Expansion

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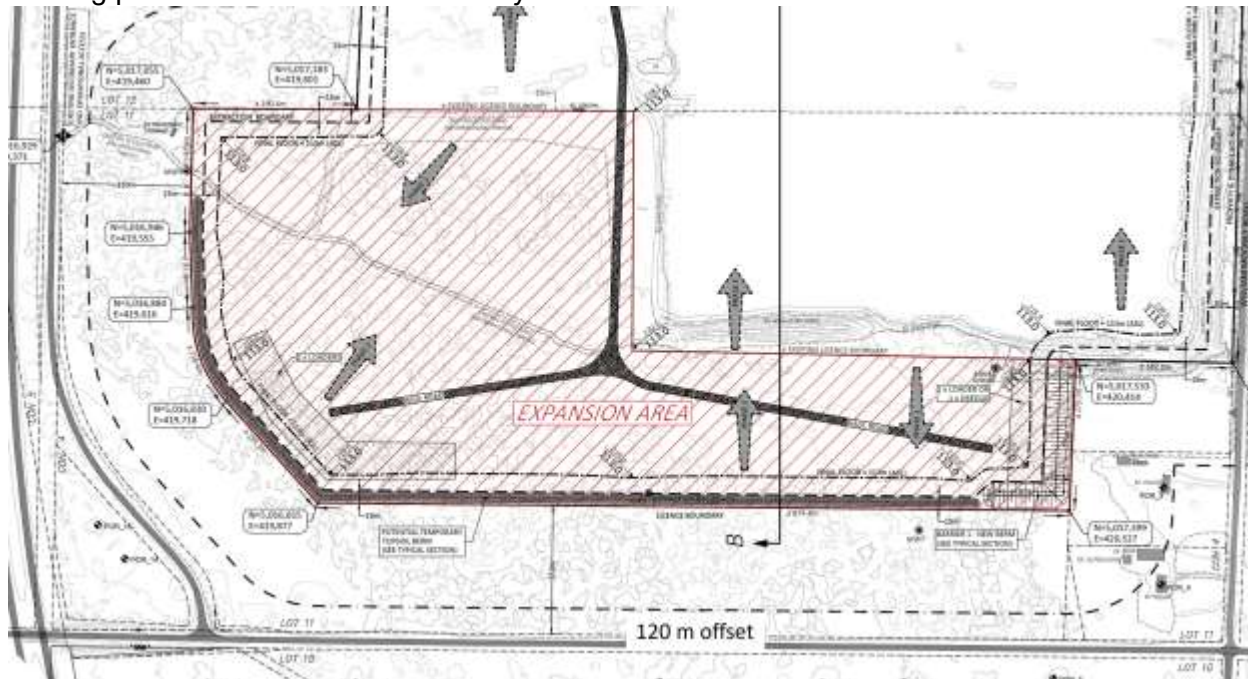
1. Overview

Under the Provincial Aggregate Resources Act, Karson Holding Inc. is applying for an expansion of their Class “A” pit licence (Licence 624971). The pit is located in Pt. Lot 11 and 12, Conc. 4, Huntley Township, City of Ottawa. The adjacent image from the provincial Pits and Quarries website shows the existing pit licence area outlined in solid red, and we have outlined the approximate proposed expansion area with a dashed red line.



The existing licence area covers an area of 81.9 ha., and the proposed expansion area will be 31.4 ha. for a total of 113.3 ha., of which 104.9 ha. will represent the extraction area.

The view of the expansion area is provided below via a cut-out from Egis Canada Limited Operation Plan drawing 02, Project CCO-22-1195 dated Dec. 16, 2025. The following image is provided for conceptual purposes only and not for detailed design analysis. For that purpose, please see the Egis Canada Limited drawing that is complete with appropriate details. We do note the dashed 120 m offset line and that vehicle access will continue to be made through the existing pit entrance via William Mooney Rd.



This Natural Heritage Technical Report (NETR) report follows the guidelines provided in the *Aggregate Resources Policy Manual* and *Aggregate Resources of Ontario Standards*, the most current version which came into effect on April 1, 2021 for a Natural Environment Technical Report, which investigates whether significant natural heritage features are within 120 meters of a pit project, and whether the operation of the pit will have the potential to cause a negative

impact to these features. This assessment also follows the requirements of the Provincial Policy Statement (PPS) and the City of Ottawa Official Plan (OP). Natural heritage features of the site are described in this report along with the potential for impacts to these features.

A focus of an NETR is to determine if significant natural heritage features are present. This effort is primarily based on manuals provided by the Ministry of Natural Resources and Forestry (MNR) and the Ministry of Environment Conservation and Parks (MECP). It is also based on the environmental impact assessment requirements of the Provincial Policy Statement (PPS), the City of Ottawa Official Plan (OP).

The mechanisms of the NETR process are intended to protect the significant natural heritage features outlined in the PPS and in Official Plans. If significant natural heritage features are found, and it is determined that their features or functions are at risk of a negative impact, the NETR process has two possible outcomes.

1. Determine that the negative impact is too great and not support the pit expansion application.
2. Consider whether mitigation or compensation can ameliorate the negative impact, so that the pit expansion will be consistent provincial and municipal natural environment policy.

2. Summary

Summary Findings

It is our opinion that the proposed pit expansion can proceed without causing a negative impact if the following recommendations are followed.

Recommendations

1. If they have not already done so, it is recommended that the pit operator register their activity as it relates to the Bank Swallows that inhabit the existing pit and could move to the pit expansion area once operations begin there.
2. It is recommended that tree clearing within the expansion area should not occur during the SAR bat roosting season from April 1 to Nov. 30.
3. Blanding's Turtles have not been observed within the existing pit and the pit expansion area does not provide appropriate habitat features. Nevertheless, it is conceivable that Blanding's Turtles could find their way to the aquatic features of the pit operation area. Accordingly, the following recommendations are provided for that eventuality.
 - Pit operators and staff should undertake a turtle training program, in order to be able to distinguish Blanding's Turtles from the non-SAR turtles, and to know what to do should they encounter them.
 - If Blanding's Turtles are encountered within the active pit area, the pit operators will need to register their activity with the MECP.
 - Turtle road mortality is likely the greatest threat to Blanding's Turtles in the region. If Blanding's Turtles are encountered, the pit operators will need to educate their drivers on the need to avoid these (and any other turtle species) turtles.
 - If turtles of any species are encountered, a turtle warning sign should be installed at the pit entrance to remind drivers of the potential threat.
 - The closure plan should include turtle habitat enhancements for the flooded pond that will result when pit operations cease. These could include deeper areas to support overwintering, variable depth areas to enhance plant aquatic diversity, shoals for shallow loafing and feeding, and islets to provide basking.
4. The closure plan should include Least Bittern (and other aquatic waterfowl) favorable habitat enhancements for the flooded pond that will result when pit operations cease. The primary focus would be to enhance high interspersed, similar to what now exists within north end of the flooded pit floor.
5. The pit expansion area will be excavated to below the water table, and it is expected it will become part of a larger overall fish habitat area once pumping operations cease. It is recommended that for the closure plan, the final pit lake not employ a bathtub like form, and

instead include aquatic interspersed features such as variable depths, habitat islets and shoals as fish enhancement features.

6. It is recommended that any tree clearing take place outside the bird breeding season (April 1 to August 31) to avoid contravention of the Migratory Birds Convention Act, and outside of the SAR maternity/roost season of mid April to mid September.

Closure Plan

It is our opinion that the resulting aquatic feature that will result when pit operations cease will enhance regional biodiversity by providing fish habitat, wetland habitat, waterfowl habitat, wading bird habitat, turtle habitat, amphibian habitat, turtle wintering, waterfowl staging habitat, and marsh bird breeding habitat. Consideration into the structure of the closure area should include features that support these habitats with a focus on wetland interspersed, variable depths, habitat islands, and shoals.

3. Legislative Requirements

Aggregate Resources of Ontario Provincial Standards (AROPS) for Category Licence Applications

As of 2021 the format for aggregate licence application natural environment assessments has changed as described in *Ontario Standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act*. Under section 2.2. Natural Environment Report, the following natural heritage features on or within 120 m of the site have been identified as potentially relevant to the pit licence update application.

- *significant wetlands*
- *fish habitat*
- *significant woodlands and significant valleylands in Ecoregions 6E*
- *habitat of endangered species and threatened species*
- *significant wildlife habitat*
- *significant areas of natural and scientific interest*

Where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any pit preventative, mitigative or remedial measures. The report must also identify if the site or any of the features, included in (a) through (g), are located within a natural heritage system that has been identified by a municipality in ecoregions 6E.

Provincial Policy Statement (PPS)

Issued under the *Planning Act*, the 2024 version of the PPS requires that municipalities consider natural heritage features in assessing development proposals. Guidance on the extent of adjacent lands is provided in a Natural Heritage Reference Manual (MNR 2010). The adjacent land width for significant natural heritage features is 120 m. From the PPS:

4.1.4 Development and site alteration shall not be permitted in:

- a) significant wetlands in Ecoregions 5E, 6E and 7E1; and*

4.1.5 Development and site alteration shall not be permitted in:

- a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;*
b) significant woodlands in Ecoregions 6E and 7E1;
c) significant valleylands in Ecoregions 6E and 7E1;
d) significant wildlife habitat;
e) significant areas of natural and scientific interest; and
f) coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 4.1.4.b),

unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

4.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

4.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

Note: Adjacent lands do not necessarily apply to species at risk habitat, and impacts should be based on a species-by-species basis in accordance with provincial requirements.

4.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

City of Ottawa Official Plan

The City of Ottawa has provided a document entitled Environmental Impact Statement Guidelines (2015) that was reviewed for this report. This document mirrors, and references, the Natural Heritage Reference Manual (MNR 2010). It requires an EIS to discuss

- **Property Information**
As described in this report, but for full details we refer to drawing 02, project number CCO-22-1195 provided by Egis Canada Ltd.
- **Description of the Site and the Natural Environment**
As described and discussed in this report including ANSI's, Fish Habitat, Significant Wildlife Habitat, Significant Valleylands, Significant Woodlands, and Habitat of endangered and threatened species. Surface and groundwater features are not discussed within this report. For those, please see GRI – Level 1 and Level 2 Hydrogeological Assessment.
- **Description of the Proposed Project**
Southward expansion of existing pit licence 624971. For full project details please see drawing 02, project number CCO-22-1195 provided by Egis Canada Ltd.
- **Impact Assessment**
As discussed in this report.
- **Mitigation**
As discussed, and recommended in this report

4. Methodology

Screening for significant natural heritage features was based on the MNRF (2018) and the MECP (2019) screening protocol.

Habitat community assessments were based on the Ecological Land Classification (ELC) manual for Southern Ontario (Lee *et al.*, 1998). Plant species were used to characterize ELC community types, and some representative plants were posted to iNaturalist.

Significant natural heritage feature assessments were based on the Natural Heritage Reference Manual (MNR 2010), Significant Wildlife Habitat Ecoregion Criteria Schedules (MNRF 2015) and Significant Wildlife Habitat Technical Guide (MNR 2000).

Breeding bird surveys were based on the Ontario Breeding Bird Atlas Guide for Participants (Cadman and Kopysh, 2001) and the Canadian Wildlife Service Forest Bird Monitoring Program. Surveying included both dawn and evening site visits.

Taxa, species, and habitat surveys were based on published protocols where needed, but not limited to BSC (2009; amphibians), MNR (2015; wetlands), MNR (2012; Whip-poor-will), MNRF (2015c; turtles), MNRF (2016; snakes), and MECP (2022; bats).

Table 1. Site visit summary.

Survey Date	Starting Time	Surveyor	Field Work Undertaken
2020			
June 1	2045	Heather Lunn	Marsh Monitoring/Night Birds
June 4	2045	Heather Lunn	Marsh Monitoring/Night Birds
June 11	1440	Rob Snetsinger	Bat Acoustic Monitor
June 12	715	Heather Lunn	Avifauna, General Ecology
June 14	1120	Rob Snetsinger	Bat Acoustic Monitor
June 14	1330	Heather Lunn	General Ecology
June 15	700	Heather Lunn	Avifauna
June 16	1030	Heather Lunn	General Ecology
June 18	700	Rob Snetsinger Dale Kristensen	General Ecology/Herps Bat Acoustic Monitor
June 26	2100	Heather Lunn	General Ecology/Herps
June 29	800	Heather Lunn	General Ecology/Herps
June 30	900	Heather Lunn	Marsh Monitoring/Night Birds
2023			
April 29	2050	Heather Lunn	Herps
May 14	2120	Heather Lunn	Herps
May 27	650	Heather Lunn	Breeding Birds
May 28	2115	Heather Lunn	Night Birds/Herps
June 3	2138	Heather Lunn	Herps
June 9	2135	Heather Lunn	Night Birds/Herps
June 11	720	Heather Lunn	Breeding Birds
June 20	2045	Heather Lunn	Herps
July 2	2200	Heather Lunn	Night Birds/Herps
July 8	630	Heather Lunn	Breeding Birds
July 20	730	Rob Snetsinger Dale Kristensen	All taxa

5. Ecological Site History

A review of the historical use helps provide an understanding of its current ecological character. The history of the area is outlined by Matrix Heritage (2021) who notes farming, and dairy in particular, as being carried out at one time. Matrix Heritage (2021) also describes the various owners of the property who lived on the property starting in the 1800's. Existing remnant cedar fence lines belies past agricultural use.

In the adjacent image, the approximate existing pit area has been outlined in yellow, and the approximate expansion area has been outlined in a dashed red line overtop of the adjacent 1954 aerial image. It is evident that the expansion area was still in agricultural use at that time. Some brush growth is starting to take place, suggesting either abandonment or use as cattle pasture. It is not known when all agricultural activity ceased.



A red pine plantation was added to the expansion site (date unknown, but before 1990). The plantation has been thinned at various times over the last 30 years, with the most recent being in 2020. Hardwood logging has also been undertaken within the expansion area in the past for purposes unknown, but possibly for firewood. Trails and bush roads exist within the expansion area that are used for hiking, hunting, and off-road vehicle use.

Other contributing historical events that would have some influence on the ecological features of the expansion area include the development of houses to the south along McGee Side Rd. and east along William Mooney Road, the existing adjacent pit to the north that began operations in the early 2000's, current and past pit operations to the east along William Mooney Road that began in the mid-1970's, and the TransCanada highway to the west that went to four lanes in the 1990's. Wind storms in 2022 and 2023 have resulted in significant blowdown within the pit expansion woodlands.

6. Regional Land Use, Soils, Topography, Drainage, Geology

Regional Land Use: The expansion area is within the Smiths Falls Ecodistrict 6E-11, which consists of limestone and sandstone plains with ridges of igneous bedrock. Henson and Brodribb (2005) note that about 60% of the ecodistrict is in natural cover, with about 40% in forest and 20% in wetland. Aside from urban associated use, the remaining lands are primarily in agricultural use, and about 0.6% are gravel pits and quarries.

Soils: The soils of the expansion area are described by Schut and Wilson (1987). The expansion area is mostly covered by Oka soils, which consist of “*gravelly to very gravelly, coarse to moderately coarse textured marine beach materials.*” Vaudreuil series soils are found on the southern periphery of the expansion area and are poorly drained with “*very dark grayish brown to dark gray with a granular structure*”. Lee (2013) describes the large sand and large regional deposit that extends for several kilometers beyond the expansion lands as having tertiary significance.

Topography: The expansion property is relatively flat, but generally moving downwards to the west towards the larger SWT2 area shown in Figure x.

Drainage: Drainage details of the expansion area is provided by GRI (2024). The expansion area is well drained, and is influenced by the Trans-Canada Highway and the pumping that takes place within the existing pit.

Geology: The bedrock geology of the area in and around the expansion area is described by Lee (2013) as part of the Verulam Formation. A “*thin-to medium-bedded, sublithographic to coarse-crystalline, fossiliferous limestone with interbeds of dark grey calcareous shale.*”

7. Ecological Land Classification

The minimum ELC polygon used for mapping in Figure 1 is 0.5 ha. Different habitat types of less than 0.5 ha. were lumped into the large surrounding habitat type as is directed in Lee et. al. (1998). The proposed pit expansion area is outlined with a yellow dashed line, the ELC sites are outlined with a solid red line, and the ELC codes are in white. A description of the ELC terms is provided further down.

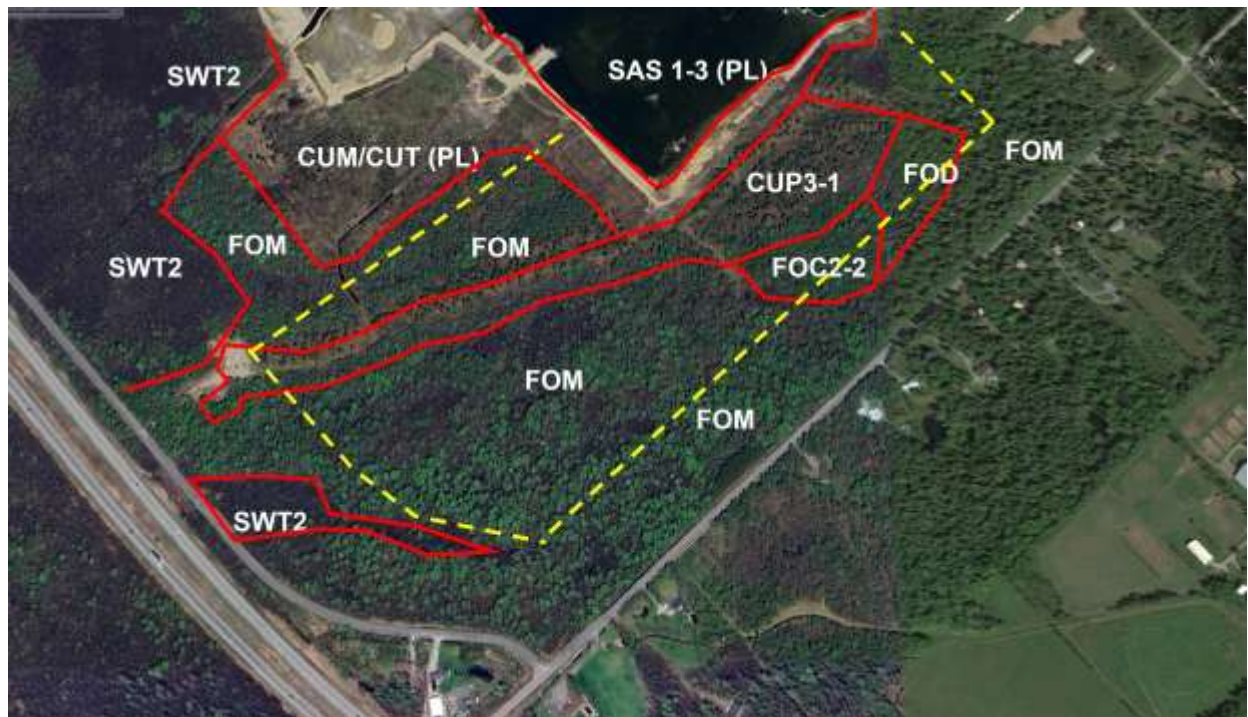


Figure 2. ELC associated with the proposed pit expansion area (outlined with yellow dashed line).

UPLAND ELC SITES

CUM/CUT (PL); (Cultural Meadow/Cultural Thicket).

The PL indicates that this area is within the Pit Licence area. The vegetation regularly gets altered as part of pit operation activities, including scraped soils, and soil piles. When it was visited for ELC purposes it was comprised of a diffuse mix of meadow and thicket communities. The plants that colonized cleared areas were mainly common weedy species that are normally found on recently disturbed land. 55% of these plants were nonnative (i.e., SNA) and this is above the provincial average of 20 to 30%. All of the observed native species were S5 (very common). The average



Coefficient of Conservatism (see Oldham et al. 1995) value of the plants found was 1.4 on a potential scale of 0 to 10. This low value indicates low ecological sensitivity. The average wetness index is 0.6, indicating a non-wetland site. A plant species list is provided in Section 11, Table 13.

Since 2023 about half of the CUM/CUT had become unvegetated as it was actively being accessed for aggregate extraction.

SAS1-3 (PL) (Stonewort Submerged Shallow Aquatic Type):

The PL indicates that this area is within the Pit Licence area. The density of vegetation and depth and length of submergence here is dependent on pit pumping activities. Observed submergent vegetation in 2023 was almost entirely stonewort. Other wetland plants observed were largely confined to drier islets. 28% of plants are nonnative (i.e., SNA) and this is within the provincial



average of 20 to 30%. All the native species are S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value is 2.6 on a potential scale of 0 to 10, this low value indicates a site with lower ecological sensitivity. The average wetness index is -2.9 (on a wetland scale of 0 to -5), indicating a wetland site. A plant list is provided in Table 16, Section 11.

Red Pine Coniferous Plantation Type (CUP 3-1): An ~ 6-hectare red pine plantation that has undergone past thinning and includes a bush road that extends to Diamondview Road. The number of stems per hectare of the entire CUP3-1 mapped area was counted and found to contain about 70/hectare that were greater than 20 cm DBH. From the Forestry Act, as outlined in MNR (2010) a woodland must have over 250 trees/hectare to be considered a woodland, and therefore from that perspective this plantation is not technically a woodland. A bush road runs throughout the CUP3-1 area.



As it is a recently disturbed site, it has a relatively high percentage of non-native plants (i.e. 44%). This is above the provincial average of 20 to 30%. Except for one common species (i.e., S4), all the native species observed were S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value is 1.6 on a potential scale of 0 to 10, this low value indicates a site with low ecological sensitivity. The average wetness index was determined to be 1.8 (on a upland scale of 0 to 5), indicating a fresh-moist, non-wetland site. A plant list is provided in Table 10, Section 11.

Mixed Woodland (FOM): The plant growth in this FOM area is very diffuse and patchy, not allowing for a finer level of ELC delineation. The deciduous portion of the mixed woodland included many species randomly spread in diffuse patches including Trembling Aspen, Eastern Cottonwood, Balsam Poplar, White Birch, Red Maple, Sugar Maple, White and Green Ash, Black Cherry, and Red and White Oak. The conifer portion of the mixed canopy was also a diffuse and patchy mix of Balsam Fir, White Spruce, White Cedar. Many of the ash trees were dead and evidence of the Emerald Ash Borer was observed. There was significant blowdown throughout the FOM area resulting from known wind storms in 2020 and 2023.

The shrub layer cover varied from sparse to dense and was predominately comprised of either tree saplings or Glossy Buckthorn. The ground layer also varied from sparse to dense with no clear dominant species present. Ground cover examples included tree seedlings, various fern species, ground shrubs (e.g., Poison Ivy and Virginia Creeper), and woodland ephemerals such as Canada Mayflower. 17% of the plants recorded are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. Except for one common species (i.e., S4), all the native species recorded are S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value was measured at 3.2 on a potential scale of 0 to 10. This low value indicates a site with lower ecological sensitivity. The average wetness index was determined to be 1.5 (on a upland scale of 0 to 5), indicating a fresh-moist, non-wetland site. A plant list is provided in Table 11, Section 11. Trails and bush roads exist that are used for hiking, hunting, and off-road vehicle use.

FOC2-2 (Dry-Fresh White Cedar Coniferous Forest Type): An almost pure stand of white cedar with a minimal secondary canopy, shrub layer, and ground cover. 22% of the plants recorded are nonnative (i.e., SNA) and this is within the provincial average of 20 to 30%. Except for one common species (i.e., S4), all the native species are S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value is 2.8 on a potential scale of 0 to 10, this low value indicates a site with lower ecological sensitivity. The average wetness index was determined to be 1.1 (on a upland scale of 0 to 5), indicating a fresh-moist, non-wetland site. A plant list is provided in Table 15, Section 11.



FOD (Deciduous Forest): Mapped as a separate ELC unit from the adjacent FOM, primarily due to its assemblage of younger aged (~30 years) trees, and minimal conifer presence. A clear dominant tree species could not be discerned for the top canopy and a shrub layer was largely lacking, and the ground cover was mostly sparse. 8% of plants are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. Except for one



common species (i.e., S4), all the native species are S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value is 3.6 on a potential scale of 0 to 10, this low value indicates a site with lower ecological sensitivity. The average wetness index was determined to be 1.3 (on a upland scale of 0 to 5), indicating a fresh-moist, non-wetland site. A plant list is provided in Table 14, Section 11. Trails and bush roads exist that are used for hiking, hunting, and off-road vehicle use.

SWT2 (Mineral Thicket Swamp Ecosite):

Heavily dominated by Glossy Buckthorn throughout. Glossy buckthorn is not a strong wetland indicator (Wetness Index of -1), but the presence of numerous other wetland associates supports the wetland delineation. 8% of the plants recorded are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. Except for one common species (i.e., S4), all the native species are S5 (very common). The average Coefficient of Conservatism (see Oldham et al. 1995) value is 3.7 on a potential scale of 0 to 10, this low value indicates a site with lower ecological sensitivity. The average wetness index was determined to be - 1.1 (on a wet scale of 0 to -5), indicating a site that is not strongly wetland. A plant list is provided in Table 12, Section 11.



8. Assessment of Natural Features

8.0 Species at Risk (Threatened and Endangered)

The following Species at Risk (SAR) were considered during the field work because of their potential to be on or near the site. The listing below was based on site screening undertaken using the MNRF (2018) and MECP (2019) screening protocols, as well as the Ottawa Stewardship Council (undated) Species at Risk Handbook for Ottawa.

Table 2. SAR under consideration for EIS purposes.					
Species	ESA Status	Habitat	Habitat Present	Observed	Impact Risk
Plants					
American Ginseng	Threatened	Woodland	Yes, but does not contain associated species or typical Ginseng topography	No	None
Butternut	Endangered	Woodland	Yes, woodlands	No	None
Black Ash	Endangered	Wetland	Yes, SWT2 wetland	Adjacent SWT2 habitat (see Fig. 2)	None
Herps					
Blanding's Turtle	Threatened	Aquatic Habitat	Flooded pit floor	South March Highlands >5 km	None, but see below
Birds					
Bank Swallow	Threatened	Sand wall face	Yes	Yes	Minimal, see below
Bobolink	Threatened	Hay fields, meadows	No	No	None
Cerulean Warbler	Threatened	Mature Woodlands	Yes, but marginal	No	None
Eastern Meadowlark	Threatened	Hay fields, meadows	No	No	None
Least Bittern	Threatened	Marsh	Marginal	Yes	Minimal, see below
Mammals					
Small Footed Myotis	Endangered	Woodland	Yes	No	See below
Little Brown Myotis	Endangered	Woodland	Yes	No	See below
Northern Myotis	Endangered	Woodland	Yes	No	See below
Tri-colored Bat	Endangered	Woodland	Yes	No	See below
Eastern Red	Endangered	Woodland	Yes	Yes	See below
Hoary	Endangered	Woodland	Yes	Yes	See below
Silver Haired	Endangered	Woodland	Yes	Yes	See below

Bank Swallow: Nesting in the south wall of the existing pit licence area was observed in 2020 (see adjacent images). This area experienced significant erosion weathering making it unsuitable for nesting, and the Bank Swallow nesting moved to a west wall in 2023. Bank Swallows were also observed foraging over the flooded pit licence area in 2020 and 2023.



It is not surprising that Bank Swallows were seen as these birds are attracted to the sheer sand faces of pits for nest building purposes, and Heneberg (2001) notes that Bank Swallows preferentially move to sand pits over traditional nesting areas due to the good nesting qualities of the sand substrate. As such, it is likely that when proposed pit expansion area becomes an active pit, it too will attract Bank Swallows.

Pit operations as they apply to Bank Swallows are outlined in Ontario Regulation 242/08, where pit operations are allowed to continue, but a Notice of Activity Form is required to be sent to the MECP which lays out reasonable steps to minimize adverse effects on Bank Swallow nesting.

If they have not already done so, it is recommended that the pit operator register their activity as it relates to Bank Swallows.

Bats (Endangered): There are seven endangered bat species in Ontario that need to be considered in impact assessment work.

The MECP (2022) protocol for bat surveys, recommends snag surveys in the off-leaf periods. Due to the timing of the field efforts, we were unable to complete snag efforts, but note the dominance of non-favorable bat trees within the expansion woodlands including red pine, white cedar, balsam fir, trembling aspen. This along with their relatively young age (mostly 60 years) limits their cavity potential. Significant wind storm blowdown that occurred between 2020 and 2023 significantly reduced the potential use of cavity trees, including dead ash trees.

Bat acoustic monitoring was undertaken with monitors set up at six sites in June 2020 using the SM4BAT from Wildlife Acoustics and two sites in June 2023. Original plans had the expansion going into Sites 1 to 3, which is no longer the case. As a result, data from Sites 1 to 3 is not being presented. We note that the average nightly pass numbers of SAR bats recorded in 2023 were less than in 2020. The wind storms and the significant blowdown that occurred in between may be a causative factor.



Results from the 2020 and 2023 surveys revealed that none of the SAR bats present at that time were recorded in monitors placed at sites 4 to 8. However, the monitors did record the SAR bat species that were added the ESA in 2025, and these results are provided in Table 3. Acoustic monitoring only indicates flight passes and does not necessarily indicate roosting. Bats picked up by monitors could be flying into forage from adjacent sites. The recording data indicated a number of bunched passes over small time frames which could indicate a single bat foraging near the acoustic monitor over several minutes, or could indicate several bats passing through. Some of the SAR bats were recorded at dusk on some nights, which could indicate roost emergence within the expansion lands. However, this was not a consistent finding every night, which might also suggest SAR bats were using different roost sites on different nights.

Table 3. Bat acoustic monitoring results.			
Site	Habitat	Recording Time (hrs)/Dates	SAR Species Passes/Night
2020			
4 (expansion)	FOM	June 11-14	Eastern Red (2.5); Hoary (11.5); Silver (17)
5 (expansion)	FOD	June 11-14	Eastern Red (18.3); Hoary (1.3); Silver (7.5)
6 (expansion)	FOM	June 14-18	Eastern Red (0.2); Hoary (15); Silver (11.4)
2023			
7 (expansion)	FOM	June 11-22	Eastern Red (0.8); Hoary (4); Silver (4)
8 (expansion)	FOC2-2	June 22- July 3	Eastern Red (0.2); Hoary (4.3); Silver (4)

The three bat species listed in Table 3 were designated as Endangered in 2025 due to declining rates in population numbers across North America. Their decline is due to the White Nose Fungus that harms these bats during winter roosts when they are bunched in high numbers and therefore the fungus has the ability to kill large numbers in a single season. The three bats in Table 3 are all U.S. migrants and do not overwinter in Ontario.

It is important to note that no END Ontario bat was habitat limited prior to the introduction of the White Nose Fungus, and so they are definitely not habitat limited today with their lower numbers. As a result, the removal of the wooded expansion areas will not be removing a limiting resource.

Despite perceived declines across N.A., our bat acoustic monitoring efforts in Eastern Ontario since 2018 has shown that the Table 3 bats are present in every single site we have surveyed. These sites range from downtown urban cores to relatively pristine wilderness. Given their ubiquitous presence throughout, and the fact that SAR bats will roost at different locations at different times within a season, it is reasonable to assume that roosting could occur within the expansion woodlands at some point in time and therefore there is a possible impact risk.

The amended 2025 ESA puts the onus on the proponent to prevent harm to SAR and a common method for achieving this is with timing restrictions. As a result, it is recommended that tree clearing should not occur during the SAR bat roosting season from April 1 to Nov. 30.

In our opinion, further recommendations are unwarranted for the following reasons.

1. Bats are not habitat limited and there is more than sufficient woodland habitat nearby to provide bat roosting habitat.
2. Bats are highly tolerant of nearby human activity. Their extensive use of urban habitat supports this.
3. Bats are only active at night, when pit activities will be dormant so their will be minimal risk of deleterious bat/human interactions.
4. The aquatic/wetland habitat that will result from the pit closure plan will benefit bats in providing foraging habitat.

Blanding's Turtle (Threatened): Blanding's Turtles surveys were given the most field survey efforts in 2020 and 2023. This field work was guided by:

- MNR Blanding's Turtle General Habitat Description (BTGHD),
- Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (2015)
- Ross and Johnson (2018)

No Blanding's Turtles were observed on or adjacent to the pit expansion area, and based on the MNRF (2015), this provides a degree of confidence that they are not present.

No Blanding's Turtle sightings were made in two stream tributaries near the pit lands that flow to the Carp River during the 2019 Stream Watch survey program (see MVCA 2019), and Hamill and Seburn (2010) did not observe any for the area south of March Rd. and west of Carp Road, which covers the pit area. Most sightings by Hamill and Seburn (2010) were in association with the larger water bodies and larger wetlands associated with March Road, and these features are absent within the proposed pit expansion lands.

From other sources, we know that many sightings occur east of the Carp River in association with the South March Highlands and Carp Hills natural areas. The many interconnected ponds and lakes of the Carp Barrens ANSI located almost 5 km north of the proposed pit expansion area provide excellent Blanding's Turtle habitat features.

Dillon Consulting Limited (2013) undertook a study of a Blanding's Turtle populations of the South March Highlands located about 5 km. from the expansion area. A straight-line turtle movement from the highlands to the expansion area is unlikely due to the long distance and because they would have to contend with a number of busy roads including Carp Road. Hamill and Seburn (2010) note that vehicle strikes represents the highest threat to Blanding's Turtles in this region. However, of more relevance is the understanding that Blanding's Turtles do not stray from water during long distance overland travels. Beaudry et al (2010) found that the average distance from water during these long travel routes was 127 m, and similar information is provided with the MNRF's *Blanding's Turtle General Habitat Description*, which notes average nesting distances to nearest wetlands ranging from 99.5 to 242 m.

There are two stream systems west and north of the existing pit area that connect to the Carp River that turtles might follow to avoid roads, but because of the circuitous route, it would mean travel distances of about 6 km and 2.5 km respectively to reach the active pit.

Except for a small dug pond for loafing purposes, and the bush road for nesting purposes, the pit expansion woodlands do not have any favorable Blanding's habitat features. They lack open aquatic habitat, and the mostly heavy canopy cover negates the potential for nesting, as turtle nests require sun exposure for egg incubation purposes.

The flooded floor of the active pit area currently does have favorable nesting, basking, and feeding features, although periodic water changes related to pit activity would periodically alter the functionality and favourability of those habitat needs.

The pit floor and the dug pond are too currently too shallow to support overwintering as Edge et al. (2009) noted that Blanding's Turtles sought out winter locations that would provide free water

under the ice during the winter. Newton and Herman (2009) and Rowe and Moll (1991) found them to overwinter near their main activity areas, and since all Blanding's sightings that we are aware of are for areas well outside of the pit area, overwintering is unlikely to occur here.

There are four constructed ponds east of William Mooney Road of variable sizes and distance from the proposed expansion area: ~ 3ha. at 347 m, ~11 ha., at 600 m, ~7 ha., at 800 m, and ~1 ha. at 700. The three closest to the pit expansion area have features that could support Blanding's Turtles year-round, but we are unaware of any Blanding's Turtles being observed here.

The lack of Blanding's turtle sightings within the pit area as based on MNRF (2015) survey protocols, as well as the lack of sightings in the recent and historical records makes the probability of Blanding's being present as being low within the expansion lands. However, in future, it is not out of the question that they could eventually find their way to the flooded pit areas. Accordingly, we make the following recommendations:

1. Pit operators and staff should undertake a turtle training program, in order to be able to distinguish Blanding's Turtles from the non-SAR turtles, and to know what to do should they encounter them.
2. If Blanding's Turtles are encountered within the active pit area, the pit operators will need to register their activity with the MECP.
3. Turtle road mortality is likely the greatest threat to Blanding's Turtles in the region. If Blanding's Turtles are encountered, the pit operators will need to educate their drivers on the need to avoid these (and any other turtle species) turtles.
4. If turtles of any species are encountered, a turtle warning sign should be installed at the pit entrance to remind drivers of the potential threat.
5. The closure plan should include turtle habitat enhancements for the flooded pond that will result when pit operations cease. These could include deeper areas to support overwintering, variable depth areas to enhance plant aquatic diversity, shoals for shallow loafing and feeding, and islets to provide basking.

Least Bittern (Threatened): The woodlands of the pit expansion area do not contain Least Bittern habitat. The flooded floor of the existing pit contains some areas that provide suitable features and one Least Bittern was observed in proximity to an area of *Phragmites* in the flooded pit floor area on June 26, 2020. This area is near pit entrance weigh scale, about 800 meters from the proposed pit expansion area. A concerted effort was subsequently undertaken in 2020 and 2023 to duplicate this sighting, but without success. A lack of subsequent sightings suggests that this single sighting was not a nesting Least Bittern. Due to its open nature, the bulk of the flooded pit floor is not suitable for this reclusive species as it lacks cover. We speculate that the Bittern we observed had flown in from wetland areas further east looking for prospective foraging opportunities, as we have observed this behavior at other sites.

It is our understanding that aggregate extraction within the pit expansion area will result in similar features of the licenced flooded pit floor, which could eventually result in favorable Least Bittern favorable features. The flooded pit floor has a mosaic of favorable waterfowl features, and the Great Egrets (adjacent image), Great Blue Herons, Wood Ducks, Black Ducks, Cormorants, and gulls have been observed undertaking opportunistic exploitation of the flooded pit floor.



The lack of Least Bittern sightings within the pit, the limited nesting structure features, and the lack of sightings nearby, puts the potential for them as nesting in the pit currently as unlikely. However, it is possible that they could eventually find their way to the flooded pit area when waters deepen after pumping operations cease. Accordingly, we recommend the closure plan include Least Bittern (and other aquatic waterfowl) favorable habitat enhancements for the flooded pond that will result when pit operations cease. The primary focus would be to enhance high interspersed, similar to what now exists within north end of the flooded pit floor.

8.1 Wetland

There is no provincially significant wetland (PSW) on or within 120 m of the proposed pit area. The nearest provincially significant wetland is Corkery Creek, about 5 km to the west.

Since there is no PSW within the 120m adjacent lands, we refer to the following excerpt from Section 4.4 of the Natural Heritage Reference Manual.

The need to evaluate the ecological function of adjacent lands (i.e., undertake an EIS or equivalent study) would be removed if proponents choose to avoid having development and site alteration occur within the extent of adjacent lands.

Accordingly, the necessity to discuss PSW impacts is removed.

There are two adjacent non-evaluated wetland areas (see SWT2 in Figure 2) to the west of the pit expansion areas, and the flooded pit floor of the licence area (see SAS1-3 (PL) in Figure 2) is technically a wetland due to percent of sufficient vegetative coverage (i.e., > 10%). It is our understanding that the closure plan for the existing licence area and the expansion area will result in the creation of wetland features, and this is seen as a net positive result.

There are no plans to intrude into the SWT2 areas to support the proposed pit expansion. The SWT2 areas are comprised of very dense growths of Glossy Buckthorn, and this hardy robust shrub species is tolerant to habitat alterations. As an example, they continue to thrive further north in an area where existing licence pit activity directly abuts the SWT2 area. As a result, we have no ecological feature/function concerns about these SWT2 areas.

8.2 Area of Natural and Scientific Interest (ANSI)

There are three ANSI's in the region: Carp Barrens, Marathon Forest, and South March Highlands. The latter being the closest at about 8 km away. This distance is greater than the 120 m threshold for significant features within adjacent lands as noted in the Natural Heritage Reference Manual and the PPS. In this regard, we refer to the following excerpt from Section 4.4 of the Natural Heritage Reference Manual.

The need to evaluate the ecological function of adjacent lands (i.e., undertake an EIS or equivalent study) would be removed if proponents choose to avoid having development and site alteration occur within the extent of adjacent lands.

Accordingly, the necessity to discuss valleyland impacts is removed.

8.3 Valleylands

The pit expansion area exists within a flat plain with no valleyland features on or within the adjacent land distance of 120 m. In this regard, we refer to the following excerpt from Section 4.4 of the Natural Heritage Reference Manual.

The need to evaluate the ecological function of adjacent lands (i.e., undertake an EIS or equivalent study) would be removed if proponents choose to avoid having development and site alteration occur within the extent of adjacent lands.

Accordingly, the necessity to discuss valleyland impacts is removed.

8.4 Woodlands

Woodland ranking criteria provided by the City of Ottawa (2022) and the MNRF (2010) were applied (see Table 4).

Table 4: Candidate Significant Woodland Threshold Features based on criteria from the 2010 Natural Heritage Reference Manual.			
Category & Area Size Thresholds	Significance Threshold	Candidate Habitat Criteria Analysis	Is Threshold Met
Size	Ottawa West rural planning area forest coverage of 38%. Threshold size is 50 ha.	39 ha. (excludes 5 ha. area of trees in existing licence area, and CUP3-1 area as it lacks sufficient tree density to be considered a woodland)	No
Interior Habitat	> 8 ha of interior habitat is significant	6.3 ha. (excludes CUP3-1 and area of trees in existing licence area)	No
Proximity	Woodlands that overlap other significant features	No overlap with mapped significant features	No
Linkages	Woodlands located between other significant	Does not provide a link between significant features and surrounded on all four sides by	No

	features	disturbance factors (i.e., Trans Canada highway, McGee Side Road housing, existing pit, and William Mooney Rd. housing and an aggregate operation)	
Water Protection	Protection of water features, watercourse, or fish habitat within 50 m	Not within 50 m of relevant features. Flooded pit licence floor does not count as it currently stands.	No
Woodland Diversity	High biodiversity or a declining forest type	Common woodland types within the region, and a plantation.	No
Uncommon Characteristics	S1, S2, S3 vegetation community; 8,9,10 coefficient of conservatism (CC); > 10 trees > 80 years old/ha. > 10 trees > 50 cm DBH	Plantations and mid-seral stage woodlands lacking sufficient number of old trees with overall CC values being low.	No
Conclusion: The proposed pit licence expansion woodlands are not significant. If the woodland were significant, legal precedent allows for its removal for aggregate operations as long as the woodlands is returned in the rehabilitation process. However, in this case the plan is to convert the expansion area into an aquatic/wetland habitat. In our opinion, this is preferable as it would result in a greater ecological benefit to the region.			

8.5 Wildlife Habitat

The Significant Wildlife Habitat Criteria for Smiths Falls Site Region 6E-11 (MNRF 2015) describes thresholds for habitat significance. Analysis of each wildlife habitat type is provided as follows:

Table 5: Candidate SWH analysis from MNRF (2015a).			
SWH Type	Habitat < 120 m	Candidate Habitat Criteria Analysis	Threshold Species or Numbers
Waterfowl Stopover and Staging Area A: Terrestrial	No	Licensed pit does not qualify	No
B: Aquatic	No	Licensed pit does not qualify	No
Shorebird Migratory Stopover Area	No	Lake Ontario shoreline > 5 km away	No
Raptor Wintering Area	No	Lacks appropriately sized (>20 ha) fields that would be winter wind swept.	No
Bat Hibernacula	No	No caves	No
Bat Maternity Colonies	Yes	The acoustic pass data/time was low for Big Brown and Silver Haired bats suggesting significant colonies were not present.	No.
Turtle Wintering Areas	No	Water in pit floor kept shallow with pumping	No
Reptile Hibernacula	No	Lacks overwintering features	No
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	No	Licensed pit does not qualify	No
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	No	No appropriate ELC type (i.e., SWM, SWD, FET)	No
Colonially-Nesting Bird Breeding Habitat (Ground)	No	No appropriate ELC type (i.e., MAM, MAS, CUM, CUT, CUS)	No
Migratory Butterfly Stopover Area	No	Fields are > 5 km to Lake Ontario	No
Landbird Migratory Stopover Area	No	Woodland > 5 km to Lake Ontario	No
Deer Yarding Area	No	SWH yarding areas are many km. to the west	No
Deer Winter Congregation Area	No	Not recognized for this area	No
Rare Vegetation Communities	No	Common habitat types present	No
Waterfowl Nesting	Yes	Adjacent SAS1-3 habitat of pit licence area	No

		qualifies, but lack of observed nesting may be partly due pit operations	
Bald Eagle/Osprey Nesting, Foraging, and Perching	No	Woodland habitat next to fish habitat. Flooded pit floor is not fish habitat.	No
Woodland Raptor Nesting	No	Natural woodland/forest >30ha with >10ha of interior habitat exists on adjacent lands	No
Turtle Nesting	Yes	SAS1 habitat. Snapping turtle nest observed next to a pond on an adjacent property > 120 m from expansion area.	No: See Table 9
Seeps and Springs	No	Not a headwater area	No
Amphibian Breeding Habitat A: Woodland	No	No significant amphibian breeding <120 m	No: See Table 8
B: Wetland	Yes	No significant amphibian breeding <120 m	No: See Table 8
Woodland Area-Sensitive Bird Breeding Habitat	No	No interior forest with a 200 m edge.	No
Marsh Bird Breeding Habitat	Yes	Adjacent SAS1-3 habitat of pit licence area qualifies, but lack of observed nesting may be partly due pit operations	No: See Table 17 - 19
Open Country Bird Breeding Habitat	No	No 30 ha. grasslands	No
Shrub/Early Successional Bird Breeding Habitat	No	No CUT, CUS, CUW >10 ha.	No
Terrestrial Crayfish	No	N/A to Eastern Ontario	No
Special Concern Species	Yes	None observed	No, see table 6
Amphibian Movement Corridors	No	No significant amphibian breeding <120 m	No
Deer Movement Corridors	No	No SWH deer wintering	No
Conclusion: SWH habitat not present			

Special concern and Rare Wildlife Species: Provincial S1, S2, S3, and SC species that are not threatened or endangered associated with the pit expansion area.

Table 6. Provincial S1, S2, S3 and Special Concern species associated with the proposed pit expansion area.			
Species	Preferred Habitat	Habitat present	Seen
Reptiles			
Five lined Skink (SC)	Rocky open areas	No	No
Map Turtle (SC)	Lakes or large rivers with soft bottoms.	No	No
Musk Turtle (SC)	Lakes or large rivers with lily pad cover	No	No
Snapping Turtle (SC)	A range of aquatic habitats	Yes	No
Birds			
Bald Eagle (SC)	Mature woodlands near large water bodies	No	No
Barn Swallow (SC)	Open habitat and old structures for nesting	No	No
Black Tern (SC)	Open water wetlands	No	No
Canada Warbler	Fresh-moist woodlands	Yes	No
Eastern Whip-poor-will	Open woodlands	Yes	No
Wood Pewee	A range of woodland habitats	Yes	No
Wood Thrush (SC)	A range of woodland habitats	Yes	No
Plants			
Rugulose Grapefern S2	Meadows, successional hardwood forests	Yes	No
Rams Head Lady's Slipper S3	A range of woodland habitats	No	No
Insects			

Ebony Boghaunter S2	Bog or Fen	No	No
Gorgone Crescentspot S2	Prairie	No	No

8.6 Fish Habitat

The fish habitat assessment was based on the 2016 Eastern Conservation Authorities Fish and Fish Habitat Review Guidelines.

Flooding of the pit floor commenced about 20 years ago. It has no direct surface water connection to an external source and is provided by ground water. If not already present, it is conceivable that fish will find their way at some point into the flooded pit, either through bait fish castoffs or via waterfowl. However, the maintained shallow depth of the pit water, its managed water levels, and limited aquatic vegetation limits its potential as quality fish habitat.



No fish were observed in the flooded pit floor in 2020 and in 2023. Several fish-eating birds (egrets, herons, mergansers) were observed, although no fish catches were observed. Frogs and crayfish were observed, which make up part of the normal diet of these birds.

The pit water levels are kept artificially low by pumping. When the pit is no longer being pumped, water levels will develop more favorable fish habitat features with the greater water depth. The two adjacent closed pits to the east have been converted to aquatic habitat and both contain fish.

The pit expansion area will similarly be excavated to below the water table, and it is expected it will become part of a larger overall fish habitat area. It is recommended that for the closure plan, the final pit lake not employ a bathtub like form, and instead include aquatic interspersed features such as variable depths, habitat islets and shoals as fish enhancement features.

9. References

- Banton, E., J. Johnson, H. Lee, G. Racey, P. Uhlig, and Monique Wester. 2009. Draft ELC manual for Zone 5e, produced by the Ecological Land Classification Working Group of the Ontario Ministry of Natural Resources.
- Beaudry, F., P. deMaynadier, and M. Hunter. 2010. Nesting movements and the use of anthropogenic nesting sites by spotted turtles (*Clemmys guttata*) and Blanding's turtles (*Emydoidea blandingii*). *Herpetological Conservation and Biology* 5: 1-8.
- Cadman M. and N. Kopysh. 2001. Ontario Breeding Bird Atlas Guide for Participants. Bird Studies Canada, Environment Canada: Canadian Wildlife Service, Federation of Ontario Naturalists, OFO, Ontario Ministry of Natural Resources.
- Chapman, L. J., and D. F. Putnam 2007 The Physiography of Southern Ontario. Vol. Miscellaneous Release Data 228. Ontario Geological Survey, Toronto.
- City of Ottawa. 2015. Environmental Impact Statement Guidelines.
- City of Ottawa. 2022. Significant Woodlands - Guidelines for Identification, Evaluation, and Impact Assessment
- Dillon Consulting Ltd. 2013. South March Highlands Blanding's Turtle Conservation Needs Assessment. City of Ottawa.
- Edge, C. B. Steinberg, R. Brooks, and J. Litzgus. 2009. Temperature and site selection by Blanding's Turtles (*Emydoidea blandingii*) during hibernation near the species northern range limit. *Canadian Journal of Zoology* 87:825-834.
- Environment and Climate Change Canada. 2018. Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), the Northern Myotis (*Myotis septentrionalis*), and the Tri-colored Bat (*Perimyotis subflavus*) in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. ix + 172 pp.
- Gannon, W.L, R.E. Sherwin, and S. Haymond. 2003. On the importance of articulating assumptions when conducting acoustic studies of habitat used by bats. *Wildlife Society Bulletin* 31:45–61.
- Gehrt, S., and J. Chelsvig. 2003. Species-specific patterns of bat activity in an urban landscape. *Ecological Applications*. 14:625-635.
- Gleason, Henry A. and Arthur Cronquist. 1991. Manual of the Vascular Plants of Northeastern United States and Adjacent Canada, Second Edition. D. Van Nostrand, N.Y.
- GRI Inc. 2024. Maximum predicted water table and Level 1 and Level 2 water studies. McGee Pit Expansion. Karson Holdings Inc.
- Hamill, S.E., and D.C. Seburn. 2010. Targeted surveys for turtle species at risk in the City of Ottawa. Canadian Wildlife Service.

- Henson, B.L. and K.E. Brodribb 2005. *Great Lakes Conservation Blueprint for Terrestrial Biodiversity, Volume 2: Ecodistrict Summaries*. Nature Conservancy of Canada.
- Heneberg, P. 2001. Size of sand grains as a significant factor affecting the nesting of bank swallows (*Riparia riparia*). *Biologia*. 56:205-210.
- Law, B., J. Anderson, and M. Chidel. 1998. A bat survey in state forests on the south-west slopes region of New South Wales with suggestions of improvements for future surveys. *Australian Zoologist*. 30: 467-479.
- Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario. Natural Heritage Information Centre, MNR Peterborough.
- Lee, V .L. 2013. Aggregate resources inventory for the City of Ottawa, Southern Ontario ; Ontario Geological Survey, Aggregate Resources Inventory Paper 191.
- Mississippi Valley Conservation Authority. 2019. Stream Watch Program Carp A and Carp B.
- Matrix Heritage (2021). Stage 1 Archaeological Assessment. Prepared for Karson Sand and Gravel.
- MECP, Ministry of Environment Conservation and Parks. 2019. Clients Guide to Preliminary Screening for Species at Risk.
- MECP, Ministry of Environment Conservation and Parks. 2022. Maternity Roost Surveys (Forests/Woodlands). Note: This document was provided by email in 2022 from Monique Charette (MECP SAR Biologist) and thus considered to be current up to 2022.
- MNR, Ministry of Natural Resources and Forestry. undated. Blanding's Turtle General Habitat Description. <https://www.ontario.ca/page/blandings-turtle-general-habitat-description#section-0>
- MNR, Ministry of Natural Resources. 1998. Life science areas of natural and scientific interest in site district 6-11. Kemptville District. Authored by David White
- MNR, Ministry of Natural Resources. 2000. Significant Wildlife Habitat Technical Guide. 151 pp. Fish and Wildlife Branch, Technical Section.
- MNR, Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005. Second Edition. Toronto: Queen's Printer for Ontario 248 pp.
- MNR, Ministry of Natural Resources. 2011. Survey Methodology under the Endangered Species Act, 2007: *Dolichonyx oryzivorus* (Bobolink). Ministry of Natural Resources Policy Division Species at Risk Branch.

- MNR, Ministry of Natural Resources (MNR). 2011. Bats and Bat Habitats: Guidelines for Wind Power Projects. Second Edition.
- MNR, Ministry of Natural Resources. 2012. Survey Protocol for Eastern Whip-poor-will (*Caprimulgus vociferous*) in Ontario. Ontario Ministry of Natural Resources, Species at Risk Branch, Peterborough, Ontario. ii + 10 pp.
- MNR, Ministry of Natural Resources and Forestry (Guelph District). 2014. Use of Buildings and Isolated Trees by Species at Risk Bats: Survey Methodology. October 2014.
- MNR, Ministry of Natural Resources. 2015. Technical Note Species at Risk (SAR) Bats. Regional Operations Division.
- MNR, Ministry of Natural Resources. 2015a. Significant Wildlife Habitat Ecoregion 6E Criterion Schedule. Draft.
- MNR, Ministry of Natural Resources and Forestry. 2015b. Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario. Species Conservation Policy Branch. Peterborough, Ontario. ii + 16 pp.
- MNR, Ministry of Natural Resources and Forestry. 2016. Bank Swallow General Habitat Description.
- MNR, Ministry of Natural Resources. 2016. Survey Protocol for Ontario's Species at Risk Snakes. Ontario Ministry of Natural Resources and Forestry, Species Conservation Policy Branch. Peterborough, Ontario. ii + 17 pp.
- MNR, Ministry of Natural Resources and Forestry. 2017. Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario. Queen's Printer for Ontario, 2017. 37 pp.
- MNR, Ministry of Natural Resources. (undated). Proposed Gray Ratsnake Survey Guidance.
- Newton, E.J., and T. Herman. 2009. Habitat, movements, and behaviour of overwintering Blanding's turtles (*Emydoidea blandingii*) in Nova Scotia. Canadian Journal of Zoology 87: 299–309.
- Ross, A.M., and G. Johnson. 2018. Conservation Plan for populations of the Blanding's turtle (*Emydoidea blandingii*). New York State Department of Environmental Conservation, Albany, New York. 98pp.
- Rowe, J., and E. Moll. 1991. A radiotelemetric study of activity and movements of the Blanding's turtle (*Emydoidea blandingii*) in northeastern Illinois Journal of Herpetology, Vol. 25, No. 2, pp. 178-185.
- Schut, L. W., and E. A. Wilson 1987 The Soils of the Regional Municipality of Ottawa-Carleton (Excluding the Ottawa Urban Fringe). Vol. Volume 1. Soil Survey Report No. 58 of the Ontario Institute of Pedology. Agriculture Canada, Ottawa.

Sherwin, R., W. Gannon, and S. Haymond. 2000. The efficacy of acoustic techniques to infer differential use of habitat by bats. *Acta Chiropterologica* 2:145-153.

Thomas, D. W. 1988. The distribution of bats in different ages of Douglas-fir forests. *Journal of Wildlife Management* 52:619–626.

Weir, R. 2008. Birds of the Kingston Region. Kingston Field Naturalists. 610 pp.

Wolbert, S., A. Zellner, and H. Whidden. 2014. Bat activity, insect biomass, and temperature along an elevational gradient. *Northeastern Naturalist*. 27:72-85.

10. Field work summaries

Table 7. Night Bird Monitoring based on MNR (2013c).

Date	Start Time	Weather	Wind Code	Noise Code	Surveyor	Results
2020						
June 1	2130	Partly Cloudy 17 C	1	0	Heather Lunn	No calls
June 4	2145	Clear 21 C	0	0	Heather Lunn	No calls
June 30	2130	Partly Cloudy 24 C	1	0	Heather Lunn	No calls
2023						
May 28	2115	Clear 22 C	0	0	Heather Lunn	No calls
June 9	2135	Partly Cloudy 14 C	0	0	Heather Lunn	No calls
July 2	2200	Clear 21 C	0	0	Heather Lunn	No calls
Summary: No night birds observed. Evening bird surveys based on MNR (2013c) that applies to Eastern Whip-poor-will were conducted in 2020 and 2023 (see Table 3). None were heard or observed.						

Table 8. Amphibian Marsh Monitoring based on BSC (2009). Listening post was adjacent to pit pond in proximity to proposed pit expansion area.

Date	Start	Weather	Wind Code	Noise Code	Surveyor	Flooded Pit Pond
2020						
June 1	2130	Partly Cloudy 17 C	1	0	Heather Lunn	SPPE (2), GRFR (1)
June 4	2145	Clear 21 C	0	0	Heather Lunn	AMTO (1), GRTR (1)
June 30	2130	Partly Cloudy 24 C	1	0	Heather Lunn	No calls
2023						
April 29	2050	Drizzle 7C	1	0	Heather Lunn	SPPE (2)
May 14	2120	Clear 10 C	0	0	Heather Lunn	NLFR (1)

June 3	2138	Clear 11 C	0	0	Heather Lunn	GRTR (1), SPPE (1)
Summary: No Call Code 3's were recorded and therefore no significant amphibian breeding.						

Table 9. Turtle nesting survey based on MNRF (2015b)						
Date	Start Time	Weather	Wind Code	Noise Code	Surveyor	Results
2020						
June 4	2112	Clear 20 C	0	0	Heather Lunn	No nesting turtles
June 12	715	Clear 16°C	0	0	Heather Lunn	No nesting turtles
June 15	700	Clear 10°C	0	0	Heather Lunn	No nesting turtles
June 16	1030	Clear 20°C	2	0	Heather Lunn	No nesting turtles
June 26	2100	Partly Cloudy 26 °C	0	0	Heather Lunn	No nesting turtles
2023						
May 28	2230	Clear 22 C	0	0	Heather Lunn	No nesting turtles
June 3	2138	Clear 11 C	0	0	Heather Lunn	No nesting turtles
June 9	2245	Partly Cloudy 14 C	0	0	Heather Lunn	No nesting turtles
June 20	2045	Clear 23 C	0	0	Heather Lunn	No nesting turtles
July 2	2200	Clear 21 C	0	0	Heather Lunn	No nesting turtles
Summary: No turtle nesting activity observed.						
Note: Depredated painted turtle nest was observed in an adjacent property pond in 2020.						

11. Plant Lists and Bird Breeding Lists

Plants found on and within 120 m of the proposed pit area: Please note that this is not an exhaustive plant list as the EIS was focused on habitat characterization and significant features analysis. Of the 166 species listed, 4 are S4, 3 are S4? (sic), 1 is a S4/S5, 110 are S5, and 48 are non-native (i.e., SNA).

Table 10. Plant species found in the CUP3-1 site. 44% of plants are nonnative (i.e., SNA) and this is above the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 1.6 on a potential scale of 0 to 10, this low value indicates a site with low ecological significance and low ecological sensitivity. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is 1.8, indicating a non-wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Abies balsamea</i>	Balsam Fir	S5	3	-3
<i>Acer rubrum</i>	Red Maple	S5	1	0
<i>Acer saccharum</i> var. <i>saccharum</i>	Sugar Maple	S5	5	3
<i>Achillea millefolium</i>	Yarrow	S5	1	3
<i>Ambrosia artemisiifolia</i>	Annual Ragweed	S5	0	3
<i>Anaphalis margaritacea</i>	Pearly Everlasting	S5	3	5
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	S5	3	5
<i>Asclepias syriaca</i>	Kansas Milkweed	S5	0	5
<i>Brassica nigra</i>	Black Mustard	SNA	0	5
<i>Carex communis</i>	Fibrous-root Sedge	S5	2	5
<i>Carex gracillima</i>	Graceful Sedge	S5	4	3
<i>Carex granularis</i>	Meadow Sedge	S5	3	-4
<i>Carex intumescens</i>	Bladder Sedge	S5	6	-4
<i>Carex pensylvanica</i>	Pennsylvania Sedge	S5	5	5
<i>Carex rosea</i>	Rosy Sedge	S5	5	5
<i>Cichorium intybus</i>	Chicory	SNA	0	5
<i>Cirsium vulgare</i>	Bull Thistle	SNA	0	4
<i>Clematis virginiana</i>	Virginia Virgin-bower	S5	3	0
<i>Conyza canadensis</i>	Fleabane	S5	0	1
<i>Crepis tectorum</i>	Narrow-leaf Hawksbeard	SNA	0	5
<i>Dactylis glomerata</i>	Orchard Grass	SNA	0	5
<i>Danthonia spicata</i>	Poverty Oatgrass	S5	5	5
<i>Daucus carota</i>	Wild Carrot	SNA	0	5
<i>Dianthus armeria</i>	Deptford-pink	SNA	0	5
<i>Dryopteris carthusiana</i>	Spinulose Shield Fern	S5	5	-2
<i>Echium vulgare</i>	Common Viper's-bugloss	SNA	0	5
<i>Erigeron philadelphicus</i>	Philadelphia Fleabane	S5	1	-3
<i>Euthamia graminifolia</i>	Flat-top Fragrant-golden-rod	S5	2	-2
<i>Fragaria virginiana</i>	Virginia Strawberry	S5	2	1
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	0	-1
<i>Fraxinus pennsylvanica</i>	Green Ash	S5	3	-3
<i>Geranium robertianum</i>	Herb-robert	SNA	3	5
<i>Hypericum perforatum</i>	Common St. John's-wort	SNA	0	5
<i>Juncus bufonius</i>	Toad Rush	S5	1	-4
<i>Juncus dudleyi</i>	Dudley's Rush	S5	1	0
<i>Leucanthemum vulgare</i>	Oxeye Daisy	SNA	0	5
<i>Lotus corniculata</i>	Birdfoot Trefoil	SNA	0	1
<i>Lythrum salicaria</i>	Purple Loosestrife	SNA	0	-5
<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5	5	0
<i>Medicago lupulina</i>	Black Medic	SNA	0	1
<i>Melilotus albus</i>	White Sweet Clover	SNA	0	5
<i>Oenothera biennis</i>	Common Evening-primrose	S5	0	3
<i>Panicum flexile</i>	Wiry Witch Grass	S4	8	-4

<i>Parthenocissus inserta</i>	Virginia Creeper	S5	3	3
<i>Pastinaca sativa</i>	Wild Parsnip	SNA	0	5
<i>Phleum pratense</i>	Meadow Timothy	SNA	0	3
<i>Phragmites australis ssp. australis</i>	European Reed	SNA	0	-4
<i>Pilosella praealta</i>	King Devil	SNA	0	5
<i>Pinus resinosa</i>	Red Pine	S5	8	3
<i>Plantago major</i>	Nipple-seed Plantain	S5	0	-1
<i>Poa pratensis ssp. pratensis</i>	Kentucky Bluegrass	S5	1	1
<i>Populus alba</i>	White Poplar	SNA	0	5
<i>Populus balsamifera</i>	Balsam Poplar	S5	4	-3
<i>Populus tremuloides</i>	Trembling Aspen	S5	2	0
<i>Potentilla simplex</i>	Old-field Cinquefoil	S5	3	4
<i>Prunella vulgaris ssp. vulgaris</i>	Self-heal	SNA	0	0
<i>Prunus serotina</i>	Wild Black Cherry	S5	3	3
<i>Prunus virginiana</i>	Choke Cherry	S5	2	1
<i>Rhus typhina</i>	Staghorn Sumac	S5	1	5
<i>Rosa blanda</i>	Smooth Rose	S5	3	3
<i>Rubus allegheniensis</i>	Allegheny Blackberry	S5	2	2
<i>Rubus idaeus ssp. idaeus</i>	Common Red Raspberry	SNA	0	-2
<i>Rubus occidentalis</i>	Black Raspberry	S5	2	5
<i>Rubus odoratus</i>	Purple Flowering Raspberry	S5	3	5
<i>Rudbeckia hirta var. hirta</i>	Black-eyed Susan	SU	0	3
<i>Rumex acetosella</i>	Sheep Sorrel	SNA	0	0
<i>Rumex crispus</i>	Curly Dock	SNA	0	-1
<i>Schedonorus arundinaceus</i>	Tall Fescue	SNA	0	5
<i>Scirpus cyperinus</i>	Cottongrass Bulrush	S5	4	-5
<i>Securigera varia</i>	Common Crown-vetch	SNA	0	5
<i>Setaria viridis</i>	Green Bristle Grass	SNA	0	5
<i>Silene vulgaris</i>	Maiden's Tears	SNA	0	5
<i>Solidago altissima</i>	Late Goldenrod	S5	1	3
<i>Solidago canadensis</i>	Canada Goldenrod	S5	1	3
<i>Solidago rugosa</i>	Roughleaf Goldenrod	S5	4	-1
<i>Sonchus arvensis ssp. arvensis</i>	Sow-thistle	SNA	0	1
<i>Taraxacum officinale</i>	Brown-seed Dandelion	SNA	0	3
<i>Toxicodendron radicans</i>	Climbing Poison Ivy	S5	2	-1
<i>Tragopogon dubius</i>	Meadow Goat's-beard	SNA	0	5
<i>Trientalis borealis</i>	Northern Starflower	S5	5	-1
<i>Trifolium aureum</i>	Yellow Clover	SNA	0	5
<i>Trifolium campestre</i>	Low Hop Clover	SNA	0	5
<i>Trifolium hybridum</i>	Alsike Clover	SNA	0	1
<i>Trifolium pratense</i>	Red Clover	SNA	0	2
<i>Tussilago farfara</i>	Colt's Foot	SNA	0	3
<i>Verbascum thapsus</i>	Great Mullein	SNA	0	5
<i>Verbena hastata</i>	Blue Vervain	S5	4	-4
<i>Veronica arvensis</i>	Corn Speedwell	SNA	0	5
<i>Vicia cracca</i>	Tufted Vetch	SNA	0	5
<i>Vitis riparia</i>	Riverbank Grape	S5	0	-2

Table 11. Plant species found in the FOM site. 17% of plants are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 3.2 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is 1.5, indicating a non-wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Abies balsamea</i>	Balsam Fir	S5	3	-3
<i>Acer rubrum</i>	Red Maple	S5	1	0
<i>Actaea rubra</i>	Red Baneberry	S5	7	5
<i>Anemone cylindrica</i>	Long-fruited Anemone	S4	6	5
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	S5	4	3
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Lady Fern	S5	4	0
<i>Betula papyrifera</i>	Paper Birch	S5	2	2
<i>Carex rosea</i>	Rosy Sedge	S5	5	5
<i>Circaea alpina</i>	Small Enchanter's Nightshade	S5	6	-3
<i>Dryopteris carthusiana</i>	Spinulose Shield Fern	S5	5	-2
<i>Dryopteris marginalis</i>	Marginal Wood-fern	S5	5	3
<i>Fagus grandifolia</i>	American Beech	S4	6	3
<i>Fragaria virginiana</i>	Virginia Strawberry	S5	2	1
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	0	-1
<i>Fraxinus pennsylvanica</i>	Green Ash	S5	3	-3
<i>Galeopsis tetrahit</i>	Common Hempnettle	SNA	0	5
<i>Galium mollugo</i>	Great Hedge Bedstraw	SNA	0	5
<i>Geranium robertianum</i>	Herb-robert	SNA	3	5
<i>Geum canadense</i>	White Avens	S5	1	0
<i>Juniperus communis</i>	Ground Juniper	S5	4	3
<i>Juniperus virginiana</i>	Eastern Red Cedar	S5	3	3
<i>Lobelia inflata</i>	Indian-tobacco	S5	3	4
<i>Lonicera tatarica</i>	Tartarian Honeysuckle	SNA	0	3
<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5	5	0
<i>Medicago lupulina</i>	Black Medic	SNA	0	1
<i>Monotropa uniflora</i>	Ghost-pipe	S5	6	3
<i>Nabalus albus</i>	White Rattlesnake-root	S5	6	3
<i>Onoclea sensibilis</i>	Sensitive Fern	S5	4	-3
<i>Parthenocissus inserta</i>	Virginia Creeper	S5	3	3
<i>Picea glauca</i>	White Spruce	S5	6	3
<i>Pinus resinosa</i>	Red Pine	S5	8	3
<i>Pinus strobus</i>	Eastern White Pine	S5	4	3
<i>Populus balsamifera</i>	Balsam Poplar	S5	4	-3
<i>Populus tremuloides</i>	Trembling Aspen	S5	2	0
<i>Prunella vulgaris</i> ssp. <i>vulgaris</i>	Self-heal	SNA	0	0
<i>Prunus pensylvanica</i>	Pin Cherry	S5	3	4
<i>Prunus serotina</i>	Wild Black Cherry	S5	3	3
<i>Prunus virginiana</i>	Choke Cherry	S5	2	1
<i>Pteridium aquilinum</i>	Bracken Fern	S5	2	3
<i>Quercus alba</i>	White Oak	S5	6	3

<i>Quercus rubra</i>	Northern Red Oak	S5	6	3
<i>Rhamnus cathartica</i>	Buckthorn	SNA	0	3
<i>Ribes cynosbati</i>	Prickly Gooseberry	S5	4	5
<i>Rubus flagellaris</i>	Northern Dewberry	S4	1	4
<i>Rubus idaeus ssp. idaeus</i>	Common Red Raspberry	SNA	0	-2
<i>Rubus occidentalis</i>	Black Raspberry	S5	2	5
<i>Rubus odoratus</i>	Purple Flowering Raspberry	S5	3	5
<i>Rubus pubescens</i>	Dwarf Raspberry	S5	4	-4
<i>Sambucus canadensis</i>	Common Elderberry	S5	5	-2
<i>Sambucus racemosa</i>	Red Elderberry	S5	5	2
<i>Thuja occidentalis</i>	Eastern White Cedar	S5	4	-3
<i>Toxicodendron radicans</i>	Climbing Poison Ivy	S5	2	-1
<i>Trientalis borealis</i>	Northern Starflower	S5	5	-1
<i>Urtica dioica ssp. dioica</i>	Nettle	SNA	1	-1
<i>Vitis riparia</i>	Riverbank Grape	S5	0	-2
<i>Zanthoxylum americanum</i>	Northern Prickley Ash	S5	3	5

Table 12. Plant species found in the SWT2 site. 8% of plants are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 3.7 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is -1.1, indicating a wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Abies balsamea</i>	Balsam Fir	S5	3	-3
<i>Acer rubrum</i>	Red Maple	S5	1	0
<i>Acer saccharinum</i>	Silver Maple	S5	2	-3
<i>Alnus incana</i>	Speckled Alder	S5	6	-5
<i>Betula papyrifera</i>	Paper Birch	S5	2	2
<i>Carex communis</i>	Fibrous-root Sedge	S5	2	5
<i>Carex gracillima</i>	Graceful Sedge	S5	4	3
<i>Carex intumescens</i>	Bladder Sedge	S5	6	-4
<i>Carex lupulina</i>	Hop Sedge	S5	6	-5
<i>Carex rosea</i>	Rosy Sedge	S5	5	5
<i>Carex scoparia</i>	Pointed Broom Sedge	S5	5	-3
<i>Dryopteris carthusiana</i>	Spinulose Shield Fern	S5	5	-2
<i>Epipactis helleborine</i>	Eastern Helleborine	SNA	0	5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5	7	-3
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	0	-1
<i>Fraxinus nigra</i>	Black Ash	S5	7	-4
<i>Fraxinus pennsylvanica</i>	Green Ash	S5	3	-3
<i>Galium mollugo</i>	Great Hedge Bedstraw	SNA	0	5
<i>Galium palustre</i>	Marsh Bedstraw	S5	3	-5
<i>Glyceria striata</i>	Fowl Manna-grass	S5	3	-5
<i>Lycopus americanus</i>	American Bugleweed	S5	4	-5

<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5	5	0
<i>Monotropa uniflora</i>	Ghost-pipe	S5	6	3
<i>Parthenocissus inserta</i>	Virginia Creeper	S5	3	3
<i>Picea glauca</i>	White Spruce	S5	6	3
<i>Populus tremuloides</i>	Trembling Aspen	S5	2	0
<i>Prunus pensylvanica</i>	Pin Cherry	S5	3	4
<i>Ribes hirtellum</i>	Smooth Gooseberry	S5	6	-3
<i>Rubus pubescens</i>	Catherinettes Berry	S5	4	-4
<i>Salix petiolaris</i>	Meadow Willow	S5	3	-4
<i>Scutellaria lateriflora</i>	Mad Dog Skullcap	S5	5	-5
<i>Thelypteris palustris</i>	Marsh Fern	S5	5	-4
<i>Thuja occidentalis</i>	Eastern White Cedar	S5	4	-3
<i>Toxicodendron radicans</i>	Climbing Poison Ivy	S5	2	-1
<i>Ulmus americanus</i>	White Elm	S5	3	-2

Table 13. Plant species found in the CUM/CUT site. 55% of plants are nonnative (i.e., SNA) and this is above the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 1.4 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is 0.6, indicating a non-wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Agrostis stolonifera</i>	Creeping Bentgrass	SNA	0	-3
<i>Ambrosia artemisiifolia</i>	Annual Ragweed	S5	0	3
<i>Artemisia vulgaris</i>	Common Wormwood	SNA	0	5
<i>Barbarea vulgaris</i>	Yellow Rocket	SNA	0	0
<i>Brassica nigra</i>	Black Mustard	SNA	0	5
<i>Carex flava</i>	Yellow Sedge	S5	4	-5
<i>Carex gracillima</i>	Graceful Sedge	S5	4	3
<i>Chenopodium album</i> var. <i>album</i>	White Goosefoot	SNA	0	1
<i>Cirsium arvense</i>	Canada Thistle	SNA	0	3
<i>Cirsium vulgare</i>	Bull Thistle	SNA	0	4
<i>Conyza canadensis</i>	Fleabane	S5	0	1
<i>Eupatorium perfoliatum</i>	Common Boneset	S5	2	-4
<i>Lobelia inflata</i>	Indian-tobacco	S5	3	4
<i>Lythrum salicaria</i>	Purple Loosestrife	SNA	0	-5
<i>Mimulus ringens</i>	Square-stem Monkeyflower	S5	6	-5
<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed	S5	3	-4
<i>Rhamnus alnifolia</i>	Alderleaf Buckthorn	S5	7	-5
<i>Rorippa hispida</i>	Common Yellow-cress	S5	3	-3
<i>Rosa blanda</i>	Smooth Rose	S5	3	3
<i>Rubus allegheniensis</i>	Allegheny Blackberry	S5	2	2
<i>Rubus idaeus</i> ssp. <i>idaeus</i>	Common Red Raspberry	SNA	0	-2
<i>Rumex acetosella</i>	Sheep Sorrel	SNA	0	0
<i>Scirpus atrovirens</i>	Dark-green Bulrush	S5	3	-5

<i>Scirpus cyperinus</i>	Cottongrass Bulrush	S5	4	-5
<i>Setaria viridis</i>	Green Bristle Grass	SNA	0	5
<i>Solidago canadensis</i>	Canada Goldenrod	S5	1	3
<i>Tragopogon dubius</i>	Meadow Goat's-beard	SNA	0	5
<i>Trifolium aureum</i>	Yellow Clover	SNA	0	5
<i>Trifolium campestre</i>	Low Hop Clover	SNA	0	5
<i>Trifolium hybridum</i>	Alsike Clover	SNA	0	1
<i>Trifolium pratense</i>	Red Clover	SNA	0	2
<i>Tussilago farfara</i>	Colt's Foot	SNA	0	3
<i>Verbascum thapsus</i>	Great Mullein	SNA	0	5
<i>Verbena hastata</i>	Blue Vervain	S5	4	-4
<i>Veronica arvensis</i>	Corn Speedwell	SNA	0	5

Table 14. Plant species found in the FOD site. 8% of plants are nonnative (i.e., SNA) and this is below the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 3.6 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is 1.3, indicating a non-wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Abies balsamea</i>	Balsam Fir	S5	3	-3
<i>Acer rubrum</i>	Red Maple	S5	1	0
<i>Actaea rubra</i>	Red Baneberry	S5	7	5
<i>Anemone cylindrica</i>	Long-fruited Anemone	S4	6	5
<i>Betula papyrifera</i>	Paper Birch	S5	2	2
<i>Fagus grandifolia</i>	American Beech	S4	6	3
<i>Fragaria virginiana</i>	Virginia Strawberry	S5	2	1
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	0	-1
<i>Fraxinus pennsylvanica</i>	Green Ash	S5	3	-3
<i>Galium mollugo</i>	Great Hedge Bedstraw	SNA	0	5
<i>Geum canadense</i>	White Avens	S5	1	0
<i>Juniperus virginiana</i>	Eastern Red Cedar	S5	3	3
<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5	5	0
<i>Monotropa uniflora</i>	Ghost-pipe	S5	6	3
<i>Parthenocissus inserta</i>	Virginia Creeper	S5	3	3
<i>Pinus resinosa</i>	Red Pine	S5	8	3
<i>Pinus strobus</i>	Eastern White Pine	S5	4	3
<i>Populus tremuloides</i>	Trembling Aspen	S5	2	0
<i>Prunus serotina</i>	Wild Black Cherry	S5	3	3
<i>Quercus alba</i>	White Oak	S5	6	3
<i>Quercus rubra</i>	Northern Red Oak	S5	6	3
<i>Sambucus racemosa</i>	Red Elderberry	S5	5	2
<i>Thuja occidentalis</i>	Eastern White Cedar	S5	4	-3
<i>Trientalis borealis</i>	Northern Starflower	S5	5	-1
<i>Vitis riparia</i>	Riverbank Grape	S5	0	-2

Table 15. Plant species found in the FOC2-2 site. 22% of plants are nonnative (i.e., SNA) and this is within the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 2.8 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. Except for one common species (i.e., S4), all the native species are S5 (very common). The average wetness index is 1.1, indicating a non-wetland site.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Abies balsamea</i>	Balsam Fir	S5	3	-3
<i>Acer rubrum</i>	Red Maple	S5	1	0
<i>Betula papyrifera</i>	Paper Birch	S5	2	2
<i>Brassica nigra</i>	Black Mustard	SNA	0	5
<i>Carex gracillima</i>	Graceful Sedge	S5	4	3
<i>Carex granularis</i>	Meadow Sedge	S5	3	-4
<i>Dryopteris carthusiana</i>	Spinulose Shield Fern	S5	5	-2
<i>Epipactis helleborine</i>	Eastern Helleborine	SNA	0	5
<i>Frangula alnus</i>	Glossy Buckthorn	SNA	0	-1
<i>Hieracium scabrum</i>	Rough Hawkweed	S4	7	5
<i>Lobelia inflata</i>	Indian-tobacco	S5	3	4
<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5	5	0
<i>Pinus strobus</i>	Eastern White Pine	S5	4	3
<i>Populus tremuloides</i>	Trembling Aspen	S5	2	0
<i>Prunus serotina</i>	Wild Black Cherry	S5	3	3
<i>Taraxacum officinale</i>	Brown-seed Dandelion	SNA	0	3
<i>Thuja occidentalis</i>	Eastern White Cedar	S5	4	-3
<i>Trientalis borealis</i>	Northern Starflower	S5	5	-1

Table 16. Plant species found in the SAS1-3 site. 28% of plants are nonnative (i.e., SNA) and this is within the provincial average of 20 to 30%. The average Coefficient of Conservatism (see Oldham et al. 1995) value is 2.6 on a potential scale of 0 to 10, this low value indicates a site with lower ecological significance. All the native species are S5 (very common). The average wetness index is -2.9, indicating a wetland site.

Chara (also known as Stonewort) was the dominant vegetation present, but it is not in the list as it is a green algae and not a "plant". Most of the plants from Table 16 were confined to pit edges and unflooded islets.

Latin Name	Common Name	S Rank	CC	Wetness
<i>Alisma triviale</i>	Northern Water-plantain	S5	1	-5
<i>Carex gracillima</i>	Graceful Sedge	S5	4	3
<i>Eleocharis acicularis</i>	Needle Spike-Rush	S5	5	-5
<i>Fraxinus pennsylvanica</i>	Green Ash	S5	3	-3
<i>Juncus bufonius</i>	Toad Rush	S5	1	-4
<i>Juncus dudleyi</i>	Dudley's Rush	S5	1	0
<i>Lemna minor</i>	Lesser Duckweed	S5	2	-5
<i>Lythrum salicaria</i>	Purple Loosestrife	SNA	0	-5
<i>Phragmites australis</i> ssp. <i>australis</i>	European Reed	SNA	0	-4
<i>Potamogeton natans</i>	Floating Pondweed	S5	5	-5
<i>Sagittaria latifolia</i>	Broadleaf Arrowhead	S5	4	-5

<i>Salix bebbiana</i>	Bebb's Willow	S5	4	-4
<i>Salix discolor</i>	Pussy Willow	S5	3	-3
<i>Salix x babylonica</i>	Crack Willow	SNA	0	-1
<i>Salix exigua</i>	Sandbar Willow	S5	3	-5
<i>Schoenoplectus tabernaemontani</i>	Soft-stem Club-rush	S5	5	-5
<i>Setaria viridis</i>	Green Bristle Grass	SNA	0	5
<i>Stachys palustris</i>	Marsh Hedge-nettle	SNA	0	5
<i>Triadenum fraseri</i>	Marsh St. John's-wort	S5	7	-5
<i>Typha angustifolia</i>	Narrow-leaved Cattail	SNA	3	-5
<i>Typha latifolia</i>	Broad-leaf Cattail	S5	3	-5

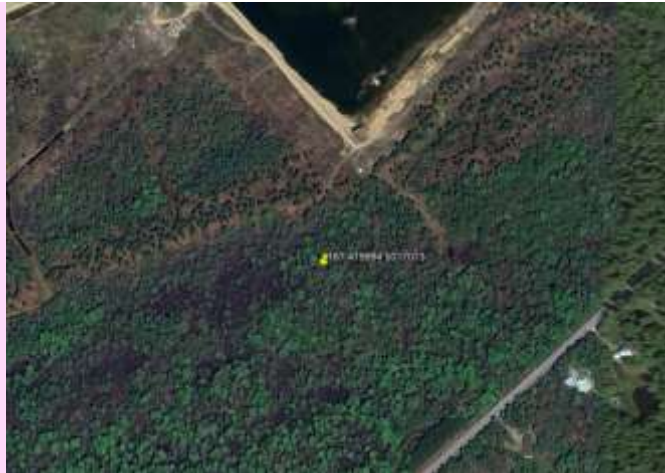
Table 17. Breeding Bird Survey at 18T 0420282 5017305 Station.



Common Name	Latin Name	May		
		27	June 11	July 8
American Crow	<i>Corvus brachyrhynchos</i>	2	1	3
American Goldfinch	<i>Spinus tristis</i>		1	1
American Robin	<i>Turdus migratorius</i>		1	1
Black-capped Chickadee	<i>Poecile atricapillus</i>	1		4
Blue Jay	<i>Cyanocitta cristata</i>			3
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	1	2	3
Common Snipe	<i>Gallinago gallinago</i>	1		
Common Yellowthroat	<i>Geothlypis trichas</i>	2	1	
Gray Catbird	<i>Dumetella carolinensis</i>		1	
Great Blue Heron	<i>Ardea herodias</i>			1
Great-crested Flycatcher	<i>Myiarchus crinitus</i>			2
House Wren	<i>Troglodytes aedon</i>		1	
Mourning Dove	<i>Zenaidura macroura</i>		1	1
Mourning Warbler	<i>Geothlypis philadelphia</i>	2		
Ovenbird	<i>Seiurus aurocapilla</i>	1		
Pine Warbler	<i>Setophaga pinus</i>	1		
Red-eyed Vireo	<i>Vireo olivaceus</i>	1		1
Ruby-crowned Kinglet	<i>Regulus calendula</i>			1

Song Sparrow	<i>Melospiza melodia</i>	1	1	1
Tennessee Warbler	<i>Leiothlypis peregrina</i>	1		
White-breasted Nuthatch	<i>Sitta carolinensis</i>	1		1
White-throated Sparrow	<i>Zonotrichia albicollis</i>	1	1	2
Winter Wren	<i>Troglodytes hiemalis</i>			1
Yellow Warbler	<i>Setophaga petechia</i>		1	1
Yellow-rumped Warbler	<i>Setophaga cronoata</i>	2	2	

Table 18. Breeding Bird Survey at 18T 419994 5017073 Station.



Common Name	Latin Name	May 27	June 11	July 8
American Crow	<i>Corvus brachyrhynchos</i>	2	2	
American Goldfinch	<i>Spinus tristis</i>	1		
American Robin	<i>Turdus migratorius</i>	1	1	
Black-and-white Warbler	<i>Mniotilta varia</i>	1	1	
Black-capped Chickadee	<i>Poecile atricapillus</i>		1	
Blue Jay	<i>Cyanocitta cristata</i>	2	1	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>	1		
Common Yellowthroat	<i>Geothlypis trichas</i>	1		
Great-crested Flycatcher	<i>Myiarchus crinitus</i>	1	1	
Hermit Thrush	<i>Catharus guttatus</i>	1		
House Wren	<i>Troglodytes aedon</i>	2	1	
Mourning Dove	<i>Zenaidura macroura</i>	1		
Northern Cardinal	<i>Cardinalis cardinalis</i>	1		
Northern Waterthrush	<i>Parkesia noveboracensis</i>	1		
Ovenbird	<i>Seiurus aurocapilla</i>	1	1	
Purple Finch	<i>Haemorhous purpureus</i>	1		
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	1		
Scarlet Tanager	<i>Piranga olivacea</i>	1		
Veery	<i>Catharus fuscescens</i>	1		
White-throated Sparrow	<i>Zonotrichia albicollis</i>	2	2	1
Winter Wren	<i>Troglodytes hiemalis</i>	1		
Yellow-rumped Warbler	<i>Setophaga cronoata</i>	1	1	

Table 19. Breeding Bird Survey at 18T 18T 419885 5017391 Station.

Misc. aquatic waterfowl observed outside of breeding bird station visits included:

Least Bittern
Great Egret
Great Blue Heron
Black Duck
Cormorant
Common Tern
Killdeer
Wood Duck



Common Name	Latin Name	May 27	June 11	July 8
Alder Flycatcher	<i>Empidonax alnorum</i>	2	1	
American Bittern	<i>Botaurus</i>		1	
American Crow	<i>Corvus</i>	2	1	3
American Goldfinch	<i>Spinus tristis</i>	1		4
American Robin	<i>Turdus migratorius</i>		2	2
Bank Swallow	<i>Riparia riparia</i>	12	5	2
Black-capped Chickadee	<i>Poecile atricapillus</i>	1		
Blue Jay	<i>Cyanocitta cristata</i>	2		
Brown Thrasher	<i>Toxostoma rufum</i>		1	
Canada Goose	<i>Branta canadensis</i>	30+	5	
Cedar Waxwing	<i>Bombycilla cedrorum</i>		1	
Chestnut-sided Warbler	<i>Setophaga pensylvanica</i>		1	1
Common Grackle	<i>Quiscalus quiscula</i>		3	2
Common Yellowthroat	<i>Geothlypis trichas</i>	1	2	1
Eastern Kingbird	<i>Tyrannus tyrannus</i>	1		
Eastern Towhee	<i>Pipilo</i>	1		
Gray Catbird	<i>Dumtella</i>	1	1	3
Hooded Merganser	<i>Lophodytes cucullatus</i>		1	1
Mallard	<i>Anas platyrhynchos</i>	40+	20+	14
Mourning Dove	<i>Zenaida macroura</i>	1	3	1
Northern Cardinal	<i>Cardinalis</i>	1		
Northern Flicker	<i>Colaptes auratus</i>	1		
Pied-billed Grebe	<i>Podilymbus podiceps</i>		1	
Purple Finch	<i>Haemorhous purpureus</i>		2	
Red-eyed Vireo	<i>Vireo olivaceus</i>	1		
Red-winged Blackbird	<i>Agelaius</i>	5	5	2

Ring-billed Gull	<i>Larus delawarensis</i>	3	3	9
Rose-breasted Grosbeak	<i>Pheucticus</i>	1	1	
Song Sparrow	<i>Melospiza melodia</i>	2	1	4
Spotted Sandpiper	<i>Actitis macularius</i>	1	1	
White-throated Sparrow	<i>Zonotrichia</i>	1	1	
Wild Turkey	<i>Meleagris gallopavo</i>	1		
Yellow Warbler	<i>Setophaga</i>	1	2	1
Yellow-rumped Warbler	<i>Setophaga</i>	1		

Table 20. Misc. animals observed beyond previous mentions with associated methodologies.			
Herps		Mammals	
Leopard Frog		White Tailed deer	Tracks
Spring Peeper		Red Squirrel	
Tree Frog		Chipmunk	
Painted Turtle	Depredated nest in pond area >120 m away and on adjacent property.	Big Brown Bat	Acoustic Monitor

12. Qualifications

Ecological Services has been in operation in eastern Ontario since 1985. Our experience includes environmental impact assessments, management plans, wetland evaluations, and municipal land use planning. We have research experience in aquatic ecology and chemistry, forest fragmentation, avian ecology, and fisheries ecology.

Dale Kristensen (botany)

Education

- Masters of Science: Biology Queen's University, Kingston, Ontario, 1996.
- Bachelor of Science: Biology University of Guelph, Guelph Ontario. 1981.

Affiliations and Certifications

- Ecological Restoration Society
- North American Wildflower Society
- Land Conservancy for Kingston, Frontenac, Lennox & Addington
- Kingston Field Naturalists
- COSEWIC Species Recovery Team – Deerberry and Cerulean Warbler habitat modelling.

Positions

1988 – present: Environmental Consultant and co-founder of Ecological Services, Elginburg, Ontario.

1985-2019 Program Associate, Phytotron Manager, and Curator of the Fowler Herbarium. Department of Biology at Queen's University, Kingston, Ontario.

Rob Snetsinger (all taxa and report preparation)

Education

- Masters of Science (1993): Biology Queen's University, Kingston, Ontario.
- Bachelor of Science (1985): Biology Queen's University, Kingston, Ontario.
- Diploma (1978): Forestry Lakehead University, Thunder Bay, Ontario.

Certifications

- Ontario Wetland Evaluation Assessor
- Ecological Land Classification
- Butternut Health Assessor: Ontario (#123)
- NHIC Data Sensitivity Training

Positions

1984 – present: Environmental Consultant. Co-founder of Ecological Services, Elginburg, Ontario.

1985-2018 Program Associate. Department of Biology at Queen's University, Kingston, Ontario.

Heather Lunn (birding and amphibian surveys)**Education**

- Bachelor of Arts (2005): Psychology. Wilfrid Laurier University, Waterloo
- Environmental Conservation Certificate (2006): University of Guelph, Guelph.
- Creating Landscapes Certificate (2018): University of Guelph, Guelph.

Certifications

- Ontario Wetland Evaluation Assessor
- Ecological Land Classification
- Butternut Health Assessor: Ontario
- NHIC Data Sensitivity Training
- Ontario Stream Assessment Protocol
- MTO/DFO/MNRF Fisheries Contract and Habitat Specialist
- Royal Ontario Museum Fish Identification Course

Positions

2009 to 2019: Ecologist. McIntosh Perry Consulting Engineers, Carp, Ontario.

2019 to present: Ecologist and Partner. ALHG Ecology, Ottawa Ontario.