

# Appendix D

Updated October 13, 2016

## **Embro Conservation Area Vegetation and Bird Inventory 2015**



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**Cover Photo**

A Great Blue Heron visits Embro Reservoir, summer 2015. Photo by Cathy Quinlan.

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## **Executive Summary**

This study examines the vegetation and bird and wildlife of Embro CA to flag any rare or sensitive species that might be impacted if changes to the Embro Dam and reservoir are undertaken. It is part of the Embro Dam Class Environmental Assessment.

A three-season botanical inventory was completed in 2015 of 5.4 ha of the Embro CA, within 100 m of the reservoir. Of the 198 plant species found, 31% are non-native, an average number. The overall quality of the terrestrial habitats (Cultural Savanna, Cultural Meadow and Mixed Forest) was assessed as average or moderate. Efforts to plant native trees and tallgrass prairie plants into the CA have added to the diversity of the site. The reservoir has a dense growth of rooted aquatic waterweeds and pondweeds, but all three native species are common. There are very few rooted emergent wetland plants along the edges of the pond owing to the steep sides and constant water levels.

No plant species-at-risk or Special Concern species were found in the study area (on the land or in the water) and no records of plant Species at Risk were found within a 2 km radius. The four plant species with SRanks of S1-S3 (rare or uncommon) have all been planted in the two tallgrass prairie plots in Community 1 and are not dependent on the pond habitat.

Thus, no plant Species at Risk or rare or uncommon or sensitive species were found on the land or in the reservoir that require special consideration prior to making changes to the dam and reservoir. There are no wetlands within the 120 m trigger distance of the Embro CA that need to be considered and, in fact, no wetlands within 1000 m of the study area.

The wooded areas of Embro CA area part of a larger significant natural heritage feature that includes the Oxford County Forest as defined by the Oxford Natural Heritage System (ONHS 2006). This feature will be unaffected by changes to the dam and reservoir.

A three season bird survey was undertaken in 2015 as well. Most of the 40 species of birds recorded in the study area are common species and most are forest birds. One bird species-at-risk, the Barn Swallow (Threatened), was seen in the study area but it was not nesting here. Since it nests in old buildings, its nesting habitat will be unaffected by changes to the dam/reservoir.

The reservoir does provide limited significance for a few resident waterfowl for raising broods (e.g., Wood Ducks, Canada Geese). These are common species. Migrating waterfowl make little use of the Embro Reservoir during spring migration, likely due to the isolation of this pond from other ponds or lakes in the area.

The only species that should be given consideration is the Snapping Turtle, a species of Special Concern that was seen in the reservoir. A slow, summer-time drawdown of the reservoir should safeguard any individuals by allowing them to move into nearby stream habitats, and ultimately, back into the creek within Embro CA.

In conclusion, there are no sensitive plants, plant communities, birds or wildlife that would be threatened from the changes to the Embro Dam and reservoir environment.

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Appendix B	Stand Descriptions
Appendix C	Descriptive Indices for Vegetation Communities
Appendix D	Bird Sightings at Embro CA, 2015
Appendix E	Animal Sightings (Incidental)

## 1.0 Purpose of the Vegetation and Bird Study

This study is a component of a larger Environmental Assessment study on the Embro Dam and Reservoir. The purposes of this study are to:

- document the vegetation communities within Embro Conservation Area (CA) to establish baseline conditions and to flag any unique or rare species that need protection or consideration prior to any potential changes to the CA (i.e., the dam and reservoir).
- document the bird species that use the aquatic and terrestrial habitats of Embro CA, either year round, seasonally or infrequently, to establish baseline conditions and to flag any unique or rare species that need protection or consideration prior to any potential changes to the CA (i.e., the dam and reservoir).

## 2.0 Vegetation Inventory

### 2.1 Methodology

A three-season vegetation inventory was carried out in 2015 on an area within Embro Conservation Area (CA) 100 m from the reservoir. This 5.4 ha area was inventoried by Brenda Gallagher, Vegetation Specialist and Forestry Technician with the Upper Thames River Conservation Authority (UTRCA). The study area did not include the western wooded section of Embro CA or the adjacent Oxford County Forest as they are outside the 100 m buffer around the pond/reservoir. Private properties (farms) to the north and east of the reservoir were not studied as they are not part of the CA and are not in natural cover.

The study area was inventoried in May, again in July and lastly in August. Each season's inventory spanned two field days. Table 1 summarizes the survey effort.

**Table 1. Vegetation Survey Dates in 2015**

Dates Inventoried	No. Days
May 27, 28	2
July 8, 10	2
August 26, 28	2
<b>Total days</b>	<b>6</b>



After walking the entire study area once, the ELC (Ecological Land Classification) vegetation communities were mapped onto 2010 colour orthoimagery. Vascular plant species in each vegetation community were recorded on field sheets. At the end of the study, the plant lists were entered into the UTRCA plant database to produce a full checklist of vascular plants by community. Statistics were generated also.

Aquatic plants in the pond/reservoir were collected and identified by John Schwindt, Aquatic Biologist, when undertaking the fish inventory. Brenda Gallagher also recorded incidental wildlife sightings, especially of birds, amphibians, reptiles and mammals, while undertaking the vegetation inventories.

## 2.2 Results and Discussion

Figure 1 shows the three ELC vegetation communities plus the pond/reservoir (Shallow Aquatic) for the study area within Embro CA. Table 2 shows the area of each community. ELC communities less than 0.5 ha in size are usually merged with neighbouring vegetation communities, as per Lee et al. 1998. A full annotated checklist of vascular plants found in all three terrestrial communities is provided in Appendix A.

**Table 2. Area of ELC Vegetation Communities**

Com #	ELC Code	Community Description	Area	Terrestrial vs. Aquatic
1	CUS	Cultural Savanna	2.1 ha	4.4 ha (terrestrial)
2	CUM	Cultural Meadow	0.7 ha	
3	FOM	Mixed Forest	1.6 ha	
4	SA	Shallow Aquatic	1.0 ha	1.0 ha (aquatic)
	<b>Total</b>		<b>5.4 ha</b>	

Table 3 summarizes the number of species, both native and non-native, as well as MCC (Mean Coefficient of Conservatism) and Average Wetness for each plant community and overall. Descriptions of these parameters are provided in Appendix C. The overall quality of the vegetation in the study area is average. The sections that follow describe the conditions in greater detail for each of the communities.

**Table 3. Summary of Plant Statistics**

Community Number and ELC		# Species	# Native Species	# Non-native Species	% Non-native Species	MCC	# Species with CC 8-10	Avg Wetness	Overall Quality Assessment
1	CUS	168	115	53	32	3.8	4	-0.8	Average
2	CUM	93	61	31	34	3.0	0	-0.8	Moderately Poor
3	FOM	101	77	24	24	3.5	0	0.2	Average
<b>Overall</b>		<b>198</b>	<b>137</b>	<b>61</b>	<b>31</b>	<b>3.8</b>	<b>4</b>	<b>-0.8</b>	<b>Average</b>

Figure 1. Embro Conservation Area Study Area and ELC Vegetation Communities



### 2.2.1 Community 1, Cultural Savanna (CUS)

The Cultural Savanna of Community 1 is 2.1 ha in size and encompasses the north part of the CA on both sides of the pond/reservoir. Cultural Savannas have a canopy cover of 25 - 35%. Cultural communities result from, or are maintained by, cultural or anthropogenic-based disturbances (Lee et al., 1998).

This community has a variety of small but different habitats within it. The day-use area has an understory of mowed grass with scattered shade trees (planted over the last 40 years). There are also small, naturalized areas of meadow/marsh along the pond's shore and by Rd 84 as well as two planted tallgrass prairie plots. Appendix F provides a short history of the tree and wildflower plantings in Embro CA.

A total of 168 plant species were recorded: 115 native and 53 non-native or adventive species. The number of plant species is relatively large for such a small area, owing to the diversity of micro-habitats within it. The percentage of non-native plants is 32%, which is about average or moderate for the Upper Thames watershed. The site is disturbed by past land use changes and day-use activities.

The MCC (Mean Coefficient of Conservatism) is 3.8, an average or moderate score. There is a slight predominance of wetland plants in this community (Average Wetness is -0.8).

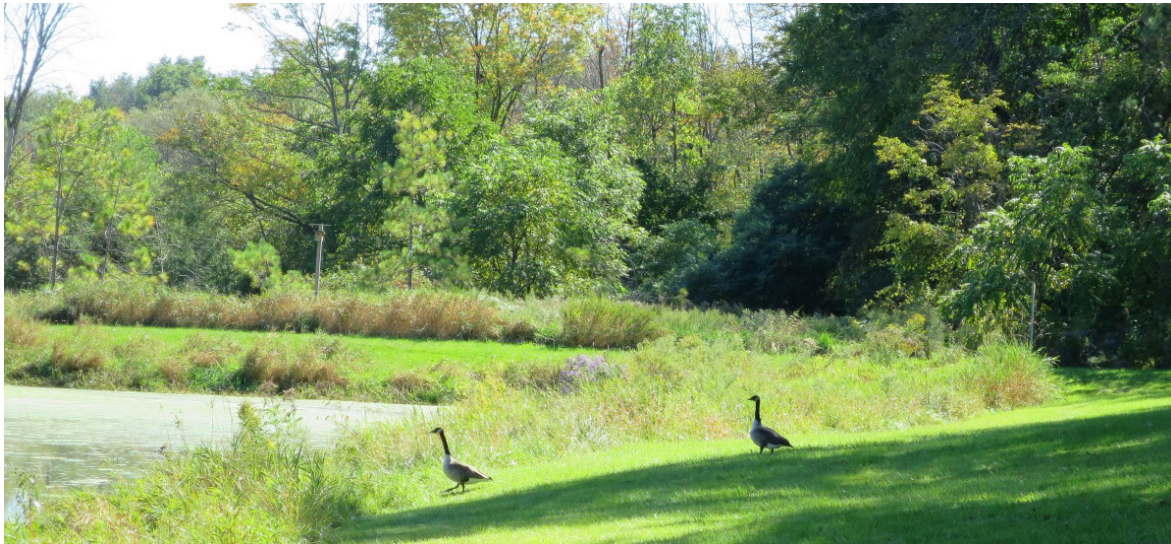
Mature trees in the overstory include Silver Maple, Red Pine, White Birch with some Black Cherry and Sugar Maple (see Appendix B). The younger trees include Sugar Maple, Red Oak, Burr Oak, with some Silver Maple. In the naturalized areas, there are raspberries, dogwoods, and Choke Cherry.



**Photo 1.** Community 1 – View looking south from Rd 84 at the small meadow and treed areas on the north side of the reservoir/pond.



**Photo 2.** Community 1 – Cultural Savanna, showing the day use area of spaced shade trees and the pavilion west of the reservoir.



**Photo 3.** Community 1 (lawn and pond fringe) meets Community 2 at the far side of the reservoir (behind bird box).

### 2.2.2 Community 2, Cultural Meadow (CUM)

The Cultural Meadow of Community 2 is located on the south or downstream side of Embro Reservoir on both sides of the Youngsville Drain. It is 0.7 ha in size. Cultural meadows are open areas characterized by grasses and flowers with tree cover  $\leq 25\%$  and shrub cover  $\leq 25\%$  and resulting from or maintained by cultural anthropogenic-based disturbances (Lee et al, 1998).

A total of 92 species were recorded, 61 native and 31 non-native. The percentage of non-native species (34%) is average or moderate and reflects the natural and human disturbances this community experiences. The MCC score is 3.0, a moderately poor to average score.

Some trees have been planted or have naturalized and include ashes, willows, Black Cherry, Black Walnut and White Elm. The herbaceous layer was dominated by Joe Pye-weed, jewelweeds, asters, goldenrods, teasels, thistles, milkweeds, and grasses (see Appendix B).



**Photo 4.** Community 2 – Riparian area along Youngsville Drain downstream of Embro Dam.



**Photo 5.** Community 2 – Trail through the grasses and trees

### **2.2.3 Community 3, Mixed Forest (FOM)**

The mixed forest of Community 3 is 1.6 ha but is part of a larger wooded area that extends west towards Embro Creek and the Oxford County Forest. Under the Ecological Land Classification (ELC) system, mixed forests have conifer (evergreen) tree species >25% and deciduous tree species >25% of canopy cover. The coniferous trees were planted about 50 years ago. The older deciduous trees have self-seeded in, while younger trees were planted by the UTRCA a few years ago to infill amongst dying Red Pines.

A total of 101 species were recorded from the community, 77 native species and 24 non-native species. The percent of non-native plants (24%) is relatively low, which indicates the habitat is moderately good. The MCC score is 3.5, an average to moderately poor score.

Dominant overstory tree species include Red Pine (in decline), Black Cherry, Silver Maple and Sugar Maple (see Stand Descriptions in Appendix B). The understory trees include ashes, Black Cherry, Black Walnut, and apple. Common shrubs include raspberries and Choke Cherry.

The forest is young to mid age, having been planted by the UTRCA post 1961. In 2010/2011 the conifer plantations were thinned by the UTRCA to remove dying pines and to encourage hardwood forest regeneration. In addition, 2100 native hardwood seedlings were planted between the rows (see history in Appendix F).



**Photo 6.** Community 3 of pines and other deciduous species west of the reservoir.

**2.2.4 Community 4, Shallow Aquatic (SA)**

The Embro Pond/Reservoir is classified as Shallow Aquatic with standing water <2 m depth and a low percentage of emergent vegetation, and floating-leaved macrophytes. The pond has silted in over the years and is likely 0.5 m deep on average today and the bottom substrate is very soft.

Duckweed and algae float on the surface of this shallow aquatic community. Four rooted aquatic species were identified by John Schwindt and these are listed in Table 4.

**Table 4. Aquatic Plant Species in Embro Reservoir**

Common Name	Scientific Name	Exotic Status	SRank	SARO	Sensitivity
Broad-leaved Arrowhead	<i>Sagittaria latifolia</i>		S5		Non-sensitive
Broad Waterweed	<i>Elodea Canadensis</i>		S5		Non-sensitive
Curly-leaved Pondweed	<i>Potamogeton cirspus</i>	SE			Non-sensitive
Slender Pondweed	<i>Potamogeton pusillus</i> ssp. <i>pusillus</i>		SU		Non-sensitive



Because there is good water clarity and a surplus of nutrients in the water, there is a heavy growth of these pondweeds and waterweeds, and smaller amounts of arrowheads. It is estimated that 50% of the pond/reservoir volume is filled with aquatic vegetation. This vegetation does provide good cover for fish species that are adapted to ponds. Other sections of the Embro Environmental Assessment discuss the fisheries.

There are very few wetland emergent plants growing along the edges of the pond. The Pond contours don't seem to favour these plants (e.g., steep sided). As well, the pond is kept at the same elevation all year with no drawdowns that would expose mudflats and promote colonization of species such as cattails and rushes. Any shoreline vegetation is included in Community 1.



**Photo 7.** Community 4 – Floating Duckweed on the surface, pondweeds and waterweeds under the surface and beggarticks on the shore. Photo by Cathy Quinlan, Sept 2015



**Photo 8.** Community 4 – View of Embro Pond/Reservoir in Sept. 2015, looking east.



**Photo 9.** Historical photo of Embro Pond shortly after construction in the 1960s. Source: Twenty-five Years of Conservation on the Upper Thames Watershed 1947 – 1973, published by the UTRCA.

### 2.2.5 Plants with High Coefficient of Conservatism (CC) Scores

Plants with a CC score of 8, 9 or 10 are considered more specialized in habitat or condition and conserve themselves to very specific environments, usually unaltered communities. Plants with low CC scores are considered generalist species that are found in a wide variety of habitats, including disturbed sites.

Table 5 summarizes the four plant species that had a CC score of 8, 9 or 10, all found in Community 1 in the planted tallgrass prairie plots. These plots were planted in 2007 and 2010 by the UTRCA, Embro Pond Community Association, and local school groups. They planted 2800 native wildflowers and grasses to add diversity to the site (see Appendix F).

**Table 5. Plant Species with high CC Scores**

Common Name	Scientific Name	CC Score	Community	Comments
Butterfly-weed	<i>Asclepias syriaca</i>	8	1	planted
Tall Coreopsis	<i>Coreopsis tripteris</i>	9	1	planted
Gray-headed	<i>Ratibida pinnata</i>	9	1	planted
Indian Grass	<i>Sorghastrum</i>	8	1	planted

### 2.2.6 Plants with Species at Risk (SAR) Designations

There are no plant species-at-risk in the study area. Appendix B lists the various species-at-risk categories.

### 2.2.7 Plant Species with Provincial Ranking (SRANK) of S1, S2, or S3

Four plant species were found that have a SRank of S1, S2 or S3 (very rare to rare to uncommon). Table 6 summarizes the list of species. All of these species were planted in the tallgrass prairie plots. These plantings should not be negatively affected by any potential changes to the dam and reservoir as they are on higher ground and are not reliant on the pond ecosystem.

**Table 6. Plant species with SRanks of S1 to S3**

Common Name	Scientific Name	SRank	Community	Comments
Tall Coreopsis	Coreopsis tripteris	S2	1	planted
Gray-headed Coneflower	Ratibida pinnata	S3	1	planted
Giant Ironweed	Vernonia gigantea	S1?	1	planted
Culver's Root	Veronicastrum	S2	1	planted

## 3.0 Bird Survey and Incidental Wildlife

### 3.1 Methodology

A three-season bird survey was undertaken in 2015 by John Schwindt, Aquatic Biologist with the UTRCA who has years of birding experience with the Breeding Bird Atlas and Christmas Bird Count. Incidental bird observations were made by Brenda Gallagher while she was undertaking the botanical inventories. Brenda is also an experienced birder.

Table 7 summarizes the dates of each of their visits. John Schwindt focused his efforts on the spring and early summer to capture the spring migration and breeding seasons. Approximately four hours were spent each time, with particular effort around the pond. Brenda Gallagher also spent six days at Embro CA from May to late August.

**Table 7. Bird Survey Dates in 2015**

Season	John Schwindt	Brenda Gallagher
Early Spring	April 22	
Spring	May 5, 14, 26	May 27, 28
Summer	June 24	July 8, 10
Late Summer		Aug 26, 28
<b>12 days total</b>	<b>6 days total</b>	<b>6 days total</b>

## 3.2 Results

- A total of 40 bird species were seen by John Schwindt and Brenda Gallagher on their separate visits to the study area in Embro CA from April to August 2015. Appendix D provides a full list of the bird species recorded. One exotic or introduced species was seen (European Starling). Of the 39 native species:
  - 28 are **common breeding species** in Oxford County,
  - 9 are common permanent residents in Oxford County,
  - 1 is an **uncommon permanent resident** in Oxford (Red-bellied Woodpecker), and
  - 1 is a **common breeding species** in Oxford but **Threatened** in Ontario (Barn Swallow).

The Barn Swallow is a common breeding species found throughout southern Ontario but there was no breeding evidence at Harrington CA. Barn Swallow is listed as Threatened by SARO (Species at Risk in Ontario), meaning the species lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.

According to the Ministry of Natural Resources and Forestry (<http://www.ontario.ca/page/barn-swallow>), Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. Barn Swallows have experienced a significant decline since the mid-1980s. While there have been losses in the number of available nest sites, such as open barns, and in the amount of foraging habitat in open agricultural areas, the causes of the recent population decline are not well understood. This bird's nests are often destroyed when old buildings in rural areas are demolished or fall down. Massive pesticide spraying of fields can also reduce the insect population barns swallows need for food.

- The Red-bellied Woodpecker, an uncommon breeder in Oxford County, was seen in the mixed forest (Community 3). There is anecdotal evidence this species is more common than reported.
- Of the 40 bird species recorded, none are exclusively pond dwellers. Species such as Canada Goose, Mallard, Great Blue Heron, and Wood Duck, feed in or by standing water but these species utilize rivers and streams as well. The pond does support some small fish species and amphibians (Green Frogs), which are suitable for Great Blue Herons. Other fish-eating birds such as Osprey or Belted Kingfishers were not seen.
- The pond provides habitat for a few resident ducks and geese. A family of Wood Ducks was seen. They are cavity nesters so they likely nested in a tree nearby, and used the

pond to raise their ducklings. A family of Canada Geese was seen also and they likely nested on the shores of the pond. Both of these waterfowl are common species.

- Very few species of waterfowl were seen using the pond/reservoir in the spring migration period. The pond/reservoir does not appear to be important for waterfowl staging perhaps because the pond is small and isolated from other ponds or wetlands in the vicinity.
- Most of the birds seen are forest birds, likely attracted to the area by the larger Oxford County Forest adjacent to the Embro CA. Nesting boxes installed by the community and UTRCA seem to be fairly well used but are in disrepair.



**Photo 12.** Indigo Buntings were seen nesting in the mixed forests near the parking lot of Embro CA, May 2015. Photo by Brenda Gallagher.



**Photo 12.** Male Tree Swallow in a nest box at Embro in Community 2. Photo by Brenda Gallagher.



**Photo 13.** Kingbirds were seen in Community 1 and feeding over the pond.

### 3.3 Other Wildlife Sightings

- Brenda Gallagher recorded incidental wildlife seen while undertaking the botanical inventories. Appendix E lists the six insect species, three herptiles and three mammal species seen, all of which are common to abundant in our area.
- The Monarch and Snapping Turtle are both designated as Special Concern (SC) under SARO (Species at Risk in Ontario). “Special Concern” means the species lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats. Special concern species do NOT receive species or habitat protection, however.
- The Snapping Turtle spends most of its life in water and was seen in the Embro Reservoir. They prefer shallow waters so they can hide under the soft mud and leaf litter with only their noses exposed to the surface to breathe (<http://www.ontario.ca/page/snapping-turtle>). In summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. The long-lived adults are killed primarily by cars on roads and intentional persecution. Turtle eggs in nests around urban and agricultural areas are subject to predators such as raccoons and Striped Skunks. The possible removal of the Embro Dam and Reservoir may impact individual turtles that use the pond, but they are just as likely to re-establish in the restored creek. See Section 5 for further discussion.
- The Monarch butterfly uses three different types of habitat over its life cycle. The caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. The adults can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests in central Mexico. The largest threat to Ontario Monarchs is habitat loss and fragmentation at overwintering sites in central Mexico where forests are being logged. Widespread pesticide and herbicide use throughout the Monarch’s range may also limit recovery. The planting of tallgrass prairie plots in Embro is a positive step for this species. As well, there is a lot of milkweed in Communities 1 and 2. The removal of the Embro Dam and Reservoir will not impact this species or their food plants.
- The Green Frog has a strong affiliation to permanent water bodies and it may be impacted by the loss of the pond/reservoir. However, it is a common species with no population threats at this time.

### **3.4 Other Species at Risk Records within 2 km of the Study Area**

Within 1.5 km of the study area there are records of Bobolink (S4B, Threatened) and Barn Swallow (S4B, Threatened). The Bobolink uses prairies and large open meadows, so it is unlikely to be found in the Embro CA which has too much tree cover. The Barn Swallow was seen in the study area and is discussed in Section 3.2.

## **4.0 Significant Natural Heritage Features**

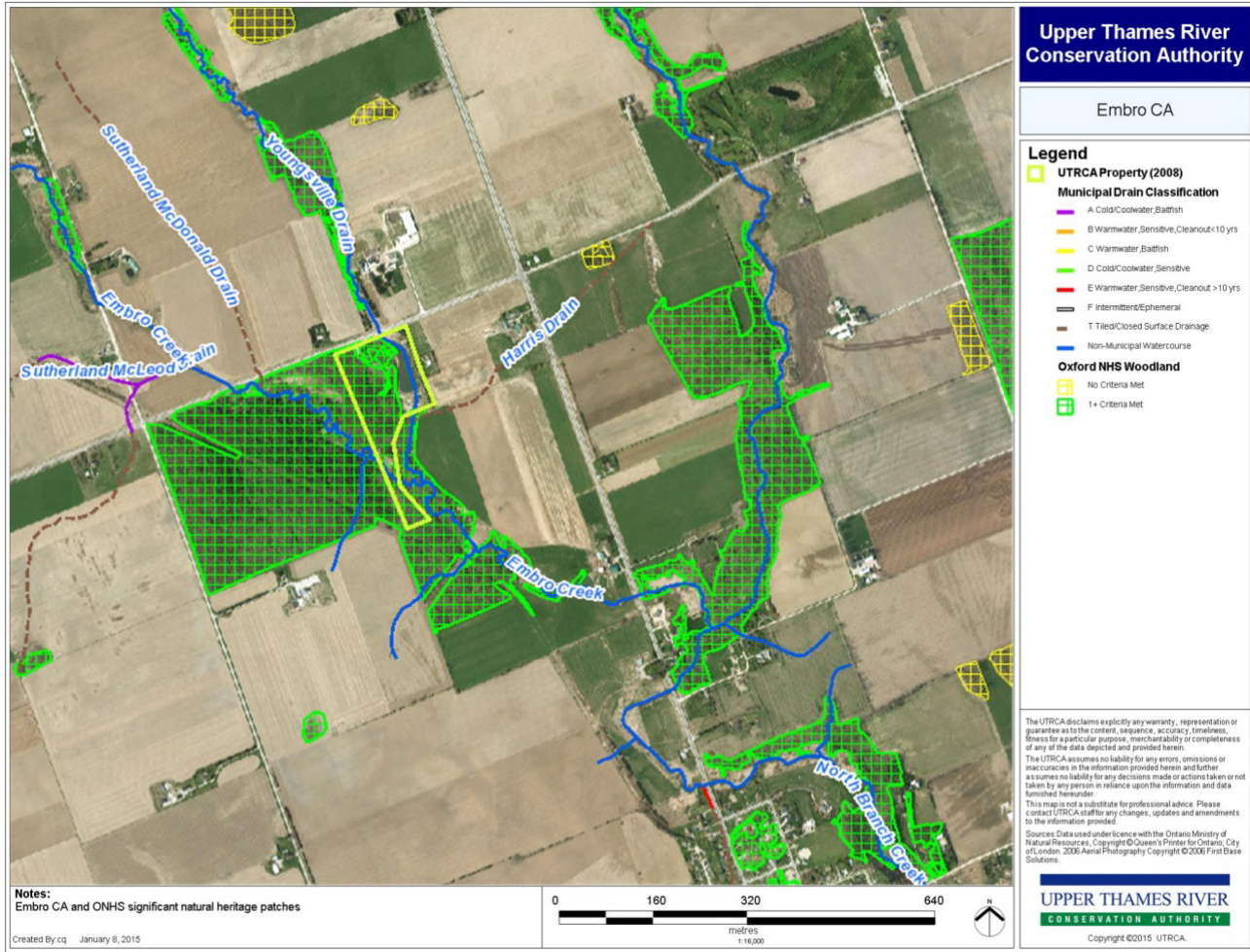
### **4.1 Oxford Natural Heritage Study (ONHS)**

The Oxford Natural Heritage Study (Oxford County 2006) identified significant woodland features in the county based on a set of ecological criteria. Figure 2 shows the significant features identified in and around Embro CA. The woodlands of Embro CA are part of a larger woodland feature that includes the Oxford County Forest and adjacent riparian woodlands downstream, considered significant on the county landscape.

The ONHS did not include meadows, marshes, ponds or manicured parkland (e.g., mowed lawn areas). Thus the pond/reservoir and open shoreline habitats around Embro Pond were excluded from the significant natural heritage features. The next iteration of the ONHS study planned for 2016 will include meadows, marshes and ponds as part of the natural features so more of the CA may be identified as significant if it meets the size criteria.



Figure 2. Significant Woodland Patches near Embro CA, ONHS 2006

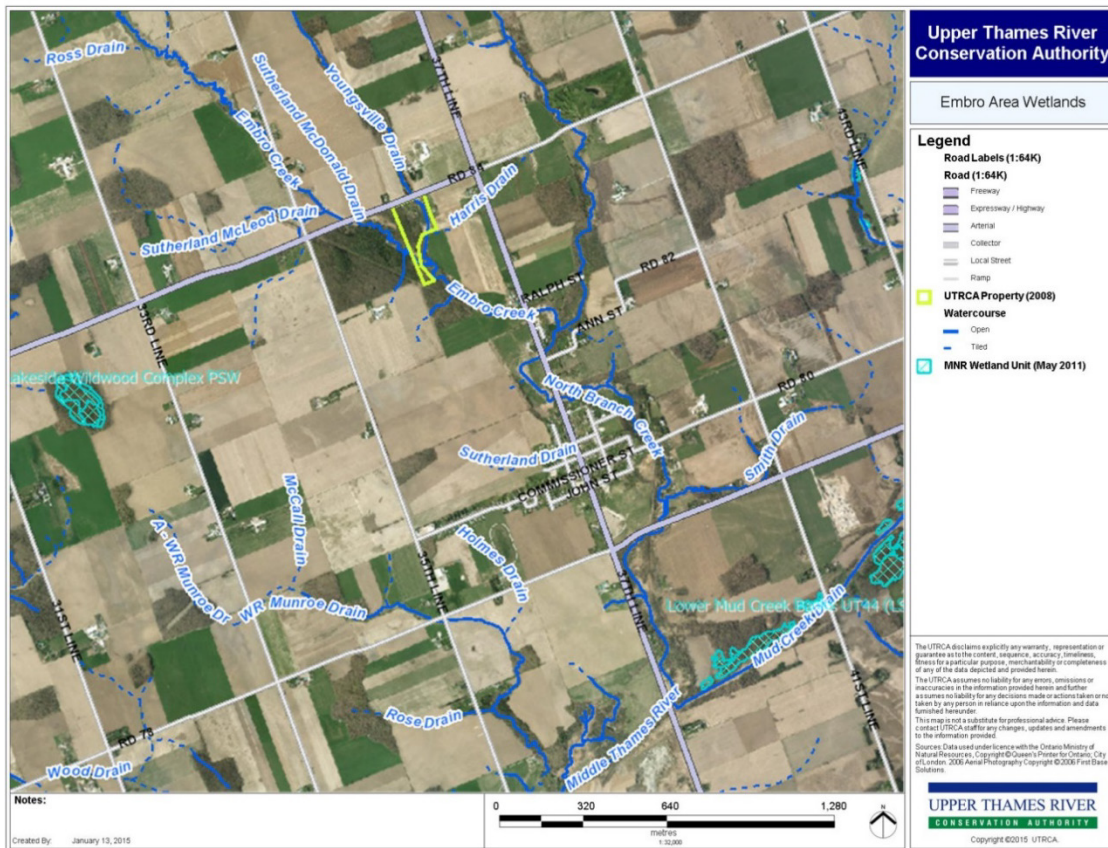


## 4.2 Wetlands

Figure 3 shows there are no evaluated or unevaluated wetlands within the 120 m trigger distance of Embro CA.

The nearest wetland, approximately 1.5 km to the west, is a small portion of the Lakeside Wildwood Wetland Complex (Provincially Significant Wetland), but it is not connected hydrologically to Embro CA. Approximately 4 km downstream of the North Branch Creek is the Lower Mud Creek Banks Wetland (Locally Significant Wetland), but it not hydrologically connected either.

**Figure 3. Harrington Area Wetlands (Lakeside Wildwood Complex)**



## **5.0 Summary and Conclusions**

### **5.1 Vegetation**

The vegetation within Embro Conservation Area is quite diverse owing to the mix of habitats including manicured parkland, pond edge, naturalized plots and maturing mixed forest plantation. Efforts to plant more native plants in Embro CA over the years have added to the diversity of the vegetation cover.

While the diversity of plants is quite large for a small site, the overall quality of the three vegetation communities ranges from average to moderately poor. The overall percentage of non-native species is 31% (24 - 34% range), which is about average and expected for a small, disturbed area. Community 3, Mixed Forest, had the lowest percentage of non-native species (24%) and is naturalizing quite well as a result of natural processes and thinning and planting by the UTRCA.

The Embro Pond/Reservoir supports only three native rooted aquatic plant species (pondweeds and waterweeds). They are prolific and occupy approximately half of the water volume due to good water clarity and a surplus of nutrients. All of the species are common.

There are very few emergent plants growing along the edges of the pond, possibly due to the steep sidedness of the reservoir and the constant water level that does not expose mudflats. By comparison, shallow natural ponds often fill in with wetland plants over time. Most of the plants that grow along the edge of Harrington pond/reservoir also grow along the shores of Harrington Creek and nearby creeks and rivers and wetlands and are not uncommon in our area. Therefore, no unique plants are seen as a result of the reservoir.

No plant species at risk was found in the study area. Four plants with a high Conservatism of Conservation score were found, all tallgrass prairie species that were planted in the plots. Four plant species with SRanks of S1-S3 were found as well, but these species are also all planted tallgrass prairie species. The prairie plots should be unaffected by the potential reservoir to creek restoration project.

### **5.2 Birds and Wildlife**

Forty bird species were seen in the study area. Of the 39 native species, 37 are common breeding or permanent residents of Oxford County. One uncommon permanent resident, the Red-bellied Woodpecker, was seen in mixed forest community and should be unaffected by the dam/reservoir work.

One Threatened bird species was seen, Barn Swallow. While Barn Swallows are common breeders in Oxford County, their overall population has been declining and may be attributed to loss of barns and human structures, pesticide spraying of fields that reduce insect

populations. Since they were not seen breeding in Embro CA (they use old buildings) and are habitat generalists, there is no special action that needs to be taken to protect them if any changes are made to the Embro dam/reservoir.

Most of the native birds seen are forest birds, likely attracted to the area by the larger Oxford County Forest adjacent to Embro CA. As such, they will be unaffected by changes to the dam/reservoir.

The pond/reservoir does provide habitat for a few resident ducks and geese as a family of Wood Ducks and Canada Geese were seen, both common species. The reservoir does not appear to be important for waterfowl staging during spring migration, likely because of the pond's small size and isolation from other ponds or wetlands in the vicinity.

Six insect species, three herptiles and three mammal species were seen, all of which are common in our area.

The Monarch butterfly is a species of Special Concern and was seen in the study area. The abundance of milkweeds in the naturalized portions of the Embro CA is a positive element for this species. This insect will not be affected by the restoration of the creek, as long as the wildflower areas are left intact or re-planted.

The Snapping Turtle is a species of Special Concern and it was seen in the reservoir. Special concern species do not receive species or habitat protection. They are likely to re-establish along the restored creek if the reservoir is decommissioned

The Green Frog, a common species, does has affinity to permanent water bodies and they are present in the reservoir. They may be affected by changes to the reservoir.

If the dam and reservoir are to be decommissioned, the timing is important to protect wildlife. The reservoir should be drawn down slowly in the summer, allowing hibernating frogs and turtles time to move out of the pond sediments and into surrounding stream habitats. These species will likely re-establish in the restored creek.

### **5.3 Conclusions**

This report examines the vegetation and bird/wildlife of a 5 ha study area within Embro CA to flag any rare or sensitive species that might be impacted if changes to the Embro Dam and reservoir are undertaken.

No rare or sensitive plant species will be affected by any proposed restoration work. No plant species-at-risk or species of Special Concern were found in the study area (on the land or in the water) and no records of plant species at risk were found within a 2 km radius. The four plant species with SRanks of S1-S3 (rare or uncommon) have all been planted in the two tallgrass prairie plots in Community 1 and are not dependent on the pond habitat.

There are no wetlands within the 120 m trigger distance of the Embro CA that need to be considered.

The wooded areas of Embro CA area part of a larger significant natural heritage feature that includes the Oxford County Forest as defined by the Oxford Natural Heritage System (ONHS 2006). This feature will be unaffected by changes to the dam and reservoir.

One bird species-at-risk, the Barn Swallow (Threatened), was seen in the study area but it was not nesting here. Since it nests in old buildings, its nesting habitat will be unaffected by changes to the dam/reservoir.

The reservoir does provide limited significance for a few resident waterfowl for raising broods (e.g., Wood Ducks, Canada Geese). These are common species. Migrating waterfowl make little use of the Embro Reservoir during spring migration, likely due to the isolation of this pond from other ponds or lakes in the area.

The only species that should be given consideration is the Snapping Turtle, a species of Special Concern. A slow, summer-time drawdown of the reservoir should safeguard any individuals by allowing them to move into nearby stream habitats, and ultimately, back into the creek within Embro CA.



**Photo 13.** Youngsville Drain downstream of the dam

## References

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Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat within Study Area	Conclusions/ Recommendations
American Badger (Northwestern population) <i>Taxidea taxus</i> ( <i>Taxidea taxus taxus</i> )	END	SC Schedule 1	SC	- Tallgrass prairie, sand barrens, farmland, shrublands, alpine areas and wetlands. - Require coherent soils that can be burrowed into without collapsing. - <b>TPS1, CUM1, CUS, SBO with dry sandy soil.</b>	- Rainy River and Thunder Bay districts.	NHIC, Mammal Atlas	Low Suitable habitat was not observed and the species was not recorded during wildlife surveys.	nothing further
Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule 1	THR	- Requires vertical faces in sand or silt deposits; river and lake banks, active/inactive sand and gravel pits, road cuts, soil stockpiles. - Breeding sites are located close to aerial foraging areas such as grasslands, meadows, pastures, and cropland. - Large wetlands used for nocturnal roost sites during post-breeding, migration and wintering periods.	- Common across southern Ontario, especially along Lake Erie and Lake Ontario shorelines and the Saugeen River. - Sparse populations scattered across northern Ontario.	OBBA	Low Suitable nesting habitat was not identified within the areas of disturbance	nothing further
Blanding's Turtle (Great Lakes / St. Lawrence population) <i>Emydoidea blandingii</i>	THR	THR Schedule 1	END	- Shallow, nutrient-rich habitats; typically large wetlands and shallow lakes with lots of water plants. - Nesting occurs in sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. - Overwintering occurs in pools about 1 metre in depth. - <b>SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.</b>	- Southern Ontario north to Sudbury, with isolated reports as far north as Timmins.	ORAA	Low Pond is unlikely to support blanding's turtle.	nothing further
Babolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	- Hayfields, pastures, wet prairie, graminoid peatlands, abandoned farm fields dominated by tall grasses, no-till cropland, small-grain fields, restored surface mining sites. - Small nests are often built on the ground in dense grasses. - Typically not abundant in short-grass prairie, alfalfa, or in row crop monocultures (corn, soybean, wheat). - <b>TPO, TPS, CUM1.</b>	- Southern Ontario north to James Bay.	NHIC, OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	- Historically included hollow trees. - More commonly found in and around urban settlements, including chimneys and other manmade structures. - Typically close to water. - <b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 adjacent to suitable nesting habitat.</b>	- Southern Ontario north to Timmins.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	- Moderately tall grasslands; prairies, savannahs, pastures and hayfields, alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, overgrown fields. - Small trees, shrubs, or fence posts used as elevated song perches. - <b>TPO, TPS, CUM1, CUS, and MAM2.</b>	- Southern Ontario north to Timmins, as well as Lake of the Woods area.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Eastern Small-footed Myotis (Eastern Small-footed Bat) <i>Myotis leibii</i>	END	N/A	N/A	- Summer habitat includes rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees. - Roosting locations are typically changed every night. - Winter hibernation occurs in caves or mines, typically drier and colder than sites selected by other bats.	- South of Georgian Bay to Lake Erie and east to the Pembroke area, the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park.	Mammal Atlas	Low Suitable habitat was not observed.	nothing further
Gray Fox <i>Urocyon cinereoargenteus</i>	THR	THR Schedule 1	THR	- Deciduous forests and marshes. - Dens are usually found in dense shrubs, close to a water source, or in rocky areas, hollow trees, or underground burrows dug by other animals.	- West of Lake Superior in the Rainy River District. - Pelee Island.	Mammal Atlas	Low Study area unlikely to contain suitable habitat.	nothing further
Little Brown Myotis (Little Brown Bat) <i>Myotis lucifugus</i>	END	END Schedule 1	END	- Large-diameter trees, attics, abandoned buildings, and barns often used for summer colonies. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Hibernacula used in winter include mines and caves that are humid and remain above freezing.	- All across Ontario; concentrated in southern Ontario.	Mammal Atlas	High Cavity trees were observed within the CUS and FOM communities.	Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.
Northern Myotis (Northern Long-eared Bat) <i>Myotis septentrionalis</i>	END	END Schedule 1	END	- Typically within the boreal forest, under loose bark or in the cavities of trees. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Overwintering occurs in cold and humid sites such as caves or mines. - <b>FOC, FOM, FOD, SWC, SWM, and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.</b>	- Forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Mammal Atlas	High Cavity trees were observed within the CUS and FOM communities.	Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	END	THR Schedule 1	END	- Woodlands and woodland edges, including oak and beech forests, grasslands, orchards, riparian forests, beaver ponds, burns, parks, golf courses, and cemeteries. - Dead trees used for nesting and perching. - <b>TPS, TPW, CUW, FOD1, FOD2, FOD4-1, FOD6, FOD7, and FOD9 that are open with an abundance of dead trees.</b>	- Woodland Caribou Provincial Park southeast to Cornwall.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further

<p>Tri-colored Bat <i>Perimyotis subflavus</i></p>	<p>END</p>	<p>END Schedule 1</p>	<p>END</p>	<ul style="list-style-type: none"> <li>- Day roost and maternity colonies are formed in older forests with large-diameter trees, barns, or other structures.</li> <li>- Foraging occurs over water or along streams in a forest.</li> <li>- Winter hibernacula include caves and mines.</li> </ul>	<p>- Southern Ontario north to Sudbury.</p>	<p>Mammal Atlas</p>	<p>High Cavity trees were observed within the CUS and FOM communities.</p>	<p>Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.</p>
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Species of Conservation Concern

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Probability of Occurrence within Study Area	Conclusions/ Recommendations
Northern Sunfish (Great Lakes - Upper St. Lawrence populations) <i>Lepomis peltastes</i>	SC	SC Schedule 1	SC	- Clear, slow flowing rivers and streams or warm lakes and ponds, with sandy banks or rocky bottoms and aquatic vegetation.	- Southern Ontario including waters flowing into Lake Huron, Georgian Bay, Lake St. Clair, Lake Erie, and Lake Ontario, as well as rivers and small lakes in eastern Ontario. - Northwestern Ontario near Lake of the Woods.	DFO	Confirmed Species is confirmed downstream of the pond; however, has not been confirmed within the pond itself.	Species should be considered during drawn down and fish relocation. Potential opportunity to explore the inclusion of habitat features during detailed design.
Barn Swallow <i>Hirundo rustica</i>	SC	SC	SC	- Cup-shaped mud nests are built on human-made structures such as open barns, under bridges, and in culverts. - Preferably constructed on rough-cut wood surfaces with right angles. - Foraging habitat includes grassy fields, pastures, cropland, lake and river shorelines, cottage areas and farmyards, islands, wetlands, and tundra. - <b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, and SAF1, adjacent to suitable nesting structures</b>	- From southern Ontario north to Hudson Bay.	OBBA, eBird, UTRCA	Confirmed Species was observed by UTRCA in 2015 as foraging; however, no suitable nesting structures were observed  It should also be noted, this species has been reassessed in 2021 as SC, and has since taken effect	nothing further no suitable nesting was observed
Canada Warbler <i>Cardellina canadensis</i>	SC	THR Schedule 1	THR	- Deciduous or coniferous forests with well-developed, dense shrub layer; commonly wet or in riparian areas. - May also include stands regenerating after natural disturbances (ie, logging). - <b>FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD</b>	- All of Ontario.	eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further
Eastern Wood-pewee <i>Contopus virens</i>	SC	SC Schedule 1	SC	- Mid-canopy layer of forest clearings, edges of deciduous and mixed forests, early successional clearings. - <b>FOC, FOM, FOD, SWD, SWM and CUW.</b>	- Southern Ontario north to Sudbury.	OBBA, eBird, UTRCA	Confirmed Species was observed by UTRCA during breeding bird surveys	Restrict vegetation removal outside of the Migratory Breeding Bird window (April 1 to August 31)
Peregrine Falcon <i>Falco peregrinus</i>  Peregrine Falcon (anatum/tundrius) <i>Falco peregrinus anatum/tundrius</i>	SC	SC Schedule 1	Not At Risk	- Tall, steep cliff ledges or tall buildings from 50 m to 200 m in height, close to large bodies of water. - Can be found in tundra, coastal, prairie or urban areas. - <b>CLO.</b>	- Breeding population centered around Lake Superior in northwest Ontario. - May be found migrating across rest of the province.	eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Wood Thrush <i>Hylocichla mustelina</i>	SC	THR Schedule 1	THR	- Mature deciduous and mixed forests; moist stands of trees with well-developed undergrowth. - Tall trees are used for singing perches. - Nests are built in live saplings, trees, or shrubs, especially sugar maple or American beech. - Preferably large forest mosaics. - <b>FOD and FOM greater than 1 ha</b>	- Southern Ontario north to Hearst.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further
Snapping Turtle <i>Chelydra serpentina</i>	SC	SC Schedule 1	SC	- Shallow wetland habitats with slow-moving water and soft bottoms; ponds, sloughs, shallow bays, river edges, or slow streams. - Nesting occurs on sandy or gravel banks or man-made structures such as roads, dams, and aggregate pits. - Overwintering occurs underwater, underneath logs, sticks, or overhanging banks, deep in mud in marshy areas, or underneath floating mats of vegetation. - <b>OAO, SA near gravelly or sandy areas.</b>	- Primarily southern Ontario north to Timmins; also found near Thunder Bay and Kenora.	UTRCA	Confirmed Species was observed by the UTRCA during investigations	A turtle rescue may be required during draw down should the species not relocate on their own accord. No wildlife is to be handled or relocated without obtaining a Wildlife Scientific Collectors Authorization.
Monarch <i>Danaus plexippus</i>	SC	SC Schedule 1	END	- Open or disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests. - Trees along the north shore of the Great Lakes are used for roosting before migrating across open water. - Caterpillars are confined to meadows and open areas where milkweed grows. - <b>AL, TP, and CUM where milkweed is present</b>	- South of 50° of latitude.	OBBA, UTRCA	Confirmed Species was observed by UTRCA. Milkweed was identified as abundant within the study area.	Milkweed should be included in native seed mixes recommended for restoration within the study area.
Woodland Vole <i>Microtus pinetorum</i>	SC	SC Schedule 1	SC	- Mature deciduous forest in the Carolinian region with ample depth of litter. - Can also be found in scrubby sand dunes, swamps, and orchards; preferably with dense herbaceous vegetation and friable soils with low saturation. - <b>FOD with a deep leaf litter and loose soils</b>	- From Chatham to Fort Erie and north to Oakville and Pinery Provincial Park. - May inhabit other areas of the province.	Mammal Atlas	Low Suitable habitat was not observed and the species was not recorded during wildlife surveys.	nothing further

8
1
5
0
1
0
1

ESA Status	
SC	8
No Status	0
EXP	0
TOTAL SCC	8

## Appendix A. Annotated Checklist of Vascular Plants for the Embro CA Study Area

Scientific Name	Common Name	Native or Adventive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Acer rubrum</i>	Red Maple	N		4	0			x	x	x
<i>Acer saccharinum</i>	Silver Maple	N		5	-3			x		x
<i>Acer saccharum</i>	Black Maple	N		7	3			x		
<i>Acer saccharum</i>	Sugar Maple	N		4	3			x	x	x
<i>Achillea millefolium</i>	Yarrow	A	-1					x	x	
<i>Agrimonia gryposepala</i>	Agrimony	N		2	2			x	x	x
<i>Alliaria petiolata</i>	Garlic Mustard	A	-3					x	x	x
<i>Amelanchier</i> sp	Serviceberry species	N		5	3			x		x
<i>Anemone canadensis</i>	Canada Anemone	N		3	-3			x	x	
<i>Angelica atropurpurea</i>	Angelica	N		6	-5			x		x
<i>Anthriscus sylvestris</i>	Wild Chervil	A	-2					x		
<i>Apocynum cannabinum</i>	Indian Hemp	N		3	0					x
<i>Arctium minus</i>	Common Burdock	A	-2					x	x	x
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	N		5	-2			x		x
<i>Aronia melanocarpa</i>	Chokeberry	N		7	-3			x		
<i>Asclepias syriaca</i>	Common Milkweed	N		0	5			x	x	
<i>Asclepias tuberosa</i>	Butterfly-weed	N		8	5			x		
<i>Athyrium filix-femina</i> var. <i>angustum</i>	Northeastern Lady Fern	N		4	0					x

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Bellis perennis</i>	English Daisy	A	-1					x		
<i>Berberis vulgaris</i>	Common Barberry	A	-2					x		
<i>Betula papyrifera</i>	Paper Birch	N		2	2			x		
<i>Bidens cernua</i>	Nodding Beggarticks	N		2	-5			x		
<i>Bidens frondosa</i>	Devil's Beggarticks	N		3	-3			x		
<i>Boehmeria cylindrica</i>	False Nettle	N		4	-5			x		
<i>Bromus inermis</i>	Smooth Brome	A	-3					x	x	
<i>Caltha palustris</i>	Marsh-marigold	N		5	-5				x	
<i>Carex cristatella</i>	Crested Sedge	N		3	-4			x		
<i>Carex lacustris</i>	Lake Sedge	N		5	-5			x	x	
<i>Carex stricta</i>	Tussock Sedge	N		4	-5			x	x	
<i>Carex vulpinoidea</i>	Fox Sedge	N		3	-5			x		
<i>Carya cordiformis</i>	Bitternut Hickory	N		6	0			x		x
<i>Celtis occidentalis</i>	Common Hackberry	N		7	1					x
<i>Centaurea jacea</i>	Brown Knapweed	A	-1					x		
<i>Cerastium fontanum</i>	Mouse-eared Chickweed	A	-1					x		
<i>Chelone glabra</i>	Turtlehead	N		7	-5			x	x	
<i>Cichorium intybus</i>	Chicory	A	-1					x		
<i>Cicuta bulbifera</i>	Bulb-bearing Water-	N		5	-5			x		

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
	hemlock									
<i>Cicuta maculata</i> var. <i>maculata</i>	Spotted Water-hemlock	N		6	-5			x		
<i>Circaea canadensis</i>	Enchanter's-nightshade	N		3	3			x	x	x
<i>Cirsium arvense</i>	Canada Thistle	A	-1					x	x	
<i>Cirsium vulgare</i>	Bull Thistle	A	-1					x		
<i>Coreopsis tripteris</i>	Tall Coreopsis	N		9	0		S2	x		
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	N		6	5			x	x	x
<i>Cornus amomum</i>	Silky Dogwood	N		5	-4			x	x	x
<i>Cornus racemosa</i>	Grey Dogwood	N		2	-2					x
<i>Cornus stolonifera</i>	Red-osier Dogwood	N		2	-3			x	x	x
<i>Crataegus</i> sp.	Hawthorn species	N		4	5			x	x	x
<i>Dactylis glomerata</i>	Orchard Grass	A	-1					x	x	x
<i>Daucus carota</i>	Wild Carrot	A	-2					x		
<i>Desmodium canadense</i>	Showy Tick-trefoil	N		5	1			x		
<i>Dipsacus fullonum</i>	Teasel	A	-1					x	x	
<i>Doellingeria umbellata</i> var. <i>umbellata</i>	Flat-topped White Aster	N		6	-3			x		
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	N		5	-2					x
<i>Dryopteris clintoniana</i>	Clinton's Wood Fern	N		7	-4			x		x

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
Echinocystis lobata	Wild Cucumber	N		3	-2			x	x	x
Elymus repens	Quack Grass	A	-3					x		
Elymus virginicus var. virginicus	Virginia Wild-rye	N		5	-2			x		
Epilobium ciliatum	Willow-herb	N		3	3			x	x	x
Epilobium hirsutum	Great Hairy Willow-herb	A	-2					x	x	
Equisetum arvense	Field Horsetail	N		0	0			x	x	x
Erechtites hieracifolius	Pilewort	N		2	3					x
Erigeron annuus	Daisy Fleabane	N		0	1			x	x	x
Erigeron philadelphicus	Philadelphia Fleabane	N		1	-3			x	x	
Euonymus europaeus	Spindle-tree, European Euonymus	A	-1							x
Euonymus obovatus	Running Strawberry-bush	N		6	5					x
Eupatorium perfoliatum	Boneset	N		2	-4				x	x
Euthamia graminifolia	Grass-leaved Goldenrod	N		2	-2			x	x	x
Eutrochium maculatum var. maculatum	Spotted Joe-Pye-weed	N		3	-5			x	x	x
Fagus grandifolia	American Beech	N		6	3					x
Fragaria vesca	Woodland Strawberry	N		4	4					x

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Fragaria virginiana</i>	Wild Strawberry	N		2	1			x	x	x
<i>Frangula alnus</i>	Glossy Buckthorn	A	-3					x	x	x
<i>Fraxinus americana</i>	White Ash	N		4	3			x	x	x
<i>Fraxinus pennsylvanica</i>	Red/Green Ash	N		3	-3			x	x	x
<i>Galium asprellum</i>	Rough Bedstraw	N		6	-5			x	x	
<i>Galium mollugo</i>	Wild Madder	A	-2					x	x	x
<i>Galium palustre</i>	Marsh Bedstraw	N		5	-5			x		
<i>Geranium robertianum</i>	Herb Robert	A	-2					x	x	x
<i>Geum aleppicum</i>	Yellow Avens	N		2	-1			x	x	x
<i>Geum canadense</i>	White Avens	N		3	0			x	x	x
<i>Geum laciniatum</i>	Cut-leaved Avens	N		4	-3			x		
<i>Glechoma hederacea</i>	Gill-over-the-ground	A	-2					x	x	x
<i>Helianthus divaricatus</i>	Woodland Sunflower	N		7	5			x		
<i>Heliopsis helianthoides</i>	Ox-eye	N		3	5			x		
<i>Hesperis matronalis</i>	Dame's Rocket	A	-3					x		x
<i>Hypericum perforatum</i>	Common St. John's-wort	A	-3							x
<i>Impatiens capensis</i>	Spotted Touch-me-not	N		4	-3			x	x	x
<i>Inula helenium</i>	Elecampane	A	-2					x		

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
Juglans nigra	Black Walnut	N		5	3			x	x	x
Juncus tenuis	Path Rush	N		0	0			x		
Juniperus communis	Common Juniper	N		4	3			x		
Leersia oryzoides	Rice Cut Grass	N		3	-5			x		
Lemna minor	Common Duckweed	N		2	-5			x		
Leonurus cardiaca	Motherwort	A	-2					x	x	
Linaria vulgaris	Butter-and-eggs	A	-1						x	
Lindera benzoin	Spicebush	N		6	-2					x
Lobelia siphilitica	Great Lobelia	N		6	-4			x		
Lonicera tatarica	Tartarian Honeysuckle	A	-3					x		x
Lycopus americanus	American Water-horehound	N		4	-5			x	x	
Lycopus uniflorus	Bugleweed	N		5	-5			x		
Lysimachia ciliata	Fringed Loosestrife	N		4	-3			x		x
Lysimachia nummularia	Moneywort	A	-3					x		x
Maianthemum stellatum	Starry False Solomon's-seal	N		6	1					x
Malus pumila	Apple	A	-1					x	x	x
Medicago lupulina	Black Medick	A	-1					x	x	
Mentha arvensis	Field Mint	N		3	-3			x	x	
Mentha x piperita	( <i>M. aquatica</i> X <i>M. spicata</i> )	A	-1					x		

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Monarda fistulosa</i> var. <i>fistulosa</i>	Wild Bergamot	N		6	3			x		
<i>Oenothera biennis</i>	Hairy Yellow Evening-primrose	N		0	3			x	x	
<i>Onoclea sensibilis</i>	Sensitive Fern	N		4	-3			x		x
<i>Oxalis stricta</i>	European Wood-sorrel	N		0	3			x		x
<i>Parthenocissus inserta</i>	Virginia Creeper	N		3	3			x	x	x
<i>Persicaria lapathifolia</i>	Pale Smartweed	N		2	-4			x		
<i>Phalaris arundinacea</i>	Reed Canary Grass	N		0	-4			x	x	
<i>Phleum pratense</i>	Timothy	A	-1					x	x	
<i>Phragmites australis</i> ssp. <i>australis</i>	Common Reed	A	-3					x		
<i>Picea abies</i>	Norway Spruce	A	-1							x
<i>Picea glauca</i>	White Spruce	N		6	3			x	x	
<i>Pilea pumila</i>	Clearweed	N		5	-3					x
<i>Pinus resinosa</i>	Red Pine	N		7	3			x	x	x
<i>Pinus strobus</i>	White Pine	N		4	3			x		x
<i>Plantago lanceolata</i>	English Plantain	A	-1					x		
<i>Plantago major</i>	Common Plantain	A	-1					x	x	
<i>Plantago rugelii</i>	Rugel's Plantain	N		1	0			x	x	x
<i>Poa pratensis</i> ssp.	Kentucky	N		0	1			x	x	



Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
pratensis	Bluegrass									
Populus tremuloides	Trembling Aspen	N		2	0					x
Potentilla norvegica	Rough Cinquefoil	N		0	0					x
Prunella vulgaris ssp. lanceolata	Heal-all	N		1	0			x	x	x
Prunus avium	Sweet Cherry	A	-2					x		
Prunus serotina	Wild Black Cherry	N		3	3			x	x	x
Prunus virginiana	Choke Cherry	N		2	1			x		x
Quercus macrocarpa	Bur Oak	N		5	1			x		x
Quercus rubra	Red Oak	N		6	3			x		x
Ranunculus acris	Common Buttercup	A	-2					x	x	x
Ranunculus hispidus var. caricetorum	Hispid Buttercup	N		7	0			x		
Ranunculus repens	Creeping Buttercup	A	-1					x		
Ratibida pinnata	Gray-headed Coneflower	N		9	5		S3	x		
Rhamnus cathartica	Common Buckthorn	A	-2					x	x	x
Rhus typhina	Staghorn Sumac	N		1	5			x	x	x
Ribes americanum	Wild Black Currant	N		4	-3			x	x	x
Ribes cynosbati	Prickly Gooseberry	N		4	5			x		x
Ribes rubrum	Garden Red	A	-2					x	x	x

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
	Currant									
<i>Robinia pseudoacacia</i>	Black Locust	A	-3					x		x
<i>Rosa multiflora</i>	Multiflora Rose	A	-3							x
<i>Rubus allegheniensis</i>	Common Blackberry	N		2	2			x		x
<i>Rubus idaeus ssp. strigosus</i>	Wild Red Raspberry	N		0	-2			x	x	x
<i>Rubus occidentalis</i>	Black Raspberry	N		2	5			x	x	x
<i>Rudbeckia hirta var. pulcherrima</i>	Black-eyed Susan	N		0	3			x		
<i>Rudbeckia laciniata</i>	Cut-leaved Coneflower	N		7	-4			x		
<i>Rumex crispus</i>	Curly Dock	A	-2					x		
<i>Rumex obtusifolius</i>	Bitter Dock	A	-1					x		x
<i>Sagittaria latifolia</i>	Common Arrowhead	N		4	-5			x		
<i>Salix alba</i>	White Willow	A	-2					x	x	
<i>Salix bebbiana</i>	Bebb's Willow	N		4	-4				x	
<i>Salix euina</i>	Crack Willow	A	-3						x	
<i>Sambucus canadensis</i>	Common Elder	N		5	-2			x	x	x
<i>Sambucus racemosa</i>	Red-berried Elder	N		5	2			x		x
<i>Schedonorus pratensis</i>	Meadow Fescue	A	-1					x	x	
<i>Scirpus atrovirens</i>	Dark Green Bulrush	N		3	-5			x		

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Scirpus pendulus</i>	Nodding Bulrush	N		3	-5			x		
<i>Solanum dulcamara</i>	Climbing Nightshade	A	-2					x	x	x
<i>Solidago altissima</i> ssp. <i>altissima</i>	Late Goldenrod	N		1	3			x	x	x
<i>Solidago canadensis</i> var. <i>canadensis</i>	Canada Goldenrod	N		1	3			x	x	x
<i>Sonchus arvensis</i> ssp. <i>arvensis</i>	Perennial Sow-thistle	A	-1					x	x	
<i>Sonchus oleraceus</i>	Annual Sow-thistle	A	-1					x		
<i>Sorghastrum nutans</i>	Indian Grass	N		8	2			x		
<i>Spiraea alba</i>	Meadowsweet	N		3	-4				x	
<i>Symphotrichum lanceolatum</i> ssp. <i>lanceolatum</i>	Panicled Aster	N		3	-3			x	x	x
<i>Symphotrichum lateriflorum</i>	Calico Aster	N		3	-2			x	x	x
<i>Symphotrichum novae-angliae</i>	New England Aster	N		2	-3			x	x	x
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	N		6	-5			x		
<i>Symplocarpus foetidus</i>	Skunk-cabbage	N		7	-5			x	x	x
<i>Syringa vulgaris</i>	Common Lilac	A	-2					x		
<i>Taraxacum officinale</i>	Common Dandelion	A	-2					x	x	x
<i>Thalictrum pubescens</i>	Tall Meadow-rue	N		5	-2			x	x	

Scientific Name	Common Name	Native or Adv-entive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
<i>Thuja occidentalis</i>	White Cedar	N		4	-3			x		
<i>Tilia americana</i>	Basswood	N		4	3					x
<i>Toxicodendron rydbergii</i>	Rydberg's Poison Ivy	N		0	0			x		x
<i>Tragopogon pratensis</i>	Yellow Goat's-beard	A	-2						x	
<i>Trifolium repens</i>	White Clover	A	-1					x	x	
<i>Tussilago farfara</i>	Coltsfoot	A	-2					x	x	x
<i>Typha latifolia</i>	Common Cattail	N		3	-5				x	
<i>Ulmus americana</i>	American Elm	N		3	-2				x	x
<i>Urtica dioica</i> ssp. <i>gracilis</i>	Stinging Nettle	N		2	-1			x	x	
<i>Verbascum thapsus</i>	Common Mullein	A	-2					x		
<i>Verbena hastata</i>	Blue Vervain	N		4	-4			x		
<i>Verbena urticifolia</i>	White Vervain	N		4	-1			x	x	x
<i>Vernonia gigantea</i>	Giant Ironweed	N		6	0		S1?	x		
<i>Veronica officinalis</i>	Common Speedwell	A	-2					x		x
<i>Veronica peregrina</i> ssp. <i>peregrina</i>	Purslane Speedwell	N		0	-4			x		
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme-leaved Speedwell	A	-1					x		
<i>Veronicastrum virginicum</i>	Culver's root	N		7	0		S2	x		
<i>Viburnum lentago</i>	Nannyberry	N		4	-1			x	x	x

Scientific Name	Common Name	Native or Adventive	Weed	CC	Cwet	SARO	Srank S1-S3	Com 1	Com 2	Com 3
Viburnum opulus ssp. Trilobum	Highbush-cranberry	N		5	-3			x		x
Vicia cracca	Cow Vetch	A	-1						x	
Viola canadensis var. canadensis	Canada Violet	N		6	5					x
Viola cucullata	Marsh Violet	N		5	-5			x		x
Vitis riparia	Riverbank Grape	N		0	-2			x	x	x
<b>TOTAL</b>				<b>-108</b>	<b>520</b>	<b>-104</b>				
<b>COUNT</b>		<b>198</b>	<b>61</b>	<b>137</b>	<b>137</b>	<b>0</b>	<b>4</b>	<b>168</b>	<b>93</b>	<b>101</b>
<b>MEAN / AVERAGE</b>				<b>-1.8</b>	<b>3.8</b>	<b>-0.8</b>				
		<b>Over-all</b>	<b>By Community</b>							
<b>Adventive Species</b>		<b>61</b>						<b>53</b>	<b>31</b>	<b>24</b>
<b>Native Species</b>		<b>137</b>						<b>115</b>	<b>61</b>	<b>77</b>
<b>Total Species</b>		<b>198</b>						<b>168</b>	<b>92</b>	<b>101</b>
<b>% Adventive Species</b>		<b>31</b>						<b>32</b>	<b>34</b>	<b>24</b>
<b>Avg Weediness</b>		<b>-1.8</b>						<b>-1.8</b>	<b>-1.7</b>	<b>-2.1</b>
<b>Mean Coefficient of Conservatism (MCC)</b>		<b>3.8</b>						<b>3.8</b>	<b>3.0</b>	<b>3.5</b>
<b># species with CC 8-10</b>		<b>4</b>						<b>4</b>	<b>0</b>	<b>0</b>
<b>Avg Wetness</b>		<b>-0.8</b>						<b>-0.8</b>	<b>-0.8</b>	<b>0.2</b>
<b># Species with SARO</b>		<b>4</b>						<b>4</b>	<b>0</b>	<b>0</b>
<b># Species with SRANK S1-S3</b>		<b>4</b>						<b>4</b>	<b>0</b>	<b>0</b>

## **Appendix B. Stand Descriptions**

### **Community 1**

Canopy: Silver Maple (>25 m tall, 25-60% cover) > Red Pine > White Birch

Sub-Canopy: Sugar Maple (2-10 m tall, 10-25% cover) = Red Oak = Burr Oak > Silver Maple

Understory: Raspberries (1-2 m tall, 0-10% cover) >> dogwoods = Choke Cherry

Ground Layer: Grasses

### **Community 2**

Canopy: Green Ash (10-25 m tall, 10-25% cover) = willows > Black Walnut = Black Cherry

Sub-Canopy: Red Pine (2-10 m tall, 10-25% cover) = Black Walnut > American Elm = Green Ash

Understory: Dogwoods (1-2 m tall, 1-10% cover) = raspberries

### **Community 3**

Canopy: Red Pine (10-25 m tall, >60% cover) > Black Cherry = Silver Maple > Sugar Maple

Sub-Canopy: White Ash (10-25 m tall, >60% cover) > Black Cherry = apples >> Black Walnut

Understory: American Elm (2-10 m tall, >60% cover) >> Choke Cherry = Black Cherry = raspberries

## Appendix C. Descriptive Indices for Vegetation Communities

Descriptive indices such as Mean Conservatism Coefficient (MCC), Floristic Quality Index (FQI) and Wetness Index (CW) can decrease the variability that is caused by misidentification of species (Coles-Ritchie et al. 2004). This is because similar dominant species are often ecological equivalents, in that they are found in similar habitats and perform similar ecosystem functions. For this reason, taxonomic differences, which can be difficult to identify in the field, may not be important when trying to understand the functioning of the riparian ecosystem (Coles-Ritchie et al. 2004). Descriptive indices have the advantage of minimizing the influence of differences in species that are unimportant for the index. The most useful indices are those with many gradations that are based on scientific information about vegetation.

Code and Measure	Description	Examples
CC Coefficient of Conservatism	<ul style="list-style-type: none"> <li>Each native plant species is assigned a coefficient of conservatism (CC) score between 0 and 10 using the floristic quality assessment system for southern Ontario (Oldham et al., 1995)</li> <li>CCs represent an estimated probability that a plant species is likely to occur in a landscape relatively unaltered from what is believed to be pre-European settlement conditions (DNR Wisconsin 2001). Higher CCs are given to plants more specialized in habitat or condition and conserve themselves to very specific environments and communities (i.e., fidelity to a habitat).</li> </ul>	<ul style="list-style-type: none"> <li>0 to 3: Plants found in a wide variety of plant communities, including disturbed sites</li> <li>4 to 6: Plants that typically are associated with a specific plant community but tolerate moderate disturbance. Most woodland species fall in this category</li> <li>7 to 8: Plants associated with a plant community in an advanced successional stage that has undergone minor disturbance.</li> <li>9 to 10: Plants with a high degree of fidelity to a narrow range of synecological parameters or habitat specialists.</li> </ul>

<p>MCC Mean Conservatism Coefficient</p>	<ul style="list-style-type: none"> <li>• MCC is used as a measure of the pristiness or lack of disturbance of a site (Oldham et al. 1995). Communities or sites with high MCCs contain more plants unlikely to be found in disturbed habitat.</li> <li>• Middlesex Natural Heritage Study (UTRCA 2003) found MCC scores of 3.0 to 5.0 in woodland sites. Burke et al. 2007 found MCC scores of 4.1 to 5.3 at 12 woodlots with 75 km of London.</li> <li>• <b>Formula:</b> Add all of the CC scores for a particular site or community and then divide by the number of species (native only).</li> </ul>	<ul style="list-style-type: none"> <li>• 3.0 to 5.0 MNHS, UTRCA 2003</li> <li>• 4.1 to 5.3 Burke 2007</li> <li>• 3.3 to 3.8 London Dykes (UTRCA 2013)</li> <li>• London Subwatershed Study, thresholds for woodland protection: <ul style="list-style-type: none"> <li>• &lt;4.0 low priority</li> <li>• 4.0 to 4.5 medium priority</li> <li>• &gt;4.5 high priority</li> </ul> </li> </ul>
<p>Number of Conservative Species</p>	<ul style="list-style-type: none"> <li>• The number of plant species with a CC of 8 to 10 gives an indication of site quality and highlights species of concern for management.</li> <li>• Dr. Jane Bowls (pers. com) indicated that using CC of 8 to 10 for Conservative Plants is a combination of intuition, convention, experience and data.</li> <li>• Species with 0 to 2 CC score are generalists, and 8 to 10 are specialists. The rest are the in-betweens.</li> <li>• Formula: Count the number of species with CC score of 8, 9 and 10.</li> </ul>	<ul style="list-style-type: none"> <li>• CC scores: <ul style="list-style-type: none"> <li>• 0 to 2 generalist species</li> <li>• 3 to 7 in-betweens</li> <li>• 8 to 10 specialist species</li> </ul> </li> </ul>



<p>WEED Weediness Score</p>	<ul style="list-style-type: none"> <li>• Each non-native plant species has been assigned a weediness score between -1 and -3, where -1 represents a weed with low invasiveness and a -3 a very invasive species (Oldham et al, 1995).</li> <li>• The Weediness Score represents an estimated probability that a non-native plant is likely to infest and negatively impact a natural area by displacing native plants.</li> </ul>	<ul style="list-style-type: none"> <li>• -1 little or no impact on natural areas</li> <li>• -2 occasional impacts on natural areas, generally infrequent or localized</li> <li>• -3 major potential impacts on natural areas</li> </ul>
<p>MWS Mean Weediness Score</p>	<ul style="list-style-type: none"> <li>• The mean weediness score can be used like MCC to measure the representation of weedy adventive (alien) species abundance in a site (Moc 2001). In combination with the percentage of non-native plants, this measure can be used as an indicator of disturbance. Also, it is an indication of the threat to native species from highly invasive adventive species.</li> <li>• <b>Formula:</b> Add all the weediness scores from a particular site or community and divide by the number of non-native species.</li> </ul>	<ul style="list-style-type: none"> <li>• -1.0 to -1.6 little or no impact on natural areas</li> <li>• -1.7 to -2.3 occasional impacts on natural areas, generally infrequent or localized</li> <li>• -2.4 to -3.0 major potential impacts on natural areas</li> <li>• *The above is an estimation devised by C. Quinlan at UTRCA using equal divisions between -1 and -3.</li> </ul>

<p>CW (CWet) Coefficient of Wetness</p>	<ul style="list-style-type: none"> <li>• Each plant species is assigned a value from -5 to +5 based on the probability of being found in a wetland or not.</li> <li>• Usually only native species are used, even though a CW exists for adventive species also.</li> </ul>	<ul style="list-style-type: none"> <li>• -5 occurs in wetlands under natural conditions (obligate wetland species)</li> <li>• -4 to -2 usually occurs in wetlands, but occasionally found in non-wetlands</li> <li>• -1 to 1 equally likely to be occur in wetlands or non-wetlands (facultative)</li> <li>• 2 to 4 occasionally occurs in wetlands, but usually occurs in non-wetlands</li> <li>• 5 almost never occurs in wetlands under natural conditions (obligate upland)</li> </ul>
<p>WI Wetness Index (Mean Wetness Coefficient)</p>	<ul style="list-style-type: none"> <li>• Wetness Index is an assessment of a plant community as to whether it has a predominance of wetland species or not. It is not an indication of site quality.</li> <li>• The MNHS 2003 found mean wetness coefficients from individual woodland patches ranged from -2.5 to +2.1.</li> <li>• Formula: Add all the CW scores (native species only) from a particular site or community and divide by the number of native species found (Michigan DNR).</li> </ul>	<ul style="list-style-type: none"> <li>• Examples:</li> <li>• -0.4 to -1.1 London Dykes</li> <li>• -2.5 to 2.1 MNHS 2003 woodlands</li> <li>• Overall:</li> <li>• &lt;0 site has a predominance of native wetland species</li> <li>• &gt;0 site has a predominance of native upland species</li> </ul>

### Provincial (SARO) Status:

The Committee on the Status of Species at Risk in Ontario (COSSARO), an independent committee of experts, considers which plants and animals should be listed as at risk. There are seven categories:

<b>Extinct</b>	A wildlife species that no longer exists
<b>EXT - Extirpated</b>	A wildlife species no longer existing in the wild in Ontario but exists elsewhere
<b>END - Endangered</b>	A wildlife species facing imminent extirpation or extinction in Ontario
<b>THR - Threatened</b>	A wildlife species likely to become endangered if limiting factors are not reversed.
<b>SC – Special Concern</b>	A wildlife species that may become a threatened or endangered species because of a combination of biological characteristics and identified threats.
<b>NAR – Not at Risk</b>	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances
<b>UNK – Data Deficient</b>	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment of (b) to permit an assessment of the wildlife species' risk of extinction

## SRanks – Provincial Ranks

SRANKS are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities in Ontario.

<b>SX</b>	Presumed Extirpated	<b>S1</b>	Extremely rare in Ontario
<b>SH</b>	Possibly Extirpated (Historical)	<b>S2</b>	Very rare in Ontario
<b>SNR</b>	Unranked, or, if following a ranking, rank uncertain (e.g., S3?). S? species are thought to be rare in Ontario but there is insufficient information available to assign a more accurate rank.	<b>S3</b>	Rare to uncommon in Ontario
<b>SE</b>	Exotic; not believed to be a native component of Ontario's flora	<b>S4</b>	Common and apparently secure in Ontario
<b>SNA</b>	Not Applicable; a conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., is exotic or migrant)	<b>S5</b>	Very common and demonstrably secure in Ontario
<b>SU</b>	Status unknown		

## Appendix D. Bird Sightings at Embro CA, 2015

Common Name	SARO	SRank (S1-S3)	Regional Status	Br	s	S	F	W
American Goldfinch			Common PR	4	C	C	C	C
American Robin			Common BS	4	A	C	A	U
American/Common Crow			Common PR	4	A	C	C	A
Baltimore/Northern Oriole			Common BS	4	C	C	U	
Barn Swallow	THR		Common BS	4	C	C	C	
Black-capped Chickadee			Common PR	4	C	C	C	C
Blue Jay			Common PR	4	C	C	C	C
Brown Headed Cowbird			Common PR	4	C	C	C	U
Canada Goose			Common BS	4	A	C	A	C
Cedar Waxwing			Common BS	4	C	C	C	E
Chipping Sparrow			Common BS	4	C	C	C	O
Common Grackle			Common BS	4	C	C	A	R
Common Yellowthroat			Common BS	4	C	C	C	O
Downy Woodpecker			Common PR	4	C	C	C	C
Eastern Kingbird			Common BS	4	C	C	C	
Eastern Wood-pewee			Common BS	4	C	C	C	
European Starling			Common PR (SE)	4	C	C	C	C
Gray Catbird			Common BS	4	C	C	C	O
Great Blue Heron			Common BS	4	C	C	C	U
Great Crested Flycatcher			Common BS	4	C	C	C	
Hairy Woodpecker			Common BS	4	C	C	C	C
House Wren			Common BS	4	C	C	C	
Indigo Bunting			Common BS	4	C	C	C	
Mallard			Common BS	4	C	C	A	C
Northern Cardinal			Common PR	4	C	C	C	C
Northern Flicker			Common BS	4	C	C	C	R
Northern Rough-winged Swallow			Common BS	4	C	C	C	
Pine Warbler			Common BS	4	C	C	U	
Red-bellied Woodpecker			Uncommon PR	4	U	U	U	U

Common Name	SARO	SRank (S1-S3)	Regional Status	Br	s	S	F	W
Red-breasted Nuthatch			Common PR	4	C	U	C	E
Red-eyed Vireo			Common BS	4	C	C	C	
Red-winged Blackbird			Common BS	4	C	C	R	R
Rose-breasted Grosbeak			Common BS	4	C	C	C	
Song Sparrow			Common BS	4	C	C	C	U
Spotted Sandpiper			Common BS	4	C	C	C	
Tree Swallow			Common BS	4	C	C	C	U
Warbling Vireo			Common BS	4	C	C	C	
White Breasted Nuthatch			Common PR	4	C	C	C	C
Wood Duck			Common BS	4	C	U	C	R
Yellow Warbler			Common BS	4	C	C	C	
<b>Total # Common PR</b>			<b>9</b>					
<b>Total # Common BS</b>			<b>29</b>					
<b>Other</b>			<b>2</b>					
<b>TOTAL</b>	<b>1</b>	<b>0</b>	<b>40</b>					

**Notes:**

BS – Breeding Species, PR – Permanent Resident, WR – Winter Resident, SE = Status Exotic

Regional Status based on: Checklist of the Birds of Oxford County, 1st edition, May 2007 by Jeffrey H. Skevington and James M. Holdsworth. Available through The Woodstock Field Naturalists' Club

**Br (Breeding Codes):**

0 = no evidence of breeding

1 = status uncertain, possibly breeds

2 = formerly bred

3 = sporadically breeds

4 = regularly breeds

**Seasonal Codes (relating to bird activities, not calendar dates)**

s = Spring; period when a species is migrating to its breeding area

S = summer; the period when a species is nesting

F = Fall; the period when a species is migrating to its wintering area

W = Winter; the period when a species is over-wintering.

**Abundance Codes**

V = accidental vagrant

O = occasional; very few records; normally absent

R = rare; usually present annually, but seen infrequently

U = uncommon; present in low numbers, unlikely to be found daily without concerted effort

C = common; can be found daily, usually in moderate numbers

A = abundant; found daily in large numbers

E = erratic; numbers highly variable

## Appendix E. Animal Sightings (Incidental)

Common Name	SARO	SRank (S1-S3)	Regional Status
Mammals			
Eastern Chipmunk			Common
Grey Squirrel			Common
Red Squirrel			Common
Reptiles and			
Reptiles and Amphibians			
Green Frog			Common
American Toad			Common
Snapping Turtle	SC	S3	Common
Insects			
Cabbage White (exotic)			Abundant
Eastern Comma			Common
Eastern Tiger			Common
Monarch	SC	S2N	Common
Red Admiral			Common
Spring Azure			Common

### Notes:

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

S2N S4B:

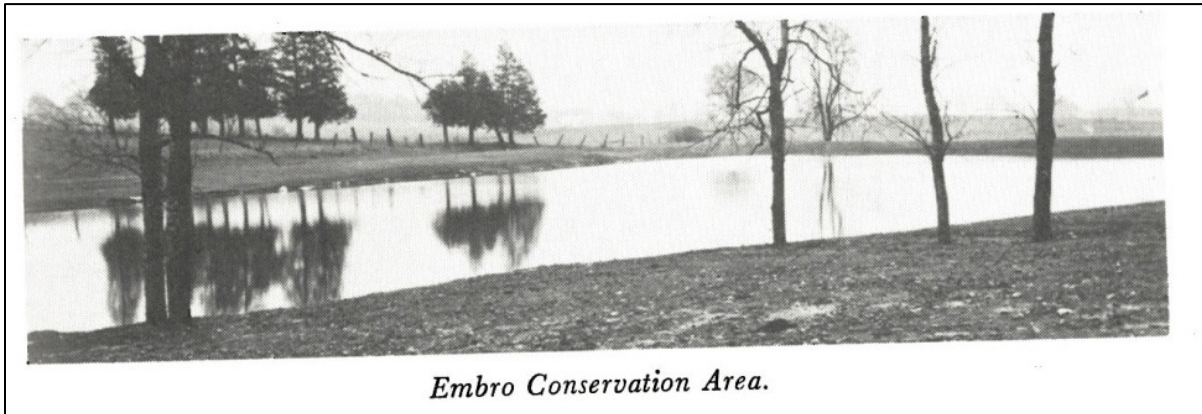
N = Non-breeding, B = Breeding



## Appendix F. History of Embro CA and Tree Planting Programs

### From: 25 Years of Conservation on the Upper Thames Watershed 1947 – 1973, UTRCA.

In 1958 development began on the Embro CA with the replacement of the old dam with a new 300 feet wide structure and a lake (600 feet long and 300 feet wide). To provide a suitable recreation area, 14 acres of the Oxford County Forest and 7 ac of the Charles Harris property were purchased. The area embraces 21 acres. The official opening was Oct 26, 1959. In 1968 existing recreation area expanded to better accommodate the general public.



**Source: From: Managed Forest Tax Incentive Program Report, UTRCA 2007**

Approximately 14 acres of the 21 acre conservation area is in tree cover, some of it mixed plantation and some natural woodland.

Prior to UTRCA ownership in 1961, approximately 8 acres of plantation and woodland were part of the Oxford County Forest and these trees were established between 1947 and 1957. An additional 7 acres were purchased to create the Conservation Area and much of that was planted to trees by the UTRCA in subsequent years.

In 1997 the UTRCA assisted the Embro Pond Community Association (who took over management of the CA in 1993) with shade tree planting around the pond. In 2007, an additional 80 trees were planted by students under the UTRCA's Communities for Nature Program. In 2007 and in 2010, 2800 native wildflowers and grasses were planted in a plot along the laneway (Mud Creek 2012 Watershed Report Card).

In 2010/2011 the conifer plantations were thinned by the UTRCA to encourage hardwood forest regeneration. As well, 2100 native hardwood seedlings were planted between the rows. The project was funded by Oxford County and the Clean Water Project. Trail enhancements were carried out in 2012.

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Suitable Habitat within Study Area	Conclusions/ Recommendations
American Badger (Northwestern population) <i>Taxidea taxus</i> ( <i>Taxidea taxus taxus</i> )	END	SC Schedule 1	SC	- Tallgrass prairie, sand barrens, farmland, shrublands, alpine areas and wetlands. - Require coherent soils that can be burrowed into without collapsing. - <b>TPS1, CUM1, CUS, SBO with dry sandy soil.</b>	- Rainy River and Thunder Bay districts.	NHIC, Mammal Atlas	Low Suitable habitat was not observed and the species was not recorded during wildlife surveys.	nothing further
Bank Swallow <i>Riparia riparia</i>	THR	THR Schedule 1	THR	- Requires vertical faces in sand or silt deposits; river and lake banks, active/inactive sand and gravel pits, road cuts, soil stockpiles. - Breeding sites are located close to aerial foraging areas such as grasslands, meadows, pastures, and cropland. - Large wetlands used for nocturnal roost sites during post-breeding, migration and wintering periods.	- Common across southern Ontario, especially along Lake Erie and Lake Ontario shorelines and the Saugeen River. - Sparse populations scattered across northern Ontario.	OBBA	Low Suitable nesting habitat was not identified within the areas of disturbance	nothing further
Blanding's Turtle (Great Lakes / St. Lawrence population) <i>Emydoidea blandingii</i>	THR	THR Schedule 1	END	- Shallow, nutrient-rich habitats; typically large wetlands and shallow lakes with lots of water plants. - Nesting occurs in sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops. - Overwintering occurs in pools about 1 metre in depth. - <b>SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.</b>	- Southern Ontario north to Sudbury, with isolated reports as far north as Timmins.	ORAA	Low Pond is unlikely to support blanding's turtle.	nothing further
Bobolink <i>Dolichonyx oryzivorus</i>	THR	THR Schedule 1	THR	- Hayfields, pastures, wet prairie, graminoid peatlands, abandoned farm fields dominated by tall grasses, no-till cropland, small-grain fields, restored surface mining sites. - Small nests are often built on the ground in dense grasses. - Typically not abundant in short-grass prairie, alfalfa, or in row crop monocultures (corn, soybean, wheat). - <b>TPO, TPS, CUM1.</b>	- Southern Ontario north to James Bay.	NHIC, OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Chimney Swift <i>Chaetura pelagica</i>	THR	THR Schedule 1	THR	- Historically included hollow trees. - More commonly found in and around urban settlements, including chimneys and other manmade structures. - Typically close to water. - <b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 adjacent to suitable nesting habitat.</b>	- Southern Ontario north to Timmins.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Eastern Meadowlark <i>Sturnella magna</i>	THR	THR Schedule 1	THR	- Moderately tall grasslands; prairies, savannahs, pastures and hayfields, alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, overgrown fields. - Small trees, shrubs, or fence posts used as elevated song perches. - <b>TPO, TPS, CUM1, CUS, and MAM2.</b>	- Southern Ontario north to Timmins, as well as Lake of the Woods area.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Eastern Small-footed Myotis (Eastern Small-footed Bat) <i>Myotis leibii</i>	END	N/A	N/A	- Summer habitat includes rock outcrops, in buildings, under bridges, or in caves, mines or hollow trees. - Roosting locations are typically changed every night. - Winter hibernation occurs in caves or mines, typically drier and colder than sites selected by other bats.	- South of Georgian Bay to Lake Erie and east to the Pembroke area, the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park.	Mammal Atlas	Low Suitable habitat was not observed.	nothing further
Gray Fox <i>Urocyon cinereoargenteus</i>	THR	THR Schedule 1	THR	- Deciduous forests and marshes. - Dens are usually found in dense shrubs, close to a water source, or in rocky areas, hollow trees, or underground burrows dug by other animals.	- West of Lake Superior in the Rainy River District. - Pelee Island.	Mammal Atlas	Low Study area unlikely to contain suitable habitat.	nothing further
Little Brown Myotis (Little Brown Bat) <i>Myotis lucifugus</i>	END	END Schedule 1	END	- Large-diameter trees, attics, abandoned buildings, and barns often used for summer colonies. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Hibernacula used in winter include mines and caves that are humid and remain above freezing.	- All across Ontario; concentrated in southern Ontario.	Mammal Atlas	High Cavity trees were observed within the CUS and FOM communities.	Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.
Northern Myotis (Northern Long-eared Bat) <i>Myotis septentrionalis</i>	END	END Schedule 1	END	- Typically within the boreal forest, under loose bark or in the cavities of trees. - Foraging occurs over water, along waterways, and forest edges, while open areas such as clearcuts or fields are typically avoided. - Overwintering occurs in cold and humid sites such as caves or mines. - <b>FOC, FOM, FOD, SWC, SWM, and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.</b>	- Forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Mammal Atlas	High Cavity trees were observed within the CUS and FOM communities.	Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i>	END	THR Schedule 1	END	- Woodlands and woodland edges, including oak and beech forests, grasslands, orchards, riparian forests, beaver ponds, burns, parks, golf courses, and cemeteries. - Dead trees used for nesting and perching. - <b>TPS, TPW, CUW, FOD1, FOD2, FOD4-1, FOD6, FOD7, and FOD9 that are open with an abundance of dead trees.</b>	- Woodland Caribou Provincial Park southeast to Cornwall.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further

<p>Tri-colored Bat <i>Perimyotis subflavus</i></p>	<p>END</p>	<p>END Schedule 1</p>	<p>END</p>	<ul style="list-style-type: none"> <li>- Day roost and maternity colonies are formed in older forests with large-diameter trees, barns, or other structures.</li> <li>- Foraging occurs over water or along streams in a forest.</li> <li>- Winter hibernacula include caves and mines.</li> </ul>	<p>- Southern Ontario north to Sudbury.</p>	<p>Mammal Atlas</p>	<p>High Cavity trees were observed within the CUS and FOM communities.</p>	<p>Should tree removal be required further surveys (acoustic monitoring) and consultation with the MECP may be required to determine impacts.</p>
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Species of Conservation Concern

Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat <sup>1,2</sup>	Known Species Range <sup>1,2</sup>	Source Identifying Species Record	Probability of Occurrence within Study Area	Conclusions/ Recommendations
Northern Sunfish (Great Lakes - Upper St. Lawrence populations) <i>Lepomis peltastes</i>	SC	SC Schedule 1	SC	- Clear, slow flowing rivers and streams or warm lakes and ponds, with sandy banks or rocky bottoms and aquatic vegetation.	- Southern Ontario including waters flowing into Lake Huron, Georgian Bay, Lake St. Clair, Lake Erie, and Lake Ontario, as well as rivers and small lakes in eastern Ontario. - Northwestern Ontario near Lake of the Woods.	DFO	Confirmed Species is confirmed downstream of the pond; however, has not been confirmed within the pond itself.	Species should be considered during drawn down and fish relocation. Potential opportunity to explore the inclusion of habitat features during detailed design.
Barn Swallow <i>Hirundo rustica</i>	SC	SC	SC	- Cup-shaped mud nests are built on human-made structures such as open barns, under bridges, and in culverts. - Preferably constructed on rough-cut wood surfaces with right angles. - Foraging habitat includes grassy fields, pastures, cropland, lake and river shorelines, cottage areas and farmyards, islands, wetlands, and tundra. - <b>TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, and SAF1, adjacent to suitable nesting structures</b>	- From southern Ontario north to Hudson Bay.	OBBA, eBird, UTRCA	Confirmed Species was observed by UTRCA in 2015 as foraging; however, no suitable nesting structures were observed  It should also be noted, this species has been reassessed in 2021 as SC, and has since taken effect	nothing further no suitable nesting was observed
Canada Warbler <i>Cardellina canadensis</i>	SC	THR Schedule 1	THR	- Deciduous or coniferous forests with well-developed, dense shrub layer; commonly wet or in riparian areas. - May also include stands regenerating after natural disturbances (ie, logging). - <b>FOC3, FOC4, FOM6, FOM7, FOM8, FOD6, FOD7, FOD8, FOD9, SWC, SWM and SWD</b>	- All of Ontario.	eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further
Eastern Wood-pewee <i>Contopus virens</i>	SC	SC Schedule 1	SC	- Mid-canopy layer of forest clearings, edges of deciduous and mixed forests, early successional clearings. - <b>FOC, FOM, FOD, SWD, SWM and CUW.</b>	- Southern Ontario north to Sudbury.	OBBA, eBird, UTRCA	Confirmed Species was observed by UTRCA during breeding bird surveys	Restrict vegetation removal outside of the Migratory Breeding Bird window (April 1 to August 31)
Peregrine Falcon <i>Falco peregrinus</i>  Peregrine Falcon (anatum/tundrius) <i>Falco peregrinus anatum/tundrius</i>	SC	SC Schedule 1	Not At Risk	- Tall, steep cliff ledges or tall buildings from 50 m to 200 m in height, close to large bodies of water. - Can be found in tundra, coastal, prairie or urban areas. - <b>CLO.</b>	- Breeding population centered around Lake Superior in northwest Ontario. - May be found migrating across rest of the province.	eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys.	nothing further
Wood Thrush <i>Hylocichla mustelina</i>	SC	THR Schedule 1	THR	- Mature deciduous and mixed forests; moist stands of trees with well-developed undergrowth. - Tall trees are used for singing perches. - Nests are built in live saplings, trees, or shrubs, especially sugar maple or American beech. - Preferably large forest mosaics. - <b>FOD and FOM greater than 1 ha</b>	- Southern Ontario north to Hearst.	OBBA, eBird	Low Suitable habitat was not observed and the species was not recorded during breeding bird surveys. However habitat for this species may be in the adjacent Oxford County Forest.	nothing further
Snapping Turtle <i>Chelydra serpentina</i>	SC	SC Schedule 1	SC	- Shallow wetland habitats with slow-moving water and soft bottoms; ponds, sloughs, shallow bays, river edges, or slow streams. - Nesting occurs on sandy or gravel banks or man-made structures such as roads, dams, and aggregate pits. - Overwintering occurs underwater, underneath logs, sticks, or overhanging banks, deep in mud in marshy areas, or underneath floating mats of vegetation. - <b>OAO, SA near gravelly or sandy areas.</b>	- Primarily southern Ontario north to Timmins; also found near Thunder Bay and Kenora.	UTRCA	Confirmed Species was observed by the UTRCA during investigations	A turtle rescue may be required during draw down should the species not relocate on their own accord. No wildlife is to be handled or relocated without obtaining a Wildlife Scientific Collectors Authorization.
Monarch <i>Danaus plexippus</i>	SC	SC Schedule 1	END	- Open or disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests. - Trees along the north shore of the Great Lakes are used for roosting before migrating across open water. - Caterpillars are confined to meadows and open areas where milkweed grows. - <b>AL, TP, and CUM where milkweed is present</b>	- South of 50° of latitude.	OBBA, UTRCA	Confirmed Species was observed by UTRCA. Milkweed was identified as abundant within the study area.	Milkweed should be included in native seed mixes recommended for restoration within the study area.
Woodland Vole <i>Microtus pinetorum</i>	SC	SC Schedule 1	SC	- Mature deciduous forest in the Carolinian region with ample depth of litter. - Can also be found in scrubby sand dunes, swamps, and orchards; preferably with dense herbaceous vegetation and friable soils with low saturation. - <b>FOD with a deep leaf litter and loose soils</b>	- From Chatham to Fort Erie and north to Oakville and Pinery Provincial Park. - May inhabit other areas of the province.	Mammal Atlas	Low Suitable habitat was not observed and the species was not recorded during wildlife surveys.	nothing further

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0
1

ESA Status	
SC	8
No Status	0
EXP	0
TOTAL SCC	8