

**Environmental Review 2011 -
Eden Oak (Trailhead)**

**Report prepared for:
Eden Oak, Mississauga, ON**

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Acronyms and Abbreviations

| | |
|---------|--|
| BBS | Breeding Bird Survey |
| CCSWS | Craigleith Camperdown Subwatershed Study |
| COSEWIC | Committee on the Status of Endangered Wildlife in Canada |
| COSSARO | Committee on the Status of Species at Risk in Ontario |
| DBH | Diameter (of a tree) at breast height |
| EIS | Environmental Impact Study |
| ELC | Ecological Land Classification |
| GSCA | Grey Sauble Conservation Authority |
| masl | meters above sea level |
| OBBA | Ontario Breeding Bird Atlas |
| SAR | Species at Risk |

1.0 INTRODUCTION

1.1 Background

Multi-residential development is currently proposed for a 15.49-ha property known as Part Lot 20, Concession 2, Town of the Blue Mountains. The development proponent is Eden Oak (Mississauga), and the property is referred to as the Trailhead Property.

Under a preliminary servicing agreement with the Town of the Blue Mountains, the development footprint of the Trailhead Property has been cleared and graded, and a stormwater management pond has been constructed. Approximately 1.5 ha of the development footprint remains undisturbed. The current plan calls for 217 residential units and associated infrastructure within the footprint. A conceptual site plan is attached as Figure 2. The development area of the current plan (17.3 ha) is fairly consistent with the original plan for 77 units that was draft approved in 2007. Draft approval lapsed in July 2011.

An environmental overview report was prepared in 2004 by Ages Consultants limited, and submitted in support of the 2007 draft-approved plan (Registered Plan 529). This overview appears to have been received as a scoped Environmental Impact Study (EIS). A copy of this original EIS is attached as Appendix B.

In September 2011, pre-consultation was held for the current Eden Oak development proposal. In that consultation, the Grey Sauble Conservation Authority (GSCA) requested that an update of the 2004 EIS be completed.

1.2 Scope of Work

The overall purpose of this report is to provide review of the environmental constraints on the Trailhead Property, and to update the original EIS.

The original EIS (Ages, 2004) was a “Scoped” EIS, focused on a limited number of specific issues, and thus limited in coverage and intensity relative to a full intensive EIS. Based on the dialogue with the GSCA to date, the expectation is that the scope of this EIS update would be similarly focused.

The 2004 EIS identified two environmental features that would pose development constraints: 1) the wooded slope of the Nipissing Ridge, and 2) the corridor of the stream (i.e., Stream #7) that traverses the property.

The EIS concluded that the vegetation and wildlife communities present at the Eden Oaks property at the time were not expected to pose environmental constraints. In pre-consultation discussions with GSCA regarding the Trailhead Property, the potential presence of Butternut trees and Bobolinks was identified as an issue to be addressed.

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Both species are now designated as species at risk (SAR), and neither was considered in the completion of the 2004 EIS.

This EIS update has been prepared to be a stand-alone report, and to effectively address the noted issues of concern and satisfy the requirements of a scoped EIS.

The EIS update is based on brief review of existing documents and relevant data, and also on the basis of data obtained through direct on-site assessment.

The on-site assessment was conducted to confirm the current conditions, especially in regard to the constraints identified in the 2004 EIS. The corridor of Stream #7 and the wooded slopes of the Nipissing Ridge have been directly examined. The report provides adequate and up-to-date descriptions of these features. .

Areas where woody vegetation is still present within or immediately adjacent to the Trailhead Property were also examined for the presence of Butternut trees. The potential presence of habitat suitable for Bobolinks and other grassland birds (i.e., meadow habitat) was also assessed during field surveillance.

2.0 METHODOLOGY

The work undertaken to allow the preparation of this EIS Report has included;

1. desktop review of available information (documents and data) regarding the characteristics of the property, and
2. focused field monitoring of the Trailhead Property.

The assessment of potential adverse effects collectively considers the findings of the desktop review and the on-site monitoring in a weight-of-evidence manner.

2.1 Review of Existing information

A review of existing information of relevance to the Trailhead Property has been completed. Several sources of information were consulted for this purpose, including:

- The Craigeith Camperdown Subwatershed Study (CCSWS) (Gore and Storrie, 1993),
- Grey County's web-based interactive GIS mapping tool,
- The Soil Survey of Grey County (Gillespie and Richards, 1954),
- The Ontario Breeding Bird Atlas (Cadman *et al.*, 2007), and
- Results of ecological monitoring conducted in 2010 on the property immediately adjacent to the Trailhead property (i.e., the Oelbaum Property, Part of Lot 21, Concession 2, Town of The Blue Mountains).

2.2 On-Site Monitoring

On-site surveillance was conducted on 29 September and 12 October 2011. Focused site-specific monitoring was conducted to describe:

- plant community composition and distribution,
- current presence of SAR (Butternut and Bobolink),
- habitat potential for grassland bird SAR (e.g., Bobolink), and
- stream and aquatic habitat characteristics.

Surveillance of ecological endpoints was conducted throughout the property, focused on the noted endpoints of concern (woody plant communities, Stream #7, and SAR). Casual observations of terrestrial wildlife were also recorded.

3.0 SITE CHARACTERISTICS

The physical and biological characteristics of the Trailhead Property are described below.

3.1 Physical Characteristics

3.1.1 Topography

The Subject Property occupies an area of terraced relief. The southwest corner of the Trailhead property is occupied by the upper terrace of the Nipissing Ridge, with elevation in the range of 200 to 210 meters above sea level (masl). To the northeast of the base of the ridge, the majority of the property has little relief and an elevation of about 180-185 masl. The 20-25 m of relief between the upper and lower terraces is associated almost exclusively with the steep face of the ridge.

3.1.2 Soils

The original environmental review (Ages, 2004) suggests that soil throughout the property is Granby sand (Gs). This soil type consists of shallow sand over finer textured materials, and drainage is indicated as poor. The current investigation shows that the Granby sand is present throughout the majority of the property and all of the area proposed for development (i.e., the portion of the property below the Nipissing Ridge).

According to the Grey County soil survey (Gillespie and Richards, 1954), approximately one third of the Trailhead property contains soil classed as Waterloo sandy loam (Wsl). This includes the area occupied by the Nipissing Ridge, its upper terrace, and the land immediately at its base. This sandy loam exhibits relatively good drainage.

The presence of the Granby sand and Waterloo sandy loam was confirmed at field level. The portion of the Trailhead property proposed for development lies within the area of poorly drained Granby sand.

3.1.3 Hydrology

Based on subwatershed delineation reported in the CCSWS, the Trailhead property lies within two subwatersheds. Roughly half of the property to the west is within the subwatershed for Stream #7, with the eastern half draining to Stream #6. The Trailhead property occupies only a small fraction of the total basin areas of these two watersheds (i.e., <4% of the 205-ha basin of Stream # 7, and <2% of the 568-ha basin of Stream #6).

The total length of Stream #7 is approximately 4 km, with about 350 m (<10%) of the watercourse located within the boundary of the Trailhead Property.

The CCSWS reports that the hydrology of the various streams draining to Georgian Bay is most critically a function of infiltration in the upper terrace areas. Infiltration and runoff from lands below the ridge are much less important to the hydrological regime of a stream. During the recent reconnaissance, several points of seepage to Stream #7 were observed along the base of the ridge.

3.2 Ecological Characteristics

The following sections describe the ecological characteristics of the Trailhead Property. A description of the regional ecology is provided for context.

3.2.1 Regional Ecology

The Study Area is situated within the Mixedwood Plains *Ecozone*, and more specifically it is within the Manitoulin – Lake Simcoe *Ecoregion*, equivalent to Site Region 6E under Provincial classification.

This Manitoulin-Lake Simcoe Ecoregion is characterized by warm summers, mild winters, and relatively abundant precipitation (700 to 1000 mm/a) that is evenly distributed throughout the year. The dominant land cover is cropped land with significant areas of mixed forest. Climax vegetation is characterized by mixed hardwoods, including Sugar Maple, American Beech, Eastern Hemlock, Red Oak, and Basswood. Pioneer species include White Pine, Paper Birch, and Trembling Aspen.

3.2.2 Plant Communities

The original EIS (Ages, 2004) included Ecological Land Classification (ELC), identifying three community types within the Trailhead Property, including Deciduous Forest, Cultural Thicket, and Cultural Meadow. Further specification and detailed characterization of these communities was not provided in the 2004 report. Based on the recent on-site surveillance, and on past surveillance of adjacent properties, the identified community types are further described herein. A plant species list for the Trailhead Property is provided in Appendix A (Table A1). This list reflects only single season (fall) inventory and is acknowledged as incomplete.

On the upper terrace and face of the ridge, the main tree species comprising the mature deciduous forest canopy are Sugar Maple (*Acer saccharum*), Red Oak (*Quercus rubra*), and American Beech (*Fagus grandifolia*), White Birch (*Betula papyrifera*), Basswood (*Tilia americana*), Ironwood (*Ostrya virginiana*), and White Ash (*Fraxinus americana*) are also present. Most of these tree species are relatively common within the broader Manitoulin-Lake Simcoe Ecoregion. Under the ELC system of Lee et al. (1998), this deciduous forest type would be classed as FOD5-3 (dry-fresh Sugar Maple – Oak

Deciduous Forest Type). Owing to a closed canopy, vegetation is relatively sparse in the under-storey of the deciduous forest, and consists of saplings of the various tree species and common herbaceous species for the Ecoregion (e.g. Herb Robert, Zig-zag Goldenrod, Solomon's Seal).

Immediately below the ridge face, the wooded area is a mixture of a variety of deciduous trees, including Sugar Maple, Basswood, White and Red Ash (*Fraxinus americana* and *F. pennsylvanica*), and White Elm (*Ulmus americana*). Clusters of Trembling Aspen (*Populus tremuloides*), scattered hawthorns (*Crataegus* spp.) are also irregularly present. A few large Black Willow (*Salix nigra*) are present in close proximity to the stream. Butternuts (*Juglans cinerea*) are also present in this zone (see discussion in Section 3.2.5). A few scattered Eastern White Cedar (*Thuja occidentalis*) are present. This is the only notable presence of conifers within the Trailhead Property. Under the ELC system of Lee et al. (1998), this forest type would be classed as FOD7 (Moist Lowland Deciduous Forest Type).

The majority of the Cultural Thicket Community identified in the original EIS has recently been cleared and graded, and is no longer present. It is surmised that the thicket was dominated by red ash, consistent with successional thickets/savannahs found on adjacent properties. A narrow fringe of Staghorn Sumac (*Rhus typhina*), hawthorns (*Crataegus* spp.) and young ash (*Fraxinus* spp.) remains along the interface of the former thicket and the deciduous forest zone.

The Cultural Meadow community has also been subject to clearing and grading. The majority of the area now has relatively sparse vegetation cover, consisting mainly of herbaceous species typical of disturbed sites, many of which are non-native (see Table A1, Appendix A). Woody shrubs (red-osier dogwood, willows, aspens) are establishing in spots, but are mostly 1 m or less in height.

In the central portion of the proposed development area, there still remains an area (<1 ha) of cultural meadow that does not appear to have been altered in the recent site grading and clearing. The vegetative cover here is intermittent and dominated by grasses. The narrow and raised spoil piles created during grading, present mainly along the eastern edge of the development area, also exhibit a relatively dense plant cover that has a significant grass component.

The only observed occurrence of plants indicative of wet conditions was a scattering of sedges (*Carex* and *Scirpus* sp.) and narrow-leafed cattail (*Typha angustifolia*) along the edge of the newly constructed SWM pond, and also within drainage channels that have recently been excavated within the property.

3.2.3 Terrestrial Animals

The surveillance of the Trailhead Property yielded evidence of the presence of five species of native mammal, including;

- Meadow Vole (*Microtus pennsylvanicus*),
- Eastern Chipmunk (*Tamias striatus*),
- Eastern Grey Squirrel (*Sciurus carolinensis*),
- Northern Raccoon (*Procyon lotor*), and
- White-tailed Deer (*Odocoileus virginianus*).

These are common species in Ontario and Grey County. Other common species of mammal are likely present at the Trailhead Property.

With regard to birds, 19 species were observed during the early fall surveillance. This included Canada Goose, Lesser Yellowlegs, Blue Jay, Song Sparrow, Field Sparrow, Savannah Sparrow, Chipping Sparrow, White-throated Sparrow, Northern Flicker, Yellow-bellied Sapsucker, Downy Woodpecker, Hairy Woodpecker, Black-capped Chickadee, American Goldfinch, Mourning Dove, American Crow, Common Raven, House Wren, and American Redstart. These species are all common birds in Grey County and throughout Ontario. Each species was observed resting or foraging within or immediately adjacent to the Trailhead Property. The large majority of avian occurrences were associated with the property perimeter (fence-lines and tree-lines). An overflight of a small flock of mixed blackbirds (Icteridae) was also observed, but individual species identification was not possible.

A full breeding bird survey (BBS) has not been completed for the Trailhead Property. In absence of this, existing BBS data of relevance from other sources has been consulted to gain an understanding of the species of birds that might occur in the general area during the breeding season. Specifically, Ontario Breeding Bird Atlas (OBBA) data as well as breeding bird survey data collected in 2010 at the neighbouring Oelbaum Property have been reviewed.

The Trailhead Property lies on the boundary between OBBA squares 17NK52 and 17NK53. During the most recent Ontario Breeding Bird Atlas (OBBA, 2001-2005), standardized breeding bird surveillance was conducted at 15 road-side point-count stations within square 17NK53, and 44 point-count stations in Square 17NK52. Data have been obtained for each of the noted squares, and also for the nearest individual point-count station (BSC et al., 2008). These data are summarized in Appendix A (Tables A2 and A3).

The OBBA surveillance of squares 17NK52/53 has identified 130 species of bird with some evidence of breeding within the 20-km² area of those squares. Of these species, 19 have been subject to assessment by COSEWIC or COSSARO. As of the date of this report, nine of the 19 have been deemed to be *Not at Risk*. The 10 species on record for the area in question that are currently designated as Species at Risk (SAR) include the Alder Flycatcher (*Endangered*), Barn Swallow (*Threatened*), Bobolink (*Threatened*), Canada Warbler (*Special Concern* – COSEWIC only), Chimney Swift (*Threatened* –

COSEWIC only), Common Nighthawk (*Special Concern* – COSEWIC only), Eastern Meadowlark (*Threatened*), Golden Winged Warbler (*Special Concern*), Louisiana Waterthrush (*Special Concern*), and the Red-headed Woodpecker (*Threatened* – COSEWIC, *Special Concern* – COSSAR0). The OBBA data indicate most of these species as either “possible” or “probable” breeders in the squares in question, and several have no breeding evidence on record in one or both squares for the last atlas period (2001-2005).

OBBA point-count station #9 (square 17NK53) is established along Lakeshore Road East, approximately 500 m west of the Trailhead Property, overlooking the Oelbaum Property. The data for this station are most representative of the avian community that resides in and around the Trailhead Property. A total of only eight species were recorded during OBBA surveillance at point-count station #9 (see Table A3, Appendix A). These eight species are very common in Ontario and Grey County, and none are currently considered to be species at risk (SAR).

The data from a BBS completed at the neighbouring Oelbaum Property are also considered to be representative of the avian community in the immediate area of the Trailhead Property. In total, that BBS has identified 50 species as present in the area of the Trailhead Property during the breeding season (Tables A4 and A5, Appendix A). Of these 50 species, the Bobolink was the only species designated as a species at risk by COSEWIC or COSSARO at the time of surveillance. There was a single observation of this species at the Oelbaum property in mid-May of 2010. No breeding evidence was observed in this single occurrence.

Since the completion of the Oelbaum BBS in 2010, other common grassland bird species have been designated as SAR under the Ontario *Endangered Species Act* (ESA). Specifically, the Barn Swallow (*Hirundo rustica*) and the Eastern Meadowlark (*Sturnella magna*) were both added to the Provincial SAR list as *Threatened* in January 2012. There were single occurrences of both species recorded during the Oelbaum BBS. These isolated occurrences were recorded at point count stations established within cultural meadow habitat (i.e., idle pasture).

3.2.4 Aquatic Ecology

Stream #7 is the only watercourse encountered within the confines of the Trailhead Property. Immediately below the Nipissing ridge, the stream exhibits mainly riffle flow (70% riffle, 25% run, 5% pool) and has a bank-full channel width in the range of 2-3 m. Substrate is largely cobble and gravel. There is very little in-stream cover (macrophytes, logs, undercut banks), other than a few boulders. As the stream progresses northward, the degree of run and pool habitat increases slightly, and undercut banks and some logs are encountered. Riparian cover is complete throughout most of the stream length through the Trailhead Property, except isolated pockets along the last 100 m where tree cover is less than complete.

Water temperature was recorded at several locations along Stream #7 throughout the day on 29 September, and again on 29 October. On 29 September, temperature was a constant 14 C⁰ at several locations within the Trailhead Property, at morning, mid-day and later afternoon. Ambient air temperature ranged from 9 C⁰ to 15 C⁰ through the day. On 29 October, mid-day water temperature in Stream #7 was 6.5 C⁰ at the culvert at Lakeshore Road, with ambient air temperature at about 8-9 C⁰ following overnight lows slightly below 0 C⁰. At the culvert on Grey Road 19, stream # 7 water temperature was 7.5 C⁰. Concurrent temperatures in nearby streams #9 and #10 (at Lakeshore Road) were 7 C⁰ and 9 C⁰, respectively. Temperature data reported in the CCSWS show that stream # 7 exhibited late summer water temperatures of ~18 C⁰, slightly higher than most of the other streams examined (15 to 17 C⁰).

In the original EIS, Stream #7 was identified as a mixed warm/coolwater stream, based on available fishery data reported in the CCSWS. The fishery data are now 20 years old. No surveillance of fish communities in Stream #7 has been conducted since that time.

Fish surveillance of nearby Streams #9 and #10 was conducted in July 2010 (MNR license number 1057363) as part of an unpublished EIS for the adjacent Oelbaum property. No fish were caught in Stream #10, likely reflecting an intermittent pattern of flow. The catch record for the two stations surveyed along Stream #9 suggests a very low diversity of fish. Only two species were caught during the electrofishing effort. Creek chub (*Semotilus atromaculatus*) was the most abundant fish caught, followed by the Blacknose dace (*Rhinichthys obtusus*). These were also the most abundant species previously reported for Stream #7 in the CCSWS. These two fish species are native and common in the Great Lakes basin. They are typical of warm-water or cool-water streams in southern Ontario. Creek chub are found in virtually all streams that support fish. The CCSWS also reports a few fathead minnows and longnose dace in the upper and lower reaches of Stream #7. Rainbow trout are also reported, only for the lower reach of Stream #7. The assemblage of species reported for Stream #7 and adjacent streams is indicative of a cool/warmwater fishery.

3.2.5 Species at Risk

The available data indicate that four species at risk (SAR) have been observed on or near to the Trailhead Property, including the Butternut tree and three species of grassland bird (Bobolink, Barn Swallow, and Eastern Meadowlark).

The Provincial status of all but two of the plant species on record (see Table A1, appendix A) is either “secure” (S5) or “apparently secure” (S4). Butternut (*Juglans cinerea*) is ranked as “vulnerable” (S3). That is, this species is deemed vulnerable in Ontario due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation. Butternut is listed as “Endangered” by COSEWIC (Federal) or CASSARO (Provincial).

A total of 27 butternuts were found within or immediately adjacent to the Trailhead property (see Table 1). Canker was obviously evident in all but six of these trees. Most of these trees exhibited some degree of die-back. Numerous dead butternuts (not recorded) were also observed within and around the property, showing signs that they likely succumbed to canker.

Four butternuts (B1, B2, B24, and B25) are outside of the southern property boundary and will not be directly affected by proposed development. Another five butternuts (B10 to B15) are immediately adjacent to the stream and thus protected within the proposed 30-m stream set-back (see Figure 2). Butternuts B18 – B20 are east of the existing barn structure, between the stream and the base of the ridge and within the 30-m stream setback. These will not be affected by the proposed development. B16 and B17 are in very close proximity to the existing barn, and removal at that barn is likely not achievable without destruction of these two butternuts. There are 3 butternuts (B3 to B5) that are in the northwest corner of the property, within about 5 m of the western property boundary. These could likely be retained just outside the back lot line of the third lot (proceeding counter-clockwise) on the proposed cul-de-sac). A total of eight butternuts (B6-B9, B21-23 and B26) all appear to fall within proposed lots around the cul-de-sac.

With regard to the grassland birds, there are records of occurrence on the property adjacent to the Trailhead Property. In the most recent OBBA (2001-2005), none of these species was observed at the point-count station closest to the Trailhead Property (see Table A3). In 2010, however, single occurrences of each of the three SAR were recorded at the neighbouring Oelbaum Property (Table A4 and A5). For the Bobolink, there was no evidence of breeding, while the Barn Swallow and Meadowlark were each assigned a breeding status of “possible” for the Oelbaum Property. The Oelbaum Property encompasses several hectares of idle pasture, which does provide conditions supportive of grassland birds. However, such habitat is absent within the Trailhead Property. Overall, the available data suggest that the likelihood of occurrence of breeding bobolink in the area around the Trailhead Property is relatively low. Owing to an absence of appropriate habitat within the Property, there is no expectation of occurrence of breeding pairs of these birds within the Trailhead Property boundary.

4.0 SUMMARY AND CONCLUSIONS

The original EIS (Ages Consultants, 2004) concluded that the woodland vegetation of the Nipissing Ridge and the corridor of Stream #7 were the two environmental features of the Trailhead Property (then referred to as the Glenleith Property) that would pose development constraints. In that EIS, existing data were reviewed to assess the potential presence of SAR and it was concluded that “none of the sources reviewed identified endangered or threatened species...in the vicinity of the property.” Bobolink and Butternut were not considered as potential SAR at that time.

The EIS included recommendations to confirm its observations and conclusions. The GSCA has also requested an update of the original EIS, with specific concerns regarding Species at Risk (Butternut and Bobolink). Since the original discussions with the GSCA, other common grassland bird species (i.e., Barn Swallow and Eastern Meadowlark) have been designated as Species at Risk. These species are considered in this EIS update.

4.1 Woodland Vegetation

The recent surveillance of the Trailhead Property confirms the presence of deciduous forest as originally reported in the 2004 EIS. The woodland community on the upper terrace of the ridge is assessed as FOD5-3 (dry-fresh Sugar Maple – Oak Deciduous Forest Type). In the northwest portion of the Trailhead Property, in the low-lying area below the ridge, the existing woodland is classed as FOD7 (Moist Lowland Deciduous Forest Type). Both community types are common in Ontario.

Development should not occur within the Maple-Oak forest associated with the ridge. Where other constraints are absent, there is no reason for constraints on development within the Lowland forest area.

4.2 Stream Habitat

The original EIS recognized that control of erosion and alteration of hydrology were not critical concerns in regard to potential environmental constraints associated with Stream #7. Overall, the available information indicates that the area proposed for development within the Trailhead property is not expected to have meaningful influence on the hydrology or water quality of the local streams.

The original EIS recommended a buffer of 15-30 m, depending on the status as warm or coldwater fishery. The available data suggest that the Stream #7 supports a fish community that is warmwater to coolwater. Adoption of a setback appropriate for coldwater streams would be more than adequate in this case. Limited instances of development within 30 m of the stream (but no closer than 15 m) may be acceptable, particularly if the form of that development excludes impermeable surfaces.

The current conceptual site plan includes a 30-m setback from Stream #7 (see Figure 2). This is considered to be fully protective of the stream and its ecological functions.

4.3 Species at Risk

At this time, the available data indicate that four species at risk (SAR) are present within or near to the Trailhead property. These SAR (Butternut, Bobolink, Meadowlark and Barn Swallow) were not designated at the time of the original EIS.

For Butternut, 27 trees were identified during recent on-site surveillance. Most of the observed butternuts exhibit evidence of canker and poor health, and the long term natural presence of butternut in this location is likely jeopardized by the presence of the disease. This is consistent with findings of recent butternut surveillance on properties in the immediate vicinity of the Trailhead Property. Despite this prognosis, the proposed development would ideally be planned and constructed so that the existing butternuts are not adversely affected, to the extent practical. Ideally, none of the trees should be harmed or removed, and the associated root zone should remain undisturbed. To preclude any harm to the root system or above-ground growth of this tree, certain activities should be avoided within the drip-line of the tree (i.e., within 10 m or less of the trunk). Such activities include;

- Disturbance of soil deeper than 5 cm,
- Control or removal of vegetation other than through selective and light methods (i.e., no control through burning or herbicides, targeted removal with hand-held tools or machinery is acceptable),
- Passage of heavy machinery, particularly when the ground is wet, and
- Felling of other trees without ensuring fall direction away from the Butternut specimen.

The current conceptual site plan identifies the individual butternuts reported herein. The plan includes a 30-m buffer zone around each tree, which is considered wholly sufficient to protect those trees from potential impacts related to development activity.

Otherwise, it is recommended that a formal health assessment be completed for all butternuts within the Trailhead Property, and options be discussed with the MNR. It should be noted that three butternuts that are located in the Lowland Forest area are old and likely near the end of their life, regardless of the occurrence of canker. If development is to occur near Butternuts 8, 9 or 10, evaluation of the option to retain these trees within residential lots should consider the potential hazard posed by large trees in the late stages of their life.

Regarding the three grassland bird SAR, there are only isolated records of their presence in the general vicinity of the Trailhead Property, with no firm breeding evidence. Within the Property, grassland habitat is significantly limited at this time, being sparse

and patchy and accounting for <0.5 ha in total. In general, grassland areas that exhibit patches of bare ground, that are small and/or fragmented, or that are in close proximity to forest edges are least suitable as breeding or foraging habitat for Bobolinks, Barn Swallows and Meadowlarks (COSEWIC, 2010, 2011a, 2011b). Overall, the occurrence of breeding pairs of these grassland bird SAR within the development area of the Trailshead Property is not expected. No specific mitigation is recommended for the design of the proposed development.

5.0 REFERENCES

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TABLES

Table 1: Results of Butternut Survey - Trailhead Property

| Tree ID | UTM Coordinates | | DBH (cm) | Health Status |
|---------|-----------------|----------|----------|---|
| | Easting | Northing | | |
| B1 | 17 T 0554592 | 4929604 | 14 | Canker evident (mild), no die-back observed |
| B2 | 17 T 0554531 | 4929583 | 27 | Canker evident (moderate), especially on exposed roots, ~25% die-back |
| B3 | 17 T 0554333 | 4929827 | 13 | Canker evident (moderate), ~20% die-back |
| B4 | 17 T 0554332 | 4929825 | 29 | Canker evident (mild), ~25% die-back |
| B5 | 17 T 0554331 | 4929824 | 6 | Healthy, canker not obviously evident |
| B6 | 17 T 0554365 | 4929783 | 13 | Canker evident (mild), ~20% die-back |
| B7 | 17 T 0554361 | 4929765 | 133 | Trunk hollow and heavily scarred with sapsucker holes, no obvious canker lesions, numerous dead lower branches, evidence of recent heavy fruiting |
| B8 | 17 T 0554401 | 4929771 | 53/51 | Twin trunks, both with evidence of canker (advanced), evidence fruiting in recent years, no fruit at present |
| B9 | 17 T 0554403 | 4929767 | 77 | Twin trunks (one trunk dead), canker advanced, heavy overgrowth of wild grape |
| B10 | 17 T 0554444 | 4929715 | 39 | Advanced canker, heavy over-growth of wild grape |
| B11 | 17 T 0554460 | 4929675 | 41 | Trunk is scarred with sapsucker holes, no discernable evidence of canker. A dead butternut is immediately adjacent. |
| B12 | 17 T 0554466 | 4929650 | 19/14 | Twin trunks, both with evidence of canker (advanced), especially on exposed roots, ~30% die-back of lower branches |
| B13 | 17 T 0554476 | 4929649 | 41 | Canker evident (advanced), especially on exposed roots, ~40% die-back of lower branches |
| B14 | 17 T 0554485 | 4929650 | 25 | Canker evident (advanced), especially on exposed roots, ~40% die-back of lower branches |
| B15 | 17 T 0554488 | 4929652 | 18 | Canker evident (moderate), heavy over-growth of wild grape |
| B16 | 17 T 0554403 | 4929722 | 14 | Canker evident (advanced), especially on exposed roots, ~20% die-back of lower branches |
| B17 | 17 T 0554411 | 4929720 | 10 | Advanced canker, very large lesion at base. |
| B18 | 17 T 0554417 | 4929722 | 23 | Canker evident (moderate), especially on exposed roots. |
| B19 | 17 T 0554421 | 4929719 | 26 | Mild canker evident. |
| B20 | 17 T 0554429 | 4929719 | 49 | Canker evident (moderate), %30 die-back |
| B21 | 17 T 0554392 | 4929752 | 8 | Canker evident (advanced), especially on exposed roots. |
| B22 | 17 T 0554391 | 4929747 | 13 | No obvious signs of canker. |
| B23 | 17 T 0554400 | 4929753 | 9 | Mild canker evident. |
| B24 | 17 T 0554612 | 4929622 | 11 | No obvious signs of canker. Some wild grape over-growth. |
| B25 | 17 T 0554630 | 4929628 | 8 - 11 | 5 stems in a cluster. No obvious evidence of canker. Wild grape overgrowth. |
| B26 | 17 T 0554398 | 4929748 | 4 | Moderate canker. |
| B27 | 17 T 0554480 | 4929758 | 6 | Mild canker. Heavy grape overgrowth. |

FIGURES

Figure 1: Trailhead Property and Features



LEGEND:

-  Butternut Tree (approximate location)
-  Property Boundary
-  Subwatershed Boundary
-  Stream #7



Conceptual Site Plan
Current Plan- March 21, 2012

AREA STATS

MODEL SITE- 2419,77m²
 DEVELOPMENT AREA- 170908,45m²
 TOTAL- 173,328,22m² (17,332 Ha)
 DENSITY- 12,52 units/ha

OPEN SPACE- 14,681 acres (5,941 Ha)

UNIT COUNT

VILLAS- 128
 TOWNS- 62 + 3 MODELS
 SEMIS- 22+ 2 MODELS
 TOTAL- 212 +5 MODELS = 217 UNITS

PARKING STATS

VILLAS- 8 BLOCKS x 26 SPACES =208 SPACES
 VILLAS-SURFACE PARKING 84 SPACES
 TOWNS- 65 x 2 SPACES= 130 SPACES
 SEMIS- 24 x 2 SPACES= 48 SPACES
 TOTAL- 470 SPACES (2,16 spaces per unit)

MODEL SITE- 2419,77m²
 DEVELOPMENT AREA- 170908,45m²
 TOTAL- 173,328,22m² (17,332 Ha)
 DENSITY- 12,52 units/ha (gross)
 TOTAL- 117,953m² (11,795 Ha)
 DENSITY- 17,33 units/ha (nett)

APPENDICES

Appendix A – Ecological Monitoring Data

Table A1: Plant Species List for the Trailhead Property

| Common Name | Scientific Name | Provincial Status (S-RANK)¹ | Alien vs Native | Typical habitat |
|--------------------------|--------------------------------|---|------------------------|---|
| Alfalfa | <i>Medicago sativa</i> | NA | Alien | disturbed areas |
| Alternate-leaved Dogwood | <i>Cornus alternifolia</i> | S5 | Native | open woodlands |
| American Basswood | <i>Tilia americana</i> | S5 | Native | deep fertile soils, in association with other hardwoods |
| American Beech | <i>Fagus grandifolia</i> | S4 | Native | usually found on rich, well-drained soils |
| Balsam Poplar | <i>Populus balsamifera</i> | S5 | Native | moist, rich low lying ground |
| Black Locust | <i>Robinia pseudoacacia</i> | NA | Alien | well drained soils, disturbed areas |
| Black Medic | <i>Medicago lupulina</i> | NA | Alien | roadsides and waste areas |
| Black Raspberry | <i>Rubus occidentalis</i> | S5 | Native | woodland openings and edges |
| Black Willow | <i>Salix nigra</i> | S4 | Native | low wet areas |
| Bladder Campion | <i>Silene cucubalus</i> | NA | Alien | roadsides, fields |
| Brown Knapweed | <i>Centaurea jacea</i> | NA | Alien | roadsides, fields |
| Buckthorn | <i>Rhamnus cathartica</i> | NA | Alien | disturbed areas, woodland perimeter |
| Butternut | <i>Juglans cinerea</i> | S3 | Native | fertile soils in shallow valleys or on gradual slopes |
| Canada Goldenrod | <i>Solidago canadensis</i> | S5 | Native | roadsides, thickets and clearings |
| Canada Thistle | <i>Cirsium arvense</i> | NA | Alien | Roadsides, pastures and fields |
| Chicory | <i>Chicorium intybus</i> | NA | Alien | roadsides and waste areas |
| Choke Cherry | <i>Prunus virginiana</i> | S5 | Native | rich soils in clearings or along forest edge |
| Coltsfoot | <i>Tussilago farfara</i> | NA | Alien | waste places and roadsides |
| Common Burdock | <i>Arctium minus</i> | NA | Alien | roadsides and waste areas |
| Common Buttercup | <i>Ranunculus acris</i> | NA | Alien | fields and meadows |
| Common Cinquefoil | <i>Potentilla simplex</i> | S5 | Native | fields and dry woods |
| Common Dandelion | <i>Taraxacum officinale</i> | NA | Alien | lawns, fields, roadsides |
| Common Elderberry | <i>Sambucus nigra</i> | S5 | Native | deciduous forest edge and understory |
| Common Milkweed | <i>Asclepias syriaca</i> | S5 | Native | roadsides, fields, dry soil |
| Common Mullein | <i>Verbascum thapsis</i> | NA | Alien | roadsides, fields, waste places |
| Common Plantain | <i>Plantago major</i> | NA | Alien | common to waste paces |
| Common Ragweed | <i>Ambrosia artemisiifolia</i> | S5 | Native | roadsides, fields |

Table A1: Plant Species List for the Trailhead Property

| Common Name | Scientific Name | Provincial Status (S-RANK)¹ | Alien vs Native | Typical habitat |
|--------------------------|------------------------------------|---|------------------------|---|
| Common Strawberry | <i>Fragaria virginiana</i> | S5 | Alien | pastures and rocky woods |
| Common Tansy | <i>Tanacetum vulgare</i> | NA | Alien | roadsides and waste areas |
| Common Yarrow | <i>Achillea millefolium</i> | NA | Alien | roadsides, fields, waste places |
| Curly Dock | <i>Rumex crispus</i> | NA | Alien | fields and waste places |
| Domestic Apple | <i>Malus pumila</i> | NA | Non-Native | orchards |
| Eastern White Cedar | <i>Thuja occidentalis</i> | S5 | Native | usually associated with limestone, wet or dry conditions |
| English Plantain | <i>Plantago lanceolata</i> | NA | Alien | common to roadsides and waste places |
| Field Horsetail | <i>Equisetum arvense</i> | S5 | Native | wet meadows, moist forests |
| Garlic mustard | <i>Alliaria petiolata</i> | NA | Alien | disturbed areas |
| Hawthorn | <i>Crataegus spp</i> | - | Native | oldfield habitat |
| Herb-Robert | <i>Geranium robertianum</i> | NA | Native | rocky woods and shorelines |
| Ironwood | <i>Ostrya virginiana</i> | S5 | Native | well-drained areas, often in shade of larger hardwoods |
| Jewelweed | <i>Impatiens capensis</i> | S5 | Native | moist, shady areas |
| Lady's Thumb | <i>Polygonum persicaria</i> | NA | Alien | cultivated ground, waste places |
| Large-tooth Aspen | <i>Populus grandidentata</i> | S5 | Native | best on moist fertile soils, will grow on dry sandy soils |
| Manitoba Maple | <i>Acer negundo</i> | S5 | Native | often in riparian or shoreline areas |
| Narrow-leaved Cattail | <i>Typha angustifolia</i> | NA | Native | marshes, ponds and ditches |
| New England Aster | <i>Symphotrichum novae-angliae</i> | S5 | Native | thickets, meadows, cultivated fields |
| Northern Maidenhair-fern | <i>Adiantum pedatum</i> | S5 | Native | moist wooded areas |
| Ostrich Fern | <i>Matteuccia struthiopteris</i> | S5 | Native | moist wooded areas |
| Philadelphia Fleabane | <i>Erigeron philadelphicus</i> | S5 | Native | fields, open woods |
| Pineapple-weed | <i>Matricaria discoidea</i> | NA | Alien | roadsides and waste areas |
| Poison Ivy | <i>Toxicodendron radicans</i> | S5 | Native | shores and banks, or areas with little competition |
| Red Ash | <i>Fraxinus pennsylvanica</i> | S5 | Native | shores and banks, or areas with little competition |
| Red Clover | <i>Trifolium pratense</i> | NA | Alien | fields and wayside areas |
| Red Oak | <i>Quercus rubra</i> | S5 | Native | deciduous forest |
| Red Raspberry | <i>Rubus idaeus</i> | S5 | Native | woodland openings and edges |

Table A1: Plant Species List for the Trailhead Property

| Common Name | Scientific Name | Provincial Status (S-RANK)¹ | Alien vs Native | Typical habitat |
|--------------------------|------------------------------------|---|------------------------|--|
| Red-osier Dogwood | <i>Cornus sericea</i> | S5 | Native | wetlands, wet fields and thickets |
| Reed Canary Grass | <i>Phalaris arundinacea</i> | S5 | Alien | meadows, old pastures |
| Rough-fruited Cinquefoil | <i>Potentilla recta</i> | NA | Alien | fields and roadsides |
| Scotch Thistle | <i>Onopordum acanthium</i> | NA | Alien | roadsides, waste areas |
| Self-heal | <i>Prunella vulgaris</i> | S5 | Alien | roadsides and waste areas |
| Small White Aster | <i>Symphotrichum lateriflorum</i> | S5 | Native | fields and meadows |
| Solomon's-seal | <i>Polygonatum biflorum</i> | S4 | Native | woods and thickets |
| Staghorn Sumac | <i>Rhus typhina</i> | S5 | Native | woodland edges, thickets |
| Sugar Maple | <i>Acer saccharum</i> | S5 | Native | mature deciduous forest |
| Teasel | <i>Dipsacus sylvestris</i> | NA | Alien | roadsides and waste areas |
| Trembling Aspen | <i>Populus tremuloides</i> | S5 | Native | grows best on well-drained moist sandy or gravelly soils |
| Tufted Vetch | <i>Vicia cracca</i> | NA | Alien | disturbed areas |
| Viper's Bugloss | <i>Echium vulgare</i> | NA | Alien | Meadows and open woods |
| Virginia Creeper | <i>Parthenocissus quinquefolia</i> | S4 | Native | forest floor, woodland edges |
| White Ash | <i>Fraxinus americana</i> | S5 | Native | woods and thickets |
| White Baneberry | <i>Actaea pachypoda</i> | S5 | Native | woods |
| White Birch | <i>Betula papyrifera</i> | S5 | Native | well drained soils, intolerant of shade |
| White Elm | <i>Ulmus americana</i> | S5 | Native | moist, well-drained slopes and bottom-lands. |
| White Sweet Clover | <i>Melilotus albus</i> | NA | Alien | roadsides, field edges |
| Wild Carrot | <i>Daucus carota</i> | NA | Alien | roadsides, fields and waste areas |
| Wild Grape | <i>Vitis riparia</i> | S5 | Native | woodland openings and edges |
| Wood Anemone | <i>Anemone quinquefolia</i> | S5 | Native | deciduous forest |
| Wood Strawberry | <i>Fragaria vesca</i> | S5 | Native | fields and open places |
| Woodland Horsetail | <i>Equisetum sylvaticum</i> | S5 | Native | wet, wooded areas |
| Yellow Birch | <i>Betula alleghaniensis</i> | S5 | Native | moist hardwood forests |
| Yellow Goat's-beard | <i>Tragopogon pratensis</i> | NA | Alien | roadsides, fields and waste areas |
| Zigzag Goldenrod | <i>Solidago flexicaulis</i> | S5 | Native | woodlands and rich thickets |

1 - Provincial Status (S-Rank): S3 - Vulnerable, S4 - Apparently Secure, S5 - Secure

Table A2: OBBA Data - Squares 17NK52 and 17NK53

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|------------------------------|----------------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Alder Flycatcher | <i>Empidonax virescens</i> | Confirmed | Possible | | Probable | S2/S3 | END | END |
| American Black Duck | <i>Anas rubripes</i> | Confirmed | | | Confirmed | S4 | | |
| American Crow | <i>Corvus brachyrhynchos</i> | Confirmed | Confirmed | Probable | Confirmed | S5 | | |
| American Goldfinch | <i>Carduelis tristis</i> | Confirmed | Probable | Probable | Probable | S5 | | |
| American Kestrel | <i>Falco sparverius</i> | Confirmed | Possible | | Possible | S5 | | |
| American Redstart | <i>Setophaga ruticilla</i> | Confirmed | Possible | Possible | Probable | S5 | | |
| American Robin | <i>Turdus migratorius</i> | Confirmed | Confirmed | Confirmed | Confirmed | S5 | | |
| American Woodcock | <i>Scolopax minor</i> | Confirmed | Possible | Possible | Possible | S4 | | |
| Baltimore Oriole | <i>Icterus galbula</i> | Confirmed | Probable | Confirmed | Confirmed | S4 | | |
| Bank Swallow | <i>Riparia riparia</i> | Confirmed | Confirmed | Confirmed | | S4 | | |
| Barn Swallow | <i>Hirundo rustica</i> | Confirmed | Confirmed | Confirmed | Confirmed | S4 | THR | THR |
| Belted Kingfisher | <i>Ceryle alcyon</i> | Confirmed | | | Possible | S4 | | |
| Black-billed Cuckoo | <i>Coccyzus erythrophthalmus</i> | Probable | Possible | | Possible | S5 | | |
| Blackburnian Warbler | <i>Dendroica fusca</i> | | Possible | | | S5 | | |
| Black-capped Chickadee | <i>Poecile atricapillus</i> | Confirmed | Confirmed | Probable | Confirmed | S5 | | |
| Black-crowned Night-heron | <i>Nycticorax nycticorax</i> | Possible | | Confirmed | Confirmed | S3 | | |
| Black-throated Blue Warbler | <i>Dendroica caerulescens</i> | Possible | Probable | | Possible | S5 | | |
| Black-throated Green Warbler | <i>Dendroica virens</i> | Possible | Possible | | Possible | S5 | | |
| Black-and-white Warbler | <i>Mniotilta varia</i> | Probable | Possible | | Possible | S5 | | |
| Blue Jay | <i>Cyanocitta cristata</i> | Confirmed | Confirmed | Confirmed | Probable | S5 | | |
| Blue-winged Teal | <i>Anas discors</i> | Confirmed | | | Possible | S4 | | |
| Blue-winged Warbler | <i>Vermivora pinus</i> | | Possible | | | S4 | | |
| Bobolink | <i>Dolichonyx oryzivorus</i> | Confirmed | Probable | Confirmed | Possible | S4 | THR | THR |
| Brewster's Warbler | <i>Vermivor Pinus</i> | | Possible | | | NA | | |
| Brown Creeper | <i>Certhia americana</i> | Probable | Possible | | | S5 | | |
| Brown Thrasher | <i>Toxostoma rufum</i> | Confirmed | Probable | Possible | Probable | S4 | | |

Table A2: OBBA Data - Squares 17NK52 and 17NK53 (cont.)

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|--------------------------|---------------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Brown-head Cowbird | <i>Molothrus ater</i> | Confirmed | Probable | Confirmed | Probable | S4 | | |
| Canada Goose | <i>Branta canadensis</i> | Confirmed | Confirmed | | Confirmed | S5 | | |
| Canada Warbler | <i>Wilsonia canadensis</i> | Possible | | | Possible | S4 | SC | |
| Cedar Waxwing | <i>Bombycilla cedrorum</i> | Confirmed | Confirmed | Confirmed | Possible | S5 | | |
| Chestnut-sided Warbler | <i>Dendroica pensylvanica</i> | Confirmed | Possible | | Probable | S5 | | |
| Chimney Swift | <i>Chaetura pelagica</i> | Probable | | | | S4 | THR | |
| Chipping Sparrow | <i>Spizella passerina</i> | Confirmed | Confirmed | Confirmed | Probable | S5 | | |
| Clay-colored Sparrow | <i>Spizella pallida</i> | | Possible | | | S4 | | |
| Cliff Swallow | <i>Petrochelidon pyrrhonota</i> | Confirmed | Possible | | | S4 | | |
| Common Grackle | <i>Quiscalus quiscula</i> | Confirmed | Confirmed | Confirmed | Confirmed | S5 | | |
| Common Loon | <i>Gavia immer</i> | | | Possible | Possible | S5 | NAR | NAR |
| Common Merganser | <i>Mergus merganser</i> | Probable | | Confirmed | Confirmed | S5 | | |
| Common Nighthawk | <i>Chordeiles minor</i> | | | Probable | Possible | S4 | SC | |
| Common Raven | <i>Corvus corax</i> | | Probable | | Possible | S5 | | |
| Common Snipe | <i>Gallinago delicata</i> | Confirmed | Possible | | | S5 | | |
| Common Tern | <i>Sterna hirundo</i> | | | Confirmed | Confirmed | S4 | NAR | NAR |
| Common Yellowthroat | <i>Geothlypis trichas</i> | Confirmed | Probable | Possible | Probable | S5 | | |
| Cooper's Hawk | <i>Accipiter cooperii</i> | | Possible | | Possible | S4 | NAR | NAR |
| Dark-eyed Junco | <i>Junco hyemalis</i> | Probable | | | | S5 | | |
| Double-crested Cormorant | <i>Phalacrocorax auritus</i> | | | | Confirmed | S5 | NAR | NAR |
| Downy Woodpecker | <i>Picoides pubescens</i> | Confirmed | Possible | Confirmed | Possible | S5 | | |
| Eastern Bluebird | <i>Sialia sialis</i> | | Confirmed | | | S5 | NAR | NAR |
| Eastern Kingbird | <i>Tyrannus tyrannus</i> | Confirmed | Confirmed | Confirmed | Probable | S4 | | |
| Eastern Meadowlark | <i>Sturnella magna</i> | Confirmed | Probable | Confirmed | Probable | S4 | THR | THR |
| Eastern Phoebe | <i>Sayornis phoebe</i> | Probable | Confirmed | Possible | Confirmed | S5 | | |
| Eastern Screech-Owl | <i>Megascops asio</i> | Possible | Possible | Possible | | S5 | NAR | NAR |

Table A2: OBBA Data - Squares 17NK52 and 17NK53 (cont.)

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|--------------------------|--------------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Eastern Towhee | <i>Pipilo erythrophthalmus</i> | Confirmed | Possible | Possible | | S4 | | |
| Eastern Wood-Pewee | <i>Contopus virens</i> | Confirmed | Probable | Possible | Possible | S4 | | |
| European Starling | <i>Sturnus vulgaris</i> | Confirmed | Confirmed | Confirmed | Confirmed | SNA | | |
| Field Sparrow | <i>Spizella pusilla</i> | Confirmed | Possible | Possible | Possible | S4 | | |
| Gadwall | <i>Anas strepera</i> | | | Probable | | S4 | | |
| Golden-crowned Kinglet | <i>Regulus satrapa</i> | Probable | Possible | | | S5 | | |
| Golden-winged Warbler | <i>Vermivora chrysoptera</i> | | Probable | | | S4 | SC | SC |
| Great Crested Flycatcher | <i>Myiarchus crinitus</i> | Confirmed | Confirmed | Possible | Probable | S4 | | |
| Gray Catbird | <i>Dumetella carolinensis</i> | Confirmed | Probable | Possible | Probable | S4 | | |
| Great Black-backed Gull | <i>Larus marinus</i> | | | | Confirmed | S2 | | |
| Great Blue Heron | <i>Ardea herodias</i> | Possible | | Confirmed | Confirmed | S5 | | |
| Great Egret | <i>Ardea alba</i> | | | Probable | Confirmed | S2 | | |
| Great Horned Owl | <i>Bubo virginianus</i> | Confirmed | | | Probable | S5 | | |
| Green Heron | <i>Butorides virescens</i> | Probable | Possible | Possible | | S4 | | |
| Hairy Woodpecker | <i>Picoides villosus</i> | Confirmed | Possible | | Possible | S5 | | |
| Herring Gull | <i>Larus argentatus</i> | Confirmed | | Confirmed | Confirmed | S5 | | |
| Horned Lark | <i>Eremophila alpestris</i> | Confirmed | Possible | | | S5 | | |
| House Finch | <i>Carpodacus mexicanus</i> | | Probable | | Probable | NA | | |
| House Sparrow | <i>Passer domesticus</i> | Confirmed | Probable | Confirmed | | NA | | |
| House Wren | <i>Troglodytes aedon</i> | Confirmed | Confirmed | Confirmed | Probable | S5 | | |
| Indigo Bunting | <i>Passerina cyanea</i> | Confirmed | Probable | Possible | Possible | S4 | | |
| Killdeer | <i>Charadrius vociferus</i> | Confirmed | Probable | Probable | Probable | S5 | | |
| Least Flycatcher | <i>Empidonax minimus</i> | Confirmed | Possible | Possible | Possible | S4 | | |
| Louisiana Waterthrush | <i>Seiurus motacilla</i> | Probable | Probable | | | S3 | SC | SC |
| Magnolia Warbler | <i>Dendroica magnolia</i> | | Possible | | | S5 | | |

Table A2: OBBA Data - Squares 17NK52 and 17NK53 (cont.)

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|-------------------------------|-----------------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Mallard | <i>Anas platyrhynchos</i> | Confirmed | Probable | Confirmed | Confirmed | S5 | | |
| Mourning Dove | <i>Zenaida macroura</i> | Confirmed | Probable | Probable | Possible | S5 | | |
| Mourning Warbler | <i>Oporornis philadelphia</i> | Confirmed | Possible | | Possible | S4 | | |
| Nashville Warbler | <i>Vermivora ruficapilla</i> | Confirmed | Possible | | Possible | S5 | | |
| Northern Rough-winged Swallow | <i>Stelgidopteryx serripennis</i> | Confirmed | Probable | | | S4 | | |
| Northern Waterthrush | <i>Seiurus noveboracensis</i> | Confirmed | Possible | | Possible | S5 | | |
| Northern Cardinal | <i>Cardinalis cardinalis</i> | Confirmed | Probable | Probable | Probable | S5 | | |
| Northern Flicker | <i>Colaptes auratus</i> | Confirmed | Possible | Probable | Probable | S4 | | |
| Northern Harrier | <i>Circus cyaneus</i> | Probable | | | | S4 | NAR | NAR |
| Northern Pintail | <i>Anas acuta</i> | | | Confirmed | | S5 | | |
| Orchard Oriole | <i>Icterus spurius</i> | | Possible | | | S4 | | |
| Ovenbird | <i>Seiurus aurocapilla</i> | Confirmed | Probable | | Probable | S4 | | |
| Pileated Woodpecker | <i>Dryocopus pileatus</i> | Probable | Possible | | | S5 | | |
| Pine Warbler | <i>Dendroica pinus</i> | | | | Possible | S5 | | |
| Purple Finch | <i>Carpodacus purpureus</i> | Confirmed | Possible | | Possible | S4 | | |
| Purple Martin | <i>Progne subis</i> | Confirmed | | | Confirmed | S4 | | |
| Red-bellied Woodpecker | <i>Melanerpes carolinus</i> | | | | Possible | S4 | | |
| Red-breasted Merganser | <i>Mergus serrator</i> | Confirmed | | Confirmed | Probable | S4/S5 | | |
| Red-breasted Nuthatch | <i>Sitta canadensis</i> | Probable | | Confirmed | Possible | S5 | | |
| Red-eyed Vireo | <i>Vireo olivaceus</i> | Confirmed | Probable | Possible | Probable | S5 | | |
| Red-headed Woodpecker | <i>Melanerpes erythrocephalus</i> | Probable | | | | S4 | THR | SC |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | Confirmed | Possible | Probable | Possible | S5 | NAR | NAR |
| Red-winged Blackbird | <i>Agelaius phoeniceus</i> | Confirmed | Confirmed | Confirmed | Confirmed | S5 | | |
| Ring-billed Gull | <i>Larus delawarensis</i> | | | Confirmed | Confirmed | S4/S5 | | |
| Rock Dove | <i>Columba livia</i> | Confirmed | Possible | Possible | Possible | NA | | |

Table A2: OBBA Data - Squares 17NK52 and 17NK53 (cont.)

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|---------------------------|----------------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Rose-breasted Grosbeak | <i>Pheucticus ludovicianus</i> | Confirmed | Possible | Confirmed | Possible | S4 | NAR | NAR |
| Ruby-throated Hummingbird | <i>Archilochus colubris</i> | Probable | Probable | Possible | Possible | S5 | | |
| Ruffed Grouse | <i>Bonasa umbellus</i> | Confirmed | Confirmed | Confirmed | | S5 | | |
| Savannah Sparrow | <i>Passerculus sandwichensis</i> | Confirmed | Possible | | Probable | S4 | | |
| Scarlet Tanager | <i>Piranga olivacea</i> | Possible | Probable | | | S4 | | |
| Sedge Wren | <i>Cistothorus platensis</i> | | Possible | | | S4 | | |
| Song Sparrow | <i>Melospiza melodia</i> | Confirmed | Confirmed | Confirmed | Confirmed | S5 | | |
| Sora | <i>Porzana carolina</i> | Possible | | | | S4 | | |
| Spotted Sandpiper | <i>Actitis macularius</i> | Confirmed | | Confirmed | Probable | S5 | | |
| Swamp Sparrow | <i>Melospiza georgiana</i> | Confirmed | Probable | | Probable | S5 | | |
| Tree Swallow | <i>Tachycineta bicolor</i> | Confirmed | Confirmed | Confirmed | Probable | S4 | | |
| Turkey Vulture | <i>Cathartes aura</i> | Confirmed | Confirmed | Probable | | S5 | | |
| Upland Sandpiper | <i>Bartramia longicauda</i> | Confirmed | Probable | | | S4 | | |
| Veery | <i>Catharus fuscescens</i> | Confirmed | Probable | Possible | Possible | S4 | | |
| Vesper Sparrow | <i>Poocetes gramineus</i> | Confirmed | Possible | | Possible | S4 | | |
| Virginia Rail | <i>Rallus limicola</i> | | | Possible | | S5 | | |
| Warbling Vireo | <i>Vireo gilvus</i> | Confirmed | Probable | Possible | Probable | S5 | | |
| Western Meadowlark | <i>Sturnella neglecta</i> | Possible | | | | S3 | | |
| White-breasted Nuthatch | <i>Sitta carolinensis</i> | Confirmed | Possible | Possible | Possible | S5 | | |
| White-throated Sparrow | <i>Zonotrichia albicollis</i> | Confirmed | Possible | | | S5 | | |
| Wild Turkey | <i>Meleagris gallopavo</i> | | Possible | | | S5 | | |
| Willow Flycatcher | <i>Empidonax traillii</i> | | Probable | | Possible | S5 | | |
| Winter Wren | <i>Troglodytes troglodytes</i> | Probable | Possible | | Possible | S5 | | |
| Wood Duck | <i>Aix sponsa</i> | Confirmed | Probable | | Possible | S5 | | |
| Wood Thrush | <i>Hylocichla mustelina</i> | Confirmed | Possible | | Probable | S4 | | |

Table A2: OBBA Data - Squares 17NK52 and 17NK53 (cont.)

| Species | | 17NK52 | | 17NK53 | | STATUS | | |
|--------------------------|---------------------------|-----------|-----------|-----------|-----------|--------------------|----------------------|----------------------|
| Common Name | Scientific Name | 1981-1985 | 2001-2005 | 1981-1985 | 2001-2005 | SRANK ¹ | COSEWIC ² | COSSARO ² |
| Yellow Warbler | <i>Dendroica petechia</i> | Confirmed | Probable | Probable | Probable | S5 | | |
| Yellow-bellied Sapsucker | <i>Sphyrapicus varius</i> | Confirmed | Probable | Possible | Possible | S5 | | |
| Yellow-rumped Warbler | <i>Dendroica coronata</i> | Probable | Possible | | Possible | S5 | | |

1. Provincial Rank: SE - Exotic, S2 - Imperiled, S3 - Vulnerable, S4 - apparently secure, S5 - Secure

2. COSEWIC/COSSARO Status: End - Endangered, Thr - Threatened, SC - Special Concern, NAR - not at risk

Table A3: OBBA Results - Square 17NK53, Point-Count Station #9

| Species | | Total Count | Provincial Rank ¹ |
|----------------------|----------------------------|----------------|---------------------------------|
| Common Name | Scientific Name | | |
| American Goldfinch | <i>Carduelis tristis</i> | 5 | S5 |
| American Robin | <i>Turdus migratorius</i> | 4 | S5 |
| Blue Jay | <i>Cyanocitta cristata</i> | 7 | S5 |
| Cedar Waxwing | <i>Bombycilla cedrorum</i> | 4 | S5 |
| Common Grackle | <i>Quiscalus quiscula</i> | 1 | S5 |
| Mourning Dove | <i>Zenaida macroura</i> | 2 | S5 |
| Ring-billed Gull | <i>Larus delawarensis</i> | 3 | S5/S4 |
| Red-winged Blackbird | <i>Agelaius phoeniceus</i> | 7 | S5 |

1. S4 - apparently secure, S5 - Secure

Table A4: Summary of Point-Count Monitoring Results – Oelbaum Property

| Species | | Station Total | | | | | |
|--------------------------|-------------------------------|---------------|--------|-------|-------|-------|--------|
| Common name | Scientific name | PC-1 | PC-2 | PC-3 | PC-4 | PC-5 | PC-6 |
| American Crow | <i>Corvus brachyrhynchos</i> | | 4 (2) | 7 (2) | | | 1 (1) |
| American Goldfinch | <i>Carduelis tristis</i> | 8 (2) | 1 (1) | 1 (1) | 4 (3) | 6 (3) | |
| American Redstart | <i>Setophaga ruticilla</i> | 3 (1) | | | 3 (1) | 1 (1) | 6 (3) |
| American Robin | <i>Turdus migratorius</i> | 10 (3) | 6 (3) | 5 (2) | 6 (3) | | 6 (3) |
| Barn Swallow | <i>Hirundo rustica</i> | | | | | 2 (1) | |
| Black-capped Chickadee | <i>Parus atricapillus</i> | 2 (1) | 2 (2) | 4 (2) | | 4 (1) | |
| Blue Jay | <i>Cyanocitta cristata</i> | 1 (1) | 6 (2) | 2 (2) | 4 (1) | 4 (1) | 1 (1) |
| Brown-headed Cowbird | <i>Molothrus ater</i> | | | | | 4 (1) | 2 (1) |
| Cedar waxwing | <i>Bombycilla cedrorum</i> | 3 (1) | | | 2 (1) | 3 (1) | 3 (2) |
| Chipping Sparrow | <i>Spizella passerina</i> | | | | | 2 (1) | |
| Common Grackle | <i>Quiscalus quiscula</i> | 7 (2) | 1 (1) | 2 (1) | 1 (1) | 4 (1) | 7 (2) |
| Common Yellowthroat | <i>Geothlypis trichas</i> | 2 (1) | | 1 (1) | | | 7 (3) |
| Downy Woodpecker | <i>Picoides pubescens</i> | | | 1 (1) | | 1 (1) | |
| Eastern Kingbird | <i>Tyrannus tyrannus</i> | 1 (1) | | | | | |
| Eastern Meadowlark | <i>Sturnella magna</i> | 1 (1) | | | | | |
| Eastern Wood-Peevee | <i>Contopus virens</i> | | 6 (3) | 2 (1) | 2 (2) | | |
| European Starling | <i>Sturnus vulgaris</i> | 2 (1) | | | | | |
| Field Sparrow | <i>Spizella pusilla</i> | | | | | 3 (3) | |
| Gray Catbird | <i>Dumetella carolinensis</i> | 1 (1) | 1 (1) | | 3 (2) | 2 (1) | 2 (2) |
| Great Crested Flycatcher | <i>Myiarchus crinitus</i> | | 1 (1) | 1 (1) | | 2 (1) | |
| Great Egret | <i>Casmerodius albus</i> | 1 (1) | | | | 3 (1) | |
| Green Heron | <i>Butorides virescens</i> | | 2 (1) | | | | |
| House Finch | <i>Carpodacus mexicanus</i> | 2 (1) | | | | 2 (2) | |
| House Wren | <i>Troglodytes aedon</i> | | | | | 2 (1) | |
| Indigo Bunting | <i>Passeina cyanea</i> | | | 2 (1) | | | |
| Killdeer | <i>Charadrius vociferus</i> | 4 (1) | 1 (1) | | | | |
| Mourning Dove | <i>Zenaida macroura</i> | 2 (1) | 3 (2) | | | | |
| Northern Cardinal | <i>Cardinalis cardinalis</i> | 1 (1) | | | | 1 (1) | |
| Northern Flicker | <i>Colaptes auratus</i> | | 1 (1) | | 2 (2) | | |
| Northern Oriole | <i>Icterus galbula</i> | 5 (3) | | | | | 1 (1) |
| Ovenbird | <i>Seiurus aurocapillus</i> | | 1 (1) | | | | |
| Red-eyed Vireo | <i>Vireo olivaceus</i> | 2 (2) | 11 (3) | 8 (3) | 9 (3) | 2 (1) | 1 (1) |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | | 2 (1) | | 1 (1) | | |
| Red-winged Blackbird | <i>Agelaius phoeniceus</i> | 5 (2) | | | 1 (1) | 1 (1) | 14 (3) |
| Ring-billed Gull | <i>Larus delawarensis</i> | 12 (1) | | | | 9 (1) | 11 (1) |
| Song Sparrow | <i>Melospiza melodia</i> | 3 (2) | 1 (1) | | | 5 (2) | 4 (2) |
| Yellow Warbler | <i>Dendroica petechia</i> | 2 (2) | | | | | 1 (1) |

Bracketed values indicate the number of point-count events (3 in total) during which the species was observed at the noted station

Table A5: Summary of all BBS Observations - Oelbaum Property

| Species | | Breeding Status | | Conservation Status | | |
|--------------------------|----------------------------------|------------------|-------------------|---------------------|----------------------|----------------------|
| Common name | Scientific name | Oelbaum Property | OBBA ¹ | SRANK ² | COSEWIC ³ | COSSARO ³ |
| American Crow | <i>Corvus brachyrhynchos</i> | Probable | Confirmed | S5 | - | - |
| American Goldfinch | <i>Carduelis tristis</i> | Probable | Probable | S5 | - | - |
| American Redstart | <i>Setophaga ruticilla</i> | Probable | Probable | S5 | - | - |
| American Robin | <i>Turdus migratorius</i> | Confirmed | Confirmed | S5 | - | - |
| Barn Swallow | <i>Hirundo rustica</i> | Possible | Confirmed | S5 | THR | THR |
| Belted Kingfisher | <i>Ceryle alcyon</i> | Observed | Possible | S5 | - | - |
| Black-billed Cuckoo | <i>Coccyzus erythrophthalmus</i> | Observed | Possible | S4 | - | - |
| Black-capped Chickadee | <i>Parus atricapillus</i> | Probable | Confirmed | S5 | - | - |
| Blue Jay | <i>Cyanocitta cristata</i> | Confirmed | Confirmed | S5 | - | - |
| Bobolink | <i>Dolichonyx oryzivorus</i> | Observed | Probable | S4 | THR | THR |
| Brown Thrasher | <i>Toxostoma rufum</i> | Possible | Probable | S5 | - | - |
| Brown-headed Cowbird | <i>Molothrus ater</i> | Probable | Probable | S5 | - | - |
| Canada Goose | <i>Branta canadensis</i> | Possible | Confirmed | S5 | - | - |
| Cedar waxwing | <i>Bombycilla cedrorum</i> | Confirmed | Confirmed | S5 | - | - |
| Chipping Sparrow | <i>Spizella passerina</i> | Probable | Confirmed | S5 | - | - |
| Common Grackle | <i>Quiscalus quiscula</i> | Confirmed | Confirmed | S5 | - | - |
| Common Raven | <i>Corvus corax</i> | Possible | Probable | S5 | - | - |
| Common Yellowthroat | <i>Geothlypis trichas</i> | Probable | Probable | S5 | - | - |
| Downy Woodpecker | <i>Picoides pubescens</i> | Possible | Possible | S5 | - | - |
| Eastern Kingbird | <i>Tyrannus tyrannus</i> | Possible | Confirmed | S5 | - | - |
| Eastern Meadowlark | <i>Sturnella magna</i> | Possible | Probable | S5 | THR | THR |
| Eastern Wood-Pee wee | <i>Contopus virens</i> | Probable | Probable | S5 | - | - |
| European Starling | <i>Sturnus vulgaris</i> | Confirmed | Confirmed | SE | - | - |
| Field Sparrow | <i>Spizella pusilla</i> | Probable | Possible | S5 | - | - |
| Gray Catbird | <i>Dumetella carolinensis</i> | Possible | Probable | S5 | - | - |
| Great Crested Flycatcher | <i>Myiarchus crinitus</i> | Probable | Confirmed | S5 | - | - |
| Great Egret | <i>Casmerodius albus</i> | Observed | Confirmed | S2 | - | - |
| Green Heron | <i>Butorides virescens</i> | Observed | Possible | S4 | - | - |
| House Finch | <i>Carpodacus mexicanus</i> | Possible | Probable | SE | - | - |
| House Wren | <i>Troglodytes aedon</i> | Probable | Confirmed | S5 | - | - |
| Indigo Bunting | <i>Passerina cyanea</i> | Possible | Probable | S5 | - | - |
| Killdeer | <i>Charadrius vociferus</i> | Confirmed | Probable | S5 | - | - |
| Mallard | <i>Anas platyrhynchos</i> | Observed | Confirmed | S5 | - | - |
| Mourning Dove | <i>Zenaida macroura</i> | Possible | Probable | S5 | - | - |
| Northern Cardinal | <i>Cardinalis cardinalis</i> | Possible | Probable | S5 | - | - |
| Northern Flicker | <i>Colaptes auratus</i> | Possible | Probable | S5 | - | - |
| Northern Oriole | <i>Icterus galbula</i> | Probable | Confirmed | S5 | - | - |
| Ovenbird | <i>Seiurus aurocapillus</i> | Possible | Probable | S5 | - | - |
| Pileated Woodpecker | <i>Dryocopus pileatus</i> | Observed | Possible | S4/S5 | - | - |
| Red-bellied Woodpecker | <i>Melanerpes carolinus</i> | Observed | Possible | S4 | - | - |
| Red-eyed Vireo | <i>Vireo olivaceus</i> | Probable | Probable | S5 | - | - |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | Possible | Possible | S5 | NAR | NAR |
| Red-winged Blackbird | <i>Agelaius phoeniceus</i> | Confirmed | Confirmed | S5 | - | - |

Table A5: Summary of Breeding Bird Status at the Oelbaum Property (cont.)

| Species | | Breeding Status | | Conservation Status | | |
|--------------------------|--------------------------------|------------------|-------------------|---------------------|----------------------|----------------------|
| Common name | Scientific name | Oelbaum Property | OBBA ¹ | SRANK ² | COSEWIC ³ | COSSARO ⁴ |
| Ring-billed Gull | <i>Larus delawarensis</i> | Observed | Confirmed | S5 | - | - |
| Rose-breasted Grosbeak | <i>Pheucticus ludovicianus</i> | Possible | Possible | S5 | - | - |
| Song Sparrow | <i>Melospiza melodia</i> | Confirmed | Confirmed | S5 | - | - |
| Turkey Vulture | <i>Cathartes aura</i> | Observed | Confirmed | S4 | - | - |
| Wild Turkey | <i>Meleagris gallopavo</i> | Possible | Possible | S5 | - | - |
| Yellow Warbler | <i>Dendroica petechia</i> | Possible | Probable | S5 | - | - |
| Yellow-bellied Sapsucker | <i>Sphyrapicus varius</i> | Observed | Probable | S5 | - | - |

1 - the highest breeding status reported in the 2001-2005 OBBA for either Square 17NK52 or 17NK53

2. Provincial Rank: , S2 - Imperiled, S4 - Apparently Secure, S5 - Secure, SE - Exotic

3. Status: NAR - not at risk, THR - Threatened

Appendix B – Environmental Review (2004)