

APPENDIX H

Suggested Terms of Reference for the Formation and Operation of a Conservation Advisory Committee (CAC)

The following suggestions for the formation and operation of a Conservation Advisory Committee are based largely on the experience and approach developed and used by the Regional Municipality of Waterloo to revise the Waterloo Region's Significant Species List: Breeding Birds Component.

- Clearly stated objectives will help to guide the actions of the CAC and will keep it focused on the most important tasks.
- Initial selection of tasks for the CAC should emphasize the strengths of the panel of experts. Staff at the Regional Municipality of Waterloo began with the Bird Component of the Region's Significant Species List because birds are better known than other groups of wildlife, there is a broader base of available expertise, and the list of birds is of a manageable length. The examination of reptiles and amphibians species and their respective habitats might also provide a starting point because there are few species in the province and many of them are found in wetland habitats.
- Invite the most knowledgeable experts to a series of evening meetings. The participants might represent a broad spectrum of backgrounds and interests: consultants; OMNR, CWS and other government agency staff; university professors; municipal staff or council members; and local naturalists.
- Prospective members need not live in the municipality. However they must be familiar with the flora and fauna in the planning area. Awareness of the important ecological considerations involved in the identification, evaluation, and protection of natural heritage features and areas would be an important asset. CAC candidates should be willing to work with other members towards the development of a natural heritage system for the municipality. However they must realize that their primary role is to assist the planning authority with decisions concerning the conservation of important areas within the municipality.
- Include in the invitation, an explanation of the proposed objectives of the CAC, a description of the specific tasks to be undertaken by committee members, any pertinent information related to these specific tasks (e.g., list of bird species, written reports), a polite request that the recipient review the enclosed information, an explanation about why the recipient has received an invitation and the need for his or her involvement, an agenda, location, and schedule of meetings, and a request that the recipient call by a certain date to indicate a willingness to attend, or send written comments.
- Informal, informative presentations at the first meeting (and subsequent meetings if desired) can provide participants with the necessary background information, and a sense of the

current situation (e.g., existing information, knowledge gaps, priorities) as well as set the stage for future involvement by them.

- As early as possible, try to agree by consensus on the approaches that will be used to work on the specific tasks before the CAC. Sometimes this may require some facilitation.
- Encourage feedback from participants by making time available for discussion and remaining flexible.
- To keep the process moving, provide “homework” for committee members during interludes between meetings. This might include research, reading, revision of lists and data sources, or site visits.

Prior to adoption of CAC recommendations, encourage public awareness and participation in CAC decisions through advertised information sessions. Occasional newsletters might help to inform local residents and provide opportunities for comments.

APPENDIX I

Information Sources for the Identification of Significant Wildlife Habitats

Table I-1: Information Sources for the Identification of Seasonal Concentrations of Animals

Seasonal Concentrations of Animals	Information Sources and Information Provided
Mammals	
Winter deer yards	<ul style="list-style-type: none"> • OMNR for location and relative importance of many yards; deer habitat requirements • OMNR publications • Broadfoot & Voigt (1996) suggested how and when to measure deer yard size • Ranta (1998) outlines how to conduct aerial surveys of deer yards
Bat winter hibernacula and maternity colonies	<ul style="list-style-type: none"> • OMNR for possible locations of hibernacula; a source for contact with bat experts • Ontario Ministry of Northern Development and Mines for locations of abandoned mines that may provide potentially significant bat hibernacula • some members of outdoor recreation clubs (e.g., Sierra Club) explore caves and may know location of hibernacula • little available information on location of bat hibernacula • University Biology Departments for bat experts who may know locations of important sites & habitat requirements • other sources including consultant and naturalist club reports, atlas results etc. may provide some site-specific information for some of the species. They may be found at OMNR, NHIC, Conservation Authority, OMOT, Ontario Hydro, municipality offices
Moose winter habitat	OMNR for possible locations of some sites; moose habitat requirements
Birds	
Colonial bird nesting sites including colonies of herons, gulls and terns, swallows	<ul style="list-style-type: none"> • OMNR for location and size of some heronries, gull and tern colonies • some information regarding location and size of heronries, gull and tern colonies may be out-dated and in need of verification since some inventories were done during the 1970s and 1980s • CWS for location and size of some gull, tern, cormorant colonies on Great Lakes • OMNR wetland evaluations identify colonial nest sites (e.g., Black Terns, heronries) if they were observed at time of wetland evaluation • OMNR publications • Bowman & Siderius (1984) guidelines for heronry protection • Bird Studies Canada (LPBO) for location and size of some heronries • Ontario Birds at Risk Program (OBAR); Bird Studies Canada (LPBO) volunteers monitor known breeding sites of rare species and survey for new breeding sites; some colonial species (e.g., Black Tern) are on this list • Ontario Nest Records Scheme (ONRS); ROM database provides information on breeding distribution, nest locations for 283 species • local birders for location of some local colonies

Seasonal Concentrations of Animals	Information Sources and Information Provided
Waterfowl nesting, staging, migration stopover areas	<ul style="list-style-type: none"> • OMNR for location of regionally and locally significant sites • Hickie (1985) – Habitat management guidelines for waterfowl in Ontario. • OMNR Wetland Evaluations identify locally significant areas • Canadian Wildlife Service for location of regionally and provincially significant sites; species habitat requirements; species of conservation concern; source of several potentially helpful publications • Ontario Nest Records Scheme (ONRS); ROM database provides information on breeding distribution, nest locations for 283 species • Ducks Unlimited Canada for location of important local sites; species habitat requirements; restoration of waterfowl nesting habitat • local birders for location of some locally important areas; location of some nesting species of conservation concern
Forested sites with concentrations of nesting birds	<ul style="list-style-type: none"> • Canadian Wildlife Service, Guelph for locations of and data on their Forest Bird Monitoring Program sites; may also provide contact with local Program volunteers who know locations of sites with high density and diversity of breeding and/or migrant birds. • OMNR/Bird Studies Canada (LPBO) for location of some sites with several raptor nests (e.g., Ospreys) • Ontario Nest Records Scheme (ONRS); ROM database provides information on breeding distribution, nest locations for 283 species • local birders for location of some locally significant sites
Migration stopover areas for landbirds, shorebirds	<ul style="list-style-type: none"> • Canadian Wildlife Service; Bird Studies Canada; Federation of Ontario Naturalists for location of provincially and regionally significant sites • CWS, Downsview for contact with volunteers involved in Ontario Shorebird Survey; these people may know locally significant sites for shorebirds • local birders for location of some locally significant sites and names of local birding guidebooks that describe location of hotspots for migratory birds
Raptor (hawks, eagles, owls, falcons) Winter roosting & feeding areas	<ul style="list-style-type: none"> • OMNR; local birders and area farmers for location of some significant areas (little available information)
Wild Turkey winter roosting and feeding areas	<ul style="list-style-type: none"> • OMNR; local birders and area farmers for location of some significant areas (little available information) • OMNR publication: ⇒ Reid (1991) OMNR habitat requirements of Wild Turkeys • local residents and birders for location of some sites
Turkey Vulture summer roosting areas	<ul style="list-style-type: none"> • local residents and birders for location of some sites (little available information) • other sources including consultant and naturalist club reports, atlas results etc. may provide some site-specific information for some of the bird species listed in this table. They may be found at OMNR, NHIC, Conservation Authority, OMOT, Ontario Hydro, and municipality offices.

Seasonal Concentrations of Animals	Information Sources and Information Provided
Reptiles and Amphibians	
	<ul style="list-style-type: none"> • OMNR offices for general location of some important habitats; location of a few bullfrog concentration areas; species habitat requirements; a source of contact with experts • NHIC in Peterborough maintains database on location of reptiles and amphibians & includes location of known concentration areas; contact through local OMNR Ecologist • Canadian Wildlife Service, Burlington for contact with volunteers participating in Amphibian Road Call Counts who know locally important sites • Long Point Bird Observatory for contact with local volunteers participating in Marsh Monitoring Program and the Backyard Amphibian Survey, who know locally important sites • Royal Ontario Museum and Canadian Museum of Nature data have been incorporated into the NHIC database • other sources including consultant and naturalist club reports, atlas results etc. may provide some important site locations and species descriptions. They may be found at OMNR, NHIC, Conservation Authority, OMOT, Ontario Hydro, municipality offices
Butterfly Migratory Stopover Areas (little available information)	
	<ul style="list-style-type: none"> • OMNR; Agriculture Canada (Ottawa) are possible sources for contact with local experts and location of locally and regionally significant sites • University Biology Departments for contact with authorities who may know locally important sites • Holmes et al. 1991. <i>The Ontario Butterfly Atlas</i>. Toronto: Toronto Entomologists' Association for general information on distribution, habitat, food requirements but no site-specific information. This may be found at the NHIC in Peterborough, FON in Toronto, and various other bookstores • Toronto Entomologists' Association (contact Royal Ontario Museum) for members who may know location of some locally significant sites • local naturalists may know location of locally significant sites • other sources including consultant and naturalist club reports, atlas results etc. may provide some important site locations and species descriptions. They may be found at OMNR, NHIC, Conservation Authority, OMOT, Ontario Hydro, municipality offices

Table I-2: Information sources for the identification of rare vegetation communities or specialized wildlife habitats

Rare Vegetation Community	Information Sources and Information Provided
wetland communities	<ul style="list-style-type: none"> • OMNR Ecologists can provide lists of plant species that are indicators of fen and bog wetlands. • OMNR publication: ⇒ Bakowsky (1996) <i>Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario</i> describes natural communities by dominant plant species, and physical characteristics of the site such as soil depth and moisture regime and rare wetland community types are identified. • OMNR Wetland Evaluations Class 1-7 differentiate more uncommon wetland type e.g., fens, bogs that often support of rare vegetation communities; many provide common plant species lists; some rare plants are recorded for some wetlands; include map illustrating dominant plant communities; mention other scientific studies, reports related to the wetland. • Ontario Geological Survey Peat and Peatland Evaluation reports also describe and map these communities. • OMNR ANSI Site District Reports describe vegetation composition (species observed) of candidate areas; may briefly describe other potentially locally or regionally significant wetlands that have been identified but were not closely examined for ANSI status; provide complete site descriptions and maps of ANSIs and candidate ANSIs. • Topographical maps (scale 1:50,000) can help to locate wetlands, provide fairly specific location & approximate size of identified wetland communities. • Aerial photographs (scale 1:10,000) can help to locate wetlands, especially helpful finding smaller wetlands; can help to determine whether marsh or swamp and location of wetland relative to upland communities; essential in mapping location and extent of vegetation communities; some unique communities can be identified depending on photo interpretative skill. • Local naturalists may know locations of locally significant communities. • OMNR NW Ontario Wetland Classification (Racey and Harris 1995) describes procedures for differentiating wetland communities at a hierarchy of scales; locations of some rare wetland community types in northwestern Ontario are provided. • Consultant and naturalist club reports may provide descriptions of significant wetland vegetation communities found in local wetlands. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices. • Parks Canada produced a report on all of the wetlands on the Rideau Canal system; contact Parks Canada, Smiths Falls or OMNR. • Federation of Ontario Naturalists (FON) produced a report on some of the wetlands of Ontario. • University, museum, and provincial/national park herbaria collections include rare plant species, name of collector and date of collection, approximate location where plants were collected.

Rare Vegetation Community	Information Sources and Information Provided
prairies, alvars, savannahs; rock barrens; sand barrens	<ul style="list-style-type: none"> • OMNR Ecologists can obtain maps of these rare plant communities from the NHIC in Peterborough and can provide lists of plant species that are indicators of prairies, alvars, savannahs. • OMNR and NHIC publication: <ul style="list-style-type: none"> ⇒ Bakowsky (1996) <i>Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario</i> describes plant communities by dominant plant species, and physical characteristics of the site such as soil depth and moisture regime; comprehensive listing of rare plant communities found in southern Ontario. • OMNR ANSI Site District Reports provide detailed descriptions (plant species and communities) of several of these rare communities as well as site maps. • Some researchers have examined these communities in Ontario describing physical characteristics, and plant species composition. They also have included precise locations of sites (e.g., Catling and Catling (1993)- limestone savannah, prairie, sand barren; Catling and Brownell (1995)- alvars; Bakowsky (1993) - prairie, savannah. These studies can be obtained from the OMNR Ecologist. • Local naturalists may know locations of locally significant communities. • Consultant and naturalist club reports may provide some site-specific information about locally significant areas. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices. They may also be found in scientific journals and publications such as <i>The Canadian Field-Naturalist</i>. • University, museum, and provincial/national park herbaria collections include rare plant species, name of collector and date of collection, approximate location where plants were collected. Indicator plants of these rare communities found in these collections may help to locate specific sites. • County soil survey reports and maps describe local physical characteristics such as landforms, drainage patterns, soils, and moisture regimes that can narrow search for rare communities such as alvars (e.g., indicate areas with deep sand deposits, little mineral soil).
forest stands with rare tree associations and/or rare tree species See Appendix L for a list of rare forest communities found in S. Ontario	<ul style="list-style-type: none"> • OMNR Foresters often know the location of forest stands containing rare tree species. • OMNR publication: <ul style="list-style-type: none"> ⇒ Bakowsky (1996) <i>Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario</i> describes these communities by dominant plant species, and physical characteristics of the site such as soil depth and moisture regime; lists and briefly describes rare forest communities of southern Ontario. • OMNR ANSI Site District Reports provide detailed descriptions (plant species and communities) of candidate ANSI sites that may contain rare forest types as well as site maps. • OMNR Forest Resource Inventory (FRI) maps (scale 1:15,840) indicate the dominant tree species, percent composition of the stand, and approximate age of the forest stands; initially helpful in locating potentially rare forest types for the municipality; but only indicate species comprising at least 10% of the mapped stand. • Local naturalists may know locations of locally significant communities. • Aerial photographs (scale 1:10,000) can help to locate woodlands, provide rough estimate of woodland area, and are essential in mapping location and extent of vegetation communities; can also locate help to locate older woodlands. • Topographical maps (scale 1: 50,000) can help to locate woodlands, provide fairly specific location and approximate size of identified communities; they should be used in conjunction with Forest Resource Inventory (FRI) maps and aerial photographs. • OMNR Forest Ecosystem Classifications for NW Ontario (Sims et al. 1989); NE Ontario (Taylor et al. 2000); Central Ontario (Chambers et al. 1997); Southern Ontario (Lee et al. 1998) provide detailed descriptions of natural forest types of these regions; some information on the

Rare Vegetation Community	Information Sources and Information Provided
	<p>distribution of species. Database for S. Ontario (contact H. Lee, OMNR London office). Municipalities can use the information to classify their own forests and determine the representation of forest types in the area; forest types should be mapped at similar scale to aerial photograph interpretations (i.e., 1:10,000).</p> <ul style="list-style-type: none"> • OMNR Growth and Yield Program have established research plots in some woodlands with locally or regionally rare trees and tree associations. • Ontario Tree Atlas is being coordinated by the University of Guelph. Contact staff at the Arboretum; they can provide contact with local volunteers who may know locations of woodlands containing rare trees and tree associations. • University, museum, and provincial/national park herbaria collections include rare plant species, name of collector and date of collection, approximate location where plants were collected. Indicator plants of these rare communities found in these collections may help to locate specific sites. • County soil survey reports and maps describe local physical characteristics such as landforms, drainage patterns, soils, and moisture regimes that can narrow search for rare forest associations. • Consultant and naturalist club reports may provide some site-specific information about locally significant woodlands with rare trees and tree associations. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices. They may also be found in scientific journals and publications such as <i>The Canadian Field-Naturalist</i>.
<p>cliffs/talus slopes; Great Lakes dunes; beach shorelines; grasslands etc.</p>	<ul style="list-style-type: none"> • OMNR Ecologists may know the location of some of these rare communities. • OMNR publication: ⇒ Bakowsky (1996) <i>Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario</i> describes these communities by dominant plant species, and physical characteristics of the site such as soil depth and moisture regime; these rare communities are listed and briefly described. • OMNR ANSI Site District Reports provide detailed descriptions (plant species and communities) of some of the candidate ANSI sites, and include site maps. • Local naturalists may know locations of locally significant communities. • Aerial photographs used in conjunction with topographical maps can help to verify presence of these communities. • Topographical maps indicate areas of sharp relief, shorelines, and potential grassland areas. • County soil survey reports and maps describe local physical characteristics such as landforms, drainage patterns, soils, and moisture regimes that can narrow search for these communities (e.g., indicate areas with deep sand deposits). <p>Consultant and naturalist club reports may provide some site-specific information about these communities. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices. They may also be found in scientific journals and publications such as <i>The Canadian Field-Naturalist</i>.</p>

Specialized Wildlife Habitats	Information Sources and Information Provided
habitat supporting area-sensitive birds (e.g., hawks, songbirds)	<ul style="list-style-type: none"> • OMNR Ecologists may know the location of sites supporting area-sensitive species. • Topographical maps and aerial photographs can help to locate existing forest stands, grasslands; aerial photographs especially helpful for finding areas of greatest amount of contiguous closed-canopy forest cover required by forest species • OMNR Forest Resource Inventory (FRI) maps (scale 1:15,840) indicate dominant tree species, percent composition of the stand, and approximate age of the forest stands; latter information particularly helpful in locating potentially significant forest habitats for these species because older deciduous stands with abundant and diverse forest structure tend to be preferred. Most effectively used in conjunction with aerial photographs and topographical maps. • Ontario Hydro has produced regional forest cover maps for southern Ontario that provide an indication of percent forest cover for each mapped area; they could be used to identify sites with greatest potential to support these species. • Local birders may know location of premier woodlands for area-sensitive species, the location of some forest nesting raptors, and premier grassland sites. • Canadian Wildlife Service, Guelph, for locations of and data on their Forest Bird Monitoring Program sites; may also provide contact with local Program volunteers who know locations of locally significant forest stands supporting these species. • OMNR Growth and Yield and Ecological Land Classification Programs (OMNR); plot information may reveal significant forest stands by providing information such as presence of old and large trees, a variety of different vegetation strata and down woody debris- forest characteristics that are attractive to these species. • OMNR/Bird Studies Canada (LPBO) Ontario Birds at Risk Program (OBAR) runs the Red-shouldered Hawk Survey; volunteers monitor many stands in southwest and central Ontario and the records of nest locations can help to locate sites important to this area-sensitive species; OBAR program also monitors forest species currently at risk and can provide some site-specific information concerning the location of these species. • OMNR ANSI Site District Reports may describe such forest and grassland habitats and include list of bird species where observed; include site maps.
forest stands providing a diversity of habitats (e.g., tree cavities, fallen logs, vertical stratification)	<ul style="list-style-type: none"> • OMNR Foresters may know stands with high proportion of diseased or damaged trees and therefore likely to have more snags and cavity trees. They may also know locations of stands they call “over mature”. • OMNR FRI maps note age and tree species composition of forest stands- can help to locate sites with more cavity trees and snags; particularly older forests comprised of large proportion of aspen, beech, basswood, conifers. These maps can also indicate older forests that often have diverse vertical structure. Consider the date of the FRI information. • Topographical maps and aerial photographs indicate areas with steep slopes and valleys next to streams; often these areas were not logged, resulting in older trees and abundant fallen logs. The proximity of water can make these areas attractive to salamanders. • OMNR Growth and Yield Program- plot information includes sites with cavity trees and snags, diversity of vegetation layers, and abundant down woody debris. • OMNR ANSI Site District Reports- sites with a variety of recorded shrub and tree species may indicate diversity of vegetation layers; include site maps. • OMNR publications: <ul style="list-style-type: none"> ⇒ Gerson (1984) - management guidelines for bats and cavity trees ⇒ Keddy and Drummond (1995)- value of wildlife trees in Eastern Ontario forests ⇒ Naylor et al. (1994)- forestry management guidelines for the provision of Pileated

Specialized Wildlife Habitats	Information Sources and Information Provided
	<p>Woodpecker habitat.</p> <ul style="list-style-type: none"> • Local birders may know location of locally significant stands with these features. • University biology departments for contact with researchers with knowledge of local habitats supporting their species of interest (e.g. southern flying squirrel, Pileated Woodpecker, four-toed salamander).
woodlands supporting springtime amphibian breeding ponds	<ul style="list-style-type: none"> • Contact local OMNR Ecologist • Topographical maps and aerial photographs can help to locate some potential areas. • Local naturalists may know location of woodland ponds and areas with notable spring breeding choruses of frogs. • Long Point Bird Observatory for contact with local volunteers participating in Marsh Monitoring Program and Backyard Amphibian Survey • CWS (Burlington) for contact with volunteers involved with the Amphibian Road Call Counts who know locally important sites.
foraging areas producing abundant fruit and nuts	<ul style="list-style-type: none"> • OMNR Foresters, Ecologists, and Conservation Officers know locations of some sites. • OMNR FRI maps will indicate forest stands with abundance of mature trees producing mast nuts (e.g., oaks, beech, hickory) • Topographical maps and aerial photographs can indicate features like ridges and rock barrens that often have oaks and berry-producing shrubs respectively. • OMNR Ecological Land Classification Programs- plot information records sites that were sampled with trees and shrubs that can produce nuts and berries; food production potential can be inferred from this information • OMNR ANSI Site District Reports describe plant communities and record shrubs and trees-food production potential can be inferred from this information; include site maps • OMNR/local fish and game and hunt clubs for contacts with local hunters (especially turkey, Ruffed Grouse, deer, bear) who may know local sites with significant concentrations of mast and berry producing vegetation. • Ontario Nut Producers Association- members are seed collectors and know where productive trees and stands are located.
moose aquatic feeding areas, mineral licks, calving areas	<ul style="list-style-type: none"> • OMNR for location of some important aquatic feeding areas and description of such habitats; moose habitat requirements; contact with knowledgeable people • Aerial photographs can help to identify sections of creeks and bays with high potential as aquatic feeding areas • Little available information on location of mineral licks and calving areas • OMNR publications: <ul style="list-style-type: none"> ⇒ OMNR (1988) for timber management guidelines for provision of moose habitat ⇒ Ranta (1998) to identify, map and rank moose aquatic feeding areas ⇒ Other references with more information about moose habitat include: Allen 1987; Bellhouse et al. 1993; Jackson et al. 1987; Naylor et al. 1992
mink and otter feeding and denning sites	<p>These sites are difficult to find but the following sources will provide assistance:</p> <ul style="list-style-type: none"> • Aerial photographs can help to locate prime areas- undisturbed shorelines with abundant vegetation and down woody debris e.g., dead falls, large logs • OMNR for contact with local trappers for information on locations of high populations • OMNR Wetland Evaluations record presence of these mammals or signs of them (tracks, scat etc.) as well as presence in other years, through interviews with local trappers. • Novak et al. (eds.) 1987. <i>Wild Furbearer and Conservation Management in Ontario</i> - available at OMNR offices

Specialized Wildlife Habitats	Information Sources and Information Provided
marten and fisher denning habitat	<p>These sites are also hard to find but some may be found by referring to the following sources:</p> <ul style="list-style-type: none"> • OMNR FRI maps will indicate potential woodlands containing larger, older trees that are likely to provide cavities and abundant down woody debris. • OMNR for contact with local trappers for information on areas with high populations. • Novak et al. (eds.) 1987. <i>Wild Furbearer and Conservation Management in Ontario</i> – available at OMNR offices
areas of high species and/or community diversity	<ul style="list-style-type: none"> • OMNR Ecologist may know location of sites with high diversity. • OMNR ANSI Site District Reports note diverse communities and include species lists and site maps. • Many OMNR Wetland Evaluations provide plant species lists and record all types of wetland communities found within a defined wetland boundary. • Local naturalists and FON members may know location of areas of high community and/or species diversity. • Aerial photographs may indicate sites with community diversity (e.g., several different wetlands, forested uplands, open fields within the same general area). • Consultant and naturalist club reports may provide some site-specific information about areas with high community diversity. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices.
old growth or mature forest	<ul style="list-style-type: none"> • OMNR Foresters know locations of oldest forest stands and may refer to them as “over-mature”. • OMNR FRI maps indicate age of forest stands and can help to locate older forests in the municipality • OMNR ANSI Site District Reports describe some examples of older forests of provincial or regional significance; some reference may be made to older forests of local significance; include site maps • OMNR Growth and Yield and Ecological Land Classification Programs sampled plots in some stands with older trees. • Local naturalists and FON members may know location of areas of older forests in the municipality. • Consultant and naturalist club reports may provide some site-specific information about areas of old growth forest. They may be found at OMNR, OMOT, Ontario Hydro, Conservation Authority, and municipality offices.
permanent springs; seeps; cold or cool-water streams	<ul style="list-style-type: none"> • Topographical maps and aerial photographs indicate headwaters of streams where springs may be found. • County soil survey reports and maps describe local physical characteristics such as soils, landforms, and drainage patterns that can narrow search for springs and seeps. • Local naturalists and landowners may know of some locations. • Municipalities may have surveyed drainage systems and headwater areas may be mapped. • Many Conservation Authorities monitor stream flows and consequently may know locations of springs and seeps. • OMNR staff and local anglers may know location of some springs/seeps that can affect the distribution of sportfish such as brook trout or plants often associated with seeps (e.g., ginseng).
caves	<ul style="list-style-type: none"> • University faculty biologists with interest in caves or bats may know some locations. • Local naturalists, landowners, spelunkers may know location of some locations. Contact applicable clubs (e.g., Sierra Club). • Geology maps can indicate areas with certain geological features resulting in more caves (e.g., Niagara Escarpment, Upper Ottawa Valley).

Table I-3: Information Sources for the Identification of Habitats of Species of Conservation Concern

Group	Information Sources and Information Provided
Birds	<p>OMNR Ecologists; NHIC in Peterborough</p> <ul style="list-style-type: none"> • lists of candidate species of conservation concern and mapped locations of some of them • Downes and Collins. 1996. <i>The Canadian Breeding Bird Survey, 1966-1994</i>. presents bird population trends derived from annual surveys from 1966-1994; identified significant declines in some species; purpose of the program is to detect and measure year-to-year and long-term changes in breeding bird populations (also found at CWS, Bird Studies Canada) • Lepage et al. 1998. <i>Setting Conservation Priorities for Ontario's Breeding Landbirds</i>-represents the most recent effort to provide lists of landbirds of high conservation priority; the methodology is explained; report was prepared for the OMNR and is available from OMNR Ecologists and Bird Studies Canada. • Couturier. 1999. <i>Conservation Priorities for the Birds of Southern Ontario</i> reviews existing systems for setting conservation priorities; presents a suggested approach and list of species of conservation concern; includes rankings of each species based on abundance in Ontario and on the proportion of its North American breeding range/population in Canada and Canadian breeding range/population in Ontario (also found at CWS, Bird Studies Canada) • Austen et al. 1994. <i>Ontario Birds at Risk</i>. Summarized data from the Ontario Breeding Birds Atlas and Ontario Rare Breeding Bird Program to describe status, habitat requirements, and conservation needs of 58 bird species considered to be at risk (also found at Bird Studies Canada; FON) • Cadman et al. 1987. <i>Atlas of the Breeding Birds of Ontario</i>. University of Waterloo Press, Waterloo. Summary of results from atlas work by volunteers regarding breeding bird species abundance and richness observed in 10 by 10 km squares; good habitat descriptions for breeding birds of Ontario; regional coordinators and local volunteers who conducted surveys are perhaps best source of site-specific information (field work proposed for 2001 – 2005 for new updated atlas) • COSEWIC and COSSARO lists of vulnerable, threatened, endangered species in Ontario • COSEWIC status reports- present population status of species, distribution, and habitat requirements (found at CWS, Bird Studies Canada) • RENEW recovery plans for threatened and endangered species <p>Other potential sources of information</p> <ul style="list-style-type: none"> • Naturalist club publications (e.g. <i>Trail and Landscape</i> by the Ottawa Field-Naturalists' Club) • regional/local accounts such as Weir. 1989. <i>Birds of the Kingston Region</i>. • Parker et al. 1984. <i>Toronto Region Bird Report</i> possibly found at the Toronto Ornithological Club, Toronto • studies of individual species funded by OMNR, WWF, Bird Studies Canada (LPBO), universities; possibly found at OMNR; Bird Studies Canada • consultant, naturalist club, university studies may provide some additional information for specific areas/regions and may be found at OMNR; OMOT; Ontario Hydro; Conservation Authority, and municipality offices; NHIC in Peterborough • Bain and Henshaw. 1992. <i>Annual Bird Report, Durham Region</i> • journals (e.g., <i>The Canadian Field-Naturalist</i>)
Plants	<p>OMNR Ecologists; NHIC in Peterborough</p> <ul style="list-style-type: none"> • lists of some candidate species of conservation concern and mapped locations of some of them • Argus and Pryer. 1990. <i>Rare Vascular Plants in Canada. Our Natural Heritage</i>. Canadian Museum of Nature, Ottawa. • Provincially rare list of plants. This list is regularly updated by staff at the NHIC.

Group	Information Sources and Information Provided
	<ul style="list-style-type: none"> • Argus et al. Eds. 1982-87. <i>Atlas of the Rare Vascular Plants of Ontario. Parts 1-4</i>. National Museum of Natural Sciences, Ottawa. Provides notes on status, habitat, small-scale maps of known locations, and pertinent references for many rare plants. Includes herbaria that were consulted and names and addresses of contributors- people who may be able to provide more site-specific information. • NHIC-Peterborough has produced a draft of an annotated plant species list for Ontario that shows distribution of species by county. • Cuddy. 1991. <i>Vascular Plants of Eastern Ontario</i> lists the status of plant species that grow in Eastern Ontario by physiographic region as provincially rare, rare, and present. • Riley. 1989. <i>Distribution and status of the vascular plants of Central Region</i> lists the status of plant species that grow in Central Ontario by county as provincially rare, rare, uncommon, and common. • Oldham. 1993. <i>Distribution and status of the vascular plants of Southwestern Ontario</i> lists the status of plant species that grow in Southwestern Ontario by county as provincially rare, rare, very uncommon, uncommon, and common. • County/regional municipality vascular plant floras for the Carolinian zone of Canada. (Varga and Allen 1990) pp. 129-153. <i>In</i> Allen, G.M., P.F.J. Eagles & S.D. Price (eds.) <i>Conserving Carolinian Canada</i>, University of Waterloo Press, Waterloo. Summarizes vascular flora in 16 counties and regional municipalities in Carolinian zone of southern Ontario; notes rare species, general locations of them; names and locations of top botanical sites in each areas; names, addresses of contributors. • other county/regional flora and checklists (e.g., Gillette and White. 1978. <i>Checklist of Vascular Plants of the Ottawa-Hull Region</i> found at the National Museum of Natural Sciences, Ottawa; Morton and Venn. 1982. <i>A Checklist of the Flora of Ontario: Vascular Plants</i> found at OMNR offices and University of Waterloo • COSEWIC status reports on vulnerable species (also found at CWS) • Ontario tree atlas (in preparation) by the University of Guelph <p>Other potential sources of information</p> <ul style="list-style-type: none"> • Field Botanists of Ontario newsletter may indicate locations of some species and diverse vegetation communities; found at the NHIC in Peterborough, some OMNR offices • Naturalist club publications (e.g., <i>Trail and Landscape</i> by the Ottawa Field-Naturalists' Club) • Scientific journals and publications (e.g., <i>The Canadian Field-Naturalist</i>) • Consultant, naturalist club, and university studies may be found at OMNR; OMOT; Ontario Hydro; Conservation Authority, and municipality offices; NHIC in Peterborough
Reptiles and amphibians	<p>OMNR Ecologists; NHIC in Peterborough</p> <ul style="list-style-type: none"> • status list of all provincial species is determined and regularly updated by OMNR & NHIC staff • Weller and Oldham. 1986. <i>Results of Ontario Herpetofaunal Summary</i> provides locations of different species of reptiles and amphibians; NHIC maintains the database • COSEWIC status reports on species at risk and may also document species that are declining (also found at CWS) <p>Canadian Wildlife Service, Burlington</p> <ul style="list-style-type: none"> • for contact with local volunteers participating in Amphibian Road Call Counts who know locally important habitats for these species. <p>Long Point Bird Observatory</p> <ul style="list-style-type: none"> • for contact with volunteers participating in Marsh Monitoring Program and/or Backyard Amphibian Survey who may know locally important habitats and sites for these species. <p>Other potential sources of information</p>

Group	Information Sources and Information Provided
	<ul style="list-style-type: none"> • naturalist club publications • consultant, naturalist club, and university studies may be found at OMNR; OMOT; Ontario Hydro; Conservation Authority, and municipality offices; NHIC in Peterborough
Mammals	<p>OMNR Ecologists; NHIC in Peterborough</p> <ul style="list-style-type: none"> • status list of all provincial species is determined and regularly updated by OMNR and NHIC staff • COSEWIC status reports on vulnerable species (also found at CWS) <p>Other potential sources of information</p> <ul style="list-style-type: none"> • Dobbyn, J.S. 1994. <i>Atlas of the Mammals of Ontario</i> describes the range and distribution of mammals in Ontario; may help to determine local rarity (available from FON) • naturalist club publications • Museum of Natural Science (Ottawa) produces some publications • consultant, naturalist club, university studies may be found at OMNR; OMOT; Ontario Hydro; Conservation Authority, and municipality offices; NHIC in Peterborough • Peterson, R.L. 1966. <i>The Mammals of Eastern Canada</i>. Oxford University Press, Toronto may be found at some University libraries; OMNR offices
Butterflies	<p>OMNR Ecologists; NHIC in Peterborough</p> <ul style="list-style-type: none"> • status list of all provincial species is determined and regularly updated by NHIC and OMNR staff • Campbell, C., D.P. Coulson and A.A. Bryant 1990. Status, distribution, and life history characteristics of some butterflies at risk in the Carolinian forest zone of Ontario. pp. 207-252. <i>In</i> Allen, G.M. , P.F.J. Eagles, and S.D. Price (eds.) <i>Conserving Carolinian Canada</i>, University of Waterloo Press, Waterloo. Reports on the status of most threatened butterflies in the Carolinian zone of southern Ontario, includes general location of records; notes on distribution, habitat preferences; mentions public and private collections; recommendations for conservation. Found at the NHIC-Peterborough; some OMNR offices and university libraries. <p>Other potential sources of information</p> <ul style="list-style-type: none"> • Agriculture Canada, Ottawa, may provide contact with butterfly experts • Toronto Entomologists' Association newsletter may be found at the NHIC • naturalist club publications • Holmes et al. 1991. <i>The Ontario Butterfly Atlas</i>. Toronto: Toronto Entomologists' Association may be found at the NHIC • Layberry et al. 1998. <i>The Butterflies of Canada</i>.
Other groups	<p>NHIC in Peterborough</p> <ul style="list-style-type: none"> • Maintains a database on rare dragonflies, moths, tiger beetles, & unionid mussels • can provide contact with specialists

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APPENDIX J

Natural Heritage Resources of Ontario: S-Ranks for Communities in Site Regions 6 and 7

The classification of communities in this appendix is a first approximation of a classification system for southern Ontario. It is based on a combination of empirical data, literature review and expert opinion of ecologists work in this field. The S-ranks are assigned on frequency of occurrence as described in the following pages.

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INTRODUCTION

The mission of the Natural Heritage Information Centre (NHIC), Ontario Ministry of Natural Resources (OMNR), is to acquire, maintain and update, and make available data on the province's rare species, vegetation communities, and natural areas. Together, flora, fauna, and vegetation communities are considered to be 'elements' of biodiversity.

The NHIC actively collects information on rare vegetation types in Ontario, as well as information on high-quality, extensive examples of non-rare vegetation types. "Rare" in this case refers to those types which are ranked as S1, S2 or S3, as are explained later in this document. These data are stored and maintained in the NHIC central database, and are used for environmental and conservation planning and research.

This document lists the vegetation communities of southern Ontario that occur within Site Regions 6E and 7E (Figure 1), and provides global and provincial ranks for each community type, along with the rationale used to determine each provincial rank, as well as additional comments. Communities that are cultural (anthropogenic) in origin, and dominated by introduced species, are not tracked by the NHIC, and are excluded from this list.

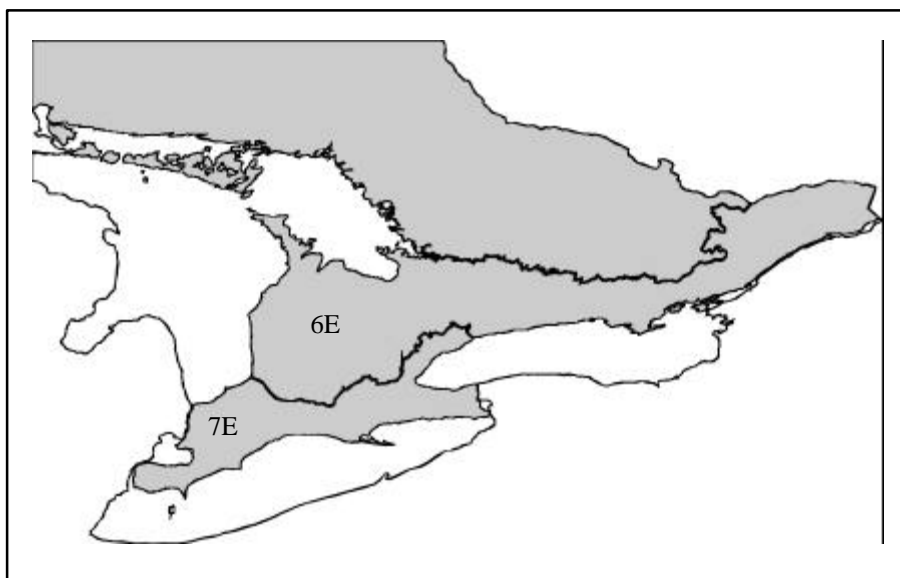


Figure 1. Southern Ontario, showing Site Regions 6E and 7E.

Site Region refers to an ecological subdivision of the land, based upon a combination of climate, physiography, and biological productivity. The Site Regions of Ontario were developed and mapped by Angus Hills (Hills 1961). The map below shows recent modifications to the Site Region boundaries, based on more detailed mapping and interpolation of physiographic features (Jalava *et al.* 1996).

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The vegetation classification is based upon the Ecological Land Classification (ELC) for southern Ontario developed jointly by the Southcentral Region Science and Technology Transfer Unit (STTU) and the NHIC. This ELC currently exists as a first approximation; developed to 'rough out' a preliminary hierarchy and classification, based on the review, sorting and collation of existing information. These data have been collected from numerous sources, including OMNR reports, International Biological Program (IBP) inventories, consultant studies, and the published literature (Lee *et al.* 1996). This assembled information has been compiled into a Community Catalogue, which presents the ELC and lists documented associations for each vegetation type, as an aid to understanding and recognizing the vegetation types (Lee and Bakowsky 1996).

The OMNR is currently collecting quantitative quadrat data on the vegetation in these two site regions (6E and 7E) which, when completed, can be analyzed and correlated with environmental variables (soil, site and landscape) using multivariate methods to derive an updated and refined classification. Since this project is ongoing and will require several more years to complete, this first approximation will be used in the interim (Lee *et al.* 1996). The planned publication date for both this document and the Community Catalogue is 1997 (Harold Lee pers. comm.).

OUTLINE FORMAT

Column 1. System

System refers to a broad classification category for organizing the landscape, largely on the basis of moisture. In this ELC, there are three traditional systems:

- Aquatic
- Wetland
- Terrestrial

Aquatic systems are defined as shallow to deep open water not dominated by emergent vegetation. Wetlands are lands that are seasonally or permanently flooded, as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water-tolerant plants (OMNR 1993). Terrestrial refers to all systems occurring on non-hydric soils. In some cases, such as the interface between terrestrial and either aquatic or wetland systems, these distinctions become less meaningful. For example, flat sandy beaches may be dry in some places and wet in others. Similar situations occur with gravel and bedrock shorelines which are exposed to fluctuating water levels. Out of necessity, these variable habitats need a 'place', and in this classification they reside in the terrestrial system

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Column 2. Community Series I

The Community Series are useful units for grouping communities, based on similarities in physiognomy and site. The first Series is the broader of the two, organizing communities into largely widely-known units such as swamps, marshes, etc. This Series places a greater emphasis on physiognomic similarity.

Column 3. Community Series II

The second Series represents a refinement of the first Series, and broadly groups communities further along site criteria such as substrate and site moisture. For example, marshes are grouped into meadow marsh (drier) and shallow marsh (wetter).

Column 4. Ecosite and Vegetation Type

Ecosite is a mappable landscape unit defined by a relatively uniform parent material, soil and hydrology, and consequently supports a consistently recurring formation of plant species which develop over time (vegetation chronosequence). The Vegetation Type is part of an ecosite, and represents a specific assemblage of species which generally occur in a site with a more uniform parent material, soil and hydrology, and a more specific stage within a chronosequence.

In this document, the Vegetation Type represents the basic community unit that is ranked for conservation purposes. In some instances, where a vegetation type is known to occur but for which insufficient information exists, the classification is left at the ecosite level, and the ecosite receives the provincial rank.

Columns 5 & 6. Occurrence in Site Regions 6E and 7E

An 'X' in either column indicates the occurrence of a particular vegetation type within the site region, as documented in the Community Catalogue (Lee and Bakowsky 1996). In some cases, a community type or ecosite is known to occur in a site region, but no descriptions are available, thus it is not documented in the catalogue. In these instances, the column is marked as '(X)', which indicates it is present, but not listed in the catalogue.

Column 7. Global Rank (GRANK)

Heritage Programs such as the NHIC use a combination of global and provincial ranks as a tool to prioritize conservation and protection efforts, focusing efforts first on those elements of diversity that are both globally and provincially rare. Global ranks for each element are assigned by The Nature Conservancy (United States), based upon

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consideration of the provincial and state ranks assigned by heritage programs for the element across the range of its distribution, as well as the opinion of scientific experts.

The two major criteria used in determining a community's rank are the total number of occurrences and the total areal extent of the community range-wide. Secondary factors used in determining global rank include measures of the geographic range of an element's distribution, trends in status (eg. expanding or shrinking range), trends in condition (eg. declining condition of remaining areal extent), threats, and fragility (Grossman *et al.* 1994).

Until recently, global ranks were unavailable for community types, as there was no overall classification scheme that heritage programs could use to consistently classify vegetation according to similar standards. The Nature Conservancy (U.S.) has been working with the heritage programs to develop a standardized, hierarchical North American classification system appropriate for conservation planning and management, and for the long-term monitoring of ecological communities and ecosystems (Grossman *et al.* 1994). Global ranks for this list were provided by The Nature Conservancy (TNC), Midwestern Regional Office, Minneapolis, Minnesota, in December 1996.

Global ranks are defined as follows:

- G1** **Critically imperiled** globally because of extreme rarity (5 or fewer occurrences or very few remaining hectares) or because of some factor(s) making it particularly vulnerable to extinction.
- G2** **Imperiled globally** because of extreme rarity (6 to 20 occurrences or few remaining hectares) or because of some factor(s) making it very vulnerable to extinction throughout its range.
- G3** **Either very rare** and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (eg. a single province or physiographic region) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

Vegetation communities assigned lower ranks, such as **G4** and **G5**, are considered to be globally secure. A rank of **G4** refers to a community which is apparently secure globally, while a rank of **G5** indicates a community is demonstrably secure globally.

Global ranks can be modified further, usually in cases where insufficient information exists for a community type. For example, **G2G3** indicates that an element is rare, but it is not known if it is clearly **G2** or **G3**. Since the global classification has only very recently been developed, and is based in some cases on incompletely documented

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community occurrences, in some cases there is uncertainty as to the validity or appropriateness of the global community type. In such cases, a rank of GQ may be applied. There are numerous information gaps for many communities, hence, a number of global types have insufficient information on which to properly determine rank. These have received an interim rank of G?, until more information on the community becomes available.

Column 8. Provincial Rank (SRANK)

The NHIC uses a ranking system that considers the provincial rank of an element (=species or community type) as a tool to prioritize protection efforts. These ranks are not legal designations. The provincial (=subnational) rank is known as SRANK. These ranks have been assigned using the best available scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy (U.S.). The ranks are based on the three factors outlined in the three previous columns, namely: estimated number of occurrences, estimated community areal extent, and estimated range of the community within the province. The provincial ranks are explained below.

- S1** **Extremely rare** in Ontario; usually 5 or fewer occurrences in the province, or very few remaining remaining hectares.
- S2** **Very rare** in Ontario; usually between 5 and 20 occurrences in the province, or few remaining hectares.
- S3** **Rare to uncommon** in Ontario; usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.

Communities are assigned lower ranks, such as S4 and S5, are considered to be common and widespread in Ontario. A rank of S4 denotes a community that is apparently secure in the province, with many occurrences, while S5 indicates it is demonstrably secure in the province.

The provincial ranks may be further modified. For example, S2S3 indicates that an element is rare, but insufficient information exists to accurately assign a single rank. SH indicates that an element is known from the province historically, but that it hasn't been seen in many years, although it is not known conclusively to be extirpated. SX indicates that an element is extirpated from the province.

It is important to note that while only those communities which occur in southern Ontario are listed here, many of them occur elsewhere in the province. Consequently, these ranks are intended to reflect their total provincial extent and distribution.

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Column 9. Estimated Number of Community Element Occurrences

In the methodology employed by the NHIC, a species or community is referred to as an **element**. For the estimated number of element occurrences, the letter codes are:

- A 1-5 occurrences
- B 6-20 occurrences
- C 21-100 occurrences
- D >100 occurrences

In some cases, such as when communities have disappeared to the point that they now exist mostly as tiny fragments, such as tallgrass prairie, only larger (e.g. > 2ha) occurrences are considered in the ranking.

Column 10. Estimated Areal Extent of the Community Element

The codes for the estimated areal extent of a community element within the province are:

- A < 1,000 ha
- B 1,000 - 5,000 ha
- C 5,000 - 25,000 ha
- D >25,000 ha

Column 11. Estimated Distribution Range of the Community Element

The codes for the estimated distribution range of the community element within the province are:

- A Very small range in province, < 3% of province area
- B Narrow range, > 3% but < 10% of province area
- C Moderately widespread, > 10% but < 50% of province area
- D Widespread, > 50% of the province area

Column 12. Comments

This column provides notes on various community types.

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FINAL COMMENTS

The NHIC welcomes comments and information on community occurrences in the province, particularly those which are ranked as rare, or which are high-quality, extensive examples of non-rare types. Also appreciated is any information or comments that would assist in refining the accuracy of assigned provincial ranks. See the next page for the mailing address.

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COMMON NAME	SCIENTIFIC NAME
Balsam Fir	<i>Abies balsamea</i> L. Miller
Manitoba Maple	<i>Acer negundo</i> L.
Red Maple	<i>Acer rubrum</i> L.
Silver Maple	<i>Acer saccharinum</i> L.
Black Maple	<i>Acer saccharum</i> Marsh. ssp. <i>nigrum</i> (Michaux f.) Desmarais
Sugar Maple	<i>Acer saccharum</i> Marshall. ssp. <i>saccharum</i>
Mountain Maple	<i>Acer spicatum</i> Lam.
Maple	<i>Acer</i> spp.
Swamp Maple	<i>Acer x freemanii</i> E. Murr. [<i>rubrum</i> x <i>saccharinum</i>]
Red-top	<i>Agrostis gigantea</i> Roth
Nodding Onion	<i>Allium cernuum</i> Roth
Alder	<i>Alnus</i> spp.
Serviceberry	<i>Amelanchier</i> spp.
Beachgrass	<i>Ammophila breviligulata</i> Fern.
Chokeberry	<i>Aronia melanocarpa</i> (Michaux) Elliott [= <i>Pyrus melanocarpa</i>]
Wormwood	<i>Artemisia campestris</i> L. ssp. <i>caudata</i> (Michaux) H.M. Hall & Clements
Paw-paw	<i>Asimina triloba</i> (L.) Dunal
Yellow Birch	<i>Betula allegheniensis</i> Britton
White Birch	<i>Betula papyrifera</i> Marshall
Fen Birch	<i>Betula pumila</i> L.
Lowland Ash	Black Ash, Green Ash, Red Ash
Sea Rocket	<i>Cakile edentula</i> (Bigelow) Hook.
Bluejoint	<i>Calamagrostis canadensis</i> (Michaux) P. Beauv.
Long-leaved Reed Grass	<i>Calamovilfa longifolia</i> (Hook.) Scribn. var. <i>magna</i> Scribn. & Merr.
Calla Lily	<i>Calla palustris</i> L.
Slender Sedge	<i>Carex lasiocarpa</i> Ehrh.
Few-seeded Sedge	<i>Carex oligosperma</i> Michaux
Hay Sedge	<i>Carex siccata</i> Dewey [= <i>C. foenea</i>]
Sedge	<i>Carex</i> spp.
Beaked Sedge	<i>Carex utriculata</i> F. Boott
Bitternut Hickory	<i>Carya cordiformis</i> (Wang.) K. Koch
Shagbark Hickory	<i>Carya ovata</i> (Miller) K. Koch
Hickory	<i>Carya</i> spp.
Hackberry	<i>Celtis occidentalis</i> L.
Buttonbush	<i>Cephalanthus occidentalis</i> L.
Leatherleaf	<i>Chamaedaphne calyculata</i> (L.) Moench
Stonewort	<i>Chara</i> spp.
Twig-rush	<i>Cladium mariscoides</i> (Muhlenb.) Torrey
Silky Dogwood	<i>Cornus amomum</i> Miller ssp. <i>obliqua</i> (Raf.) J.S. Wilson [= <i>C. obliqua</i>]
Gray Dogwood	<i>Cornus foemina</i> Miller ssp. <i>racemosa</i> (Lam.) J.S. Wilson [<i>C. racemosa</i>]
Round-leaved Dogwood	<i>Cornus rugosa</i> Lam.
Red-osier	<i>Cornus stolonifera</i> Michaux
Hawthorn	<i>Crataegus</i> spp.
Bulblet Fern	<i>Cystopteris bulbifera</i> (L.) Bernh.
Water Willow	<i>Decodon verticillatus</i> (L.) Elliott
Tufted Hairgrass	<i>Deschampsia cespitosa</i> (L.) P. Beauv.
Spike Rush	<i>Eleocharis</i> spp.
Waterweed	<i>Elodea</i> spp.
Slender Wheat-grass	<i>Elymus trachycaulus</i> (Link) Gould in Shinn. [<i>Agropyron trachycaulum</i>]
Great Lakes Wheat-grass	<i>Elymys lanceolatus</i> (Scribn. & J.G. Smith) Gould ssp. <i>psammophilus</i> (J.M. Gillett & Senn) A. Löve [= <i>Agropyron psammophilum</i>]
Horsetail	<i>Equisetum</i> spp.

COMMON NAME	SCIENTIFIC NAME
Cotton-grass	<i>Eriophorum</i> spp.
Beech	<i>Fagus grandifolia</i> Ehrh.
White Ash	<i>Fraxinus americana</i> L.
Black Ash	<i>Fraxinus nigra</i> Marshall
Green Ash	<i>Fraxinus pennsylvanica</i> Marshall
Red Ash	<i>Fraxinus pennsylvanica</i> Marshall
Huckleberry	<i>Gaylussacia baccata</i> (Wang.) K. Koch
Herb Robert	<i>Geranium robertianum</i> L.
Fowl Manna Grass	<i>Glyceria</i> spp.
Water Star-grass	<i>Heteranthera dubia</i> (Jacq.) MacMillan
Winterberry	<i>Ilex verticillata</i> (L.) A. Gray
Jewelweed	<i>Impatiens</i> spp.
Low Sedge	includes <i>Carex chordorrhiza</i> Ehrh., <i>C. limosa</i> L., <i>C. livida</i> (Wahlenb.) Willd.
Butternut	<i>Juglans cinerea</i> L.
Black Walnut	<i>Juglans nigra</i> L.
Common Juniper	<i>Juniperus communis</i> L.
Juniper	<i>Juniperus communis</i> L. and <i>Juniperus horizontalis</i> Moench
Creeping Juniper	<i>Juniperus horizontalis</i> Moench
Red Cedar	<i>Juniperus virginiana</i> L.
European Larch	<i>Larix decidua</i> Miller
Tamarack	<i>Larix laricina</i> (DuRoi) K. Koch
Japanese Larch	<i>Larix leptolepis</i> (Sieb. & Zucc.) Gord.
Rice Cut-grass	<i>Leersia</i> spp.
Duckweed	<i>Lemna</i> spp.
Spicebush	<i>Lindera benzoin</i> (L.) Blume
Tulip Tree	<i>Liriodendron tulipifera</i> L.
Water Marigold	<i>Megalodonta beckii</i> (Torrey ex Sprengel) E. Greene [= <i>Bidens beckii</i>]
Bog Buckbean	<i>Menyanthes trifoliata</i> L.
Sweet Gale	<i>Myrica gale</i> L.
Water Milfoil	<i>Myriophyllum</i> spp.
Watercress	<i>Nasturtium officinale</i> R. Br. Ex Aiton and <i>N. microphyllum</i> (Boenn.) Reichb.
American Lotus	<i>Nelumbo lutea</i> (Willd.) Pers.
Mountain Holly	<i>Nemopanthus mucronatus</i> (L.) Loes.
Bullhead Lily	<i>Nuphar</i> spp.
Water Lily	<i>Nymphaea</i> spp.
Ironwood	<i>Ostrya virginiana</i> (Miller) K. Koch
Philadelphia Panic Grass	<i>Panicum philadelphicum</i> Bernh. ex Trin.
Switchgrass	<i>Panicum virgatum</i> L.
Cliffbrake	<i>Pellaea</i> spp.
Reed-canary Grass	<i>Phalaris arundinacea</i> L.
Rush Grass	<i>Phragmites australis</i> (Cav.) Trin ex Steudel [= <i>P. communis</i>]
Ninebark	<i>Physocarpus opulifolius</i> (L.) Maxim.
Norway Spruce	<i>Picea abies</i> (L.) Karsten
White Spruce	<i>Picea glauca</i> (Moench) Voss
Black Spruce	<i>Picea mariana</i> (Miller) Britton, Sterns & Pogg.
Red Spruce	<i>Picea rubens</i> Sarg.
Jack Pine	<i>Pinus banksiana</i> Lambert
Red Pine	<i>Pinus resinosa</i> Sol. ex Aiton
Pitch Pine	<i>Pinus rigida</i> P. Mill.
Pine	<i>Pinus</i> spp.
White Pine	<i>Pinus strobus</i> L.
Scotch Pine	<i>Pinus sylvestris</i> L.
Canada Bluegrass	<i>Poa compressa</i> L.
Pickerel-weed	<i>Pontederia cordata</i> L.

COMMON NAME	SCIENTIFIC NAME
Balsam Poplar	<i>Populus balsamifera</i> L.
Poplar	<i>Populus balsamifera</i> L. and <i>Populus grandidentata</i> Michaux
Cottonwood	<i>Populus deltoides</i> Bartram ex Marshall
Aspen	<i>Populus tremuloides</i> Michaux
Hybrid Poplar	<i>Populus x</i>
Pondweed	<i>Potamogeton</i> spp.
Shrubby Cinquefoil	<i>Potentilla fruticosa</i> L.
Sand Cherry	<i>Prunus pumila</i> L.
Black Cherry	<i>Prunus serotina</i> Ehrh.
Chokecherry	<i>Prunus virginiana</i> L.
Hop-tree	<i>Ptelea trifoliata</i> L.
Bracken Fern	<i>Pteridium aquilinum</i> (L.) Kuhn
White Oak	<i>Quercus alba</i> L.
Swamp White Oak	<i>Quercus bicolor</i> Willd.
Bur Oak	<i>Quercus macrocarpa</i> Michaux
Chinquapin Oak	<i>Quercus muehlenbergii</i> Engelm.
Pin Oak	<i>Quercus palustris</i> Muenchh.
Red Oak	<i>Quercus rubra</i> L. [= <i>Q. borealis</i>]
Shumard's Oak	<i>Quercus shumardii</i> Buckley
Oak	<i>Quercus</i> spp.
Black Oak	<i>Quercus velutina</i> Lam.
Fragrant Sumac	<i>Rhus aromatica</i> Aiton
Poison Ivy	<i>Rhus radicans</i> L.
Sumac	<i>Rhus typhina</i> L. and <i>R. glabra</i> L.
Poison Sumac	<i>Rhus vernix</i> L.
Raspberry	<i>Rubus idaeus</i> L.
Black Willow	<i>Salix nigra</i> Marshall
Willow	<i>Salix</i> spp.
Sassafras	<i>Sassafras albidum</i> (Nutt.) Nees
Little Bluestem	<i>Schizachyrium scoparium</i> (Michaux) Nees [= <i>Andropogon scoparius</i>]
Clubrush	<i>Scirpus hudsonianus</i> (Michaux) Fern. and <i>S. cespitosus</i> L.
Threesquare	<i>Scirpus pungens</i> M. Vahl [= <i>S. americanus</i>]
Bulrush	<i>Scirpus</i> spp.
Bur-reed	<i>Sparganium</i> spp.
Prairie Slough Grass	<i>Spartina pectinata</i> Link
Meadowsweet	<i>Spiraea</i> spp.
Northern Dropseed	<i>Sporobolus heterolepis</i> (A. Gray) A. Gray
White Cedar	<i>Thuja occidentalis</i> L.
Basswood	<i>Tilia americana</i> L.
False Pennyroyal	<i>Trichostema brachiatum</i> L. [= <i>Isanthus brachiatus</i>]
Hemlock	<i>Tsuga canadensis</i> (L.) Carriere
Cattail	<i>Typha</i> spp.
White Elm	<i>Ulmus americana</i> L.
Bladderwort	<i>Utricularia</i> spp.
Highbush Blueberry	<i>Vaccinium corymbosum</i> L.
Velvet-leaf Blueberry	<i>Vaccinium myrtilloides</i> Michaux
Blueberry	<i>Vaccinium</i> spp.
Wild Celery	<i>Vallisneria americana</i> Michaux
Nannyberry	<i>Viburnum lentago</i> L.
Southern Arrow-wood	<i>Viburnum dentatum</i> L. var. <i>lucidum</i> Ait [= <i>V. recognitum</i>]
Prickly Ash	<i>Zanthoxylum americanum</i> Miller [= <i>Xanthoxylum americanum</i>]
Wild-rice	<i>Zizania</i> spp.

COMMUNITY FIELD REPORTING FORM



NATURAL HERITAGE INFORMATION CENTRE

P.O. Box 7000, Peterborough, Ontario, K9J 8M5, (705) 755 - 2162, FAX (705) 755 - 2168



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INSTRUCTIONS - PLEASE READ CAREFULLY

1. **Important:** this form to be COMPLETED BY THE PERSON WHO MADE THE OBSERVATION and is for reporting FIRST-HAND ON-SITE FIELD OBSERVATIONS; do NOT use this form to report second-hand data from a letter, report, or conversation. Send us a copy of the letter, report, memo etc. and we will process it in another manner.
2. Complete ONE FORM per COMMUNITY per SITE. Use a pen or dark pencil.
3. Data sheets or cards from a standard survey method (eg. quadrat) may be attached to this sheet.
4. **Very Important:** attach a copy of the NTS or OBM topographic map indicating the location/boundary of the community (see next page).

COMMUNITY TYPE:

OBSERVATION DATA:

LAST observed: month: ____ day: ____ yr: ____ FIRST observed: month: ____ day: ____ yr: ____

Name of observer(s):

Address:

Telephone:

FAX:

Others knowledgeable about this occurrence (name, address, telephone):

LOCATIONAL DATA:

SURVEY SITE NAME (local or place name):

TOPOGRAPHIC MAP NAME:

DATUM (eg. NAD27):

TOPOGRAPHIC MAP NUMBER:

CENTROID UTM:

GRID ZONE:

COUNTY OR DISTRICT:

TOWNSHIP:

SITE DISTRICT (Hill's Site Region and district):

DIRECTIONS TO THE OCCURRENCE: Describe in detail the PRECISE LOCATION of the community occurrence. Refer to nearby topographic landmarks and street names. Include distances whenever possible. Be clear and concise:

COMMUNITY PROFILE SKETCH:

COMMUNITY FIELD REPORTING FORM



NATURAL HERITAGE INFORMATION CENTRE

P.O. Box 7000, Peterborough, Ontario, K9J 8M5, (705) 755 - 2162, FAX (705) 755 - 2168



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COMMUNITY INFORMATION:

DOMINANT SPECIES:

OTHER SPECIES:

COMMUNITY DESCRIPTION (describe structure and composition of community in terms of layers):

ADJACENT COMMUNITIES:

MOSAIC COMMENTS:

SUCCESSIONAL DYNAMICS:

DISTURBANCE COMMENTS:

SPECIES LIST: IMPORTANT - If a species list for the community has been compiled, ATTACH (staple) a PHOTOCOPY of the species list. Also indicate the date the list was compiled, and the approximate time spent compiling the list. **SPECIES LIST ATTACHED:** Y N

ENVIRONMENTAL INFORMATION:

LANDFORM (eg. alluvial sand plain, ground moraine, bedrock):

TOPOGRAPHIC POSITION:

GEOLOGY:

SOIL TYPE:

SITE MOISTURE:

DRAINAGE:

SOIL DESCRIPTION:

HYDROLOGICAL INFLUENCE:

TOPOGRAPHIC MAP: (VERY IMPORTANT) - ATTACH (staple) a PHOTOCOPY of the appropriate portion of the TOPOGRAPHIC MAP for the area, and indicate the precise location of each community occurrence centroid, and preferably draw a boundary or approximate boundary for the community. If the community occurs as a mosaic within an area, please indicate this on the map with a comment.

FORM FILLED OUT BY:

Name:
Address:

Date:

Natural Heritage Information Centre
Community Type Provincial
Ranks

System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EO's			Comments
	I	II						EO Abundance	EO Range	EO Range	
Aquatic: shallow to deep open water without emergent vegetation dominance (standing water always present)											
	Lacustrine / Riverine										
		Open Water		(X)	(X)	NA	S5	D	D	D	
		Shallow Water									these community types are poorly documented and described in Ontario
		Submerged Shallow Aquatic Ecosite									
		Pondweed Submerged Shallow Aquatic Type		X	X	G5Q	S5	D	D	D	should be subdivided further, but more information needed
		Waterweed Submerged Shallow Aquatic Type		X	X	G5Q	S4S5	D	B?	B?	
		Stonewort Submerged Shallow Aquatic Type		X	X	G5Q	S4S5	D	BC?	D	
		Water Milfoil Submerged Shallow Aquatic Type		X	X	G?	S5	D	C	D	
		Wild Celery Submerged Shallow Aquatic Type		X	(X)	G?	S4	D	C	C	
		Water Marigold Submerged Shallow Aquatic Type		X	(X)	G?	S4	D	BC?	C?	
		Water Star-grass Submerged Shallow Aquatic		X	(X)	G5Q	S3S4	D	B?	C	
		Submerged - Floating-leaved Shallow Aquatic Ecosite									
		Pickereel-weed Submerged - Floating-leaved Shallow Aquatic Type		X	X	G5	S5	D	CD	D	
		Duckweed Submerged - Floating-leaved Shallow Aquatic Type		X	(X)	G5Q	S5	D	CD	D	
		Watercress Submerged Shallow Aquatic Type		X	X	G5Q	S4	D	A?	D	
		Pondweed Submerged - Floating-leaved Shallow Aquatic Type		X	(X)	G5Q	S5	B	CD	D	should be subdivided further, but more information needed
		Bur-reed Submerged - Floating-leaved Shallow Aquatic Type		X	(X)	G5Q	S5	D	CD	D	
		Bladderwort Submerged - Floating-leaved Shallow Aquatic Type		X	(X)	G5Q	S5	D	C	D	
		Water-milfoil Submerged - Floating-leaved Shallow Aquatic Type		(X)	X	G?	S5	D	CD	D	
		Floating-leaved Shallow Aquatic Ecosite									
		Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type		X	X	G5	S5	D	D	D	
		American Lotus Floating-leaved Shallow Aquatic Type			X	G5	S1	AB	A	A	
		Duckweed Floating-leaved Shallow Aquatic Type		X	X	G5Q	S5	D	C	C?	
Wetland: Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants											
	Marsh										
		Meadow Marsh									
		Great Lakes Coastal Meadow Marsh Ecosite ('Shoreline Fen' or 'Panne')									
		Graminoid Coastal Meadow Marsh Type		X	X	G2?	S2	C	AB	B	occur along Great Lakes shores and wet dune 'pannes' or 'wet meadows', composition varies with changes in water levels
		Shrubby Cinquefoil Coastal Meadow Marsh Type		X	X	G2?	S1	B	A	B	occurs along drier, less frequently inundated portions of above habitats
		Wet - Moist Tallgrass Prairie Meadow Marsh Ecosite									
		Wet Bluejoint-Prairie Slough Grass Tallgrass Prairie Meadow Marsh Type			X	G2G3	S1	B	A	A	fewer than 5 extensive (>2 ha) EO's known, similar to Meadow Marsh, but grows in mosaic with tallgrass prairie, includes prairie species in its composition
		Mineral Meadow Marsh Ecosite									
		Bluejoint Mineral Meadow Marsh Type		X	X	G5?	S5	D	D	D	
		Fowl Manna Grass Mineral Meadow Marsh Type		X	X	G?	S4	D	AB	C	
		Narrow-leaved Sedge Mineral Meadow Marsh		X	X	G4?	S5	D	D	D	eg. <5mm leaf width
		Broad-leaved Sedge Mineral Meadow Marsh Type		X	X	G4G5Q	S5	D	D	D	eg. >5mm leaf width

Natural Heritage Information Centre
Community Type Provincial
Ranks

System	Community Series		Ecosite	6E 7E		Global Rank	Provincial Rank	Estimated # EO's			EO Range	Comments
	I	II		6E	7E			EO's	EO's	EO's		
			Forb Mineral Meadow Marsh Type	X	X	G?	S4S5	D	C	D		
			Horsetail Mineral Meadow Marsh Type	X	X	G?	S5	D	CD	D		
			Prairie Slough Grass Mineral Meadow Marsh Type	X	(X)	G2G3	S3	CD	AB	CD	does not occur in association with tallgrass prairie, prairie species absent	
			Jewelweed Mineral Meadow Marsh Type	(X)	X	G?	S4	D	AB	D		
			Organic Meadow Marsh Ecosite									
			Bluejoint Organic Meadow Marsh Type	X	X	G5?	S5	D	D	D		
			Rice Cut-grass Organic Meadow Marsh Type	X	X	G?	S4	D	BC	C		
			Fowl Manna Grass Organic Meadow Marsh Type	X	X	G?	S4	D	AB	C		
			Narrow-leaved Sedge Organic Meadow Marsh Type	X	X	G4?	S5	D	D	D	eg. <5mm leaf width	
			Broad-leaved Sedge Organic Meadow Marsh Type	X	X	G4G5Q	S5	D	D	D	eg. >5mm leaf width	
			Forb Organic Meadow Marsh Type	X	X	G?	S4S5	D	C	D		
			Prairie Slough Grass Organic Meadow Marsh Type	X	(X)	G2G3	S3	CD	AB	CD		
			Jewelweed Organic Meadow Marsh Type	(X)	X	G?	S4	D	AB	D		
			Shallow Marsh									
			Mineral Shallow Marsh Ecosite									
			Cattail Mineral Shallow Marsh Type	X	X	G5	S5	D	D	D		
			Bulrush Mineral Shallow Marsh Type	X	X	G?	S5	D	D	D		
			Narrow-leaved Sedge Mineral Shallow Marsh Type	X	X	G4?	S5	D	D	D	eg. <5mm leaf width	
			Broad-leaved Sedge Mineral Shallow Marsh Type	X	X	G4G5Q	S5	D	D	D	eg. >5mm leaf width	
			Forb Mineral Shallow Marsh Type	X	X	G?	S4	D	CD	D	marshes dominated by mixtures of forbs (=herbs)	
			Wild-rice Mineral Shallow Marsh Type	X	(X)	G?	S5	D	D	D		
			Threesquare Mineral Shallow Marsh Type	X		G4G5	S4	D	CD	D		
			Bur-reed Mineral Shallow Marsh Type	(X)	X	G4G5	S4	D	C	D		
			Rice Cut-grass Mineral Shallow Marsh Type		X	G?	S4	D	BC	C		
			Organic Shallow Marsh Ecosite									
			Cattail Organic Shallow Marsh Type	X	X	G5	S5	D	D	D		
			Bulrush Organic Shallow Marsh Type	X	X	G?	S5	D	D	D		
			Narrow-leaved Sedge Organic Shallow Marsh Type	X	X	G4?	S5	D	D	D	eg. <5mm leaf width	
			Broad-leaved Sedge Organic Shallow Marsh Type	X	X	G4G5Q	S5	D	D	D	eg. >5mm leaf width	
			Water Willow Organic Shallow Marsh Type	X	X	G?	S4	D	BC	B	a herbaceous species, not a shrub	
			Forb Organic Shallow Marsh Type	X	X	G?	S4S5	D	CD	D	marshes dominated by mixtures of forbs (=herbs)	
			Common Reed Grass Organic Shallow Marsh Type	X		G3G4	S4	D	C	D	if fen indicator species present, see fen section	
			Wild-rice Organic Shallow Marsh Type	X	(X)	G?	S5	D	D	D		
			Bur-reed Organic Shallow Marsh Type	(X)	X	G4G5	S5	D	D	D		
			Rice Cut-grass Organic Shallow Marsh Type		X	G?	S4	D	BC	C		
			Spike-rush Organic Shallow Marsh Type	(X)	X	G4G5	S4S5	D	C	D		
			Calla Lily Organic Shallow Marsh Type	(X)	X	G?	S4	D	BC	D		
			Thicket Swamp									
			Mineral Thicket Swamp Ecosite									
			Alder Mineral Thicket Swamp Type	X	X	G5?	S5	D	D	D		
			Willow Mineral Thicket Swamp Type	X	X	G5	S5	D	D	D		
			Mountain Maple Mineral Thicket Swamp Type	X	X	G?	S4	D	C	D		
			Buttonbush Mineral Thicket Swamp Type	X	X	G4	S3	C	AB	B		
			Red-osier Mineral Thicket Swamp Type	X	X	G5	S5	D	D	D		
			Meadowsweet Mineral Thicket Swamp Type	X	X	G?	S5	D	D	D		
			Ninebark Mineral Thicket Swamp Type		X	G?	S4	CD	D	CD		
			Silky Dogwood Mineral Thicket Swamp Type		X	G5	S3S4	C	B	B		
			Gray Dogwood Mineral Thicket Swamp Type		X	G5	S3S4	C	B	B		
			Nannyberry Mineral Thicket Swamp Type	(X)	X	G?	S4	D	BC	C		
			Southern Arrow-wood Mineral Thicket Swamp Type		X	G?	S3	C	B	C		
			Paw-paw Mineral Thicket Swamp Type		X	G?	S1	AB	A	AB	occurs on sites wet in spring, dry by summer	

Significant Wildlife Habitat Technical Guide - Appendix J
W.D. Bakowsky
Natural Heritage Information Centre
Community Type Provincial
Ranks

System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EO%	EO Abundance	EO Range	Comments
	I	II									
			Organic Thicket Swamp Ecosite								
			Alder Organic Thicket Swamp Type	X	X	G5?	S5	D	D	D	
			Willow Organic Thicket Swamp Type	X	X	G5	S5	D	D	D	
			Mountain Maple Organic Thicket Swamp Type	X	X	G?	S4	D	C	D	
			Buttonbush Organic Thicket Swamp Type	X	X	G4	S3	C	AB	B	
			Red-osier Organic Thicket Swamp Type	X	X	G5	S5	D	D	D	
			Sweet Gale Organic Thicket Swamp Type	X	X	G?	S5	D	D	D	
			Winterberry Organic Thicket Swamp Type	X		G3G4Q	S3S4	CD	BC	C	
			Mountain Holly Organic Thicket Swamp Type	X		G?	S3S4	CD	BC	C	
			Fen Birch Organic Thicket Swamp Type	X		G4G5	S4	D	C	C	
			Gray Dogwood Organic Thicket Swamp Type		X	G5	S4	D	B	B	
			Spicebush Organic Thicket Swamp Type	(X)	X	G?	S3	C	AB	B	
			Nannyberry Organic Thicket Swamp Type	(X)	X	G?	S4	D	BC	C	
			Poison Sumac Organic Thicket Swamp Type		X	G4?	S3	C	AB	C	
			Huckleberry Organic Thicket Swamp Type		X	G2Q	S1	A	A	A	only known from Dorchester Swamp. 2 ha
			Deciduous Mineral Swamp (includes Wet Woods)								
			Oak Deciduous Mineral Swamp Ecosite								
			Swamp White Oak Mineral Deciduous Swamp Type	X	X	G1G2Q	S2S3	BC	B	AB	Swamp White Oak hybridizes with Bur Oak
			Bur Oak Mineral Deciduous Swamp Type	X	X	G2G3Q	S3	BC	BC	BC	
			Pin Oak Mineral Deciduous Swamp Type		X	G2	S2S3	BC	AB	A	
			Ash Deciduous Mineral Swamp Ecosite								
			Black Ash Mineral Deciduous Swamp Type	X	X	G4	S5	D	D	D	
			Red / Green Ash Mineral Deciduous Swamp Type	X	X	G?	S5	D	D	D	
			Maple Deciduous Mineral Swamp Ecosite								
			Silver / Red Maple Mineral Deciduous Swamp Type	X	X	G4?	S5	D	D	BC	most of Ontario's trees are hybrids between these two species (Acer x freemanii)
			Manitoba Maple - Willow Mineral Deciduous Swamp Type	(X)	X	G?	S5	D	C	C	wet in spring, dry in summer, the open treed vegetation along floodplains
			White Elm Deciduous Mineral Swamp Ecosite								
			White Elm Mineral Deciduous Swamp Type	X	X	G?	S5	D	D	C	now dominated by saplings and immature trees due to Dutch Elm Disease
			Aspen - White Birch - Poplar Mixed Deciduous Mineral Swamp Ecosite								
			Aspen - White Birch - Poplar Mineral Deciduous Swamp Type	X	X	G5	S5	D	D	D	
			Yellow Birch Mineral Deciduous Swamp Ecosite								
			Yellow Birch Mineral Deciduous Swamp Type	X	X	G4	S5	D	D	D	
			Deciduous Organic Swamp								
			Ash Deciduous Organic Swamp Ecosite								
			Black Ash Deciduous Organic Swamp Type	X	X	G4	S5	D	D	D	
			Maple Deciduous Organic Swamp Ecosite								
			Silver / Red Maple Deciduous Organic Swamp Type	X	X	G4?	S5	D	D	BC	most of Ontario's trees are hybrids between these two species (Acer x freemanii)
			Aspen - White Birch - Poplar Organic Swamp Ecosite								
			Aspen - White Birch - Poplar Deciduous Organic Swamp Type	X	X	G5	S5	D	D	D	
			Mixed Mineral Swamp								
			White Cedar - Mixed Mineral Swamp Ecosite								
			White Cedar - White Birch Mixed Mineral Swamp Type	X	X	G4?	S5	D	D	D	
			White Cedar - Mixed Mineral Swamp Type	X	X	G4?	S5	D	D	D	
			Red Maple Mixed Mineral Swamp Ecosite								
			Red Maple - Hemlock Mixed Mineral Swamp Type	X	(X)	G3	S3S4	C	BC	C	

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System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EOs	EO Abundance	EO Range	Comments
	I	II									
			Mixed Organic Swamp								
			White Cedar Mixed Organic Swamp Ecosite								
			White Cedar - Black Ash Mixed Organic Swamp Type	X	X	G?	S5	D	D	D	
			White Cedar - Yellow Birch Mixed Organic Swamp Type	X	(X)	G4?	S5	D	CD	C	
			White Cedar - White Birch Mixed Organic Swamp Type	X	X	G4?	S5	D	D	D	
			White Cedar Mixed Organic Swamp Type	X	X	G4?	S5	D	D	D	
			Red Maple Mixed Organic Swamp Ecosite								
			Red Maple - Hemlock Mixed Organic Swamp Type	X	(X)	G3	S3S4	C	BC	C	
			Red Maple - Balsam Fir Mixed Organic Swamp Type	X		G4?	S5	D	D	D	
			Red Maple - Tamarack Mixed Organic Swamp Type	(X)	X	G4?	S4S5	D	CD	C	
			Coniferous Mineral Swamp								
			White Cedar Mixed Mineral Swamp Ecosite								
			White Cedar - Balsam Fir Coniferous Mineral Swamp Type	X		G4	S5	D	D	D	
			White Cedar - Hemlock Coniferous Mineral Swamp Type	X		G?	S3S4	C	BC	C	
			White Cedar - White Spruce Coniferous Mineral Swamp Type	X		G4	S5	D	D	D	
			White Pine Coniferous Mineral Swamp Ecosite								
			White Pine Coniferous Mineral Swamp Type	(X)	X	G3G4	S2	AB	A	B	occur along borders of kettle peatlands
			Coniferous Organic Swamp								
			Tamarack - Black Spruce Coniferous Organic Swamp Ecosite								
			Tamarack Coniferous Organic Swamp Type	X	X	G4	S5	D	D	D	
			Tamarack - Black Spruce Coniferous Organic Swamp Type	X	X	G5Q	S5	D	D	D	
			Black Spruce Coniferous Organic Swamp Type	X		G5	S5	D	D	D	
			White Cedar Coniferous Organic Swamp Ecosite								
			White Cedar Coniferous Organic Swamp Type	X	(X)	G4	S5	D	D	D	
			White Cedar - Tamarack Coniferous Organic Swamp Type	X	X	G4G5	S5	D	D	D	
			White Cedar - Balsam Fir Coniferous Organic Swamp Type	X		G4	S5	D	D	D	
			White Cedar - Black Spruce Coniferous Organic Swamp Type	X		G4	S5	D	D	D	
			White Cedar - Hemlock Coniferous Organic Swamp Type	X		G?	S3S4	C	BC	C	
			White Cedar - White Spruce Coniferous Organic Swamp Type	X		G4	S5	D	D	D	
	Fen										fen indicators present, more species than in bogs, mineralized groundwater
			Open Fen								
			Graminoid Fen Ecosite								
			Twig-rush Graminoid Fen Type	X	X	G3Q	S3?	C	BC	C	
			Slender Sedge Graminoid Fen Type	X		G4G5	S5	D	D	D	<i>Carex lasiocarpa</i>
			Low Sedge - Clubrush Graminoid Fen Type	X		G2G4Q	S4	CD	CD	D	
			Beaked Sedge Graminoid Fen Type	X		G4?	S4S5	D	CD	D	<i>Carex utriculata</i>
			Boo Buckbean Graminoid Fen Type	X		G3G4	S3S4	CD	BC	CD	
			Perched Mineral Prairie Fen Type		X	G3G4	S1	A	A	A	soils mineral, occur on mineralized seepage slopes, mixture of fen and prairie species

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System	Community Series		Ecosite	6E 7E		Global Rank	Provincial Rank	Estimated # EOs	EO Abundance	EO Range	Comments
	I	II									
			Shrub Fen Ecosite								
			Sweet Gale Shrub Fen Type	X		G?	S5	D	D	D	
			Fen Birch Shrub Fen Type	X		G4G5	S5	D	D	D	<i>Betula pumila</i>
			Low White Cedar Shrub Fen Type	X		G?	S4S5	CD	CD	D	
			Leatherleaf - Forb Shrub Fen Type	X		G5	S5	D	D	D	
			Shrubby Cinquefoil Shrub Fen Type	X		G3G4	S4	CD	CD	D	
			Velvet-leaf Blueberry Shrub Fen Type	X		G5	S5	D	CD	D	
			Mountain Holly Shrub Fen Type	X		G3G4	S3S4	C	AC	C	
			Chokeberry Shrub Fen Type	X		G3G4	S3S4	C	AC	C	
			Highbush Blueberry - Leatherleaf Shrub Fen Type	X	X	G2Q	S2S3	B	AB	BC	
			Treed Fen								
			Treed Fen Ecosite								
			Tamarack Treed Fen Type	X	X	G4?	S5	D	D	D	
			Tamarack - White Cedar Treed Fen Type	X		G4?	S5	D	D	D	
			Grav Birch Treed Fen Type	X		G4?	S2S3	C	BC	C	occur along borders of fens
			Bog								species-poor, fen indicators few or absent
			Open Bog								
			Graminoid Bog Ecosite								
			Few-seeded Sedge Graminoid Bog Type	X		G3G4	S5	D	D	D	<i>Carex oligosperma</i>
			Cotton-grass Graminoid Bog Type	X		G3G4	S5	D	D	D	
			Shrub Bog Ecosite								
			Leatherleaf Shrub Bog Type	X		G5	S5	D	D	D	
			Treed Bog								
			Treed Bog Ecosite								
			Black Spruce Treed Bog Type	X		G5	S5	D	D	D	
			Kettle Peatland								occur in kettles, local areas of bog and fen within, both fen and bog indicator species present
			Open Kettle Peatland								
			Shrub Kettle Peatland Ecosite								
			Leatherleaf Shrub Kettle Peatland Type		X	G3G4	S3	C	A	A	
			Highbush Blueberry Shrub Kettle Peatland Type		X	G2Q	S1S2	AB	A	A	
			Treed Kettle Peatland								
			Treed Kettle Peatland Ecosite								
			Tamarack-Leatherleaf Treed Kettle Peatland Type		X	G3G4	S3	C	A	A	
			Terrestrial: All communities occurring on non-hydric soils								
			Shoreline								
			Beach / Bar								these communities interface with water, may be wet due to fluctuating water levels, and violate the strict terrestrial definition
			Open Sand Beach / Bar Ecosite								
			Sea Rocket Sand Beach Type	X	X	G2G4	S2S3	BC	AB	A	consists mostly of bare sand
			Gravel / Shingle / Cobble Beach / Bar Ecosite								
			Wormwood Gravel Beach Type	X		G3G4	S2S3	BC	AB	A	
			Red Cedar-Common Juniper Shingle Beach Type	X		G3G4	S1	AB	A	A	
			Willow Gravel Bar Type	X	(X)	G?	S4	D	AB	D	

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System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EOs	EO Abundance	EO Range	Comments
	I	II									
			Limestone Bedrock Beach / Bar Ecosite								
			Shrubby Cinquefoil Limestone Beach Type	X	X	G3G4	S2	BC	A	A	wave-washed areas, may occur adjacent to alvars adjacent to shoreline
			Sandstone Bedrock Beach / Bar Ecosite	(X)		G4?	S1	A	A	C	
			Granite Bedrock Beach / Bar Ecosite	(X)		G4?	S5	D	CD	D	
			Sand Dune								
			Dune Grassland Ecosite								
			Little Bluestem - Switchgrass - Beachgrass Dune Grassland Type	X	X	G?	S2	B	B	A	
			Little Bluestem - Long-leaved Reed Grass - Great Lakes Wheat Grass Dune Grassland Type	X	X	G?	S2	B	B	A	Calamovilfa longifolia, Elymus lanceolatus ssp. psammophilus (=Agropyron psammophilum)
			Dune Shrubland Ecosite								
			Sand Cherry Dune Shrubland Type	X	X	G2Q	S2	B	A	A	
			Juniper Dune Shrubland Type	X	X	G?	S2	B	AB	A	
			Hop-tree Dune Shrubland Type		X	G2Q	S1	A	A	A	
			Dune Savannah Ecosite								
			Cottonwood Dune Savannah Type	X	X	G1G2	S1	A	A	A	
			Red Cedar Dune Savannah Type		X	G?	S1	A	A	A	
			Balsam Poplar Dune Savannah Type		X	G1G2	S1	A	A	A	
			Bluff								
			Shale / Clay Bluff Ecosite								
			Open Clay Bluff Type	(X)	X	G?	S4	C	AB	C	
			Sand / Till Bluff Ecosite								
			Open Sand / Clay Bluff Type	(X)	(X)	G?	S4	C	AB	C	
			Cliff, Talus, Crevice and Cave								
			Cliff								
			Open Limestone / Dolostone Cliff Ecosite								
			Cliffbrake - Lichen Open Unshaded Limestone / Dolostone Cliff Face Type	X	X	G5	S3	C	A	A	
			Bulblet Fern - Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type	X	X	G5	S3	C	A	A	
			Canada Bluegrass Open Unshaded Limestone / Dolostone Cliff Face Type	X	X	G5	S3	C	A	A	
			Open Limestone / Dolostone Seepage Cliff Type	(X)	(X)	G?Q	S3	C	A	A	
			Open Limestone / Dolostone Cliff Rim Type	X	X	G5	S2	B	A	A	
			Limestone / Dolostone Cliff Shrubland Ecosite								
			Common Juniper Open Limestone / Dolostone Cliff Rim Shrubland Type	X	(X)	G?	S2S3	BC	A	A	
			Round-leaved Dogwood Open Limestone / Dolostone Cliff Rim Shrubland Type	X	X	G?	S3	C	A	A	
			Treed Limestone / Dolostone Cliff Ecosite								
			White Cedar Treed Limestone Cliff Type	X	X	G2Q	S3	C	AB	A	
			Sugar Maple - Ironwood - White Ash Treed	X	X	G?	S3	C	AB	A	
			White Birch - Aspen Treed Limestone Cliff Type	X	X	G?	S3S4	C	B	A	
			Open Sandstone Cliff Ecosite	(X)		G?Q	S1	AB	A	C	
			Sandstone Cliff Shrubland Ecosite	(X)		G?Q	S1	A	A	C	may not occur in 6e and 7e
			Treed Sandstone Cliff Ecosite	(X)		G?Q	S1	AB	A	C	may not occur in 6e and 7e
			Open Granite Cliff Ecosite								
			Moist Moss - Liverwort Granite Cliff Face Type	X		G4Q	S4	D	AB	D	

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System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EO's	EO Abundance	EO Range	Comments
	I	II									
			Granite Cliff Shrubland Ecosite	(X)		G?	S4	D	AB	D	
			Treed Granite Cliff Ecosite	(X)		G?	S4S5	D	BC	D	
			Talus								
			Open Limestone / Dolostone Talus Ecosite								
			Dry Herbaceous Limestone / Dolostone Talus	X	X	G?	S2	B	A	A	
			Wet Herbaceous Limestone / Dolostone Talus	(X)	(X)	G?	S2	B	A	A	
			Limestone / Dolostone Talus Shrubland								
			Round-leaved Dogwood Open Limestone / Dolostone Talus Shrubland Type	X	X	G?	S2S3	BC	A	A	not as rich or diverse, and more disturbed than Mountain Maple Type
			Mountain Maple Open Limestone Talus Shrubland Type	X	X	G?	S3	C	A	A	richer sites, more diverse and less disturbed than above
			Treed Limestone / Dolostone Talus Ecosite								
			White Birch Dry Treed Limestone Talus Type	X	X	G3G5	S3	C	B	A	
			White Cedar Dry Treed Limestone Talus Type	X	X	G?	S3	C	B	A	
			Sugar Maple Moist Treed Limestone Talus Type	X	X	G3G5	S3	C	B	A	
			Basswood - White Ash - Butternut Moist Treed Limestone Talus Type	X	(X)	G3G5	S2	B	A	A	
			Hemlock - Sugar Maple Moist Limestone Talus Type	X	X	G?	S2	B	A	A	
			Open Sandstone Talus Ecosite	(X)		G4G5	S1	A	A	C	
			Sandstone Talus Shrubland Ecosite	(X)		G4G5	S1	A	A	C	
			Treed Sandstone Talus Ecosite	(X)		G4G5	S1	B	A	C	
			Open Granite Talus Ecosite	(X)		G4G5Q	S3S4	C	B	D	
			Granite Talus Shrubland Ecosite	(X)		G4G5Q	S3S4	C	B	D	
			Treed Granite Talus Ecosite	(X)		G4G5Q	S3S4	C	B	D	
			Crevice and Cave								
			Limestone / Dolostone Crevice Ecosite								
			Liverwort - Moss - Fern Limestone Crevice Type	X	(X)	G5	S4	D	A	A	includes crevices in limestone / dolostone barrens and alvars
			Limestone / Dolostone Solution Cave Ecosite	(X)		G?	S1	B	A	A	
			Limestone / Dolostone Crevice Cave Ecosite	(X)		G?	S1	B	A	A	
			Rockland								
			Open and Treed Rock Barren								
			Open Limestone/Dolostone Barren Ecosite								
			Dry Limestone/Dolostone Barren Type	X		G?	S2S3	AB	AB	B	Rolling or uneven limestone reef bedrock, not flat alvar
			Limestone / Dolostone Shrubland Barren Ecosite								
			Common Juniper Limestone / Dolostone Shrubland Barren Type	(X)		G?	S3	B	B	A	
			Round-leaved Dogwood Limestone / Dolostone	(X)		G?	S3	B	A	A	Likely a post-fire or logging relict
			Treed Limestone / Dolostone Barren Ecosite								
			Red Cedar Treed Limestone Barren Type	X		G?	S1	A	A	AB	
			Hackberry Treed Limestone Barren Type	X		G?	S1	AB	A	AB	
			Oak Treed Limestone Barren Type	X		G?	S1	AB	A	AB	
			Open Sandstone Barren Ecosite								
			Dry Sandstone Barren Type	X	X	G?	S1	A	A	B	

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System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated #			Comments
	I	II						EO%	EO Abundance	EO Range	
			Sandstone Barren Shrubland Ecosite	(X)		G?	S1	A	A	B	
			Treed Sandstone Barren Ecosite	(X)	X	G?	S1	AB	A	B	
			Open Granite Barren Ecosite								
			Dry Granite Barren Type	X		G?	S5	D	CD	D	
			Granite Shrubland Barren Ecosite								
			Blueberry Granite Shrubland Barren Type	X		G?	S5	D	CD	D	
			Chokeberry Granite Shrubland Barren Type	X		G?	S3	C	AB	B	
			Common Juniper Granite Shrubland Barren Type	X		G?	S4	CD	BC	D	
			Treed Granite Barren Ecosite								
			Red Cedar Treed Granite Barren Type	X		G?	S1	AB	A	B	
			Pitch Pine Treed Granite Barren Type	X		G3G5	S1	A	A	B	
			Jack Pine Treed Granite Barren Type	X		G5	S5	D	D	D	
			Oak - Red Maple - Pine Treed Granite Barren Type	X		G?	S4S5	C	C	C	
			Alvar								
			Open Alvar Ecosite								
			Shrubby Cinquefoil - Creeping Juniper - Scirpus-like Sedge Alvar Pavement Type	X		G2?	S2	C	B	A	<10% tree cover >50 % exposed pavement Bruce (and Manitoulin in Site Region 5E)
			Philadelphia Panic Grass - False Pennyroyal Alvar Pavement Type	X		G1Q	S1	A	A	A	>50 % exposed pavement Napanee, Burnt Lands, Carden
			Northern Dropseed - Little Bluestem - Scirpus-like Sedge Alvar Grassland Type	X		G2G3?	S2S3	C	B	A	>50% herbaceous species cover Bruce (and Manitoulin in Site Region 5E)
			Tufted Hairgrass - Canada Bluegrass - Philadelphia Panic Grass Alvar Grassland Type	X		G2G3?	S2S3	C	B	A	>50% herbaceous species cover Napanee, Burnt Lands, Carden drier portions of higher-quality examples may include areas dominated by Little Bluestem and/or Northern Dropseed
			Canada Bluegrass - Nodding Onion Alvar Grassland Type		X	G1?	S1	A	A	A	>50% herbaceous species cover Pelee Island only examples are disturbed by past grazing
			Alvar Shrubland Ecosite								
			Common Juniper - Creeping Juniper - Shrubby Cinquefoil Alvar Shrubland Type	X		G2?	S2	B	AB	A	> 25% shrub cover
			Common Juniper - Fragrant Sumac - Hairy Beardtongue Alvar Shrubland Type	X		G2?	S2	B	AB	A	
			Treed Alvar Ecosite								
			White Cedar - Jack Pine - Shrubby Cinquefoil Treed Alvar Pavement	X		G1G2	S1	B	A	A	tree cover between 10% and 60% >50% pavement
			Jack Pine - White Cedar - Low Calamint Treed Alvar Grassland Type	X		G1?	S1	B	A	A	>50% herbaceous species cover Bruce (and Manitoulin in Site Region 5E) all tree species not always present, may also have White Spruce, Tamarack
			White Cedar - White Spruce - Philadelphia Panic Grass Treed Alvar Grassland Type	X		G3?	S3	C	B	A	>50% herbaceous species cover Carden, Napanee, Burnt Lands
			Red Cedar - Early Buttercup Treed Alvar Grassland Type	X		G2?	S2	B	B	A	>50% herbaceous species cover Napanee
			Chinquapin Oak - Nodding Onion Treed Alvar Grassland Type		X	G1?	S1	A	A	A	>50% herbaceous species cover Pelee Island only examples have been disturbed by past grazing
			Shagbark Hickory - Prickly Ash - Philadelphia Panic Grass Treed Alvar Grassland Type		X	G1Q	S1	A	A	A	Flamborough
			Jack Pine - White Cedar - Common Juniper Treed Alvar Shrubland Type	X		G2?	S2	B	AB	A	>25% shrub cover Bruce (and Manitoulin in Site Region 5E) occasionally White Spruce or White Birch dominate
			Non-Forested Deep Soil Terrestrial								
			Sand Barren								
			Sand Barren Ecosite								
			Bracken Fern Sand Barren Type	X		G?	S2	B	A	B	reported from Trent River area
			Hay Sedge Sand Barren Type	X		G?	S1	A	A	B	Carex siccata (C. foenea), reported from Trent River area
			Slender Wheat-grass Sand Barren Type	X		G?	S1	A	A	B	Elymus trachycaulus (Agropyron trachycaulum)

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System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated # EO%	EO Abundance	EO Range	Comments
	I	II									
			Tallgrass Prairie, Savannah & Woodland								
			Dry Tallgrass Prairie Ecosite								
			Dry Tallgrass Prairie Type	X	X	G3	S1	B	A	B	few extensive (> 2 ha) remnants known
			Moist - Fresh Tallgrass Prairie Ecosite								
			Moist - Fresh Tallgrass Prairie Type		X	G2	S1	B	A	A	few extensive (> 2 ha) remnants known
			Dry Tallgrass Savannah Ecosite								
			Dry Black Oak Tallgrass Savannah Type		X	G3	S1	A	A	B	ca. 400 ha at Pinery, very little elsewhere
			Dry Black Oak-Pine Tallgrass Savannah Type	(X)	X	G?	S1	A	A	B	ca. 400 ha at Pinery, also at Wasaga, Turkey Pt.
			Moist - Fresh Tallgrass Savannah Ecosite								
			Moist - Fresh Pin Oak - Bur Oak Tallgrass Savannah Type		X	G1	S1	A	A	A	< 1000 ha
			Moist - Fresh Black Oak Tallgrass Savannah Type		X	G2	S1	A	A	A	< 1000 ha
			Dry Tallgrass Woodland Ecosite								
			Dry Black Oak - White Oak Tallgrass Woodland Type		X	G?	S1	A	A	A	< 1000 ha
			Dry Bur Oak - Shagbark Hickory Tallgrass Woodland Type	X		G?	S1	A	A	A	occurs on fairly shallow soils (ca. 20-30 cm depth) over limestone, a.k.a. limestone woodland
			Moist - Fresh Oak Tallgrass Woodland Ecosite								
			Moist - Fresh Black Oak - White Oak Tallgrass Woodland Type		X	G2	S1	AB	A	A	< 1000 ha
			Moist - Fresh Pin Oak Tallgrass Woodland Type		X	G1	S1	AB	A	A	< 1000 ha
			Deciduous Forest								
			Dry Deciduous Forest Ecosite								
			Dry Oak - Hickory Deciduous Forest Type	X	X	G4?	S3S4	CD	BC	A	
			Dry Black Oak Deciduous Forest Type	(X)	X	G4?	S3	C	BC	A	
			Dry - Fresh Oak Deciduous Forest Ecosite								
			Dry - Fresh Red Oak Deciduous Forest Type	X	X	G?	S5	D	D	BC	
			Dry - Fresh White Oak Deciduous Forest Type	X	X	G?	S4	D	CD	BC	
			Dry - Fresh Mixed Oak Deciduous Forest Type	X		G?	S3S4	CD	C	BC	
			Dry - Fresh Oak - Maple Deciduous Forest Type								
			Dry - Fresh Oak - Sugar Maple Deciduous Forest Type	X	X	G?	S5	D	D	B	
			Dry - Fresh Oak - Red Maple Deciduous Forest Type	X	X	G?	S5	D	D	B	
			Dry - Fresh Hackberry Deciduous Forest Ecosite								
			Dry - Fresh Hackberry Deciduous Forest Type		X	G?	S2	BC	A	A	found on calcareous sites
			Dry - Fresh Hickory Deciduous Forest Ecosite								
			Dry - Fresh Hickory Deciduous Forest Type	X	X	G4?	S3S4	CD	BC	A	
			Dry - Fresh White Birch - Poplar - Aspen - White Ash Deciduous Forest Ecosite								
			Dry - Fresh White Birch Deciduous Forest Type	X	X	G4?	S5	D	D	D	
			Dry - Fresh Aspen - Poplar Deciduous Forest Type	X	X	G5	S5	D	D	D	
			Dry - Fresh White Ash Deciduous Forest Type	X	X	G?	S5	D	D	D	
			Dry - Fresh Sugar Maple - Mixed-Deciduous Forest Ecosite								
			Dry - Fresh Sugar Maple - Oak Deciduous Forest Type	X	X	G?	S5	D	D	C	
			Dry - Fresh Sugar Maple - Ironwood Deciduous Forest Type	X	(X)	G?	S5	D	D	C	
			Dry - Fresh Sugar Maple - Hickory Deciduous Forest Type		X	G?	S4	D	CD	B	
			Dry - Fresh Sugar Maple - Basswood Deciduous Forest Type	X	X	G?	S5	D	D	B	

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System	Community Series		Ecosite	6E 7E		Global Rank	Provincial Rank	Estimated #			Comments
	I	II		6E	7E			EOs	EO Abundance	EO Range	
			Fresh Sugar Maple - Beech Deciduous Forest Ecosite								
			Fresh Sugar Maple Deciduous Forest Type	X	X	G5?	S5	D	D	C	
			Fresh Sugar Maple - Beech Deciduous Forest Type	X	X	G5?	S5	D	D	C	
			Fresh Beech Deciduous Forest Type		X	G4G5	S4S5	D	D	C	
			Fresh Sugar Maple - Mixed-Deciduous Forest Ecosite								
			Fresh Sugar Maple - White Ash Deciduous Forest Type	X	X	G?	S5	D	D	C	
			Fresh Sugar Maple - Red Maple Deciduous Forest Type	X	X	G?	S5	D	D	C	
			Fresh Sugar Maple - White Birch - Aspen Deciduous Forest Type	X	X	G5	S5	D	D	C	
			Moist - Fresh Sugar Maple - Mixed-Deciduous Forest Ecosite								
			Moist - Fresh Sugar Maple - Lowland Ash Deciduous Forest Type	X	X	G?	S5	D	D	C	
			Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type	X	X	G?	S3?	BC	AC	A	found on dry sites and river terraces, many reports of Black Maple misidentified, hybridizes with Sugar Maple
			Moist - Fresh Sugar Maple - Yellow Birch Deciduous Forest Type	X	X	G5?	S5	D	D	C	
			Moist - Fresh Sugar Maple - White Elm Deciduous Forest Type	X	X	G?	S5	D	D	C	
			Moist - Fresh Black Walnut Deciduous Forest								
			Moist - Fresh Black Walnut Deciduous Forest Type		X	G4?	S2S3	C	A	A	
			Moist - Fresh Hackberry Deciduous Forest Ecosite								
			Moist - Fresh Hackberry Deciduous Forest Type		X	G4?	S2	B	AB	A	occur on calcareous sites
			Moist - Fresh White Birch - Aspen - Poplar - Deciduous Forest Ecosite								
			Moist - Fresh White Birch Deciduous Forest Type	X	X	G4?	S5	D	D	D	
			Moist - Fresh Aspen - Poplar Deciduous Forest Type	X	X	G5	S5	D	D	D	
			Mixed Forest								
			Dry Oak - Pine Mixed Forest Ecosite								
			Dry Oak - Pitch Pine Mixed Forest Type	X		G?	S1	B	AB	A	Pitch Pine stands declining due to fire suppression
			Dry Chinquapin Oak - Pine Mixed Forest Type		X	G3Q	S2	B	AB	A	
			Dry - Fresh White Pine Mixed Forest Ecosite								
			Dry - Fresh White Pine - Oak Mixed Forest Type	X	X	G4G5	S5	D	D	C	
			Dry - Fresh White Pine - Red Maple Mixed Forest Type	X	(X)	G4G5	S5	D	D	C	
			Dry - Fresh White Pine - Sugar Maple Mixed Forest Type	X	X	G?	S5	D	D	C	
			Dry - Fresh White Cedar Mixed Forest Ecosite								
			Dry - Fresh White Cedar - White Birch Mixed Forest Type	X	X	G4G5Q	S5	D	D	D	
			Dry - Fresh White Cedar - Aspen Mixed Forest Type	X	(X)	G4G5Q	S5	D	D	D	
			Dry - Fresh White Birch - Aspen Mixed Forest Ecosite								
			Dry - Fresh Aspen Mixed Forest Ecosite	X	(X)	G5	S5	D	D	D	
			Dry - Fresh White Birch Mixed Forest Ecosite	X	X	G4G5Q	S5	D	D	D	

Significant Wildlife Habitat Technical Guide - Appendix J
W.D. Bakowsky
Natural Heritage Information Centre
Community Type Provincial
Ranks

System	Community Series		Ecosite	6E	7E	Global Rank	Provincial Rank	Estimated #			Comments
	I	II						EO%	EO Abundance	EO Range	
			Moist - Fresh Hemlock Mixed Forest Ecosite								
			Moist - Fresh Hemlock - Sugar Maple Mixed Forest Type	X	X	G4G5	S4S5	D	CD	C	
			Moist - Fresh Hemlock - White Birch Mixed Forest Type	X	X	G4G5	S4S5	D	CD	C	
			Moist - Fresh White Cedar Mixed Forest Ecosite								
			Moist - Fresh White Cedar - Birch - Aspen Mixed Forest Type	X	X	G5Q	S5	D	D	D	
			Moist - Fresh White Cedar - Sugar Maple Mixed Forest Type	X	X	G5Q	S5	D	D	D	
			Moist - Fresh White Birch - Aspen Mixed Forest Ecosite								
			Moist - Fresh White Birch - Aspen Mixed Forest Type	X	X	G5Q	S5	D	D	D	
			Coniferous Forest								
			Dry Coniferous Forest Ecosite								
			Dry Jack Pine Coniferous Forest Type	X		G4G5	S5	D	D	D	
			Dry Red Pine - White Pine Coniferous Forest Type	X	X	G3G4	S4	C	CD	C	
			Dry Red Cedar Coniferous Forest Ecosite								
			Dry Red Cedar Coniferous Forest Type	X	X	G?	S4	CD	BC	A	
			Dry - Fresh White Pine Coniferous Forest Ecosite								
			Dry - Fresh White Pine Coniferous Forest Type	X	X	G3G4	S4S5	D	C	C	
			Dry - Fresh White Cedar - White Spruce Coniferous Forest Ecosite								
			Dry - Fresh White Cedar Coniferous Forest Type	X	X	G4	S5	D	D	D	
			Dry - Fresh White Spruce Coniferous Forest Type	X		G4	S5	D	D	D	
			Fresh Hemlock Coniferous Forest Ecosite								
			Fresh Hemlock Coniferous Forest Type	X	X	G4?	S4S5	D	BC	C	
			Fresh Hemlock - Mixed Coniferous Forest Type	X	X	G3G4Q	S4S5	D	BC	C	
			Moist - Fresh White Cedar - Mixed - Coniferous Forest Ecosite								
			Moist - Fresh White Cedar - Hemlock Coniferous Forest Type	X	X	G4?	S5	D	D	D	
			Moist - Fresh White Cedar - Balsam Fir Coniferous Forest Type	X		G4	S5	D	D	D	

APPENDIX K

Significant Wildlife Habitat: Waterfowl Component (ducks, geese and swans)

The significant waterfowl habitats described in this appendix were developed by a working group formed at a significant wildlife habitat workshop held in January 1996. The working group membership included representatives of the Ministry of Natural Resources, Canadian Wildlife Service, Ducks Unlimited and private consultants. The group also included researchers and field staff. The group met on several occasions and produced the report that makes up this appendix.

1. Conservation of Significant Waterfowl Habitat

Goal:

Ontario has a rich diversity of waterfowl species and the intent is that none of them shall be permitted to undergo sustained decline because of development-related loss of habitat or degraded habitat functions.

(Eleven waterfowl species that inhabit Ontario currently have populations that are below the goals established in the North American waterfowl Management Plan for 2001: Mallard, Pintail, Wigeon, Green-winged Teal, Blue-winged Teal, Canvasback, Scaup, Southern James Bay Canada goose, Mississippi Valley Canada goose and Atlantic Brant)

(In some southern Ontario landscapes, wetland losses range from 78 % to 87 %)

(There is no estimate of the extent of degradation that settlement activities have had on wetland functions)

Objectives:

Identify and protect all waterfowl habitat of significance in the municipality.

(Only 18 % of the municipalities in southern Ontario have no mapped wetlands)

Ensure policies do not prevent management and restoration of wetlands.

(In a sample of 40 counties across southern Ontario, there are over 1.6 million ha of soils that are poorly drained, very poorly drained, bottomlands, organic or marshes that may need restoration or management to retain functions)

2. General Principles

All migratory species are potentially important at different scales.

Migratory wildlife are significantly different from sedentary species when it comes to habitat issues: no one jurisdiction encompasses the habitats required for their survival. Consequently, cooperation is needed at local, regional, provincial, national and even international levels to protect and enhance their habitat needs.

The entire suite of waterfowl habitats must be considered, including those that lie outside of wetlands. Agricultural practices that provide or promote ephemeral waterfowl habitats or functions (wet areas in farmed locations) should be encouraged.

Waterfowl are a group of 32 species that use Ontario habitats for migration, staging, breeding, moulting, and in some cases, wintering. They depend on the following types of habitat to accommodate their needs over the course of their life cycle: pre-laying feeding habitat (usually ephemeral; include temporary pools, sheetwater, meltwater particularly on croplands during spring migration before machinery can access); nesting habitat; brood-rearing habitat; moulting areas; local roosts; staging habitat; and wintering habitat.

Habitats which are used by waterfowl that are rarely found in Ontario should be considered because of their contribution to the biological diversity of those sites.

For waterfowl, the issue of rarity is best dealt with by considering site biodiversity. Normally, waterfowl are rare only because a small portion of their North American range includes Ontario. They may be abundant elsewhere. Their unique value should be recognized as a contribution to diversity rather than a rarity.

Planning controls should not prevent wetland management or restoration.

Most wetland sites in southern Ontario are degraded and require management to restore functions.

3. Specific Habitats

The habitat of significant species can be identified by two categories: locations that are known and mapped; and locations that are unknown and must be mapped on the basis of population status and landform preference.

a) Known and Mapped Locations

The following sites are significant for waterfowl:

- . Long Point;
- . lower Detroit River;
- . Hillman/Point Pelee
- . Amherst Island;
- . Hullett PWA;
- . Minesing Swamp;
- . Matchedash Bay PWA;
- . Lake St. Francis;
- . Presqu'île Bay;
- . Lake St Clair;
- . Wolfe Island;
- . Rondeau Bay;
- . St. Lawrence River;
- . Luther Marsh PWA;
- . Tiny Marsh PWA;
- . Wye Marsh PWA;
- . Prince Edward County shores;
- . Lake Scugog;

- . Cache Bay;
- . Lake of the Woods;
- . Nighthawk Lake; and
- . west Rainy Lake;
- . Little Claybelt;
- . Holland/Scanlon Marshes.

(Sources for this information include Environment Canada - Canadian Wildlife Service, Ontario Ministry of Natural Resources, Ducks Unlimited Canada and local Conservation Authorities)

b) Unknown and Unmapped Locations

Knowledge of two factors are useful in mapping local sites of potentially significant waterfowl habitat: the population status of the waterfowl species normally expected to inhabit the municipality and the location of landforms that characterize their habitat preferences.

These 5 categories are useful in describing the population status of the waterfowl that could be present in Ontario municipalities:

Categories for Waterfowl Population Status	Applicable Species or Populations (1995 Data)
A) Species whose populations are in decline	Black Duck, Southern James Bay & Atlantic populations of Canada goose
B) Species for which Ontario provides a large portion of their continental breeding and staging habitat	Common Goldeneye, Canvasback, Redhead, Ringnecked Duck, Scaup (2 species), Hooded Merganser, Old Squaw, Scoters (3 species), Mississippi Valley & Southern Ontario Canada goose
C) Species for which Ontario provides an important component of continental breeding and staging habitat	Wood Duck, Merganser (2 species) Coot, Wigeon, Gadwall, Blue-winged Teal, Green-winged Teal, lesser Snow goose, Mallard
D) Species for which breeding, staging and wintering habitat is limited in Ontario	Ruddy Duck, King & Common Eider, Trumpeter Swan, Atlantic Brant
E) Species that are dependant on transitory habitats	Pintail, Tundra Swan, Shoveller

(Sources of this information include Environment Canada - Canadian Wildlife Service and the Ontario Ministry of Natural Resources)

The following landforms characteristically provide significant waterfowl habitat and need to be examined:

Landform Type	Measures of Significance
Wetlands	<ul style="list-style-type: none"> • Type of wetland: using the definitions in the Provincial Wetlands Classification System, marshes and swamps are more important than bogs or fens • Size of wetland: small wetlands (based on confirmed boundaries) are important but as wetland size increases, so do the local values - larger may be better in some municipalities • Groups of wetlands: clusters of wetlands (more than 10 within 1,000 m of the centre of each) are more important than single wetlands • Peripheral lands: uplands, such as grass and shrub habitats, as well as pastureland within a significant distance can provide important nesting habitat
Poorly Drained Landscapes	<ul style="list-style-type: none"> • Stream & Riverine Bottomlands: floodlands provide important waterfowl habitat • Soils: certain soil types (ie. Farmington series as determined by soil maps or Ontario land Inventory maps) are useful indicators of important habitat. • Potholes: terrain with over 50 small wetlands per sq. km. are important waterfowl habitats • Beaver Ponds: terrain with over 25 ponds per 10 sq. km. are important habitats • Seasonal Wet Locations: seasonally flooded locations, even those under active cultivation, such as sheetwater or meltwater areas and poorly drained croplands provide seasonally important pre-nesting habitat
NAWMP Project Sites	These wetland enhancement locations are undertaken only on important waterfowl habitats
Coastal Marshes	The shores of Great Lakes and other large inland lakes provide uncommon but valuable locations for breeding and staging waterfowl

(Sources of this information include Environment Canada - Canadian Wildlife Service, the Ontario Ministries of Agriculture, Food and Rural Affairs and Natural Resources, Ducks Unlimited Canada, Conservation Authorities, agricultural associations and farm, naturalist, hunter and trapper clubs)

By combining the category for each waterfowl species known to be present in the municipality with mapped landform information and the knowledge of interest groups, the local significance of waterfowl habitats can be determined.

3. Impacts from Development

There are three impacts that residential, commercial and industrial development has on significant waterfowl habitats (see the 5 types in section 3b):

- . loss of area and function;
- . degradation of wetland functions and values; and
- . fragmentation from surrounding natural landscapes.

These impacts operate more commonly in urban environments because they result in permanent changes to waterfowl habitat.

In rural environments, even those under active cultivation, the changes to waterfowl habitat are normally temporary and compensatory. Major drainage schemes and large-scale clearing efforts are the exceptions. Such techniques as crop rotation, grassed waterways, conservation tillage, buffer strips, living fencelines, windbreaks, rotational grazing and contour ploughing only shift the location of transitory habitat types - they do not permanently destroy them - particularly if they are practice within 300 m of traditional habitats.

If existing habitats are not destroyed, it allows for future restoration at appropriate times and locations.

APPENDIX L

Practical Approach for Identifying and Mapping Rare Vegetation Communities Using the Southern Ontario Ecological Land Classification Approach

Introduction

The identification and protection of rare vegetation communities within a planning area is important. Frequently these areas support numerous provincially or regionally rare species. Many plant and animals species depend on rare vegetation communities because they provide critical habitat found nowhere else. On a larger scale, they serve to maintain overall biodiversity; on a smaller scale, they contribute to healthy wildlife populations in the planning area.

While some of these communities have never been common in Ontario, many others have been lost or severely degraded, particularly in southern Ontario. The program and the efforts of researchers and naturalists have helped to identify many of the rare vegetation communities in Ontario. Planning authorities across southern Ontario, using the provincial ELC approach, can further help to identify and then protect these important natural areas.

ELC and the Vegetation Communities of Ontario

The vegetation communities of Ontario can be surveyed and classified using a process called Ecological Land Classification (ELC). The ELC is the process of arranging or ordering information about land units to better understand their similarities and relationships. The goal of the provincial ELC program is to establish a comprehensive and consistent province-wide approach for ecosystem description, classification, mapping, and data collection. It helps to identify recurring ecological patterns on the landscape to reduce complex natural variation to a reasonable number of meaningful ecosystem units. The ELC framework is being designed to facilitate key conservation, planning, and ecosystem management objectives, at various site to landscape scales of resolution. It will provide community descriptions and sampling methodologies for identifying and mapping valuable natural heritage features and areas. This will help municipalities to meet their obligations under the new system of planning in Ontario as outlined in Policy 2.3 in the Provincial Policy Statement.

The vegetation communities identified by the ELC process are developed through extensive collection and statistical analysis of primarily field data. To date, a complete range of forest communities for northern and central Ontario, and wetland communities for the northwestern part of the province have been identified. In southern Ontario, the ELC is still being developed, but during the interim, existing data have been used to develop a preliminary ecological land classification for southern Ontario. This classification is described in a 1998 publication entitled *Ecological Land Classification for Southern Ontario: First Approximation and its Application*.

Organization and brief explanation of the ELC framework

There are 6 levels to the ELC arranged in a hierarchy. They are explained in the manual *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* and vegetation and environmental characteristics are listed for each one. From the largest to the smallest scale they are:

1. Site Region. The ELC for Southern Ontario applies to Site Regions 6E and 7E.
2. System: Aquatic, Wetland, Terrestrial. The manual provides a key to determine the type of System.
3. Community Class. Ultimately the division of Community Classes is based on recurring patterns in plant species associations that have shared physiognomic characteristics, substrate type, geology, and meso- and microclimate, as well as other ecological factors.
4. Community Series. These units are normally visible and consistently recognizable on aerial photographs or from a combination of maps, aerial photograph interpretation, and other remote sensing techniques. Community Series are the lowest level in the ELC that can be identified without a site visit. They are distinguished based on the type of vegetation cover or the plant form that characterizes the community. Generally, they are identified based on whether the community has open, shrub, or treed vegetation cover, as well as whether the plant form is deciduous, coniferous, or mixed.
5. Ecosite. This landscape unit represents recurring vegetation and soil types. The manual provides a key to determine the type of Ecosite.
6. Vegetation Type. This is the finest level of resolution in the ELC hierarchy. Vegetation Types are recurring patterns found in plant species assemblages associated with a particular Ecosite. They are generated by grouping plant communities that are most similar together, based entirely on the plant species composition.

The Ontario Ministry of Natural Resources, Credit Valley Conservation Authority and a private consultant have developed a description framework, field sampling methods, an integrated database, and a manual that might be useful to southern municipalities interested in identifying and describing the vegetation communities within their jurisdiction. The following information is provided below to help municipalities identify and map vegetation communities, especially those that may be rare.

Rare vegetation communities

The ultimate objective is to identify and accurately map the rare vegetation communities found in the planning area. The methods outlined below can be used to identify and map the ELC units at a variety of scales. The list of rare vegetation communities for Site Regions 6E and 7E are listed in Appendix M. A planning authority may wish first to classify all of the land within its jurisdiction and later focus on the rare communities, or it may decide to concentrate only on the rare vegetation communities.

Remote methods such as aerial photograph interpretation, can normally be used to reliably identify vegetation communities to the Community Series level of the ELC hierarchy. However most rare vegetation communities (see Appendix J) have been identified at the Vegetation Type level, the finest scale in the ELC hierarchy. Field investigations are required to reliably identify both the Vegetation Types and Ecosites as information must be collected on soil and site conditions, as well as specific indicator vegetation species.

The identification of the Community Series can be an important first step in the screening process to identify rare vegetation communities because it can indicate where there is a high probability of finding a rare Vegetation Type and where field investigations should be focused. For example, the identification of the Tallgrass Savannah Community Series will indicate the presence of rare vegetation communities because all of the Vegetation Types under this Community Series are rare (see Appendix J). In other situations the identification of the Community Series will not readily indicate the location of the rare vegetation Types. For example, there are 27 Thicket Swamp Types under the Thicket Swamp Community Series (see Appendix J). Of these, 7 Vegetation Types are considered rare (i.e., S1 to S3). Two of them, Paw-paw Mineral Thicket Swamp and Huckleberry Organic Thicket Swamp (only found in one location) are very rare (i.e., S1).

It requires considerable botanical knowledge to identify some of these Vegetation Types, comprised of such species as Buttonbush, Southern Arrow-wood and Spicebush. However, knowing the distribution and preferred habitat of species (see Appendix G) can make it easier. Also lists of species that often are included in wetland evaluations, natural area inventories, site management plans, and consultant reports may assist in locating some of these species and rare vegetation communities.

Many, but not all rare vegetation communities have already been identified and mapped (see Appendix M). The information in Appendix M provides general locations of rare vegetation communities and can be used to identify areas where there may be additional examples of these communities.

Limitations of the ELC

The ELC is becoming the accepted framework for natural community description in Ontario and rare vegetation communities for Site Regions 6E and 7E have been identified and described based on the *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. However, there are some challenges when using the ELC and they are outlined below.

- At the present time, the ELC for Southern Ontario and the 1998 OMNR manual only apply to Site Regions 6E and 7E, an area roughly enclosed by the Ontario-Quebec border, along the north shores of Lake Ontario and Lake Erie, up the eastern shoreline of Lake Huron to the tip of the Bruce Peninsula, around Georgian Bay to Midland, and eastward through Orillia, Marmora, to Arnprior. See Figure 2-1 (site regions). This area does not include Manitoulin Island.
- The ELC for southern Ontario, based on new data collection and analysis, has only been completed for forest land. However, it will be expanded to include wetlands. In the interim, the first approximation provides an excellent source of information.
- It can be difficult to determine whether a vegetation community is rare and some communities do not fit easily into the ELC description. Often this is because most natural communities in southern Ontario have been disturbed either directly or indirectly by people. Many communities may have some species that are

indicators of a potentially rare community (e.g., some prairie grasses) but lack other key species. Or they may be comprised of a few indicator species and many invasive, exotic species. The site might have once supported a relatively pristine community, but become somewhat degraded or otherwise altered due to changes in land use. Sometimes difficult decisions are required to determine the status of these communities. As a general rule, they should be based on the rarity of the remnant community and the efforts required to restore it. There are a growing number of examples of successful tall-grass prairie restoration projects and remnants of other rare vegetation communities could be restored as well.

- It can be difficult to accurately map small vegetation communities. A minimum polygon size of 0.5 hectare is a feasible mapping unit for applying the ELC at a scale of 1:10,000. A polygon is a discrete and unique area outlined on a map or aerial photograph that contains more or less homogeneous environmental and vegetation characteristics. A hand-held GPS unit might help to accurately locate some small communities.
- Effective application of the ELC for Southern Ontario requires skilled field workers with a good knowledge of plants and soil characteristics. Some vegetation communities are quite difficult to describe because they are complex or disturbed to varying degrees.
- Training of field staff (e.g., instruction on aerial photograph interpretation, soil description, ELC field sampling methodology) might be required if the municipality would prefer to develop in-house knowledge and familiarity with the ELC.
- Aerial photograph interpretation is a skill that takes considerable practice to develop. Also the planning authority cannot assume that private consultants have this skill.
- Application of the ELC is potentially expensive because of the volume of information that must be collected during field visits. Field investigations will usually be required to find rare vegetation communities, thus increasing overall costs. Even while working at the landscape scale, a very brief site reconnaissance may be advisable to verify initial community typing obtained from aerial photographs, confirm boundaries, become familiar with the level of variation found within the community,

- or to check unusual features. This limited ground-truthing allows the photograph interpreter to develop a finer appreciation of the differences between the photograph and the communities on the ground.

How to apply ELC tools and techniques to identify rare vegetation communities for land use planning

The following table provides a brief summary of how the ELC might be applied at both the larger landscape scale and the smaller site scale to achieve several important objectives. The tools and techniques, as well as explanations of them and the ELC terminology (e.g., landform, slope position, vegetation form and cover) and Description Framework are fully explained in the manual *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Also included in the manual are examples of the ELC Field Sampling Methods and Data Cards.

Table L-1: How to apply ELC tools and techniques to identify rare vegetation communities

Objective	Landscape Scale	Site Scale
Delineation of the boundaries of potentially rare vegetation communities	<ul style="list-style-type: none"> • use aerial photographs, topographical, physiographic, soils &/or other maps & any other pertinent information (e.g., Arnup & Racey 1996 for details on how to interpret aerial photographs) to discern prominent landforms, slope position, drainage pattern, & vegetation form & cover to help to delineate the natural ecological or anthropogenic boundaries of potentially rare vegetation communities 	<ul style="list-style-type: none"> • same as for landscape scale but also will also include gathering additional information in the field to help further determine boundaries of the rare community • look for additional communities within the site based primarily on changes in site conditions & vegetation and delineate their natural or anthropogenic boundaries
Field survey of potentially rare vegetation communities	<ul style="list-style-type: none"> • select one or more potentially rare communities identified from the sources above • from this list, first visit those with the greatest potential to exhibit rarity for the planning area & use the ELC Field Sampling Methods & Data Cards to collect the necessary data to describe & classify them according to the ELC • where necessary, refine earlier interpretations conducted before this field survey 	<ul style="list-style-type: none"> • conduct more intensive field investigations of priority sites &/or sites for which more information is required • collect detailed site & vegetation data for each of these sites using the ELC Field Sampling & Data Cards
Description of potentially rare vegetation communities	<ul style="list-style-type: none"> • use the ELC Description Framework to describe the environmental, physical, historical, & vegetation conditions found on the site • use other sources of information to help to complete the Description Framework 	<ul style="list-style-type: none"> • same as for landscape scale but necessarily includes more information collected during site visits
Classification of potentially rare vegetation communities	<ul style="list-style-type: none"> • use the information & data documented above to classify the site to the Community Class & Community Series levels in the ELC 	<ul style="list-style-type: none"> • use information & data documented above to classify the site to Community Class, Community Series, Ecosite, & Vegetation Type levels in the ELC

Objective	Landscape Scale	Site Scale
	<ul style="list-style-type: none"> • use the ELC Keys & Community Tables to assign ELC units to the site • Note: only Community Class & Community Series level classifications can be achieved without a site visit 	<ul style="list-style-type: none"> • use the ELC Keys & Community Tables to assign ELC units to the site • Note: only by using field data can a site be classified according to all the levels in the ELC
Mapping of potentially rare vegetation communities	<ul style="list-style-type: none"> • boundaries of rare communities & their corresponding classifications can be mapped by 1) manually transcribing the boundaries to hard-copy maps or 2) digitization into Geographical Information Systems (GIS) for digital mapping • mapping is to the Community Class or Community Series level in the ELC 	<ul style="list-style-type: none"> • same as for the landscape scale, however mapping can be done to the Community Class, Community Series, Ecosite, & Vegetation Type level in the ELC

Basic equipment required to identify and map rare vegetation communities

The following list describes basic equipment required to identify and map rare vegetation communities.

- Maps, especially topographical, physiographical, soils, and Ontario Basic Mapping (OBM). Ontario Basic Mapping (OBM) is available in hard copy and digital format for all of southern Ontario at a scale of 1:10,000. It has become the standard for much of the natural areas mapping being carried out.
- Aerial photographs. Aerial photography varies considerably in scale, format, resolution, date, and seasonal coverage. However it forms the basis of most of the community mapping that is prepared. Aerial photographs available from the OMNR are mostly at 1:10,000. However if the planning authority wishes to use their own photos, it is suggested that they use those with a scale of 1:8,000 to facilitate interpretation. Also summer photography can be useful for the delineation of forested communities, if the expertise is available to differentiate species in the canopy of trees in full leaf. Spring photography would make areas of conifer and hardwoods, as well as waterbodies, woodland ponds, and flooded lands easier to see.
- A pocket stereoscope (2X magnification) is used for aerial photograph interpretation.

- Fine point technical pens (0.35 mm) are used to transcribe community boundaries directly onto the aerial photographs. Their ink can be erased.
- Although the manual *Ecological Land Classification for Southern Ontario: First Approximation and Its Application* was designed to produce an ecological land classification of communities for southern Ontario, it can be useful for identifying rare vegetation communities as well. It provides a description of the site, vegetation, and community characteristics that need to be sampled on a site, for the detailed description, identification, and classification of ecological land units in southern Ontario. It also provides details on how to sample characteristics, and a set of standardized data cards that can be used to record the collected information.
- A soil auger or Oakfield Tube to sample soils.
- Field guides for vascular plants to aid in plant identification.
- A plant press for collecting plants that require future identification.
- A Wedge Prism with a 2X prism factor to determine forest stand composition and basal area.
- Copies of information/data collection forms: ELC Community Description & Classification; ELC Stand & Soil Characteristics; ELC Plant Species List; ELC Management/Disturbance; and ELC Wildlife forms (sample copies are included in *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*).
- There are several ways to transfer community boundaries interpreted from aerial photographs, to the OBMs. Boundaries can be drawn on mylar overlays placed on top of aerial photographs. The overlays are then transferred to the OBMs and boundaries can be traced onto the maps. This method is not recommended because of the discrepancy of scales between photographs and OBMs. They can also be transferred mechanically using a Sketchmaster. A Sketchmaster is one of the more common reflection instruments used for manually transferring information from single vertical aerial photographs to maps of a different scale. Boundaries can also be electronically transferred through digitization directly from ortho-rectified aerial photographs (i.e., photographs that have been corrected for distortion). Increasingly, digital aerial photographs on compact discs are being used, providing benefits such as the ability to change scales, and store line files.
- A dot grid and planimeter are used to calculate land cover area and percentage cover.

Information that must be collected

Data collection during field investigations is critical to accurate identification and mapping of potentially rare vegetation communities. But due to budget and time constraints, staffing expertise, time of year or other variables, it is not always possible to collect all the information outlined in the manual *Ecological Land Classification for Southern Ontario: First Approximation and Its Application*. Nevertheless, the following information should always be collected during a site visit to a potentially rare community.

- In forests and woodlands, forest stand characteristics; for other communities, the dominant species of vegetation. A small glass Wedge Prism is used to determine the forest stand composition and basal area of the site. Information about the vegetation composition of a site is mandatory for site classification.
- Soil characteristics. A soil auger or Oakfield tube is used to sample a soil core to ultimately determine soil texture, depth of organic layer, depth to bedrock, soil moisture, and soil drainage regime of the polygon. This information is also of fundamental importance to the classification system. For example, sugar maple-beech may be a common forest cover type within the planning area, but if it is found on very shallow (e.g., less than 15 cm) sandy soils, it might represent a rare vegetation community.
- Location of the site and its boundary. This is required for accurate mapping (and protection) of the potentially rare vegetation community.

APPENDIX M

Locations of Known Rare Vegetation Communities in Ontario

The Ministry of Natural Resources Natural Heritage Information Centre (NHIC) tracks the status and occurrences of rare vegetation communities in Ontario. The table that makes up this appendix, indicates the upper tier municipalities where rare vegetation communities are known to occur. The numbers indicate the numbers of known occurrences and an “x” denotes that the community is known to occur.

The table indicates the rarity of the vegetation community, which is represented by the S-rank (described in Appendix J) and G-rank (which denotes global rarity).

The Southern Ontario ELC Code and EL Code are listed in order to cross reference the communities listed with the NHIC and those described by the Ecological Land Classification System.

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S. ONT ELC CODE	ELCODE	COMMON NAME																				
			LANARK	LEEDS & GRENVILLE	LENOX & ADDINGTON	MANITOULIN	MIDDLESEX	MUSKOGA	NIAGARA	NORTHUMBERLAND	OTTAWA-CARLETON	OXFORD	PARRY SOUND	PEEL	PERTH	PETERBOROUGH	PRESCOTT & RUSSELL	PRINCE EDWARD	RAINY RIVER	RENFREW	SIMCOE	
ALO1-1	CEGL005192	Dry Lichen-Moss Open Alvar Pavement Type	2			5					2										X	
ALO1-2	CEGL005235	Dry Annual Open Alvar Pavement Type	2		2	2					2										X	X
ALO1-3	CEON000218	Northern Dropseed - Little Bluestem - Scirpus-like Sedge Alvar Grassland Type	1		2	10					X										2	X
ALO1-4	CEON000225	White Cedar - White Spruce - Philadelphia Panic Grass Treed Alvar Grassland Type	X		1	2					2										X	X
ALO1-5	CEON000219	Tufted Hairgrass - Canada Bluegrass - Philadelphia Panic Grass Alvar Grassland Type			1	10															2	
ALS1-1	CEON000222	Common Juniper - Fragrant Sumac - Hairy Beardtongue Alvar Shrubland Type	2			6					2											1
ALS1-2	CEON000221	Creeping Juniper - common Juniper - Shrubby Cinquefoil Alvar Shrubland Type				10																
ALS1-3	CEON000216	Shrub Conifer - Dwarf Lake Iris Alvar Shrubland Type				6																
ALT1-1	CEON000220	Chinquapin Oak - Canada Bluegrass - Nodding Onion Alvar Grassland Type																				
ALT1-2	CEGL005230	Shagbark Hickory - Prickly Ash Treed Alvar																				
ALT1-3	CEON000229	Jack Pine - White Cedar - Common Juniper Treed Alvar Shrubland Type	X			X					X											X
ALT1-4	CEON000223	White Cedar - Jack Pine - Shrubby Cinquefoil Treed Alvar Pavement				X																
ALT1-5	CEON000226	Red Cedar - Early Buttercup Treed Alvar Grassland Type			X																2	
BBO1-1	CEGL005162	Sea Rocket Sand Beach Type																				X
BOS2-1	CEON000121	Leatherleaf Shrub Kettle Peatland Type					X			1	X											X
CLO1-1	CEON000133	Cliffbrake - Lichen Open Unshaded Limestone / Dolostone Cliff Face Type								9												
CLO1-2	CEON000134	Bulblet Fern - Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type								22			6									X
CLO1-4	CEGL002048	Open Limestone / Dolostone Seepage Cliff Type								6			1									X
CLO1-5	CEON000136	Open Limestone / Dolostone Cliff Rim Type								X												X
CLS1-1	CEGL005066	Common Juniper Open Limestone / Dolostone Cliff Rim Shrubland Type																				
CLS1-2	CEGL005070	Round-leaved Dogwood Open Limestone / Dolostone Cliff Rim Shrubland Type								1												
CLT1-1	CEGL002451	White Cedar Treed Limestone Cliff Type								2			2									X
FET1-3	CEON000117	Gray Birch Treed Fen Type															2					
FOC4-2	CEON000103	White Cedar - Hemlock Coniferous Organic Swamp Type									5											
FOD1-3	CEGL005030	Dry Black Oak Deciduous Forest Type								7	6											
FOD1-4	CEON000162	Dry - Fresh Mixed Oak Deciduous Forest Type																				
FOD2-2	CEON000159	Dry Oak - Hickory Deciduous Forest Type																				
FOD2-3	CEON000164	Dry - Fresh Hickory Deciduous Forest Type																				
FOD4-3	CEGL005021	Dry - Fresh Hackberry Deciduous Forest Type																				
FOD6-2	CEON000178	Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type								17		1	2									
FOD7-4	CEON000181	Moist - Fresh Black Walnut Deciduous Forest Type								3												
MAM2-8	CEON000022	Prairie Slough Grass Mineral Meadow Marsh Type																				
MAM3-7	CEON000029	Prairie Slough Grass Organic Meadow Marsh Type																				
MAM4-1	CEON000016	Graminoid Coastal Meadow Marsh Type									2										3	3
MAM4-2	CEON000017	Shrubby Cinquefoil Coastal Meadow Marsh Type																				1
MAM5-2	CEGL005139	Perched Mineral Prairie Fen Type																				
RBS1-2	CEON000202	Round-leaved Dogwood Limestone / Dolostone Shrubland Barren Type																				
RBT3-1	CEGL005046	Pitch Pine Treed Granite Barren Type		11																		
SBO1-2	CEON000153	Hay Sedge Sand Barren Type									1											
SDO1-1	CEON000126	Little Bluestem - Switchgrass - Beachgrass Dune Grassland Type									X										X	
SDO1-2	CEON000127	Little Bluestem - long-leaved Reed Grass - Great Lakes Wheat Grass Dune Grassland Type																				
SDS1-3	CEGL005064	Juniper Dune Shrubland Type																				

S. ONT ELC CODE	ELCODE	COMMON NAME																				
			LAMARK	LEEDS & GRENVILLE	LENNOX & ADDINGTON	MANITOULIN	MIDDLESEX	MUSKOKA	NIAGARA	NORTHUMBERLAND	OTTAWA-CARLETON	OXFORD	PARRY SOUND	PEEL	PERTH	PETERBOROUGH	PRESCOTT & RUSSELL	PRINCE EDWARD	RAINY RIVER	RENFREW	SIMCOE	
SDT1-1	CEON000131	Cottonwood Dune Savannah Type																				
SWT2-8	CEON000057	Silky Dogwood Mineral Thicket Swamp Type																				
SWT3-13	CEGL005083	Poison Sumac Organic Thicket Swamp Type																				
SWT3-14	CEON000072	Huckleberry Organic Thicket Swamp Type					1															
SWT3-4	CEON000065	Buttonbush Organic Thicket Swamp Type																				
SWT3-7	CEON000067	Winterberry Organic Thicket Swamp Type																				
TAO1-1	CEON000199	Dry Herbaceous Limestone / Dolostone Talus								7												X
TAO1-2	CEON000200	Wet Herbaceous Limestone / Dolostone Talus								2												X
TAS1-2	CEGL005067	Mountain Maple Open Limestone Talus Shrubland Type								2			3									X
TAT1-2	CEON000138	White Birch Dry Treed Limestone Talus Type								3												
TAT1-3	CEGL005172	White Cedar Dry Treed Limestone Talus Type								3												X
TAT1-4	CEON000139	Sugar Maple Moist Treed Limestone Talus Type								2												
TAT1-5	CEON000140	Basswood - White Ash - Butternut Moist Treed Limestone Talus Type											1									
TAT1-6	CEGL005190	Hemlock - Sugar Maple Moist Limestone Talus Type								8			1									
TPO1-1	CEGL002210	Dry Tallgrass Prairie Type					2			13												
TPO2-1	CEGL005096	Moist - Fresh Tallgrass Prairie Type																				
TPS1-1	CEGL002492	Dry Black Oak Tallgrass Savannah Type																				
TPS1-2	CEGL005129	Dry Black Oak-Pine Tallgrass Savannah Type									8											X
TPS2-1	CEON000155	Moist - Fresh Pin Oak - Bur Oak Tallgrass Savannah Type																				
TPW1-1	CEGL005029	Dry Black Oak - White Oak Tallgrass Woodland Type								X	13											
TPW1-2	CEON000230	Dry Bur Oak - Shagbark Hickory Tallgrass Woodland Type																	1			
TPW2-1	CEON000156	Moist - Fresh Black Oak - White Oak Tallgrass Woodland Type																				
TPW2-2	CEON000158	Moist - Fresh Pin Oak Tallgrass Woodland Type																				
	CEON000322	Black Spruce - Tamarack - Leatherleaf Patterned Fen Type																3				

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S. ONT ELC CODE	ELCODE	COMMON NAME	S.D.G.	THUNDER BAY	TORONTO	VICTORIA	WATERLOO	WELLINGTON	YORK
ALO1-1	CEGL005192	Dry Lichen-Moss Open Alvar Pavement Type							
ALO1-2	CEGL005235	Dry Annual Open Alvar Pavement Type							
ALO1-3	CEON000218	Northern Dropseed - Little Bluestem - Scirpus-like Sedge Alvar Grassland Type				3			
ALO1-4	CEON000225	White Cedar - White Spruce - Philadelphia Panic Grass Treed Alvar Grassland Type				2			
ALO1-5	CEON000219	Tufted Hairgrass - Canada Bluegrass - Philadelphia Panic Grass Alvar Grassland Type				5			
ALS1-1	CEON000222	Common Juniper - Fragrant Sumac - Hairy Beardtongue Alvar Shrubland Type				6			
ALS1-2	CEON000221	Creeping Juniper - common Juniper - Shrubby Cinquefoil Alvar Shrubland Type							
ALS1-3	CEON000216	Shrub Conifer - Dwarf Lake Iris Alvar Shrubland Type							
ALT1-1	CEON000220	Chinquapin Oak - Canada Bluegrass - Nodding Onion Alvar Grassland Type							
ALT1-2	CEGL005230	Shagbark Hickory - Prickly Ash Treed Alvar							
ALT1-3	CEON000229	Jack Pine - White Cedar - Common Juniper Treed Alvar Shrubland Type				X			
ALT1-4	CEON000223	White Cedar - Jack Pine - Shrubby Cinquefoil Treed Alvar Pavement				1			
ALT1-5	CEON000226	Red Cedar - Early Buttercup Treed Alvar Grassland Type							
BBO1-1	CEGL005162	Sea Rocket Sand Beach Type							
BOS2-1	CEON000121	Leatherleaf Shrub Kettle Peatland Type					X	X	X
CLO1-1	CEON000133	Cliffbrake - Lichen Open Unshaded Limestone / Dolostone Cliff Face Type							
CLO1-2	CEON000134	Bulblet Fern - Herb Robert Open Shaded Limestone / Dolostone Cliff Face Type							
CLO1-4	CEGL002048	Open Limestone / Dolostone Seepage Cliff Type							
CLO1-5	CEON000136	Open Limestone / Dolostone Cliff Rim Type							
CLS1-1	CEGL005066	Common Juniper Open Limestone / Dolostone Cliff Rim Shrubland Type							
CLS1-2	CEGL005070	Round-leaved Dogwood Open Limestone / Dolostone Cliff Rim Shrubland Type							
CLT1-1	CEGL002451	White Cedar Treed Limestone Cliff Type							
FET1-3	CEON000117	Gray Birch Treed Fen Type							
FOC4-2	CEON000103	White Cedar - Hemlock Coniferous Organic Swamp Type							
FOD1-3	CEGL005030	Dry Black Oak Deciduous Forest Type							
FOD1-4	CEON000162	Dry - Fresh Mixed Oak Deciduous Forest Type							
FOD2-2	CEON000159	Dry Oak - Hickory Deciduous Forest Type							
FOD2-3	CEON000164	Dry - Fresh Hickory Deciduous Forest Type							
FOD4-3	CEGL005021	Dry - Fresh Hackberry Deciduous Forest Type							
FOD6-2	CEON000178	Moist - Fresh Sugar Maple - Black Maple Deciduous Forest Type							
FOD7-4	CEON000181	Moist - Fresh Black Walnut Deciduous Forest Type							
MAM2-8	CEON000022	Prairie Slough Grass Mineral Meadow Marsh Type							
MAM3-7	CEON000029	Prairie Slough Grass Organic Meadow Marsh Type							
MAM4-1	CEON000016	Graminoid Coastal Meadow Marsh Type			2				
MAM4-2	CEON000017	Shrubby Cinquefoil Coastal Meadow Marsh Type							
MAM5-2	CEGL005139	Perched Mineral Prairie Fen Type							
RBS1-2	CEON000202	Round-leaved Dogwood Limestone / Dolostone Shrubland Barren Type							
RBT3-1	CEGL005046	Pitch Pine Treed Granite Barren Type							
SBO1-2	CEON000153	Hay Sedge Sand Barren Type							
SDO1-1	CEON000126	Little Bluestem - Switchgrass - Beachgrass Dune Grassland Type							
SDO1-2	CEON000127	Little Bluestem - long-leaved Reed Grass - Great Lakes Wheat Grass Dune Grassland Type							
SDS1-3	CEGL005064	Juniper Dune Shrubland Type							

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S. ONT ELC CODE	ELCODE	COMMON NAME	S.D.G.	THUNDER BAY	TORONTO	VICTORIA	WATERLOO	WELLINGTON	YORK
SDT1-1	CEON000131	Cottonwood Dune Savannah Type							
SWT2-8	CEON000057	Silky Dogwood Mineral Thicket Swamp Type							
SWT3-13	CEGL005083	Poison Sumac Organic Thicket Swamp Type					X		
SWT3-14	CEON000072	Huckleberry Organic Thicket Swamp Type							
SWT3-4	CEON000065	Buttonbush Organic Thicket Swamp Type							
SWT3-7	CEON000067	Winterberry Organic Thicket Swamp Type							
TAO1-1	CEON000199	Dry Herbaceous Limestone / Dolostone Talus							
TAO1-2	CEON000200	Wet Herbaceous Limestone / Dolostone Talus							
TAS1-2	CEGL005067	Mountain Maple Open Limestone Talus Shrubland Type							
TAT1-2	CEON000138	White Birch Dry Treed Limestone Talus Type							
TAT1-3	CEGL005172	White Cedar Dry Treed Limestone Talus Type							
TAT1-4	CEON000139	Sugar Maple Moist Treed Limestone Talus Type							
TAT1-5	CEON000140	Basswood - White Ash - Butternut Moist Treed Limestone Talus Type							
TAT1-6	CEGL005190	Hemlock - Sugar Maple Moist Limestone Talus Type							
TPO1-1	CEGL002210	Dry Tallgrass Prairie Type			X		3		1
TPO2-1	CEGL005096	Moist - Fresh Tallgrass Prairie Type							
TPS1-1	CEGL002492	Dry Black Oak Tallgrass Savannah Type			X				
TPS1-2	CEGL005129	Dry Black Oak-Pine Tallgrass Savannah Type			X				
TPS2-1	CEON000155	Moist - Fresh Pin Oak - Bur Oak Tallgrass Savannah Type							
TPW1-1	CEGL005029	Dry Black Oak - White Oak Tallgrass Woodland Type			5		1		
TPW1-2	CEON000230	Dry Bur Oak - Shagbark Hickory Tallgrass Woodland Type							
TPW2-1	CEON000156	Moist - Fresh Black Oak - White Oak Tallgrass Woodland Type							
TPW2-2	CEON000158	Moist - Fresh Pin Oak Tallgrass Woodland Type							
	CEON000322	Black Spruce - Tamarack - Leatherleaf Patterned Fen Type							

APPENDIX N

Lists of Vascular Plant Indicators of Alvar, Tall Grass Prairie, Savannah and Carolinian Forests Habitats in Southern Ontario

The communities listed in this appendix are considered rare in Ontario. The tables in this appendix list those plants that are considered to be true indicators of these rare habitat types and can be used to identify the existence of the community, or in some cases, remnants of these communities.

Table N-1 List of vascular plant indicative of Alvar habitats in southern Ontario

Species – Scientific Name	Common Name	Site 6	Site 7	Notes
<i>Allium cernuum</i>	Nodding Wild Onion		X	
<i>Allium schoenoprasum</i>	Wild Chives	X		
<i>Astragalus neglectus</i>	Cooper's Milk-vetch	X		
<i>Blephilia ciliata</i>	Downy Wood Mint		X	
<i>Bouteloua curtipendula</i>	Side Oats Grama	X		
<i>Carex crawei</i>	Crawe's Sedge	X	X	
<i>Carex juniperorum</i>	Juniper Sedge	X		
<i>Carex richardsonii</i>	Richardson's Sedge	X		
<i>Carex seirpoidea</i>	Bulrush Sedge	X		
<i>Cirsium hillii</i>	Hill's Thistle	X		
<i>Coreopsis lanceolata</i>	Coreopsis	X		
<i>Deschampsia caespitose</i>	Tufted Hair Grass	X		
<i>Eleocharis compressa</i>	Flattened Spike-rush	X	X	
<i>Euphorbia commutata</i>	Tinted Spurge	X		
<i>Geranium carolinianum</i>	Carolina Cranesbill	X	X	
<i>Geum triflorum</i>	Prairie Smoke	X		
<i>Hymenoxys herbacea</i>	Lakeside Daisy	X	X	
<i>Myosurus minimus</i>	Mousetail	X		
<i>Myosotis verna</i>	Vernal Forget-me-not	X	X	
<i>Panicum flexile</i>	Panic-grass	X	X	
<i>Panicum philadelphicum</i>	Panic-grass	X	X	
<i>Piperia unalascensis</i>	Alaskan Orchid	X		
<i>Poa alpina</i>	Alpine Bluegrass	X		
<i>Polygana senega</i>	Seneca-snakeroot	X	X	
<i>Ranunculus fascicularis</i>	Early Buttercup	X	X	
<i>Scutellaria parvula</i>	Small Skullcap	X	X	
<i>Solidago houghtonii</i>	Houghton's Goldenrod	X		
<i>Solidago ptarmicoides</i>	Upland Goldenrod	X		
<i>Sporobolus heterolepis</i>	Northern Dropseed	X		
<i>Trichostema brachiatum</i>	False Pennyroyal	X	X	
<i>Valerianella umbilicata</i>	Corn-salad		X	
<i>Verena simplex</i>	Simple Vervain	X	X	

Table N-2. List of vascular plant indicative of Tall Grass Prairie and Savannah habitats in southern Ontario

Species – Scientific Name	Common Name	Site 6	Site 7	Notes
<i>Agalinis gattingeri</i>	Gattinger's Agalinis		X	
<i>Agalinis skinneriana</i>	Skinner's Agalinis		X	
<i>Aletris farinosa</i>	Colicroot		X	
<i>Aristida purpurascens</i>	Arrow-feather Three-awn		X	
<i>Asclepias hirtella</i>	Prairie Milkweed		X	
<i>Asclepias verticillata</i>	Whorled Milkweed		X	
<i>Aster prealtus</i> var. <i>prealtus</i>	Willow Aster		X	
<i>Baptisia tinctoria</i>	Wild Indigo		X	
<i>Bouteloua curtipendula</i> var. <i>curtipendula</i>	Side-oats Gramma	X	X	
<i>Buchnera americana</i>	Blue-hearts		X	
<i>Carex bicknellii</i> var. <i>bicknellii</i>	Bicknell's Sedge		X	
<i>Carex inops</i> ssp. <i>heliophila</i>	Sun Sedge		X	
<i>Carex meadii</i>	Mead's Sedge		X	
<i>Carex mesochorea</i>	Midland Sedge		X	
<i>Carex suberecta</i>	Prairie Straw Sedge		X	
<i>Celtis tenuifolia</i>	Dwarf Hackberry	X	X	
<i>Coreopsis tripteris</i>	Tall Tickseed		X	
<i>Cuscuta coryli</i>	Hazel Dodder		X	
<i>Dalea purpurea</i>	Purple Prairie Clover			Extirpated
<i>Desmodium illinoense</i>	Illinois Tick-trefoil	X	X	Extirpated
<i>Desmodium marilandicum</i>	Smooth Small-leaved Tick-trefoil	X	X	Extirpated
<i>Desmodium sessilifolium</i>	Sessile-leaved Tick-trefoil		X	
<i>Fimbristylis puberula</i> var. <i>puberula</i>	Hairy Fimbristylis		X	
<i>Gentiana alba</i>	White Prairie Gentian	X	X	
<i>Hypericum gentianoides</i>	Orange-grass		X	
<i>Juncus biflorus</i>	Two-flowered Rush		X	
<i>Juncus brachycarpus</i>	Short-fruited Rush		X	
<i>Krigia biflora</i>	Orange dwarf			
<i>Lechea intermedia</i>	Dandelion		X	
<i>Lechea pulchella</i>	Leggett's Pinweed		X	
<i>Lespedeza virginica</i>	Slender Bush Clover		X	
<i>Liatris aspera</i>			X	
<i>Liatris spicata</i>	Dense Blazing Star		X	
<i>Panicum leibergii</i>	Leiber's Panic Grass		X	
<i>Panicum praecocius</i>	Hairy Panic Grass	X	X	
<i>Panicum rigidulum</i> var. <i>rigidulum</i>	Ridged Panic Grass	X	X	
<i>Polygala cruciata</i>	Cross-leaved Milkwort		X	
<i>Polygala incarnata</i>	Pink Milkwort		X	
<i>Pycnanthemum incanum</i> var. <i>incanum</i>	Hoary Mountain Mint		X	
<i>Pycnanthemum pilosum</i>	Whorled Mountain Mint		X	
<i>Quercus prinoides</i>	Dwarf Chinquapin Oak		X	
<i>Scleria pauciflora</i>	Papilose Nut-rush		X	
<i>Scleria triglomerata</i>	Tall Nut-rush		X	
<i>Silphium terebinthinaccum</i>	Prairie Dock		X	
<i>Solidago speciosa</i> var. <i>rigidiuscula</i>	Showy Goldenrod		X	
<i>Sphenopholis obtusata</i>	Early Bunch Grass		X	
<i>Spiranthes ovalis</i> var. <i>erostellata</i>	Small-flowered Ladie's Tresses		X	
<i>Tradescantia ohioensis</i>	Ohio Spiderwort		X	
<i>Viola pedata</i>	Bird's-foot Violet		X	

Table N-3. List of species indicative of Carolinian forest habitats

The following species are largely restricted to forests, woodlands and forest edges of the Carolinian Forest Region of Ontario (Hill's Site Region 7E). Carolinian species found only in more open habitats, such as alvars and prairies, are listed in Tables N-1 and N-2. Many of the species listed here are rare in Ontario and so are also listed, together with additional detail on habitat and distribution, in Appendix G. Species which are known to occur at fewer than five localities in Ontario (i.e. S-1) have generally not been included in this table. Several of the species listed are quite widespread or common in portions of the adjacent Site Region 6E but have been included due to their abundance in forests of the Carolinian region of the province.

Species - Scientific Name	Common Name	Site 6	Site 7	Notes
Trees				
<i>Acer nigrum</i>	Black Maple	X	X	
<i>Carya laciniosa</i>	Big Shellbark Hickory		X	
<i>Carya ovalis</i>	Sweet Pignut Hickory		X	(C. glabra)
<i>Carya ovata</i>	Shagbark Hickory	X	X	
<i>Castanea dentata</i>	American Chestnut		X	Threatened in Canada
<i>Celtis occidentalis</i>	Hackberry	X	X	
<i>Cercis canadensis</i>	Redbud		X	Mostly planted in Ontario
<i>Crataegus spp.</i>	Hawthorn		X	Several species, most are rare
<i>Fraxinus quadrangulata</i>	Blue Ash		X	Floodplains, threatened in Canada
<i>Gleditsia triacanthos</i>	Honey Locust		X	Widely planted elsewhere
<i>Gymnocladus dioica</i>	Kentucky Coffee Tree		X	Threatened in Canada
<i>Juglans nigra</i>	Black Walnut	X	X	Most occurrences outside 7E are planted
<i>Liriodendron tulipifera</i>	Tulip Tree		X	Planted beyond natural range
<i>Magnolia acuminata</i>	Cucumber Tree		X	Endangered (in the wild) in Canada, often planted
<i>Morus rubra</i>	Red Mulberry		X	Endangered in Canada, hybridizes with M. alba
<i>Nyssa sylvatica</i>	Black Gum		X	
<i>Platanus occidentalis</i>	Plane Tree, Sycamore	X	X	Frequently planted beyond natural range
<i>Ptelea trifoliata</i>	Hoptree		X	Thickets, open woods, vulnerable in Canada
<i>Quercus bicolor</i>	Swamp White Oak	X	X	
<i>Quercus muhlenbergii</i>	Chinquapin Oak	X	X	
<i>Quercus palustris</i>	Pin Oak		X	Wet forests
<i>Quercus shumardii</i>	Shumard Oak		X	Vulnerable in Canada
<i>Quercus velutina</i>	Black Oak	X	X	Woodlands and savannahs
<i>Salix nigra</i>	Black Willow	X	X	
Shrubs and Woody Vines				
<i>Asimina triloba</i>	Pawpaw		X	Edges
<i>Campsis radicans</i>	Trumpet Creeper		X	Edges
<i>Celtis tenuifolia</i>	Dwarf Hackberry	X	X	Woodlands, vulnerable in Canada
<i>Cornus drummondii</i>	Rough-leaved Dogwood		X	Edges
<i>Cornus florida</i>	Flowering Dogwood		X	Now very rare
<i>Corylus americana</i>	American Hazel	X	X	Edge species
<i>Crataegus crus-galli</i>	Cockspur Hawthorn		X	Edges, thickets
<i>Euonymus atropurpurea</i>	Burning Bush		X	
<i>Euonymus obovatus</i>	Running Strawberry Bush	X	X	
<i>Hamamelis virginiana</i>	Witch-hazel	X	X	
<i>Hypericum prolificum</i>	Shrubby St. John's-wort		X	Open sandy woods, rare
<i>Lindera benzoin</i>	Spicebush	X	X	
<i>Malus coronaria</i>	Wild Crabapple		X	Edges, thickets
<i>Prunus americana</i>	Wild plum		X	Thickets, edges, planted north of natural range
<i>Quercus prinoides</i>	Dwarf Chinquapin Oak		X	Woodlands, also open dunes
<i>Rhus vernix</i>	Poison Sumach	X	X	Swamps
<i>Rosa carolina</i>	Pasture Rose		X	Edges, thickets
<i>Rosa setigera</i>	Prairie Rose	X	X	Open woods, edges, thickets; vulnerable in Canada
<i>Sassafras albidum</i>	Sassafras		X	
<i>Smilax rotundifolia</i>	Round-leaved Greenbrier		X	Threatened in Canada
<i>Staphylea trifoliata</i>	Bladdernut	X	X	
<i>Vaccinium corymbosum</i>	High-bush Blueberry	X	X	Low, acid woods
<i>Vaccinium pallidum</i>	Dryland Blueberry	X	X	Dry acid woods

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<i>Viburnum recognitum</i>	Southern Arrowwood	X	X	Swampy woods
<i>Vitis aestivalis</i>	Summer Grape		X	Thickets, open woods
<i>Vitis labrusca</i>	Fox Grape		X	Woods, thickets, rare
Non-woody Vascular Plants				
<i>Agrimonia parviflora</i>	Swamp Agrimony		X	Damp woods but mostly open areas
<i>Aletris farinosa</i>	Colic Root		X	Woods, thickets and openings, threatened in Canada
<i>Allium cernuum</i>	Nodding Onion		X	Dry woods, prairies
<i>Anemonella thalictroides</i>	Rue-anemone	X	X	
<i>Aplectrum hyemale</i>	Putty-root	X	X	
<i>Arisaema dracontium</i>	Green Dragon		X	Floodplains, vulnerable in Canada
<i>Asclepias exaltata</i>	Poke Milkweed		X	
<i>Asclepias verticillata</i>	Whorled Milkweed	X	X	Open sandy woods
<i>Aster prenanthoides</i>	Crooked-stem Aster		X	Vulnerable in Canada
<i>Aster schreberi</i>	Schreber's Aster		X	
<i>Aster shortii</i>	Short's Aster		X	
<i>Aureolaria pedicularia</i>	Fern-leaved False Foxglove		X	Oak woodlands
<i>Baptisia tinctoria</i>	Yellow Wild Indigo		X	Open woods and prairies
<i>Camassia scilloides</i>	Wild Hyacinth		X	Meadows and open woods, vulnerable in Canada
<i>Campanula americana</i>	Tall Bellflower		X	Moist woods and thickets
<i>Carex careyana</i>	Carey's Wood Sedge		X	
<i>Carex davisii</i>	Awed Graceful Sedge		X	Low woods
<i>Carex gracilescens</i>	Slender Wood Sedge		X	
<i>Carex grayii</i>	Gray's Sedge	X	X	Low woods
<i>Carex hirsutella</i>	Hairy Green Sedge		X	
<i>Carex jamesii</i>	Grass Sedge		X	
<i>Carex muskingumensis</i>	Swamp Oval Sedge		X	Wet hardwood forests
<i>Carex seorsa</i>	sedge		X	Wet woods
<i>Carex squarrosa</i>	Narrow-leaved Cattail Sedge		X	Floodplain hardwoods forests
<i>Carex swanii</i>	Downy Green Sedge		X	Edges and forest openings
<i>Carex virescens</i>	Slender Green Sedge		X	Sandy, open woods
<i>Chaerophyllum procumbens</i>	Spreading Chervil		X	Low woods, edges
<i>Chenopodium standleyanum</i>	Woodland Goosefoot		X	
<i>Cimicifuga racemosa</i>	Black Cohosh		X	
<i>Collinsonia canadensis</i>	Horse-balm		X	
<i>Conioselinum chinense</i>	Hemlock-parsley		X	Swampy woods
<i>Corallorhiza odontorhiza</i>	Autumn Coral-root		X	Pine and pine-oak woods
<i>Corydalis flavula</i>	Yellow Corydalis		X	Sand or rocky woods
<i>Cystopteris protrusa</i>	Lowland Brittle Fern		X	
<i>Desmodium canescens</i>	Hairy Tick-trefoil		X	
<i>Desmodium cuspidatum</i>	Bracted Tick-trefoil	X	X	
<i>Desmodium paniculatum</i>	Tick-trefoil		X	
<i>Desmodium rotundifolium</i>	Round-leaved Tick-trefoil	X	X	
<i>Discorea villosa</i>	Wild Yam		X	
<i>Disporum lanuginosum</i>	Yellow Mandarin		X	
<i>Eriogenia bulbosa</i>	Harbinger-of-spring		X	Low woods
<i>Erythronium albidum</i>	White Trout-lily	X	X	
<i>Eupatorium purpureum</i>	Purple-jointed Joe Pye Weed		X	Rocky woods
<i>Floerkea proserpinacoides</i>	False Mermaid	X	X	Wet woods
<i>Frasera carolinensis</i>	American Columbo		X	Vulnerable in Canada
<i>Galium pilosum</i>	Hairy Bedstraw		X	
<i>Geum vernum</i>	Spring Avens		X	Low woods and floodplains
<i>Geranium maculatum</i>	Spotted Geranium	X	X	
<i>Heuchera americana</i>	Alum-root		X	
<i>Heuchera richardsonii</i>	Richardson's Heuchera		X	Woodlands and open sites
<i>Hibiscus moscheutos</i>	Swamp Rose Mallow	X	X	Swamps and marshes, vulnerable in Canada
<i>Hieraceum paniculatum</i>	Panicled Hawkweed	X	X	
<i>Hybanthus concolor</i>	Green Violet	X	X	
<i>Hydrastis canadensis</i>	Golden Seal	X	X	Threatened in Canada, occasionally planted
<i>Hydrophyllum appendiculatum</i>	Appendaged Waterleaf		X	
<i>Isopyrum biternatum</i>	False Rue-anemone		X	Vulnerable in Canada
<i>Jeffersonia diphylla</i>	Twinleaf	X	X	
<i>Krigia biflora</i>	Two-flowered Cynthia		X	Woodlands and open areas
<i>Lactuca floridana</i>	Woodland Blue Lettuce		X	
<i>Leersia virginica</i>	Virginia Cutgrass	X	X	

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<i>Lespedeza hirta</i>	Hairy Bush-clover	X	X	Dry woods and openings
<i>Lespedeza intermedia</i>	Intermediate Bush-clover	X	X	Dry woods and openings
<i>Linum virginianum</i>	Slender Yellow Flax		X	Dry open woods and edges
<i>Liparis liliifolia</i>	Purple Twayblade	X	X	Sandy woods and thickets; endangered in Canada
<i>Lithospermum latifolium</i>	Broad-leaved Puccoon		X	Low woods and edges
<i>Lupinus perennis</i>	Wild Lupine		X	Open woods and prairies, also planted
<i>Lycopus rubellus</i>	Stalked Water Horehound		X	Wet forests and thickets
<i>Menispermum canadense</i>	Moonseed	X	X	
<i>Mertensia virginica</i>	Bluebells		X	Wet woods and thickets
<i>Mimulus alatus</i>	Winged Monkey Flower		X	
<i>Oxytropis rigidor</i>	Stiff Cowbane		X	Swamps and low woods
<i>Panicum clandestinum</i>	Broadleaf Panic-grass		X	
<i>Panicum dichotomum</i>	Forked Panic-grass	X	X	
<i>Peltandra virginica</i>	Arrow Arum	X	X	Swamps, also marshes
<i>Phlox divaricata</i>	Blue Phlox	X	X	
<i>Phytolaca americana</i>	Pokeweed	X	X	Open forests and edges
<i>Polygonatum biflorum</i>	Hairy Solomon's-seal		X	
<i>Polygonum virginianum</i>	Virginia Knotweed		X	Swamps and wet woods
<i>Polymnia canadensis</i>	Small-flowered Leafcup	X	X	
<i>Sanicula canadensis</i>	Canadian Snakeroot		X	
<i>Smilax ecirrata</i>	Upright Carrion-flower		X	
<i>Smilax illinoensis</i>	Illinois Carrion-flower		X	
<i>Smilax lasioneura</i>	Hairy-nerved Carrion-flower		X	
<i>Solidago patula</i>	Rough-leaved Goldenrod	X	X	
<i>Taenidia integerrima</i>	Yellow Pimpernel	X	X	Sandy or rocky woodlands
<i>Thalictrum revolutum</i>	Waxy Meadow-rue		X	Wet woods and edges
<i>Thaspium trifoliatum</i>	Meadow Parsnip		X	
<i>Tradescantia ohioensis</i>	Ohio Spiderwort		X	Moist open woodlands
<i>Uvularia perfoliata</i>	Perfoliate Bellwort		X	
<i>Uvularia sessilifolia</i>	Sessile-leaved Bellwort	X	X	
<i>Verbesina alternifolia</i>	Wingstem		X	Low woods and shore thickets
<i>Veronia gigantea</i>	Ironweed		X	Floodplain woods and open areas
<i>Veronicastrum virginicum</i>	Culver's-root		X	Open woods and prairies
<i>Vicia caroliniana</i>	Wood Vetch		X	Dry woods and prairies
<i>Viola palmata</i>	Palmate Violet		X	(Incl. var. dilatata)
<i>Viola striata</i>	Cream Violet		X	
Birds				
<i>Caprimulgus carolinensis</i>	Chuck-Will's-Widow		X	
<i>Epidonax virescens</i>	Acadian Flycatcher		X	Endangered in Canada
<i>Icteria virens</i>	Yellow-breasted Chat		X	Vulnerable in Canada
<i>Icterus spurius</i>	Orchard Oriole	X	X	Range is expanding northward
<i>Oporornis formosus</i>	Kentucky Warbler		X	
<i>Parus bicolor</i>	Tufted Titmouse	X	X	
<i>Protonotaria citrea</i>	Prothonotary Warbler		X	Endangered in Canada
<i>Seiurus motacilla</i>	Louisiana Waterthrush	X	X	Vulnerable in Canada
<i>Thryothorus ludovicianus</i>	Carolina Wren		X	
<i>Vireo griseus</i>	White-eyed Vireo	X	X	
<i>Wilsonia citrina</i>	Hooded Warbler		X	Vulnerable in Canada
Mammals				
<i>Didelphis virginiana</i>	Virginia Opossum	X	X	Sporadic more northerly occurrences
<i>Glaucomys volans</i>	Southern Flying Squirrel	X	X	Vulnerable in Canada, also in Site Region 5E
<i>Pitymys pinetorum</i>	Woodland Vole		X	Vulnerable in Canada (also known as Pine Vole)
<i>Scalopus aquaticus</i>	Eastern Mole		X	Vulnerable in Canada
<i>Taxidea taxus</i>	Badger	?	X	Vulnerable in Ontario, also in Site Region 5S

Appendix O

Finding and Identifying Hawk Nests

The underlying assumption is that undertaking this task is worthwhile because by finding and then trying to protect the breeding habitat of wildlife such as hawks that require relatively large areas to survive, other wildlife that depend on the same general habitat (e.g., area-sensitive birds, mammals, and herptiles) can also benefit from such protection efforts.

The following guidelines are intended to help anyone trying to find and identify hawk nests and nesting habitat.

- Familiarize yourself with the birds and their nesting habitat requirements by reading about their natural history and biology and by consulting bird guides. Excellent sources include:
- Peck, G.K. and R.D. James. 1983. *Breeding birds of Ontario. Nidology and distribution. Volume 1: Nonpasserines*. Royal Ontario Life Sciences Miscellaneous Publication.
- Headstrom, R. 1961. *Birds' nests: a field guide*. Ives Washburn Inc.
- Szuba, K. and B. Naylor. 1998. *Forest Raptors and their nests in central Ontario. A guide to stick nests and their users*. Southcentral Section Field Guide FG-03, OMNR, North Bay. 75 p.
- Hawks will sometimes build or repair more than one nest within their nesting territory, but will only use one of them in any given year. This is particularly true for Red-shouldered Hawks and Northern Goshawks. Such nests are usually with 200m of each other.
- Signs of active nests include: down feathers stuck to the nest twigs and sticks, molted feathers near or under the nest tree, freshly broken ends on twigs used to build the nest. Northern Goshawks, Red-tailed Hawks, and Red-shouldered Hawks decorate their active nests with vegetation, often sprigs of conifer foliage, especially hemlock. Little decoration is usually seen on Cooper's, Sharp-shinned, and Broad-winged hawk nests. Active nests may also show some whitewash on the foliage of the nest tree and nearby trees and shrubs. Accumulations of feathers; regurgitated pellets of bits of bone, fur and/or feathers; as well as prey remains may also be found near the nest.
- Frequently the tail of the hawk (usually one of the accipiters) projects over the nest edge and is all that is visible to the observer on the ground.
- Use tape-recorded calls sparingly and watch for silent hawks (usually accipiters). Red-shouldered Hawks will call almost incessantly as they approach a tape-recorded call. Try to follow or retrace the flight path of hawks if they come to the tape.
- In March and April, investigate any calls just before dawn, that sound like pileated woodpeckers. They may be a pair of courting accipiters.
- Investigate what crows are mobbing (strong, incessant "cawing" by numerous birds). It could be an owl or one of these hawks.

If nests are found that appear active but no hawk is present, suspect a Cooper's Hawk nest. Sit hidden and quietly and use the back of your hand or predator call to produce a squeaking sound. These hawks may respond by flying into view long enough for an identification to be made.

Nests¹

Sharp-shinned Hawk nests are usually well-hidden high in the foliage of conifer trees, especially spruce, in young to medium age forests. Dense groves of spruce are the preferred habitat.

Cooper's Hawk prefer to nest in deciduous trees (mainly beech and maple), but will also nest in the lower crown of white and red pines and hemlock. They often build their nests in pine plantations that are 30 years and older which are adjacent to mature deciduous forest. They may resemble crow nests, but will not have grass in the nest as do crow nests. These hawks are shy and will usually slip off the nest unnoticed.

Northern Goshawks are most commonly found in large, dense stands of mature or old growth forests, and will also use older pine plantations. They nest in both deciduous and coniferous trees. In conifers, the nest is close to the trunk and made of longer, thicker sticks than a Cooper's Hawk nest. Most nests are in conifers (red, white or jack pine), poplar, and yellow birch. Nests are often close to a clearing that provides a natural flight path nearby (an old creek bed, woodland road, break in the canopy). This species is very aggressive and likely to attack humans that are in the vicinity of the nest.

Broad-winged Hawk nests are usually found in dense forest and appear loose, and poorly built. They prefer to nest in yellow and white birch in denser, younger forests. They rarely nest in beech trees, and occasionally nest in pine plantations. They may decorate their nests with sprigs of green deciduous leaves.

Red-shouldered Hawks primarily in beech trees, followed by maple trees. Nest trees are usually large and tall. Their preferred nesting habitat appears to be mature, closed-canopy stands of maple-beech, with few saplings in the understory. The canopy often looks like an umbrella over the nest. This hawk shows the strongest preference for nesting near (equal or less than 250 m) water, especially small woodland ponds and creeks. This hawk now appears to nest mainly in large forest tracts of 200 ha or more, especially in areas where there are many Red-tailed Hawks. This hawk shows strong site fidelity (20 years or more) and is strongly territorial and very vocal during the breeding season.

Red-tailed Hawks build large nests high in a variety of trees and often reuse the same nest. They also decorate their nests, usually with fresh conifer foliage. Nests of this hawk are usually found near forest edges; in small, isolated woodlots; and in fence rows. They may also nest on hydro towers. They readily respond to recorded calls of Red-shouldered Hawks.

Merlins prefer to nest in old crow nests built near the top of spruce trees. They often nest near lake shores. They are very protective of the nest and will fly 500 m or more to harrass other birds.

¹ Hawk nests are not made of leaves—these are squirrel dreys