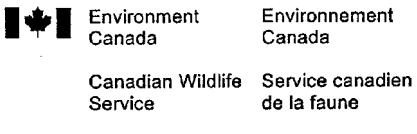
Conservation Priorities for the Birds of Southern Ontario

A cooperative project of:



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EXECUTIVE SUMMARY

Municipalities and planning authorities in Ontario are faced with the formidable task of coordinating development activities without impairing the values and functions of natural heritage features, including those associated with significant wildlife habitat and significant woodlands. The approach described in this report aims to help planning authorities set priorities for conservation efforts by targeting bird species (and their associated habitats) that are significant within their region. Specifically, this report advocates the use of prioritised lists of birds as tools that planning authorities might use when developing Official Plans (e.g., identifying significant wildlife habitat, Environmentally Sensitive Areas, etc.) and when evaluating development proposals.

To this end, this report provides a list of priority birds breeding within your municipality. An additional list of priority species for the Niagara Escarpment Plan Area is provided for upper tier municipalities containing lands within the Escarpment region (Bruce, Grey, Simcoe, Dufferin, Peel, Halton, Hamilton-Wentworth, and Niagara). Three distinct approaches have been used in establishing conservation priorities at the municipal level: *Jurisdictional Responsibility* is based on breeding distribution information and reflects the importance of a particular region to each bird species relative to its breeding distribution; *Preservation Responsibility* uses information on each species' abundance, population trend and sensitivity to identify the most vulnerable species at the provincial level; *Area Sensitivity* relates to the habitat-area requirements of a species. Each species breeding within each southern Ontario municipality is assigned a score for each of the three components. A species is added to the municipal priority list if it scores highly on at least one of the three individual components. A composite score is derived by summing the three individual scores and is used to rank species by conservation priority for planning purposes at the local level. The report describes how such lists might be used by municipal planners to fulfill obligations under the *Planning Act*, and in doing so, conserve biological diversity in Ontario.

Suggested bibliographic citation:

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How to use this report

This report serves as a planning tool for the conservation of biodiversity in southern Ontario, and is of particular use at the municipal level. The report is divided into two primary sections:

Part I will be of immediate use to anyone making decisions concerning land management and conservation planning at the local level. Here, the conceptual basis and logic of the prioritization approach are described, and a list of priority species is provided for your municipality. This is all you need to get started.

NB: The digital (PDF) version of this report does not contain lists of species for individual municipalities. If your copy of the report is missing this information, you can obtain it at the following address: http://www.bsc-eoc.org/conservation/conservmain.html

To start using the list of priority species for your municipality right away, first review the section entitled "How to interpret the list of priority species," then go directly to the list.

Part II is more technical in nature and provides a thorough description of the methodology, along with detailed tables and maps. This complementary information may be of interest to those who wish to understand the "nuts and bolts" of the approach.

Update and Contact Information:

As the project evolves, updates to priority lists for upper tier municipalities will be posted on Bird Studies Canada's web site (www.bsc-eoc.org) Upper tier municipalities are encouraged to distribute the report to their constituent lower tier municipalities or to direct appropriate personnel to the web site for downloading a digital version of the report.

Please direct any questions regarding this report to:

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INTRODUCTION

Background and Rationale

The landscapes of southern Ontario[1] consist of a varied mixture of land uses and cover types, including agriculture, urban, resource extraction, and wildlife habitat (forest, wetland, grassland). Southern Ontario is the most heavily populated and industrialized region in Canada. Forest cover in many counties in the region currently comprises a fraction of its extent prior to European settlement (Riley and Mohr, 1994). The current abundance of broad habitat types in southern Ontario is shown in Table 1. Other studies have shown that grasslands (Bakowsky, 1996) and wetlands (Snell, 1986) have also been extensively converted to other uses throughout the region. Animal and plant communities that rely on the availability of these habitat types for their survival have certainly been affected by these broad scale changes, some for the better, but most for the worse.

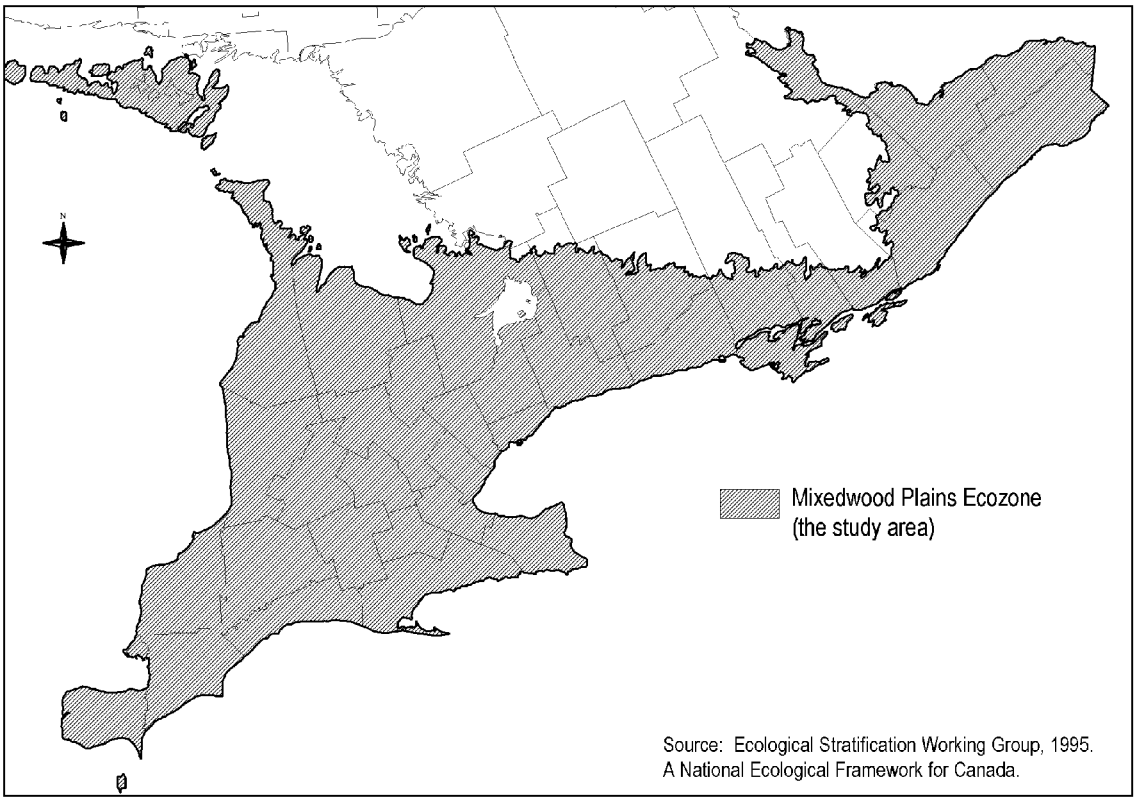

Figure 1. The Mixedwood Plains Ecozone study area.

In southern Ontario, land use planning is a local level activity, carried out by upper and lower tier municipalities, and other bodies such as the Niagara Escarpment Commission. Responsibility for land use planning is conferred upon these planning authorities by the

[1]In this report, southern Ontario is defined by the Mixedwood Plains ecozone (Ecological Stratification Working Group, 1995; Figure 1), which approximates the area of Ontario south and east of the Canadian Shield. While this ecozone is part of a national scale land classification system, its boundaries represent a close match to site regions 6E/7E in the OMNR ecological land classification system, a system with which some readers may be more familiar.

Government of Ontario via the *Planning Act*. Essentially, the province sets out planning policy, regulations and guidelines that are implemented by local planning authorities.

Table 1. Broad habitat types within southern Ontario upper tier municipalities.

Municipality	**Upland Forest (A)**		**Lowland Forest (B)**		**Total Forest (A + B)**		**Marsh (C)**		**Total Wetland (B + C)**		**Grassland & Pasture**	
	km^2	% of region	km^2	% of region	km^2	% of region	km^2	% of region	km^2	% of region	km^2	% of region
BRANT	185.9	16.6	11.0	1.0	196.9	17.6	0.0	0.0	11.0	1.0	70.9	6.3
BRUCE	1303.0	30.8	164.3	3.9	1467.2	34.6	48.8	1.2	213.0	5.0	315.8	7.5
DUFFERIN	314.5	21.0	25.0	1.7	339.5	22.7	0.7	0.0	25.7	1.7	225.9	15.1
DURHAM	565.6	22.3	78.4	3.1	644.0	25.4	8.2	0.3	86.6	3.4	332.4	13.1
ELGIN	289.6	15.3	3.2	0.2	292.8	15.5	0.0	0.0	3.2	0.2	20.4	1.1
ESSEX	48.9	2.7	6.0	0.3	54.9	3.1	6.0	0.3	12.0	0.7	35.1	2.0
FRONTENAC	220.8	25.1	22.0	2.5	242.9	27.6	7.2	0.8	29.2	3.3	161.4	18.3
GREY	1410.8	31.5	123.8	2.8	1534.6	34.3	16.3	0.4	140.1	3.1	627.4	14.0
HALDIMAND-NORFOLK	581.8	19.3	18.2	0.6	600.1	19.9	34.4	1.1	52.7	1.8	122.9	4.1
HALTON	197.7	20.6	13.0	1.4	210.7	21.9	0.5	0.0	13.5	1.4	115.0	12.0
HAMILTON-WENT.	147.4	12.9	28.8	2.5	176.2	15.4	0.0	0.0	28.8	2.5	99.4	8.7
HASTINGS	595.7	30.3	220.1	11.2	815.8	41.6	7.0	0.4	227.1	11.6	263.1	13.4
HURON	478.3	14.0	26.7	0.8	505.0	14.8	1.9	0.1	28.6	0.8	61.4	1.8
KENT	96.8	3.8	5.6	0.2	102.4	4.0	11.5	0.5	17.1	0.7	27.6	1.1
LAMBTON	334.1	11.1	3.5	0.1	337.6	11.2	45.5	1.5	49.0	1.6	39.2	1.3
LANARK*	418.9	31.0	169.2	12.5	588.1	43.5	11.8	0.9	181.1	13.4	277.1	20.5
LEEDS & GRENVILLE*	1294.0	39.1	305.4	9.2	1599.4	48.3	30.4	0.9	335.8	10.2	613.7	18.5
LENNOX & ADDINGTON*	288.9	24.1	68.0	5.7	356.9	29.8	9.3	0.8	77.3	6.4	221.4	18.5
MANITOULIN	800.7	29.7	0.0	0.0	800.7	29.7	0.0	0.0	0.0	0.0	0.0	0.0
METRO. TORONTO	21.8	3.4	3.2	0.5	25.0	3.9	0.0	0.0	3.2	0.5	10.2	1.6
MIDDLESEX	422.3	12.8	10.2	0.3	432.5	13.1	0.1	0.0	10.3	0.3	53.3	1.6
NIAGARA	329.8	18.0	16.1	0.9	345.9	18.9	0.1	0.0	16.2	0.9	201.4	11.0
NORTHUMBERLAND	535.5	24.4	142.7	6.5	678.2	30.9	12.5	0.6	155.2	7.1	299.2	13.6
OTTAWA-CARLETON	783.5	28.1	142.2	5.1	925.7	33.2	16.3	0.6	158.4	5.7	499.6	17.9
OXFORD	217.2	10.9	21.6	1.1	238.8	12.0	0.1	0.0	21.6	1.1	11.9	0.6
PEEL	162.7	13.1	6.4	0.5	169.0	13.6	0.1	0.0	6.4	0.5	158.4	12.8
PERTH	159.5	7.3	13.0	0.6	172.4	7.9	0.5	0.0	13.5	0.6	25.7	1.2
PETERBOROUGH	768.7	32.4	235.1	9.9	1003.8	42.3	7.2	0.3	242.3	10.2	328.6	13.8
PRESCOTT & RUSSELL	527.6	26.1	67.6	3.3	595.3	29.4	3.2	0.2	70.8	3.5	492.9	24.4
PRINCE EDWARD	154.9	14.4	97.7	9.1	252.6	23.5	29.9	2.8	127.6	11.9	168.5	15.6
RENFREW*	394.2	29.3	30.1	2.2	424.3	31.5	5.0	0.4	35.1	2.6	367.4	27.3
SIMCOE	1380.6	29.7	121.4	2.6	1502.0	32.3	24.7	0.5	146.1	3.1	463.1	10.0
STORMONT DUNDAS & GLENGARRY	1017.3	30.4	195.2	5.8	1212.5	36.3	2.5	0.1	197.6	5.9	668.3	20.0
VICTORIA	811.6	30.4	152.6	5.7	964.2	36.1	13.8	0.5	166.4	6.2	406.4	15.2
WATERLOO	157.5	11.3	13.3	1.0	170.8	12.3	0.4	0.0	13.7	1.0	38.2	2.7
WELLINGTON	423.6	15.7	40.4	1.5	464.0	17.2	3.1	0.1	43.6	1.6	231.5	8.6
YORK	310.6	17.4	41.2	2.3	351.8	19.7	7.6	0.4	48.9	2.7	167.0	9.3
TOTALS FOR SOUTHERN ONTARIO	18152	22.0	2642	3.2	20794	25.2	366	0.4	3008	3.6	8222	10.0

Note: Habitat coverage is derived from provincial Landsat imagery (circa early 1990s), courtesy of the Ontario Ministry of Natural Resources; * habitat area relates to portion of the municipality within the study area. Figures do not sum to 100% as other land cover types (e.g., water, urban, intensive agriculture) were not included. As well, coastal wetlands are under-represented by the GIS methodology.

Section 3 of the *Planning Act* allows the province to "provide policy direction on matters of provincial interest related to land use planning and development" and stipulates that all planning authorities (municipal governments, Conservation Authorities, etc.) "shall have regard to" policy statements issued under the Act. The Provincial Policy Statement (Government of Ontario, 1996) represents the latest evolution of provincial policy and is guided by the notion that Ontario's economic, environmental and social well-being are governed by the following principles:

1. managing change and promoting efficient, cost-effective development and land use patterns which stimulate economic growth and protect the environment and public health;
2. protecting resources for their economic use and/or environmental benefits; and
3. reducing the potential for public cost or risk to Ontario's residents by directing development away from areas where there is a risk to public health or safety or of property damage.

-Provincial Policy Statement (Government of Ontario, 1996:1)

Specific rules regarding the protection of Natural Heritage are provided in section 2.3 of the Provincial Policy Statement (PPS). For example, the policy broadly states that "natural heritage features and areas will be protected from incompatible development." Specifically, the policy states that "development and site alteration will neither be permitted in significant wetlands south and east of the Canadian Shield nor in significant portions of the habitat of endangered and threatened species." The policy indicates that development and site alteration may be permitted in the following areas, provided that there will be no negative impacts on the natural features or the ecological functions for which the area is identified:

- fish habitat;
- significant wetlands in the Canadian Shield;
- significant woodlands south and east of the Canadian Shield;
- significant valleylands south and east of the Canadian Shield;
- significant wildlife habitat; and
- significant areas of natural and scientific interest

Development and site alteration may be permitted on lands adjacent to any of the features mentioned above, provided that there will be no negative impacts on the natural features or the ecological functions for which the area is identified. There is also a provision to maintain or enhance the diversity of natural features in an area.

One of the difficulties that land use planners and resource managers face is interpreting the new provincial policies and developing practical methods for implementing them. For example, the identification of significant wetlands and ANSIs is accomplished through established evaluation procedures put forth by the province. However, for other features mentioned above (e.g., significant woodlands, significant wildlife habitat), there is presently no standardised evaluation system in place, although the Ontario Ministry of Natural Resources (OMNR) is currently working on guidelines. OMNR has also produced a comprehensive advisory manual to

assist planning authorities with interpreting policy 2.3 of the PPS (OMNR, 1999). The PPS (Government of Ontario, 1996:18) advises that the "significance" of natural heritage features could be evaluated on the basis of "ecological importance in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic or natural heritage system," or in terms of "amount, content, representation, or effect."

Given the bewildering array of plants and animals inhabiting the landscapes of southern Ontario, accommodating the specific needs of each individual species in local planning and development activities is not practical. Conservation objectives will be most attainable if planning actions are targeted to critical habitats and to sites containing regionally important assemblages of species. The approach described in this report aims to help planning authorities prioritise conservation efforts by targeting bird species (and their associated habitats) that are "significant" within their region, and not necessarily just rare. Specifically, this report advocates the use of prioritised lists of birds as tools that planning authorities might use when developing or amending Official Plans—including the identification of significant natural heritage features—and when evaluating development proposals.

Lists of birds of conservation priority thus represent another tool within a municipality's toolbox that can be used to fulfill its obligations under the *Planning Act* with regard to the protection of natural heritage features. These lists can be combined with information on significant plants, mammals, etc., in a multifaceted approach to identifying and protecting significant natural heritage features. The approach has the advantage of being standardised throughout southern Ontario, thus facilitating collaborative work among municipalities that may not have equal resources at their disposal to carry out detailed ecological studies on their own. While this approach focuses on birds, the same principles can be applied to other groups of wildlife.

Objectives

This report aims:

(1) To provide planners and resource managers in southern Ontario with an objective and defensible list of bird species of conservation concern applicable to their municipality; and

(2) Thereby maintain or enhance overall biodiversity in the southern Ontario region through assisting with the identification of significant natural heritage features.

The remaining pages in Part I describe, in general terms, the way in which lists of priority species are developed for municipalities. First, the logic and the components of the approach are reviewed. Then, a list of priority species for your municipality is provided, along with explanatory notes to aid in interpretation of the list. Finally, Part II provides technical appendices for those interested in taking a closer look at the methodology.

LOGIC OF THE PRIORITIZATION SCHEME

Components of the Conservation Priorities Approach

Determining conservation priorities for breeding birds at the municipal level involves the assessment of three criteria: *Jurisdictional Responsibility* (JR, a scale-dependent measure related to breeding distribution within a given spatial unit); *Preservation Responsibility* (PR, a scale-independent measure based on the biological characteristics of the species); and, *Area Sensitivity* (AS, a scale-independent measure related to the habitat-area requirements of the species). Each species breeding within a municipality is objectively assigned a score for each component (refer to the appendices for more detail on scoring methods) and these scores are then summed to provide a total score. **The list of priority species for a municipality comprises species that score highly on at least one of these components and which have a total score greater than 8.5 (of a total 15 possible points).**

Component 1: Jurisdictional Responsibility

The Concept

Jurisdictional Responsibility is based on the concept that some species have distributions that are concentrated in some jurisdictions more than others, regardless of the species' abundance or status. In such cases, because some jurisdictions have a proportionally greater share of a species' population, these jurisdictions also carry a proportionally greater responsibility for the conservation of the species in question. The breeding habitat of these species will need special consideration in land-use decisions, which are invariably made at the local jurisdictional level.

At the provincial level, Ontario has a higher responsibility for conserving those species whose Canadian distributions are restricted to Ontario than for species which are widely distributed throughout the nation. For example, because the Canadian breeding range of Prothonotary Warblers is restricted to Ontario, this province has a very high responsibility for the conservation of this species. Likewise, if we consider upper tier municipalities in southern Ontario, each has some responsibility for helping to maintain Ontario's biodiversity. Since most conservation action and planning occurs at the local level, JR scores are particularly important at this scale.

The Application

Jurisdictional Responsibility scores are derived from maps of breeding distribution. Broad scale range maps are used to calculate JR scores at the national, provincial, and eco-regional levels of analysis. At the municipal scale, breeding distribution information from the Ontario Breeding Bird Atlas (Cadman et al., 1987) is used. This data source indicates a species' breeding presence or absence within 10 x 10 km squares. For a given municipality, the JR component identifies species that are more widespread and abundant within the municipality relative to other municipalities. Species that have a large proportion of their breeding range falling within the boundaries of the municipality receive a high municipal Jurisdictional Responsibility score. The local level score is then averaged with JR scores from the eco-regional, provincial, and national level to derive a composite JR score for the municipality. In this manner, the conservation

priorities for a municipality are linked to priorities at broader geographic scales. Species scoring highly on the composite JR score are flagged as species of conservation priority.

Component 2: Preservation Responsibility

The Concept

In this report, Preservation Responsibility focuses on species that are at risk at the provincial level. These species—whether because of rarity, very limited distribution, low reproductive output or declining numbers—may warrant priority conservation throughout their range, regardless of jurisdictional boundaries. Essentially, this component serves as a warning that the species may be in trouble and that extra care may be necessary in local-level planning and development activities.

The Application

Species are assigned scores based on the following criteria:

- abundance: rare species score highest
- breadth of breeding/winter range: restricted ranges score highest
- reproductive output: smallest clutches, or most infrequent breeding, score highest
- population trend over time: greatest declines score highest

These individual scores are averaged together to form a composite Preservation Responsibility score. Species scoring highly on this component are identified as species of conservation priority wherever they occur within the province, regardless of their Jurisdictional Responsibility score within any particular municipality.

Component 3: Area Sensitivity

The Concept

The Area Sensitivity criterion identifies species whose presence or absence is closely related to the amount of breeding habitat area within a given spatial unit. For example, some species may not be sensitive to habitat amount at all (i.e., they are present almost everywhere -- whether there is 5% suitable habitat cover in a region or 90% suitable habitat cover), while others may be very sensitive (i.e., they only regularly breed in areas containing larger amounts of habitat). Because of their sensitivity to changes in habitat amounts, area-sensitive species may require special consideration in planning and development activities.

The Application

We used breeding range information from the Ontario Breeding Bird Atlas (Cadman et al., 1987) and land cover information from OMNR's Landsat imagery to determine relationships between breeding presence/absence and habitat area. Since this project focusses on southern Ontario, the analysis of area sensitivity was restricted to breeding distribution and land cover data within this region. Species scoring highly on the Area Sensitivity component are flagged as species of conservation priority.

PRIORITY SPECIES AT THE MUNICIPAL LEVEL

How to Interpret the List of Priority Species

The municipal list of priority species[2] (Table 3 at end of Part I) contains species that score highly *on at least one of the three criteria* used in the priority setting exercise: Jurisdictional Responsibility, Preservation Responsibility, and/or Area Sensitivity and which retain a total score of greater than 8.5. The list, therefore, is not a complete inventory of all the species occurring within your municipality; the Ontario Breeding Bird Atlas (Cadman et al., 1987) should be consulted for additional detail. Local naturalist groups can also provide more up-to-date information.

The list contains species that are a conservation priority within the municipality in question. It is important to recognize that every species on the list is important for one reason or another. Because species are evaluated on the basis of three different components, they will be placed on the list for very different reasons. By giving these three components equal weighting in the priority designation, the list captures species that are characteristic of the municipality in question (JR component); species that are uncommon and/or possess biological characteristics that render them susceptible to catastrophe (PR component); and species that are sensitive to the amount of suitable breeding habitat available within a region (AS component).

The list is designed to identify a broad group of species that represent a priority for conservation, based on the three components that make up the approach. Thus, the list is not intended to identify only rare species or species under immediate threat or in need of population restoration. Further, the approach is not designed to identify species that are indicators of ecosystem health or integrity. While many such species will undoubtedly be on the list, municipalities and others will be left with the job of deciding how to apply this information (although some suggestions are provided on the following pages).

The list is sorted in descending order by level of conservation priority: level one (highest) through level four (lowest). The list is intended to complement and not replace the official list of species at risk in the province (see Table 2 for more detail) or lists that have already been developed by municipalities and other groups. In fact, Table 3 highlights species that carry official designations of “vulnerable”, “threatened” and “endangered” (VTE) within the province of Ontario (based on provincial or federal designation). As mentioned earlier, the Provincial Policy Statement states that development is not permitted within significant portions of the habitat of endangered and threatened species. Municipalities must also adhere to the *Endangered Species Act*, which sets out specific rules regarding development in and around the habitat of endangered species. Within each priority category, species are listed in alphabetical order, and should be judged as being equal in their conservation importance. As well, to make interpretation of the list easier, the list is subdivided into broad habitat types (i.e., priority forest birds are listed separately from marsh and open country birds).

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[2]Municipalities containing portions of the Niagara Escarpment Plan Area should consult the list of priority species for this region (Appendix E), in conjunction with the list for their own municipality.

Table 2. Southern Ontario species at risk. Under the *Planning Act*, municipalities must have regard to species with official "endangered" and "threatened" status (Government of Ontario, 1996:8). The policy does not, however, stipulate whether the OMNR or COSEWIC designations – or both – should be used. Under Ontario's *Endangered Species Act*, municipalities must protect the habitat of those species with official OMNR "endangered" status. We recommend that municipalities give both designations equal weight: if a species is endangered or threatened, provincially or federally, its habitat should be protected. Further, "vulnerable" species should also be paid special attention with regard to proposed development activities in and around their breeding habitat.

SPECIES NAME	**STATUS**	
	OMNR	COSEWIC
Acadian Flycatcher		Endangered
Bald Eagle	Endangered	
Barn Owl	Threatened	Endangered
Henslow's Sparrow	Endangered	Endangered
King Rail		Endangered
Kirtland's Warbler	Endangered	Endangered
Loggerhead Shrike	Endangered	Endangered
Northern Bobwhite		Endangered
Peregrine Falcon	Endangered	Threatened
Piping Plover	Endangered	Endangered
Prothonotary Warbler		Endangered
Hooded Warbler		Threatened
Black Tern	Vulnerable	
Cerulean Warbler	Vulnerable	Vulnerable
Great Gray Owl	Vulnerable	
Least Bittern		Vulnerable
Louisiana Waterthrush	Vulnerable	Vulnerable
Red-headed Woodpecker	Vulnerable	Vulnerable
Red-shouldered Hawk	Vulnerable	Vulnerable
Short-eared Owl		Vulnerable
Yellow-breasted Chat	Vulnerable	Vulnerable
Yellow Rail		Vulnerable

Source: Royal Ontario Museum and Ontario Ministry of Natural Resources (www.rom.on.ca/ontario/risk.html) or (www.mnr.gov.on.ca/MNR/fwmenu.html). These web pages should be consulted for updates and additions to the list of species at risk in Ontario. Due to time lags between changes to the list and posting on the web site, OMNR staff may also need to be contacted directly to obtain the most up-to-date list of species at risk. The information in Table 2 is accurate to 21 June 1999.

Potential Applications and Suggested Uses of the List

Implementation of the Provincial Policy Statement

The list of priority species can be used for a variety of purposes. One such use is the fulfilment of a municipality's obligations under the *Planning Act* and, specifically, directives within the PPS pertaining to the protection of natural heritage values.

At the landscape level, the list could be used for pro-active planning and policy development, and cumulative effects assessment. In this case, the list could be used to create species richness maps. These maps depict patterns of concentration of priority species and are used to identify zones of conservation value within a municipality (Figure 2 at end of Part I). The maps could serve as a broad brush tool for evaluating current configurations of natural heritage features. For example, overlap between patterns of high species richness and existing protected areas could be interpreted as confirmation that existing protected areas are appropriately located. Conversely, if patterns of species richness do not coincide with existing protected areas, then these gaps could be targeted for further study. This type of gap analysis, when coupled with field studies, could prove useful for protecting important habitat within a municipality. In addition, zones of high conservation value might be flagged as requiring special consideration in land use planning.

At the site level[3], the list of priority species could act as a tool for identifying "significant wildlife habitat," "significant woodlands," and other features within a municipality, as mandated by the PPS. In this case, the list would act as a flagging tool to identify areas containing significant numbers of regionally important species. Where available, this information could be combined with data on other groups of plants, fish and wildlife. There is presently no procedure for determining how many regionally important species must occur on a site for that site to be classified as "significant wildlife habitat." It is important to recognize that "significance" is a relative term. Because habitats and species assemblages vary tremendously across the landscapes of southern Ontario, we would expect patterns of species richness to vary substantially as well. In some municipalities, only one or two priority species might be expected to occur within a given habitat block (out of a total of 10 priority species breeding within the region) to warrant a designation of "significant." In other municipalities, four priority species (out of a total of 20 priority species breeding within the region) would be required to warrant a designation of "significant." Please note that these numbers have not been tested in any manner; they are only presented for illustrative purposes.

Once a significance rating has been assigned to a given feature or group of features, the results could be used to evaluate development proposals. Proposed development activities within or adjacent to significant features would then require special mitigation procedures to ensure that impacts to the functions and values of the subject natural area are minimized or eliminated altogether. Other tools such as the Significant Wildlife Habitat Decision Support System, developed by the OMNR, can also be used by municipal planners in reviewing development

[3]Check OMNR's Natural Heritage Reference Manual for assistance in defining a "site."

proposals that may impact significant wildlife habitat. This technical guide (Coleman et al., In prep.) is currently in production and is expected to be released in the fourth quarter of 1999.

While the list could be used to manage conservation lands for individual species, this is not a practical alternative for the majority of municipalities. In some cases, however, species-specific management will be warranted (e.g., the management and restoration of nesting sites for critically endangered species). A more practical approach would be to use the list to identify priority groups of species with similar habitat requirements and then develop appropriate land use plans to capture these habitats.

One tool that municipalities are encouraged to use for classifying habitat types at the landscape level is the Ecological Land Classification (ELC; Lee et al., 1998) system developed by the OMNR. This approach allows municipalities to classify and map habitat types down to a size of approximately 0.5 hectares and allows much more detailed classification of vegetation communities than the broad scale Landsat imagery. It has the additional advantage of being standardised throughout southern Ontario, so that mapping is consistent across municipal boundaries. ELC mapping, combined with municipal lists, represents a powerful tool for focussing conservation efforts on appropriate habitats.

Ecological Restoration and Private Land Management

Another potential use of the priority list is to better focus future restoration efforts. For example, the rehabilitation of quarries and other disturbed sites, or the re-planting of abandoned agricultural land to native prairie or forest. The list of regionally important bird species, along with information concerning the relative abundance of different habitat types within the municipality could help in deciding what kinds of habitat to create on a given site. The same applies to private landowners interested in conserving biodiversity: such landowners could use the list of priority species (and associated habitat information) to make more informed land management decisions. Ideally, large sites are best, especially for forest interior birds. For other birds, a mosaic of habitat types, at different stages of maturity, and configured in an appropriate manner, would optimize conservation efforts. With careful planning, the need for large, relatively homogeneous blocks of habitat and for a mixture of different habitats can be accommodated within a landscape. Additional information on the design of natural area networks can be found in the Natural Heritage Reference Manual (OMNR, 1999) and the scientific literature cited therein.

We advise you to determine which habitats are threatened within your municipality and strive not lose any additional coverage of these habitats. In addition, future efforts might focus on expanding larger sites containing regionally abundant habitat (making what's already there bigger and better), filling gaps between important sites, and maintaining suitable habitat for area-sensitive species. Table 1 illustrates the current (early 1990s) availability of various habitat types within all upper tier municipalities in southern Ontario, according to satellite imagery provided by the Ontario Ministry of Natural Resources. Wherever possible, habitat for priority species should be conserved and/or created.

Limitations of the List

The approach described in this report is one of many tools a municipality can use in efforts to conserve biodiversity. Other approaches could be used in conjunction with the list of priority species to make informed decisions. The resulting list of priority species was developed with broad scale, static data (breeding presence/absence within 10 X 10 km squares). Since species ranges will likely have changed slightly since the Atlas data were gathered (approximately 15 years ago), the list for a given municipality will not contain species that have recently colonised the municipality in question. While the list cannot possibly account for the dynamic nature of bird communities, it represents the best information on species ranges currently available. The new Breeding Bird Atlas, scheduled to commence in 2001, will be used to create revised lists that reflect these changes in breeding distribution, but this information will not be available until 2005 at the earliest.

Another limitation stemming from the broad scale nature of the data sources used is that the area sensitivity analysis was generalised to an analysis of presence/absence versus the availability of very broad habitat types (forest, marsh and open country). While this approach represents the best available data and approach for the southern Ontario scale of analysis, it does not paint the truest picture of area sensitivity. Ideally, information on species' abundance (rather than simple presence/absence measures) would be compared to the availability of specific habitat types (rather than generalised categories of habitat types) to analyse the area sensitivity relationship.

Because of these inherent deficiencies, the application of the list should be carried out in consultation with other information (e.g., updated species occurrence data from naturalist groups and other experts).

Additional Sources of Information

There is a multitude of resources available on the Internet that municipalities could use to complement the information presented in this report. With respect to Ontario birds, the WILDSPACE web site (www.cciw.ca/green-lane/wildlife/wildspace/intro-e.html), developed by the Canadian Wildlife Service (www.cciw.ca/green-lane/wildlife/intro.html) contains an array of information about all species breeding within Ontario, including photographs, bird song examples, as well as detailed biological data for each species. Ontario Breeding Bird Atlas maps can also be viewed at this site. The Nature Conservancy (www.tnc.org/wings) web site also has detailed information concerning a wide variety of birds, including species management abstracts for a smaller group of species. This site, however, is not specifically geared toward Ontario birds and, therefore, will not be as useful as the WILDSPACE web site.

For information on VTE species in Ontario, the following two web sites are essential:

1) The Ontario Species at Risk web page (www.rom.on.ca/ontario/risk.html), a joint project between the Ontario Ministry of Natural Resources and the Royal Ontario Museum contains helpful information and up-to-date lists of species at risk in the province of

Ontario. In addition to birds, listings are provided for amphibians, fish, insects, mammals, plants and reptiles. Range maps and photographs are also provided at this web site. The municipal list of priority species (Table 3) is based on information from the Breeding Bird Atlas that is now approximately 12-15 years old. It is possible that since the Atlas was completed, VTE species may have been found at additional breeding sites within the province, and thus would not be captured in the current municipal list of priority species. Therefore, we recommend that **if new breeding sites for any of the VTE bird species (Table 2) are found within a given municipality, appropriate conservation efforts should be undertaken.** Users will thus need to cross-reference their municipal priority species list (Table 3) with the Ontario species at risk list (Table 2 and updates from OMNR) to ensure that all species requiring special consideration do in fact receive it.

2) The Natural Heritage Information Centre web page (www.mnr.gov.on.ca/MNR/nhic/nhic.html) provides a variety of information concerning all taxa in the province. Complete lists of all bird species (as well as reptiles, mammals, etc.) occurring in the province are found here, along with abundance estimates for each species. Information on Ecological Land Classification can also be found at the NHIC site. The NHIC also maintains a database of the precise locations of VTE species. These data are not available to the general public, however, and must be obtained by contacting NHIC staff.

The home page of the Ontario Ministry of Natural Resources (www.mnr.gov.on.cal) also has ample resources concerning environmental land-use planning, along with many useful links to other sites offering complementary information. OMNR's Natural Heritage Reference Manual (OMNR, 1999) contains a wealth of information related to natural heritage conservation under the PPS. In addition to the ROM web site, the official list of VTE species can also be downloaded from (www.mnr.gov.on.ca/MNR/fwmenu.html). When published, OMNR's technical guide concerning the evaluation of significant wildlife habitat will represent another conservation tool for municipalities. Conservation Authorities often represent a significant planning partner to most municipalities, and should be consulted for scientific expertise where appropriate. In many cases, and particularly in rural areas, Conservation Authorities will be able to provide resource management expertise that may not exist within the municipal government itself. District office personnel of the OMNR can also provide this kind of scientific support, although reduced staff in most districts will hamper this service.

SUMMARY AND CONCLUSION

The aim of this report is to provide municipalities in southern Ontario with a tool for prioritising conservation actions at the local level. The approach put forth in this report advocates the use of prioritised lists of bird species to accomplish this objective. Lists of priority species that are specifically tailored to each individual municipality can be used for a variety of purposes by municipal planners in fulfilment of *Planning Act* obligations. Specifically, they can be used to develop Official Plans and evaluate current configurations of significant wildlife habitat, significant woodlands, and the like; to broadly identify areas of concern within a municipality where development activities might have to be approached with caution; to act as a tool in wildlife

habitat restoration efforts; and numerous other applications. Ultimately, it is hoped that the lists of priority species, coupled with other approaches and information, will contribute to the conservation of Ontario's rich natural heritage.

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Table 3. Municipal list of priority species.

The table that belongs here must be downloaded separately from Bird Studies Canada's website. Click on the following link, and then follow the instructions to obtain a list of species for your municipality of interest.

http://www.bsc-eoc.org/conservation/conservmain.html