

## **PART II THE HEALTH OF THE BLACK RIVER SUBWATERSHED**

### **Chapter 6 Land**

---

#### 6.1 Terrestrial Natural Heritage

The terrestrial natural heritage features of the Black River Subwatershed were identified and mapped, along with existing land use, through an extensive examination of the Subwatershed requiring digital aerial photography, satellite imagery and ground-truthing.

##### *Mapping*

The mapping produced for this study applies the Ontario Ministry of Natural Resources' *Ecological Land Classification* (ELC) system. The goal of the ELC mapping program is to establish a uniform and consistent way to identify, describe, name, map and organize landscape patterns and vegetation communities. This framework facilitates the analysis and implementation of ecosystem based management initiatives. Existing or actual land uses have been delineated at the same time as the vegetation features. As it is, the actual land use that is mapped may not reflect Designations in the Official Plan or Zoning By-law. Land use, although not normally considered a natural heritage component or feature, is an integral element of the planning for natural heritage systems. The land use of an area may indicate areas of potential environmental impacts or opportunities for enhancement (i.e. soil erosion, groundwater recharge, wildlife habitat and restoration).

The base mapping used for this project was 1999 digital orthophoto coverage, overlaid with contours, wetland, soil and forestry information. Other sources that were referenced were detailed Ontario Ministry of Natural Resources Evaluated Mapping, 1999 York Region oblique photography and digital infrared aerial photography.



Vegetation polygons were classified to the Community level, and where detailed information was available, the polygons were further classified to Ecosite and/or Vegetation Type level. Land use units were simply classified by type. All descriptive information was entered into a MS Access97 Database. The hard copy classification was digitized using ArcView 3.0 software and linked to the Access97 Database.

## 6.2 Land Use

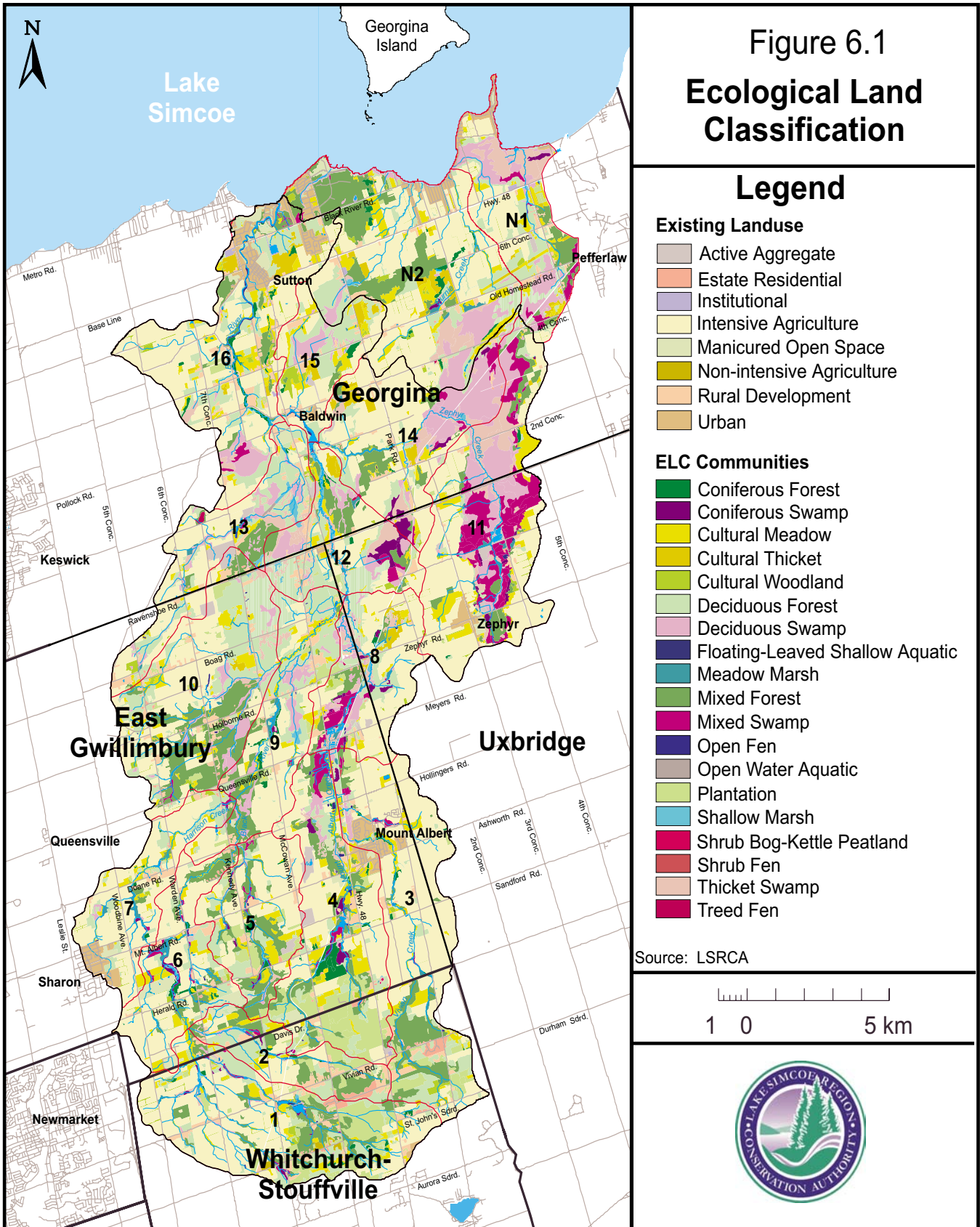
The Black River Subwatershed is comprised of several land uses, however it is dominated by two main types: agriculture and natural heritage features (Figure 6.1). Intensive agriculture accounts for approximately 39% of the Subwatershed, while natural heritage features, which include forests, wetlands and plantations, encompasses approximately 51% of the Subwatershed. The remaining 10% is shared between urban, estate residential, aggregate extraction, manicured open space and rural development types of land use.

**Table 6.2.1 Land Use Coverage in the Black River Subwatershed**

Land Use Type	Hectares	Percent of Subwatershed
Agriculture	14590.4	38.6
Development	3854.6	10.2
Tree Cover	11310.1	29.9
Meadow, Thicket	2781.7	7.4
Wetland	5255.4	13.9
<b>Total</b>	<b>37790</b>	<b>100</b>



# Black River Subwatershed Study



### 6.2.1 Natural Heritage Features

Natural heritage features encompass 19347.3ha, or 51% of the Subwatershed. Of these natural heritage features, forests are the dominant feature accounting for approximately 9346ha, or 48%. Forests are subdivided into deciduous, coniferous and mixed forests, with the majority (54% of forests) being deciduous and coniferous forests the minority (0.04% of forests).

Wetlands are another dominant feature of this Subwatershed, comprising approximately 5100ha, or 26.4% of the natural heritage features. Wetlands are categorized into swamps, marshes, bogs and fens. Swamps account for an area of 4671 ha, or 91% of wetlands; marshes encompass 409 ha, or 8%; while bogs and fens make up the remaining 1% or 20 ha.

**Table 6.1. Wetland Coverage in the Black River Subwatershed**

Wetland Type	Community	Hectares	Percentage of Wetlands	Percentage of Community
Swamp		4670.6	91.6%	
	Deciduous	2288.4		49%
	Mixed	939.0		20%
	Coniferous	266.6		5%
	Thicket	1176.6		25%
Marsh		408.9	8.0%	
	Meadow	228.2		56%
	Shallow	180.6		44%
Bog		0.77	0.01%	



Fen		20.2	0.4%	
	Open	6.7		33%
	Shrub	2.0		10%
	Treed	11.5		57%
Total		5100.5	100	N/A

Plantations cover roughly 1561ha, or 0.08% of the natural heritage features. They are typically homogenous stands of Red, White or Scots Pine (*Pinus resinosa*, *P. strobus*, *P. sylvestris*).

Cultural meadows, thickets and woodlands comprise an additional 3185ha or 16% of the natural heritage features. These features include transitional meadows and thickets, sparsely treed areas and hedges.

### 6.2.2 Anthropogenic Land Use

Non-natural features account for 49% of the Subwatershed and include all anthropogenic uses of land including agriculture, aggregate extraction, buildings and roads.

The main urban areas within the Subwatershed are the Towns of Ballantrae, Sharon, Mount Albert, and Sutton. Many smaller communities are also situated throughout the Subwatershed. An urban area is interpreted as continuous development, or where there are five or more residential units (counted by roof tops) equaling two or more hectares. Urban development accounts for roughly 2.2% of the Subwatershed.

Estate residential identifies residential housing that has an interpreted footprint of 1.0ha or



less. Rural development identifies other types of land development such as auto wrecking yards, industrial buildings or complexes and commercial sites. Aggregate extraction involves both sand, gravel and peat mining. Manicured open space refers to parks, cemeteries, golf courses and residential or industrial open space. The Institutional category includes schools, works department yards, hydro yards, water purification plants and stormwater management ponds. A majority of the roads and the railway right-of-way are also included in the anthropogenic land use category.

**Table 6.2 Anthropogenic Land Use Coverage in the Black River Subwatershed**

Anthropogenic Land Use Type	Hectares	Percentage of Subwatershed
Intensive Agriculture	14567.8	38.5
Non-Intensive Agriculture	22.6	0.06
Estate Residential	184.1	0.49
Rural Development	1483.5	3.90
Institutional	32.8	0.09
Urban	847.8	2.24
Active Aggregate	291.5	0.77
Manicured Open Space	366.8	0.97
Most Roads & Rail	642.6	1.7
Total	18439.5	48.8

### 6.3 ANSI's and ESA's



Areas of Natural and Scientific Interest (ANSIs) are defined by the Ontario Ministry of Natural Resources (OMNR) as “an area identified by the Ontario Ministry of Natural Resources as having provincially significant or regionally significant representative ecological features” (OMNR 1997,2000).

There are two Life Science ANSIs within the Black River Subwatershed (Figure 6.2). They are:

- Zephyr Creek Swamp
- Duclos Point Park Reserve and Adjacent Lands

Duclos Point Park is approximately 380 ha in size and is entirely situated within the Black River Subwatershed study area. The Zephyr Creek Swamp is approximately 3170 ha, of which roughly two thirds is within the Subwatershed. ANSIs therefore, compose approximately 6.6% of the total Subwatershed area.

Environmentally Sensitive Areas (ESAs) are defined by the OMNR as “an area identified by a municipality as being ecologically important; these areas may be known by various official names, such as "environmentally significant areas" or "significant natural areas", depending on the municipality” (OMNR 1997,2000).

The ESAs within the Lake Simcoe Watershed were located and documented in a 1982 study prepared by Ecologistics Ltd. for LSRCA. This study was designed to identify and record the most important natural environments in the Watershed. For details on the criteria used, design, methodology and results of the study, please see the ESA report (Ecologistics, 1982) available at the LSRCA.





# Black River Subwatershed Study

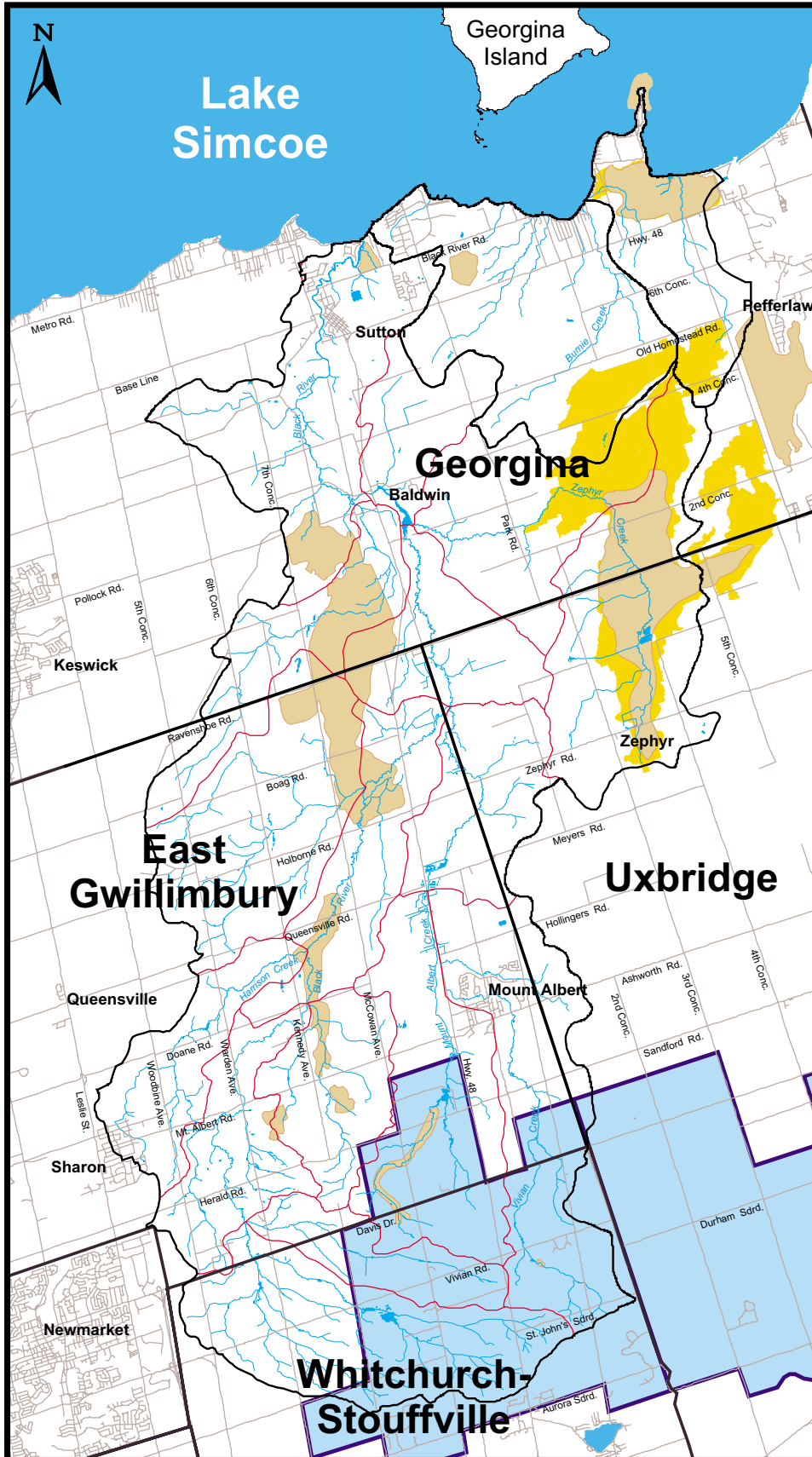


Figure 6.2

Environmentally Significant Areas and Areas of Natural and Scientific Interest

## Legend

- Biological ESA
- Hydrogeological ESA
- ANSI

Source: LSRCA, MNR





There are nine biological ESAs within the Subwatershed study area, covering a total area of 3098 ha (8.2%) of the total Subwatershed (Figure 6.2). They are:

- Mount Albert Creek Headwaters
- Cedar Valley
- Black River
- Brown Hill
- Zephyr Creek
- Virginia Beach Relict
- Mossington Park
- Morning Glory Swamp
- Duclose Point

As well, two ESA shoals have been identified along the Lake Simcoe shoreline near the mouth of the Black River. These shoals are:

- Mossington Point Shoal
- Townline Shoal

These shallow water features are important in the spawning activities of smallmouth bass, lake trout and lake herring.

The only hydrogeological ESA within the Subwatershed is the Vivian Infiltration Area, which is 6346 ha, or approximately 15% of the Subwatershed. This ESA is situated in the southern portion of the Subwatershed, contributing groundwater to the Oak Ridges aquifer complex.

#### 6.4 Core Natural Areas - Woodlands, Wetlands and Natural Corridors



### Woodlands

Woodlands are of critical importance in maintaining the ecological and environmental health of a subwatershed, in addition to contributing socially and economically. Benefits which directly affect subwatershed health include:

- T Reduced soil erosion
- T Reduced intensity and volume of stormwater
- T Improved water quality in streams and lakes
- T Improved soil texture, structure and fertility
- T Provision of habitat for forest dependent species

Additional benefits include:

- T Local climate enhancement and pollution control
- T Global climate control (carbon attenuation)
- T Aesthetic enhancement
- T Recreational values
- T Economic benefits through increased property values and forest products

A minimum of 25% forest cover has been identified in several watershed studies and other planning documents as critical to maintaining many of the values and benefits listed. The forested landscape within the Black River Subwatershed occupies a healthy 14,804 ha or 39.2% of the land base, a large percentage of which is occupied by forested wetland communities (Figure 6.3).

The dominant cover type is deciduous forest, which occupies 13.3% of the Subwatershed. It can generally be grouped into two types: mature and early successional. Mature, shade tolerant communities dominated by sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), eastern hemlock (*Tsuga canadensis*) and associated species are most commonly found on the Oak Ridges Moraine. Early successional forest communities of



# Black River Subwatershed Study

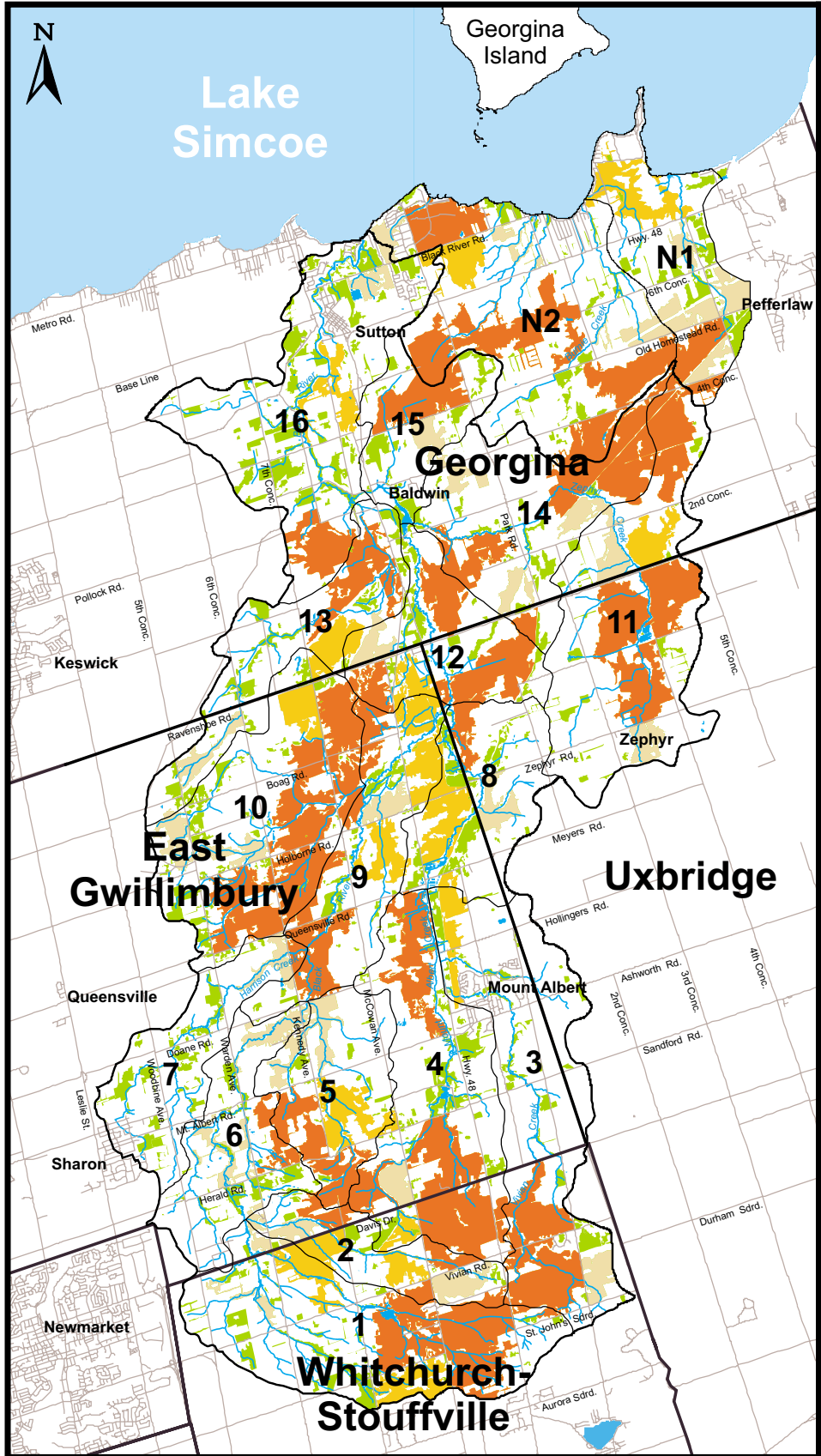




Figure 6.3

## Forest Stand Size

### Legend

-  Forest Stand <40ha
-  Forest Stand >40ha
-  Forest Stand >100ha
-  Forest Stand >200ha

Source: LSRCA ELC



# Black River Subwatershed Study

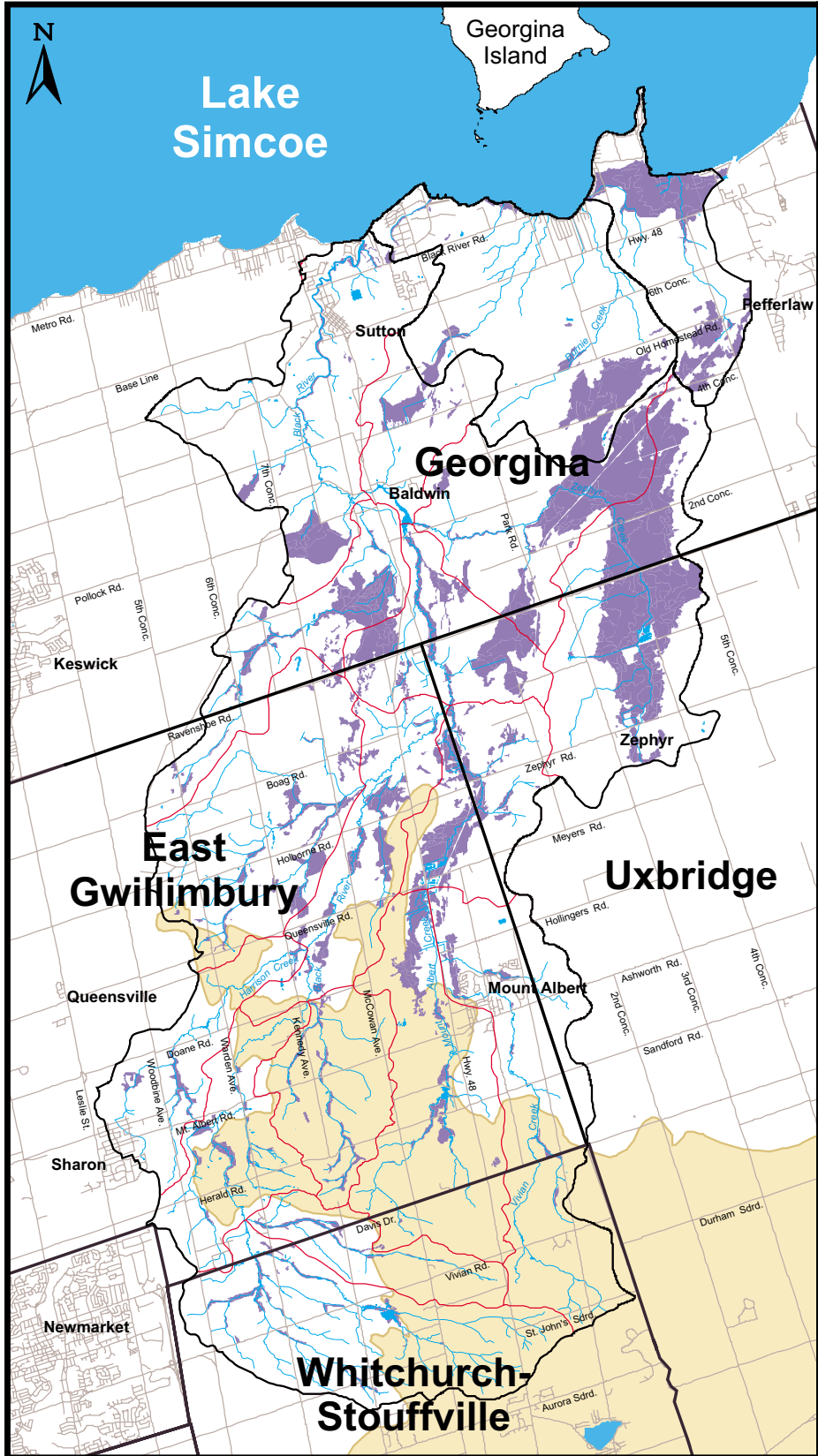




Figure 6.4  
Wetlands and  
the Oak  
Ridges Moraine

### Legend

-  Evaluated Wetlands
-  Oak Ridges Moraine

Source: MNR, LSRCA



predominantly ash (*Fraxinus spp.*), poplar (*Populus spp.*) and white birch (*Betula papyrifera*) are more common off the moraine and in wetter conditions.

Deciduous swamp, most commonly dominated by green or black ash (*Fraxinus spp.*), American elm (*Ulmus americana*), silver maple (*Acer saccharinum*) or balsam poplar (*Populus balsamifera*), is also found throughout and occupies just over 6% of the Subwatershed.

Mixed forest communities are also prevalent, occupying 10.4% of the total land base. A wide range of species associations are found within this category. White pine (*Pinus strobus*), due to its ability to grow in a wide range of conditions, is the most common coniferous species which can be found growing in association with a wide variety of deciduous species and other coniferous trees.

Substantial areas, predominantly on the Oak Ridges Moraine, which had originally been cleared for agricultural use, are now covered with forest plantations. Three tracts of the York Regional Forest add substantially to the total of 1,560 ha or 4.13% of the Subwatershed now being occupied by forest plantations. Dominant species include red pine (*Pinus resinosa*), white pine (*Pinus strobus*), scotch pine (*Pinus sylvestris*) and white spruce (*Picea glauca*). Many plantations which are now in excess of 30 years in age are beginning to diversify through the invasion of tolerant hardwood species in the understory.

Issues include:

- T Levels of afforestation should be increased on marginal and fragile lands
- T Private woodlands are often degraded by inappropriate management practices
- T Invasive exotic species are becoming an increasing threat to woodland diversity throughout Southern Ontario



## *Wetlands*

Wetlands are essential natural elements of the Black River Subwatershed totalling 5100ha, or 26.4% of the total area (Figure 6.4). Wetlands control and store surface water to assist in flood control and groundwater recharge, act as sediment traps to improve water quality, and provide habitat for a wide variety of flora and fauna.

Within the uplands of the Oak Ridges Moraine, only small wetland pockets are located along the water courses. The Black River and Mount Albert Wetland complexes form as the surface waters leave the Moraine, totalling nearly 2000 ha. Additional provincially significant wetlands include the Brown Hill Wetland, Morning Glory Swamp, and the Zephyr-Egypt Wetlands which encompasses over 2000 ha in the north east section of the Subwatershed.

There are 16 evaluated wetland complexes of which six are provincially significant and the remaining ten are locally significant. It should be noted that not all wetlands within the study area have been evaluated for various reasons (e.g. the area of the wetland is less than 2 ha in size and thus does not meet the criteria of OMNR wetland evaluation protocol). The provincially significant wetlands are:

- T Black River Wetland #1
- T Lower Pefferlaw Brook Wetland Complex
- T Morning Glory Swamp
- T Mount Albert Wetland Complex
- T Vivian Bog
- T Zephyr-Egypt Wetland Complex

and the locally significant wetlands are:

- T Black River Headwater Wetland Complex
- T Black River Wetland Complex #2





- T Black River Wetland Complex #3
- T Black River Wetland Complex #4
- T Franklin Pond Wetland
- T Mossington Park Wetland Complex
- T Sibbald Point Wetland Complex
- T Sod Swamp
- T Vachell Swamp Wetland Complex
- T Willow Swamp

Agricultural expansion and peat extraction are currently the largest potential threats to the retention of these critical wetland areas. Peat mining in particular can be a very lucrative operation which by its very nature occurs in remote areas. Further, this activity does not often require a change in zoning for work to proceed, which curtails the ability of municipal governments to regulate it. The Uxbridge Peat Bylaw is a tool that the Township of Uxbridge uses to regulate peat extraction operations. In York Region, the Region of York Tree Cutting Bylaw is, in most cases, the only legislative tool available to regulate this activity. The Conservation Authority encourages regional and local municipalities to adopt peat extraction bylaws where they do not exist to better regulate and quantify this activity.

Issues include:

- T Losses to wetland areas continues to occur due to peat mining operations
- T Inadequate provincial legislation exists to provide tools for municipalities to regulate this activity

### *Natural Corridors*

Natural corridors are areas of remnant vegetation which provide important ecological functions in addition to increasing the diversity and function of adjacent areas by providing a connecting link. Benefits of retaining and enhancing natural corridors include:

- T Increased potential for wildlife species movement and reproduction



- T Increased population sizes for some species of flora and fauna
- T Increased local diversity of habitats and successional stages
- T The maintenance of genetic variability
- T Improved water quality, aquatic habitat and reduced flooding and erosion (where the corridor exists adjacent to a watercourse)
- T Improved recreational opportunities and aesthetics

With the large percentage of woodlands and wetlands found throughout the Black River Subwatershed, the availability of corridors is excellent. From the plantations and woodlots on the Moraine in the south, throughout the riparian areas and wetlands to the north, substantial opportunities exist for the movement of wildlife.

Issues include:

- T Retaining and enhancing corridors generally requires participation from private landowners
- T Reinstating natural corridors along watercourses provides the greatest ecological benefit
- T The protection of existing corridors is difficult given existing legislation and planning processes

## 6.5 Wildlife Habitat

Habitat is defined as the conditions required by a particular species to survive and thrive including food, water and the cover required for protection, shelter, feeding and reproduction. When the requirements mentioned above are met, environmental changes can still result in the decline of a species. This can be due to the cumulative effect of incremental losses of natural areas or the severing of a travel corridor due to land use changes (e.g. construction



of a road). In either case, each species has minimum requirements and if those minimum requirements are not met, the species will not survive in that particular area.

For the fragmented landscape in much of Southern Ontario, forest interior habitat is recognized as an important feature to retain or improve where possible. Many species which are sensitive to human and other types of disturbance require interior habitat. Interior habitat is defined as forested area which is a minimum of 200 metres from the nearest forest edge. Both the total area and the shape of a given woodland have an impact upon the amount of interior habitat available. Additionally, lands surrounding these key interior areas have increased levels of importance to facilitate wildlife movement. For example, woodlands within 2000 metres of each other have been found to contain increased numbers of forest interior bird species (Environment Canada *et al.*, 1998).

The Black River Subwatershed contains forest interior throughout the Subwatershed (Figure 6.5), which should be protected and enhanced where at all possible. Outside of the main urban centres, a variety of habitat types are present including wetlands, old fields, stream corridors and various forest types.

#### *Wildlife - Birds*

A list of bird species using the Subwatershed for some portion of their life cycle was constructed from a variety of sources (Cadman, M.D. et al. 1987). A complete list of these species has been included in Appendix A.



Wild Turkey  
*Meleagris gallopavo*

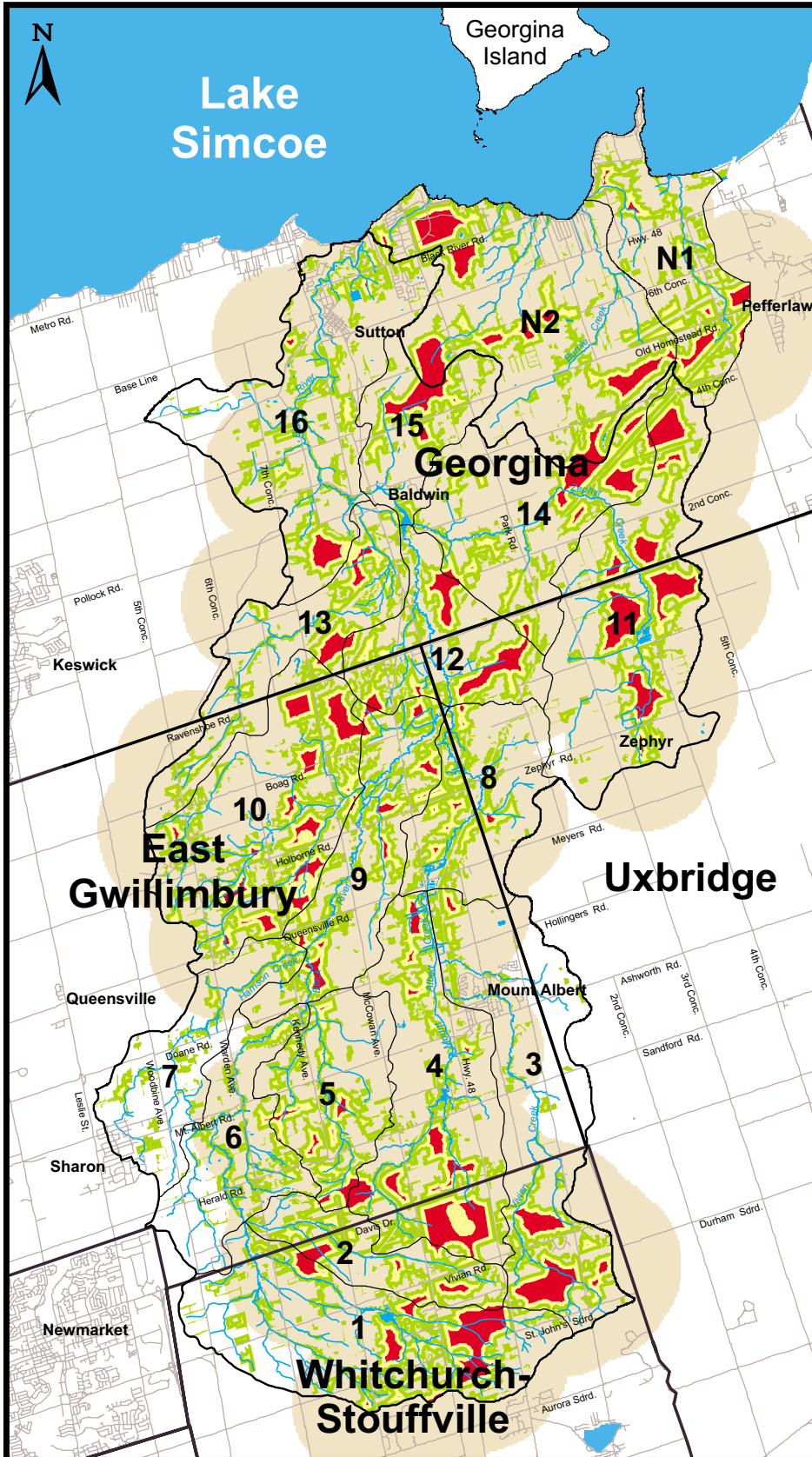
#### *Waterfowl Habitat*

Waterfowl species have specific habitat requirements that can be readily identified and described. A number of areas within the Black River Subwatershed provide valuable habitat



# Black River Subwatershed Study

Figure 6.5  
Forest Interior



## Legend

- 0 - 100m Buffer
- 100 - 200m Buffer
- Forest Interior
- 2km Buffer from Stands with Forest Interior

Source: LSRCA ELC



for waterfowl for such life cycle activities as breeding, moulting and staging. Any wetland which contains areas of permanent open water will have an environment suitable for use by waterfowl. According to Ducks Unlimited Canada, waterfowl also require upland habitat on the perimeter of the wetland which is defined by a distance of approximately 100 metres from the wetland-upland boundary (Steel, personal communication).

### *Wildlife - Mammals*

A list of mammal species using the Subwatershed for some portion of their life cycle was constructed from a variety of sources (e.g. Dobbyn, 1994). A list of these species has been included in Appendix A. Examples of common mammals within the Subwatershed are white-tailed deer (*Odocoileus virginianus*), coyotes (*Canis latrans*) and raccoons (*Procyon lotor*). Some uncommon visitors to the area are black bears (*Ursus americanus*) and moose (*Alces alces*).

### *Deer Wintering Habitat*

The availability of wintering habitat for white-tail deer is an important aspect of mixed forests in Ontario. Within the Black River Subwatershed, there are 20 core deer wintering yards (Figure 6.6).

The OMNR has defined the deer yards based on traditional use of these areas for cover and winter browse. Winter cover consists of dense stands of conifers such as eastern hemlock and eastern white cedar (Bennet, personal communication) that have a closed canopy (ie. approximately 70% canopy cover). The closed canopy prevents the loss of heat at night and the dense forest with associated shrub and brush vegetation protects the deer from cold winter winds. The minimum ideal size for winter cover habitat is 0.8 to 2 ha (depending on the size of the population using the habitat and the shape of the forested stand) with a minimum width of 90 metres (Thomas *et al.*, 1979). Areas that are suitable for winter browse are open





# Black River Subwatershed Study

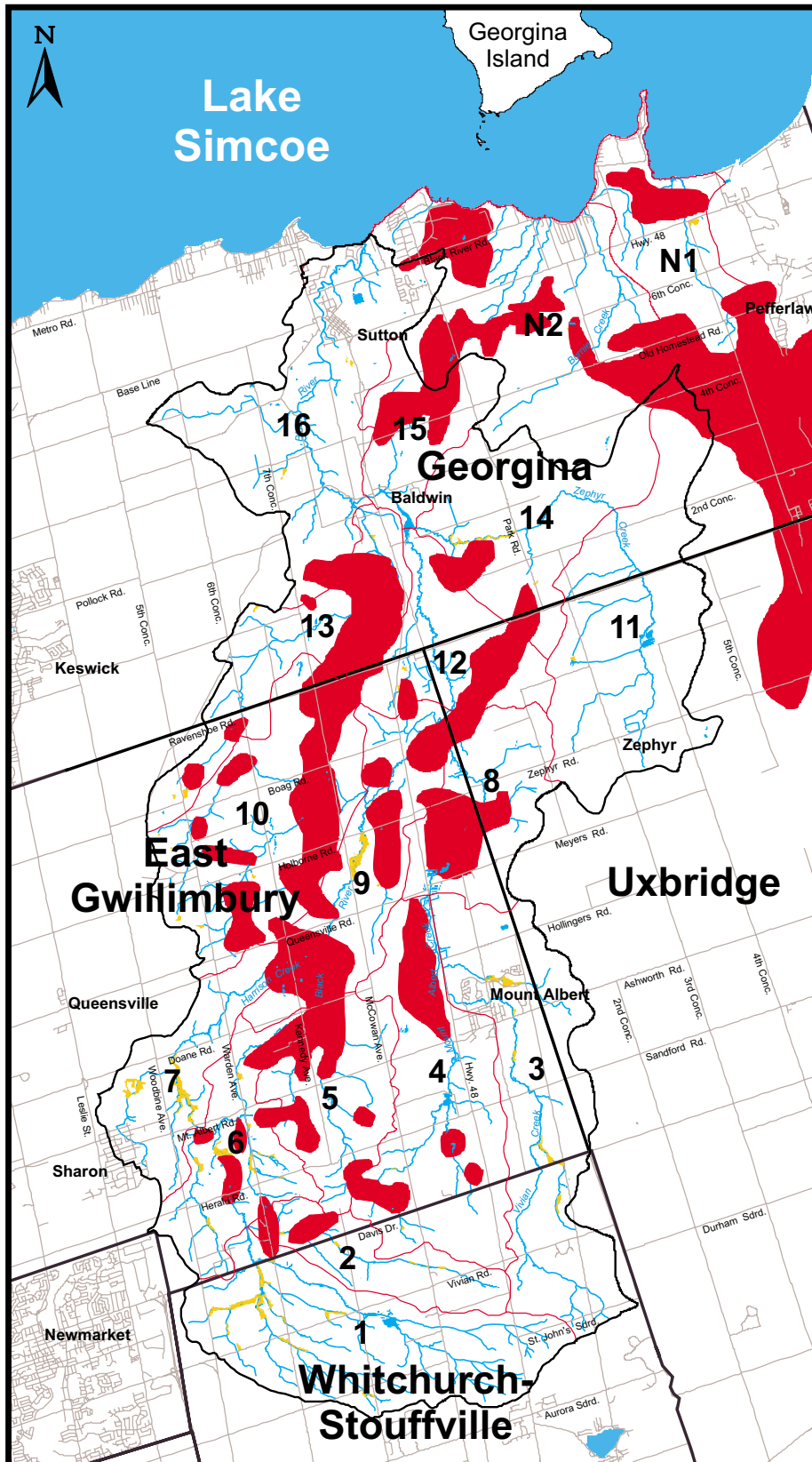


Figure 6.6  
Deer Wintering  
Yards

## Legend

 Deer Wintering  
Yards

Source: MNR





areas or early successional forests. These conditions often result following an environmental disturbance, such as a forest fire, logging or in old agricultural fields that have been allowed to naturalize. Alternatively, browse habitat may be available in open spaces created by a natural meadow or a marshy section of a wetland. In these areas, deer will feed on the twigs of young trees and shrubs such as dogwood and soft maples or the foliage of cedars. It should be noted that the use of deer yards is not as common in Southern Ontario as it is in Northern Ontario. Due to the relatively mild climate of the study area, deer only congregate in wintering yards during the most severe winter conditions (Bennet, personal communication).

#### *Wildlife - Herpetofauna*

A list of herpetofaunal species using the Subwatershed for some portion of their life cycle was constructed from a variety of sources. A complete list of these species has been included in Appendix A.



Green frog (*Rana clamitans*)

#### *Rare Flora and Fauna*

Within the Black River Subwatershed, 31 species that are considered to be rare or endangered (regionally or provincially) have been observed at various locations (e.g. least bittern (*Ixobrychus exilis*)). The precise location of the observed species is not described or indicated on maps contained in this report. This information is considered to be classified information and is not available to the public in order to protect these species and their habitat. A complete list of rare species has been included in Appendix A. It should be noted that these inventories should not be considered to be complete. Rare species generally occur in small populations and are often very difficult to locate. These lists may be expanded in the future as additional field work is done for other projects in the study area.

### Summary



There exists a wide variety of terrestrial habitats in the Black River Subwatershed today. With the high amount of forest cover and forest interior habitat, species which are sensitive to size and shape of habitats are found within the Black River Subwatershed. However the following issues still exist:

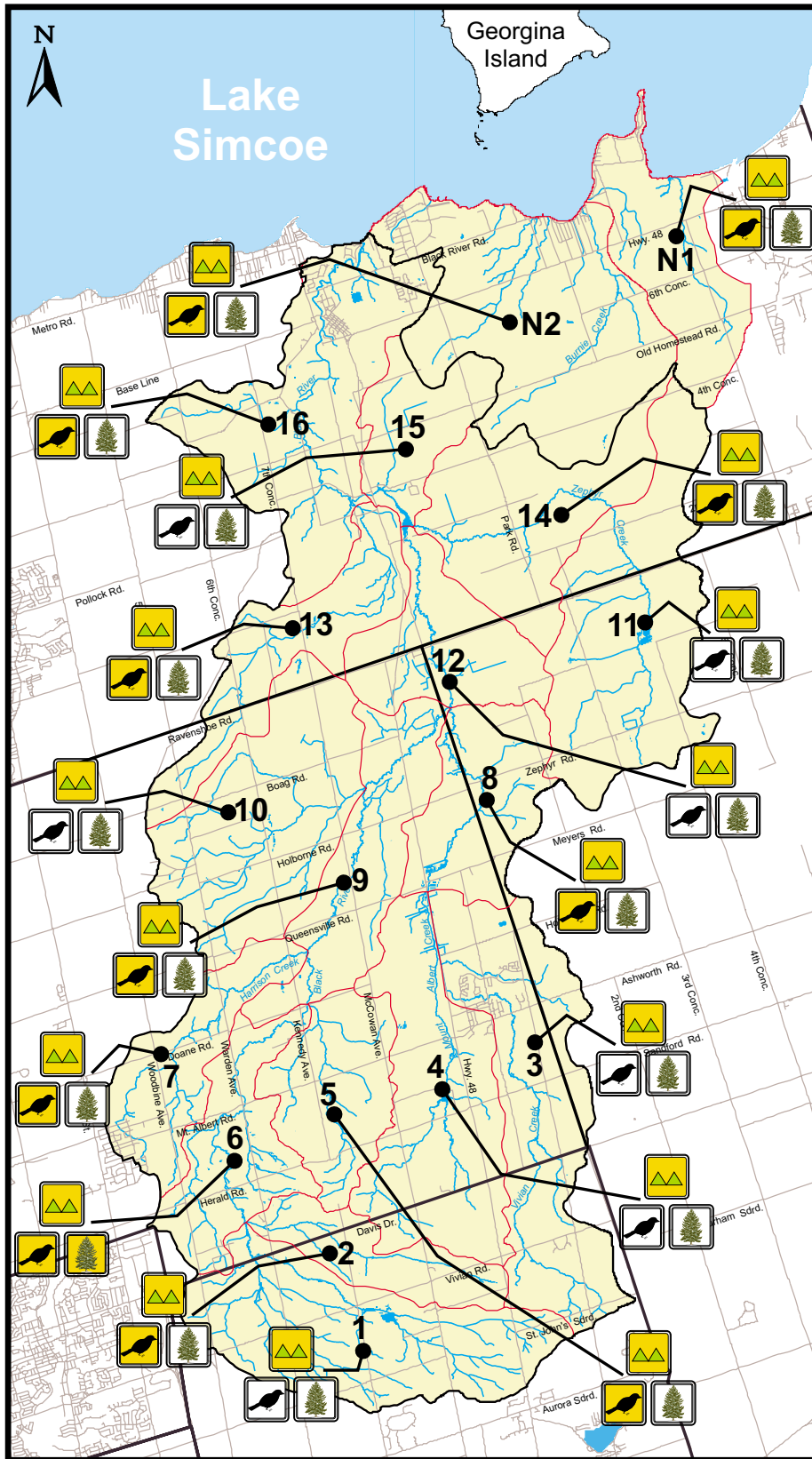
- T A fragmented landscape of habitat areas exists.
- T Wetlands are prime habitat areas and are at risk.

Land issues that have limiting effects on flora and fauna are summarized in Figure 6.7 for each individual catchment of the Black River Subwatershed.



# Black River Subwatershed Study

Figure 6.7  
Terrestrial Issues by Catchment



## Legend



Lack of Stream Cover (<75%)



Lack of Forest Cover (<25%)  
Lack of Forest Interior (<5%)



Issue is not of Concern



Issue is of Concern

Source: LSRCA

