Chapter 1. Background

1.1 Introduction

The Oxford Natural Heritage Study (ONHS) addresses the need for information on the state of Oxford County's natural areas and watercourses. The study provides a landscape assessment of natural heritage features and assesses strategies for their protection and restoration.

The ONHS builds on two previous County wide natural heritage initiatives. An early report titled *Natural Areas in Oxford County: A Preliminary Survey* (Hilts, 1976) recommended 55 sites for designation as Significant Natural Areas. These sites were officially recognized in the County's planning documents. In the late 1990s, the *Oxford County Terrestrial Ecosystem Study* (OCTES), an innovative scientific study undertaken by the County and the Upper Thames River Conservation Authority, further defined the elements of woodland health at the landscape level.

The ONHS builds on the scientific methodology of the OCTES to provide a landscape level assessment of the County's woodlands. The study scope is expanded beyond woodlands to include aquatic natural heritage resources and to also assess the range of implementation options to protect and enhance natural heritage resources in the County.

Thames upstream of Woodstock

1.2 Study Goals and Products

The overall goal of the ONHS is to describe the health of Oxford County's terrestrial and aquatic natural heritage systems including woodlands, wetlands, streams, and rivers and to develop strategies for their long term protection and rehabilitation. The specific goals of the ONHS are to:

- generate an increased understanding of the location, significance and inter-dependence of the County's natural heritage features,
- develop land use planning information and policy that identifies protects and enhances the County's terrestrial and aquatic habitats, and
- provide information that can assist conservation groups and agencies working in the County to effectively target their programming to the areas most in need of protection or restoration.

The study's products include:

- accurate, detailed and comprehensive natural heritage systems mapping at a 1:10,000 scale that includes natural areas (woodlands, wetlands, prairies) and watercourses,
- criteria and associated rationale for determining significant terrestrial habitats (patches) at the County level and mapping showing patches that meet the criteria,
- County-wide fish and benthic monitoring information of selected watercourses, criteria and associated rationale for categorizing habitat types and mapping showing categories of watercourses across the County,
- metadata associated with each mapping layer, and
- implementation strategies / tools such as stewardship, education, demonstrations, incentives and regulatory measures (land use planning policy and tree cutting bylaws, etc.).

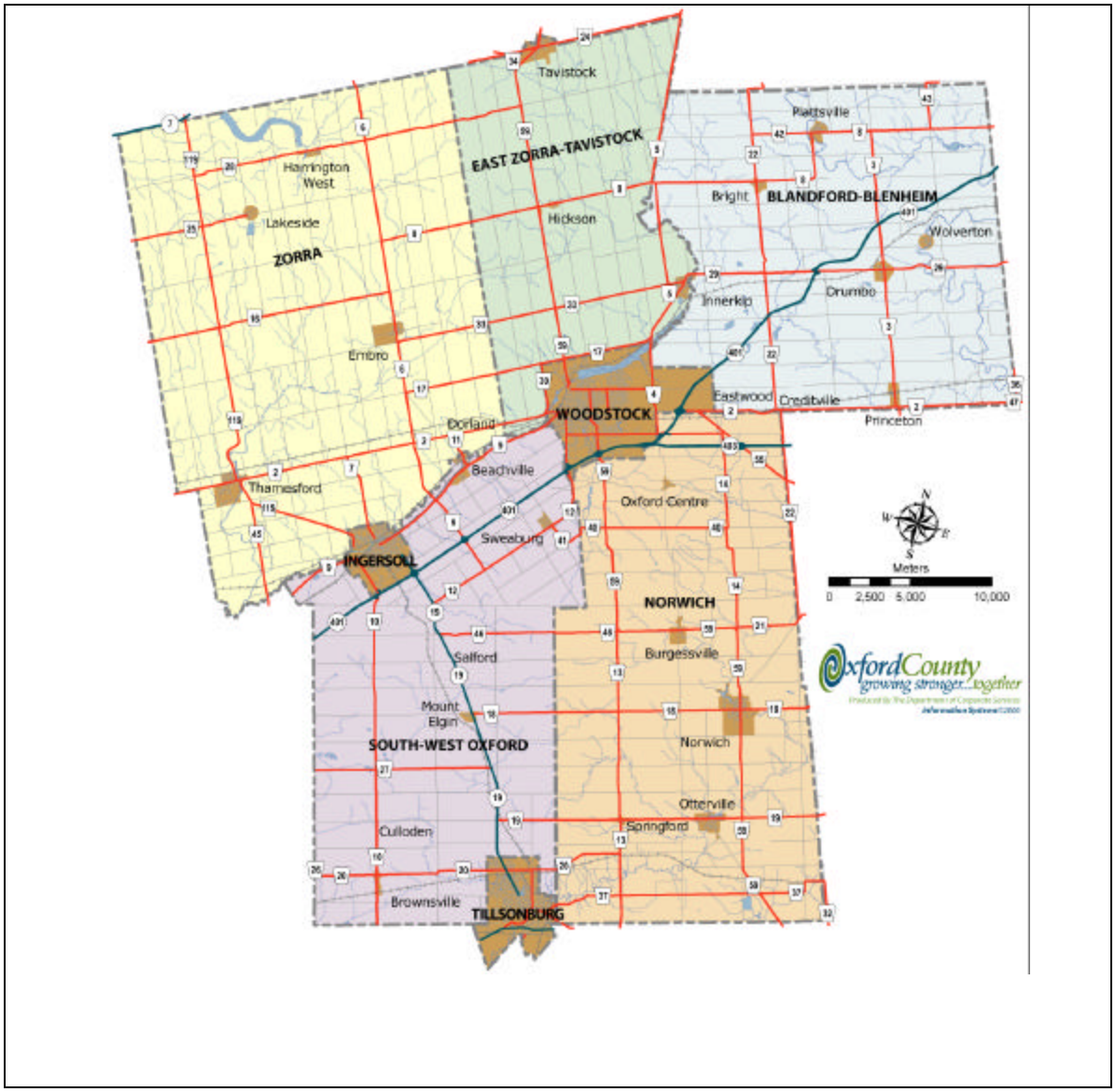
1.3 Study Area – Oxford County Description

Oxford County is situated in the agricultural heartland of southwestern Ontario, roughly halfway between Windsor and Toronto along Hwy 401 (see Figure 1). The County is largely agricultural, with three urban and five rural municipalities (see Figure 2). The County is situated in the extreme south of Canada and thus benefits from a long growing season and fertile soils, making agriculture the dominant land use. The three largest urban areas, Woodstock, Ingersoll and Tillsonburg, support the agricultural areas and have a manufacturing base.

Oxford County is approximately 2050 square kilometres in area with a population of about 106,000.

Figure 1. Oxford County within Southern Ontario

Figure 2. Oxford County Base Map

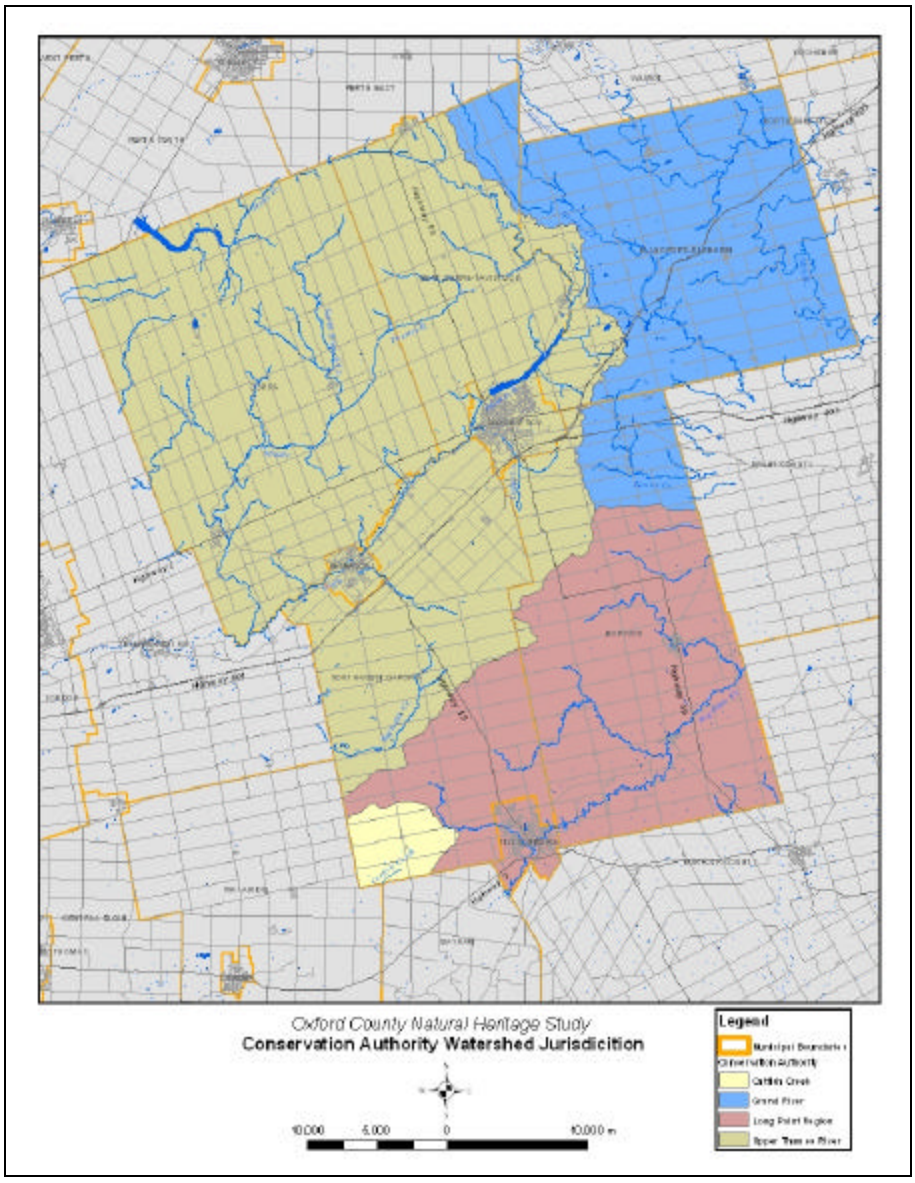


The County is within the watersheds of four Conservation Authorities (see Figure 3 and Table 1) within the Lake Erie basin. Big Otter Creek, Nith River (Grand River) and Catfish Creek drain into Lake Erie directly. The Thames River drains west into Lake St. Clair, which then drains into Lake Erie.

Table 1. Conservation Authorities of Oxford County

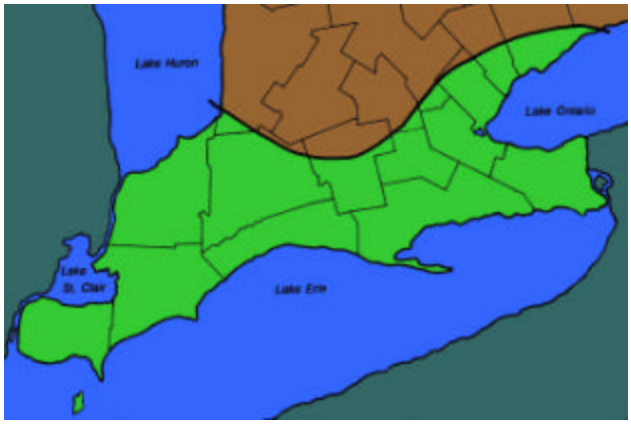
Watercourse	Conservation Authority	Percent of County
Thames River	Upper Thames River	55
Big Otter Creek	Long Point Region	22
Nith River	Grand River	21
Catfish Creek	Catfish Creek	2

Figure 3. Conservation Authorities within Oxford County



Oxford County is situated in the transition zone between the Lower Great Lakes - St. Lawrence Forest Region to the north and the Southern Mixed Deciduous Forest (Carolinian Floristic) Zone to the south (Figure 4). Despite intense agriculture and urban development, the area is still biologically rich with plant and animal species of both southern and northern affinity. For example, the County contains a significant proportion of southwestern Ontario's remnant trout streams and is home to several rare fish and mussel species. Despite these very productive and diverse fish communities, Oxford County still has many streams and rivers with poor water quality and aquatic habitat.

Figure 4. The Carolinian Zone in Southern Ontario *(map courtesy of Carolinian Canada)*



Although there are many healthy and productive natural areas and waterways in the County, the loss and degradation of woodlands, wetlands and waterways is a serious environmental concern. Across southern Ontario, woodland losses have exceeded those of almost any other major ecosystem. Forest cover across Oxford County is approximately 12.5%, one of the lowest in southern Ontario. The majority of these woodlands are small. The best available information suggests that 20-30% natural cover is needed to sustain species and protect soil, water and air quality (Environment Canada 2004).

1.4 History of Settlement and Forest Fragmentation

Oxford County was first settled by European immigrants in 1794 (Tchir and Johnson 2000). The forest at that time was dense, with only a few openings of marsh, bog and willow meadow and the trees were large, an average of 3 to 6 feet in diameter. The principle cover type of the original upland forest in Oxford County was sugar maple, followed by beech and elm. The presence of the maple-beech forest was an indication of where the best soil for producing profitable crops would be found. Norfolk and southern Oxford had enormous oaks and pines on well drained soils, both of which were in great demand for square timber. The timber industry thrived in the 1830's and 1840's and once these merchantable species were removed, the lands were settled.

Swamps and poorly drained soils were often located at the head waters and formed large natural surface water storage areas. Hemlock and cedar were found near the streams while the swamps were primarily composed of white elm, cedar and soft maple.

Major deforestation occurred from 1850 to 1890. The attitude toward forests at the time was that they were obstacles to agriculture and development. It was also thought that timber was inexhaustible. By 1860, approximately 60% of the forests were depleted, and by 1910 over 90% of the forests were gone with the wood used for an ever growing number of uses.

In the early 1900's it was common to see abandoned farms throughout south Oxford because of the loss of organic material, which depleted the fertility of the sandy soils. Attention to the environment grew as a result of the over-clearing and government programs were introduced to reforest the marginal lands to conserve soil and protect water sources.

Wildlife species in Oxford County were a mixture of northern and southern species, reflecting the forest composition. Wildlife populations peaked as land was being converted from forest to agriculture. This initial clearing diversified the food and land cover, resulting in a landscape of cleared fields, forest edge and opened ungrazed woodlots. Eventually, wildlife populations were depleted because of lack of large forest tracts, intensive wood cutting, burning and grazing, as well as excessive hunting and trapping. Wolf, beaver, wolverine, passenger pigeon and bob white disappeared from southwestern Ontario.

Again, the loss of these species awoke a concern in the community and government, and many programs were initiated to conserve animal species. For example, there has been great success at the re-introduction of wild turkeys into southwestern Ontario. Hunting and trapping limits are regulated to keep pace with population levels. New issues continue to arise, such as the overabundance of white tailed deer due to the availability of food outside of forests and the lessening hunting pressure. Other species, especially Neotropical migrant birds such as warblers, are still declining due to loss of large habitats.

1.5 Benefits of a Healthy Environment

Woodlands, wetlands, meadows and other natural areas provide a wide range of functions to both humans and the environment. Well managed woodlots provide excellent revenue for landowners (Steve Bauer, Huron County Study). Some of the benefits that woodlands and other natural areas provide include:

- reduction of soil erosion from wind,
- filtration of runoff,
- absorption of precipitation,
- protection of groundwater,
- purification of the air,
- habitat for wild plants and animals,
- education,
- recreational opportunities such as hiking, birding, hunting, fishing, and
- income for landowners (e.g. outfitting, guiding, lumber, maple syrup).

Rivers and streams are natural corridors for wildlife and provide habitat for a wide range of aquatic and semi-aquatic animals and invertebrates. They are also of great benefit to humans, providing water for irrigation and recreational opportunities such as fishing, canoeing and swimming.

Trees planted along roads and city streets do provide many benefits but they have very little wildlife habitat value and are not counted in the percent forest cover of a region. Urban wildlife such as squirrels, racoons and crows can live in the human environment, but the majority of Ontario's native wildlife cannot. Most wildlife species need blocks of natural area, with a large diversity of vegetation types and food sources to survive.

1.6 Threats to a Healthy Environment

Today, less than 15% of the original forest or natural cover remains in the County. Most of this loss occurred over a century ago when the land was cleared for agriculture and settlement, then later for urban development. Tree planting and land retirement projects have resulted in some gains since the 1930s, but natural areas are still being lost today. Every small woodlot or buffer that is removed chips away at the small amount of natural habitat that remains.

The quality of the remaining terrestrial habitats is also under threat. Some threats to our woodlots include over-harvesting or poor logging techniques, ATVs that rip up vegetation and create innumerable trails, and garbage dumping. These disturbances have, in turn, allowed non-native invasive plant species to spread and displace native species. Many native birds, animals and insects cannot survive in degraded habitats.

Waterways can be degraded by drainage, channelization and hard surfacing (pavement), as well as by pollution from urban and rural runoff. Closing drains by burying them underground in pipes also results in the loss of habitat as fish and aquatic organisms cannot live without sunlight.

1.7 Urban vs. Rural Pressures on Natural Heritage

Natural heritage protection is an important issue for both urban and rural areas and the challenges involved differ also. In general, there is more pressure to clear natural areas in urban growth centres where the cost of land is highest. In these areas, natural areas such as woodlots and stream buffers can be seen as impediments to new residential or commercial development.

In many cases, the remaining urban natural areas have been fragmented by previous development in the area or seriously degraded due to over use and activities such as dumping. As a result, remaining urban natural areas often do not meet the County wide landscape criteria to be considered significant. Nonetheless, these natural areas can be considered to be very important at the community and neighbourhood level. There is a growing expectation from the public that urban natural areas will be protected as development occurs and that that these areas will be maintained and be publicly accessible.

Municipalities must plan ahead for the management of their remaining natural areas in urban centres. This involves completing inventories of the remaining natural heritage areas to get an indication of how much, where and what natural heritage remains in the urban centre. With this information, the municipality can plan ahead for long term intended use and consider options such as designations and or acquisitions to protect important components of the natural heritage system. This planning can include official plan policy as well as management plans dealing with issues such as public access, trail linkages and liability.