

# 1. ANSI Information

## 2. METHODOLOGY

This chapter outlines the four steps taken during the analysis of the natural features in Site District 6E-15, and for the identification and evaluation of the significant sites and Areas of Natural and Scientific Interest. Limitations of the approach are also discussed.

### a) Natural Features Analysis

The Protection Objective of Ontario Provincial Parks Policy is “to protect provincially significant elements of the natural and cultural landscape of Ontario” (Ontario 1978). Life science resources are the living part of the natural landscape, as for example forests, marshes, plants, animals, and their supporting environments.

An initial inventory of natural features within the site district was undertaken by Prof. R.E. Beschel and the staff of the Fowler Herbarium, Department of Biology, Queen’s University at Kingston, in the 1960s and 1970s as part of their research into the flora of the Kingston region (Beschel *et al.* 1970). The International Biological Programme’s Conservation of Terrestrial Communities Section expanded upon this data base by identifying additional significant natural areas and conducting brief inventories between 1967 (Beschel 1968) and 1973 (MacDonald 1971 - 1973). A preliminary life science assessment, restricted to the then known significant natural areas, was conducted for the Ministry of Natural Resources by L. Luciuk (1975 - 1976, 1976). An intensive study of the natural features of Prince Edward County was conducted by Whitcombe *et al.* in 1973. Other site-specific work has been done, which offers further information on portions of the site district (e.g., Blancher 1984, Keddy 1989, Kristensen *et al.* 1999, and Norris 1992). Aerial photography from 1978 and from the early 1990s was compared for the entire site district to analyze changes in the intervening time. The present study systematically examined a variety of representative and significant landform and vegetation features throughout the site district, both within and outside of the provincial park holdings.

The Site Districts, as defined by G.A. Hills (1959) and later modified by OMNR staff, have served as a geographical and ecological framework for the analysis of the diversity of natural landscapes occurring in Ontario. Throughout much of southern Ontario, landscape diversity within these units is recognized through the physiographic and geomorphical studies of Chapman and Putnam (1984), and expanded upon from a life science representation perspective.

The purpose of the Natural Features Analysis is to allow those natural features and landscapes that are not represented by the Provincial Park System to be identified. This was accomplished within this site district by identifying the occurrence and apparent diversity of representative and significant life science features that are representative of the district, but are not present within park holdings.

The remainder of the study focuses on the selection and documentation of the best examples of the dominant vegetation/landform features occurring within Site District 6E-15. These examples are designated as Areas of Natural and Scientific Interest [ANSIs], or as Significant Sites. It is the mandate of the Peterborough District OMNR to provide protection for these areas through application of provincial policy, land use zoning controls, private landowner agreements or outright acquisition.

## b) Review of Background Information

Existing information was examined from the files of the Ministry of Natural Resources - Parks and Recreational Areas, Fish and Wildlife, Lands and Waters, and Timber Management - at Peterborough District, Southcentral regional and Queen's Park offices. Much of the information data base for significant biological areas, major deer yards, waterfowl production and staging areas, spawning and nursery areas, timber typing, agreement forests and woodland improvement areas, and other ministry concerns were available through maps prepared for the District Land Use Strategy programs (Ontario Ministry of Natural Resources 1980, 1982 a, 1983) by the former Napanee District Office. Wetland evaluation data records and maps are stored at the Kingston Area Office.

The published descriptions and maps of the bedrock and surficial geology and their major features and formation processes pertinent to the district were taken from the following literature sources:

Blachut *et al.* 1977; Chapman & Putnam 1984; Creasy *et al.* 1981; Douglas 1968; Ernsting 1976; Gartner Lee Associates 1984; Geological Association of Canada 1967; Gillie 1974; Henderson 1965, 1971, 1972; Hough 1958, 1963; Leyland 1981, 1982; Liberty 1966, 1966b, 1971; Mirytech 1962, 1967; Ontario Department of Mines and Northern Affairs and Ontario Research Foundation 1972a, 1972b; Peat 1973; Prest 1968; Terasmae & Mirytech 1964; Tovell 1972; Woerns 1977a, 1977b, 1977c, 1977d; Woodward 1949.

The character and distribution of the soils of the district were taken from the published soil survey reports:

Clayton *et al.* 1977; Gillespie, Wicklund & Matthews 1963; Gillespie, Wicklund & Richards 1962; Gillespie, Wicklund & Miller 1968; Hoffman & Acton 1974; Richards & Morwick 1948.

The literature and natural feature inventories that were completed prior to 2000 in the several provincial parks and park reserves, the national park, and select significant sites and areas of interest, and which have contributed to the site descriptions in this report include the following:

**PROVINCIAL PARKS:** Alexander & Greene 1972; Blachut *et al.* 1977; Bogart 1928; Boyd 1974; Buckle 1997; Coupland 1972; Cuddy 1978b, 1980, 1982, 1983; Darbyshire 1983; Dewey 1995; Ernsting 1976; Fox 1979; Hainault 1966, 1968, 1969-1970; Hawthorne (s.d.); Immerseel 1977; Keddy 1989; Kristensen *et al.* 1999; Lindsay 1978; McLaughlin 1977; McRae 1979, 1985; Norris and Cuddy 1990; Ontario Ministry of Natural Resources 1970 a, 1970 b, 1974, 1975 b, 1976, 1977, 1980, 1982 b, 1984, 1989, 1990; Peat 1973; Pratt 1978, 1979, 1980; Seddon 1970; Tovell 1972; Turner 1974; Wiesenberg 1976; Woerns 1977 a, 1977b, 1977c, 1977d; Woodward 1949; Wright & Engelbert 1979.

**NATIONAL PARKS / CANADIAN WILDLIFE SERVICE:** Blancher 1984; Catling 1985; Dore & Gillett 1955; Leach 1968; Hainault 1966, 1968; Levesque 1985 a, 1985 b, 1986; Revill, A.D., Associates 1982.

**OTHER AREAS:** Ballantyne 1976; Beschel 1967 a, 1969 a; Cataraqui Region Conservation Authority 1965; Cooke (s.d.); Crowder 1976, 1985; Cuddy 1977, 1978 a, 1978 c; Gartner Lee Associates 1984; Garwood 1977, 1986; Hickey *et al.* 1984; Hodges & Arbour 1981; International Biological Programme: Conservation of Terrestrial Communities 1967 - 1973;

Judd & Speirs 1964; Luciuk 1975 - 1976, 1976; Macdonald 1985 - 1986; Ontario Ministry of Natural Resources 1975 a, 1980, 1986; Palilionis 1977; Quilliam 1979; Teeple 1977; Weir 1972, 1974. As well, many wetland evaluations have been carried out since the mid 1980s; the data records are stored at the Kingston Area Office of OMNR, where these were reviewed, and are cited specifically in the individual checksheets for each ANSI.

Additional literature sources pertinent to the biota, their communities and ecology of the district were obtained from the Ministry files and personnel, university libraries and other sources. Those cited in this report are listed by category, as follows:

**MAMMALS:** Banfield 1974; Dobbyn 1994; Fenton 1965; Palilionis 1977, 1985.

**BIRDS:** Boyd 1974; Cadman *et al.* 1987; Cooke & Nicholson 1969; Curtin *et al.* 1984; Godfrey 1966; Goodwin 1982; James *et al.* 1976; McCrae 1979, 1985; Ontario Ministry of Natural Resources 1974, 1976; Pratt 1978, 1979, 1980; Quilliam 1973, 1979; Robertson & Flood 1980; Snyder 1941; Snyder *et al.* 1941; Sprague 1969; Sprague & Weir 1984; Strahlendorf 1979; Weir 1989.

**HERPETOFAUNA:** Briggs 1979; Campbell 1977 a, 1977 b; Christie 1997; Cook 1970; Curran 1965; Gregory 1977; Oldham 1988; NHIC 2000.

**GENERAL FAUNA:** Crowder *et al.* 1986; Dennis & Chandler 1974; Dennis *et al.* 1984; Fox 1979; Logier 1941; Immerseel 1976.

**FLORA:** Beschel *et al.* 1970; Catling *et al.* 1975; Crowder 1976, 1980, 1982 a, 1982 b, 1985 b; Dore 1968; Dore & McNeill 1980; Dore & Gillett 1955; Faust 1961; Fernald 1970; Fox & Soper 1952, 1953, 1954; Garwood 1965, 1976, 1985 a, 1985 b, 1986, 1987; Geis & Kee 1977; Gillett 1963; Gleason & Cronquist 1963; Guire & Voss 1967; Hosie 1973; Klugh 1908, 1912; Levesque 1985 a, 1985 b; Macdonald 1974; Macoun 1863, 1883 - 1890, 1894 - 1906; Macoun & Gibson 1878; Macoun & Malte 1917; Marquis & Voss 1981; Ontario Ministry of Natural Resources 1970 a, 1977; Peattie 1922; Roberts 1974; Scoggan 1978, 1979; Soper 1949, 1956, 1962; Soper & Heimbürger 1982; Thaler 1970; Voss 1972, 1985; Whiting & Catling 1986; Young 1907 a, 1907 b.

**VEGETATION:** Argus and White 1982, 1983; Argus and Keddy 1984; Beschel 1962, 1965 a, 1965 b, 1967 a, 1967 b; Beschel & Webber 1962; Brunton 1986; Catling *et al.* 1975; Crowder & Bristow 1986 a; Crowder & Paine 1985; Darbyshire 1983; Gartner Lee Associates 1984; Geisy & Kee 1977; Halliday 1937; Hills 1959, 1969; Hutchison & Lett 1977 (?); Jafri 1965; Macdonald 1971 - 1973; Maycock 1963, 1979; Miller 1979; Murdoch 1981; Newmaster *et al.* 1998; Ontario Ministry of Natural Resources 1979; Pryer and Argus 1987; Rowe 1972; Starling 1978; Starling & Crowder 1981; Webber 1963; Whillans 1982.

**SIGNIFICANCE STATUS:** Argus 1982; Argus & Keddy 1984; Argus & White 1977, 1982, 1983; Beschel 1968; Brownell and Riley 2000; Catling & Whiling 1976; Campbell 1977 a, 1977 b; Crowder 1980; Cuddy 1977, 1980 - 1981, 1985; Ecologistics 1984; Godfrey 1970; Mosquin & Suchal 1977; NHIC 2000; Ontario 1971 a, 1980; Whitcombe *et al.* 1973.

Past and current land use patterns in the district were derived from the following sources:

Griffiths 1985; Keenan & Hills 1964; Merrill 1892; Merritt 1973; Ontario Department of Energy and Resource Management 1968; Ontario Ministry of Natural Resources 1980, 1982 a, 1983; Turner 1974; change detection review of 1978 and 1991/1992/1993 aerial photography.

Interviews and personal communications were conducted between 1985 and 1987 with knowledgeable authorities on the flora, wildlife, geomorphology and significant features from within the ministry, universities and the public, including the following:

W.P. Barber, T.J. Beechey, J.M. Bristow, D.G. Cuddy, A.A. Crowder, A.E. Garwood, B. Griffiths, J. Immerseel, K.M. Lindsay, C. Matheson, A. Palilionis and R.J. Suffling.

Additional consultation for this update included: Todd Norris, Adele Crowder, Jeff Leggo, Erling Armson, Jarmo Jalava, Don Cuddy, Jim Hoyle, Alistair Mathers, Don Tyerman, Steve Knechtel, Peter Christie, Stephen Monet, Andy Margetson, D.V. (Chip) Weseloh, Valerie Blazeski, and others cited under personal communication in the individual check sheets of Appendix A.

Map sources were consulted and analyzed in order to identify areas of concentrations of features of concern to the project, including notable features, inventory summaries and conflicting land uses. An extensive examination of the 1978 and 1991-1993 aerial photographic coverage was conducted to identify landform / vegetation patterns, apparent condition, and changes throughout the study area. Additionally, an aerial reconnaissance flight over many of the significant natural features and areas within the site district took place in early November 1985, and another in early November 2000.

The following five criteria formed the basis of all phases of site selection and evaluation: representation, diversity, conditions, ecological considerations and special features.

- 1) **Representation** - Representation of the remaining natural features of the site district was of primary importance. In particular, the predominant vegetation / landform features that were considered to be representative of the site district were afforded special emphasis in this study.
- 2) **Diversity** - Diversity was appraised in terms of the number and diversity of vegetation, landform features, or habitats occurring within an area. The representation value of an area usually increases in proportion to the diversity of habitats contained within the area, so a high diversity was favored.
- 3) **Condition** - The degree of past disturbance to the main features of the site was assessed. Some of the impacts considered included logging, fire, flooding, draining, excavation, utility and transportation corridors, farming, and housing and cottage developments. Virtually all the site district has been disturbed to some extent over the past century and a half, so that none of the sites selected was absolutely pristine. However, the selection process attempted to minimize these impacts by selecting vegetation features that had been less disturbed or that had a longer history of natural regeneration.
- 4) **Ecological Considerations** - Ecological considerations, such as size, shape, buffering from adjacent land use impacts and watershed situation, were taken into consideration in evaluating sites. Generally, larger sites, which would be more likely to maintain their integrity through

- stable and diverse natural communities, were selected in favor of smaller sites. An exception to this rule occurred where select life science features exist only as small remnants, or where the significance of the features was sufficient to warrant special attention. In such cases, however, those small sites that were linked or occurred close together were ranked higher than more disjointed occurrences. Studies of island biogeography (e.g., Diamond 1975) suggest that species extinctions are less likely in large sites than in small, isolated ones. Headwater and watershed areas for which management control potential existed were also given special attention.
- 5) **Special Features** - Consideration was also made for special features, such as the presence of rare and endangered species, species of phytogeographic interest (significant species), nesting sites for colonial birds, such as heronries, and concentrations of breeding or migratory waterfowl, ungulates and fish. Features of earth science interest that also included notable life science features were also highlighted. The special features criterion was of secondary importance, being applied only after the above criteria had been assessed. As well, the lack of sufficiently complete or detailed biological data necessitated the use of caution in comparing the special features of those sites for which different data base levels were available.

### c) Sampling Techniques

Considerations taken from the above steps resulted in the identification of over 200 areas to be considered for survey or evaluation. Each of these areas appeared to present an aspect of good representativity of the physiographic region, a relatively high diversity of the vegetation / landform features, apparent relatively low disturbance condition, at least within the past half century, pertinent ecological considerations, and potential or actual presence of significant features, particularly with respect to the rare plant species that are distinctive to the Great Lakes coast, the limestone 'alvar' plains, the escarpments, and the wetlands. An additional criterion used in the selection of several of these areas was the occurrence of good examples of vegetation / landform features in areas immediately adjacent to present parks or park reserves.

These areas were surveyed over 26 days, between mid-October and early November 1985, and in late May 1986 and mid-June 1987, with 1/3 to 1 on-site person day being expended in each area. Limited additional field work was conducted for this update (e.g., Green Point Escarpment Forest and Yorkshire Island), although the authors are familiar with a number of the sites through other recent work (e.g., Kristensen *et al.* 1999). Those areas for which inventory information was already available (notably Presqu'île and Sandbanks Provincial Parks and the more extensive wetlands) Macdonald only briefly examined on-site, to interpret the suitability of those authors' natural features syntheses with respect to the goals of this project, and for comparison with the other areas. In the course of these reconnaissance level surveys, the following features were recorded: flora, fauna, condition, natural environmental influences, and actual or potential disturbance sources and impacts. In examining more recent wetland evaluations (and re-evaluations), particular attention was paid to comparing wetland boundaries and proposed ANSI boundaries, where ANSIs were being selected for wetland representation purposes.

#### d) Site Evaluation

Following the on-site reconnaissance, each area was reviewed, evaluated and compared within its landform / vegetation class. Those areas that presented a low overall ranking in the above criteria were rejected; those remaining were assigned 'Significant Site' status.

For all areas considered for examination, including each of the Provincially, Regionally and Locally Significant areas, a brief summary of landforms, vegetation and biota, with any significance is presented in Appendix B.

Only those areas containing vegetation / landform and other features that were unrepresented or were only poorly represented within the present provincial parks of the site district, and which presented superb examples of representative and significant features, were designated as Provincially or Regionally Significant ANSIs. These were described using the modified Life Science Inventory Check Sheet format, which includes location, overall landform, vegetation and biotic feature descriptions, outstanding associations, significant species or features, past or potential disturbances and threats, and recommendations.

The Life Science Inventory Check Sheets and Environmental Data Cards are presented in Appendix A of this report and the areas are located within the site district in Map 1.

#### e) Limitations

Limitations of the completeness and accuracy of this study include the following:

The lack of adequate coverage, detail and content of available biological information within the Site District 6E-15 necessitated additional on-site inspection of potential areas, which reduced the time available for confirmation and upgrading of the data base in the higher priority ANSIs. For the 2000-2001 finalization of the report, seasonal timing limited the opportunity for on-site inspection of additional candidate areas.

The late seasonality for the completion of the first part of the on-site study phase of this project (late autumn) likely has resulted in an omission of sightings for significant species within those areas surveyed in 1985. This is compensated for, to some extent, by the subsequent survey in spring and early summer of 1986 and 1987, and by the contributions of the authorities on the regional flora, notably the following:

Beschel *et al.* 1970, Bristow 1985, Crowder 1985, Cuddy 1985, Garwood 1985 - 1987, Suffling 1986, Darbyshire 1983 and Whitcombe *et al.* 1973.

Similarly, in finalization of this report, late seasonality and contract limitations restricted the opportunity to acquire additional field data, and limited the value of the helicopter reconnaissance (November 2000). Again, compensation occurred in the form of the authors' familiarity with the site district, including recent field work in or near a number of the ANSIs, and consultation with other knowledgeable experts.

### NATURAL HERITAGE AREA – LIFE SCIENCE CHECKSHEET

Name <b>Bloomfield Creek Wetland</b>		Map Name Wellington	Map Number 30 N/14	UTM Ref. 180700	
County Prince Edward		Lat. 43° 58'N	Long. 77° 16'W	NAD 27	Min. Alt. 75 m
Locality Marshes 3 km southwest of Bloomfield					
Township City of Prince Edward (formerly Hallowell Twp.)					
Area 980 ha					
Ownership Private					
MNR Region Southcentral	Ecoregion and Ecodistrict 6E-15				
Landform Unit(s) 40 Prince Edward Peninsula					
MNR District Peterborough					
Aerial Photographs Year – Roll – Flight Line – Numbers					
78 6 4368 506-509					
78 12 4367 69-75					
78 12 4366 21-26					
93 354 04 198-201					
<b>Physical and Biological Features</b>					
<u>Representation:</u> This site presents a diversity of coastal wetland landforms and vegetation, which are representative of the Prince Edward Peninsula Physiographic Region. The site's landforms are dominated by the extensive coastal wetland features, which have developed at the mouth of a medium sized creek in the protected waters of West Lake. The vegetation complex has a thick, fibric muck mantle over the lacustrine sands and clays of the lake bottom. As well, the flow course of the creek presents a well-developed meander pattern with some levee and tributary channel patterns. The wetland has many small ponds, and there are several small drumlins in the site, which have sand mantles and semi-mesic conditions. Coastal wetland features are well represented in the Site District (e.g., Sawquin Creek Marsh), but this is the best example located on an inland coastal lake.					
<u>Condition:</u> Disturbances to the site include flooding, farming, nutrient runoff, and development. Water levels in the site are largely controlled by Lake Ontario, which has caused periodic changes to the wetland communities. This is part of a natural cycle. Farming occurs around the periphery of the basin as well as on some of the drumlins; this has resulted in the on-going clearance of several of the remnant woodlots in the site. Some nutrient discharge into the marsh from Bloomfield Creek and along the basin's periphery has been reported. There is a campground development on Gasket					
(continued)					
Major Information Sources Reconnaissance work by Ian D. Macdonald, review of recent aerial photography, OMNR files.					
Significance Level (Provincial/Regional/Local) and Brief Summary of Major Representative Values This is a Regionally Significant ANSI, which presents a high diversity of coastal wetland natural features, with significant biota.					
Date Compiled December 2000		Compiler M.A. Snetsinger and R. Snetsinger			

Island and a homestead occurs on one of the other drumlin rises.

**Diversity:**

The wetland contains a diversity of vegetation communities that are representative of the coastal wetlands in the physiographic region. The emergent marsh dominating the central portion of the wetland is dominated by broad-leaved cattail (*Typha latifolia*), with lesser amounts of wild rice (*Zizania palustris*), bur-reeds (*Sparganium* species), Canada blue joint (*Calamagrostis canadensis*), reed canary grass (*Phalaris arundinacea*), and spotted jewelweed (*Impatiens capensis*). Throughout this cattail area are a number of small open water pockets, and these along with the main channel of Bloomfield Creek are dominated by milfoil (*Myriophyllum* species) and common hortwort (*Ceratophyllum demersum*) with lesser amounts of pondweed (*Potamogeton* species), eelgrass (*Valisneria americana*), bladderwort (*Utricularia* species), and pond lilies. There are a number of swamp shrub thickets interspersed within the marsh and on the peripheries, and these are dominated by meadow and pussy willows (*Salix petiolaris*, *S. discolor*) and speckled alder (*Alnus rugosa*), with lesser amounts of ferns, grasses, sedges, swamp milkweed (*Asclepias incarnata*), and marsh marigold (*Caltha palustris*). There are also areas of treed swamp containing silver maple (*Acer saccharinum*), red ash (*Fraxinus pennsylvanica*), black and crack willows (*Salix nigra*, *S. fragilis*), American elm (*Ulmus americana*), and eastern hemlock (*Tsuga canadensis*). The more mesic soils of the low drumlins support intermediate aged, deciduous forests of sugar maple (*Acer saccharum*), northern red oak (*Quercus rubra*), American basswood (*Tilia americana*), and eastern white pine (*Pinus strobus*). There are active croplands of corn and pasture crops on the lands surrounding the wetland basin and on the more arable drumlin slopes.

**Ecological Considerations:**

This huge 980 ha site, located at the mouth of Bloomfield Creek in the northeastern quarter of West Lake, which is separated from Lake Ontario by the Sandbanks Coastal Sandbar Dunes ANSI. The site contains a diversity of habitat types and associated species. It also contains a number of rarities, and its large size offers some internal buffering from adjacent impacts, as well as protection for the migration corridor provided by Bloomfield Creek that connects West Lake to more upland areas. A number of unique fish species have been reported from West Lake.

**Special Features:**

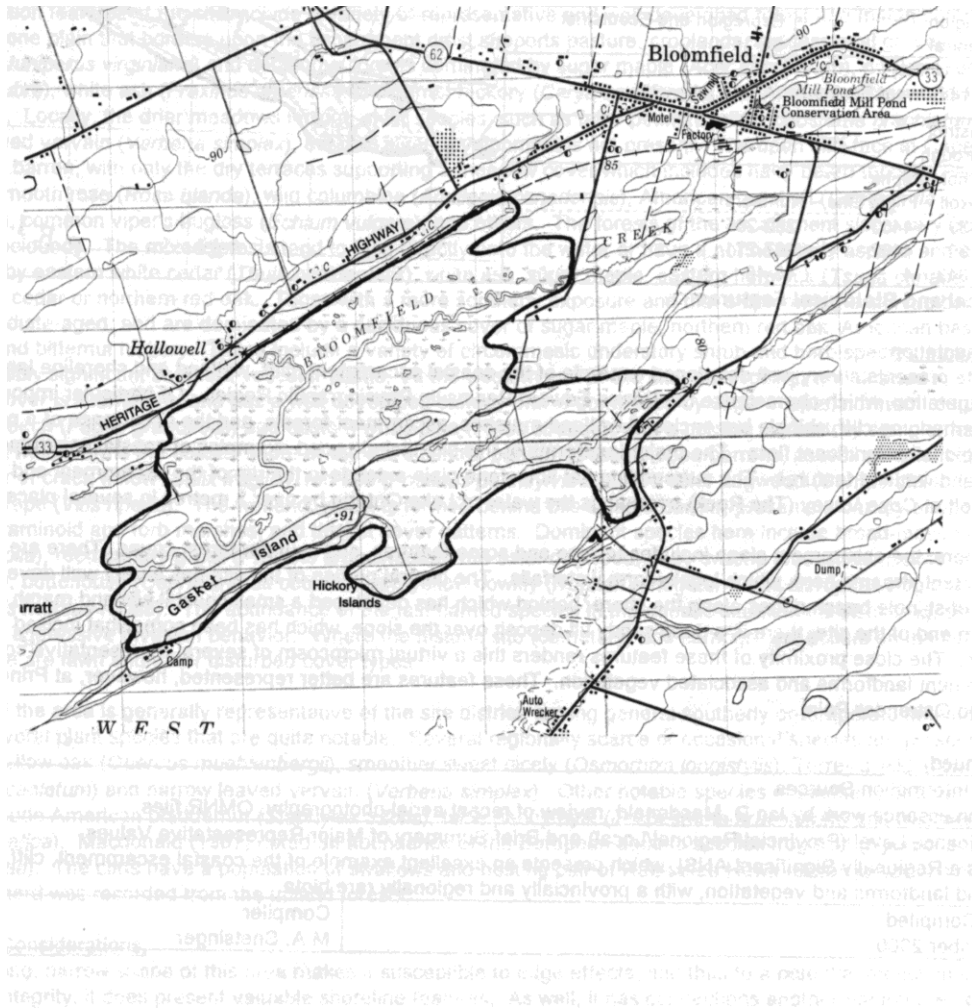
The fauna includes many wetland birds and other wildlife species, which are actively breeding or use the site as a migratory station. As well, there are several provincially significant species reported from the site, including Least Bittern (S3, Vul.), Canvasback (S1-S2), and Black Tern (S3, Vul.). The numerous small ponds throughout the wetland provide good waterfowl breeding habitat. The waters are reported to provide good spawning and feeding habitat for several rare fish species, including the Grass Pickerel (S3), Northern Hog Sucker (S4), and Tadpole Madtom (S2). The flora contains the provincially rare arrow arum (*Peltandra virginica*) (S2). The wetland has been evaluated as provincially significant.

**Recommendations:**

1. The site's significance lies in its large size, importance as fish habitat, and portrayal of representative coastal wetland natural features, which include aquatic, marsh, thicket, and riparian features. However, these features are shared with the numerous coastal wetlands in the site district, and so this site should not necessarily be singled out for ANSI designation. However, it is probably the best example of a wetland on an inland coastal lake (West Lake), and so it is recommended for designation as a Regionally Significant ANSI.
2. The wetland evaluation for the site is dated (1984) and was based on a minimal amount of fieldwork. It is recommended that a 3<sup>rd</sup> wetland evaluation be conducted in order to update the wetland file and species lists.

**References:**

- Beaudette, S. and P. Mohr. 1984. Wetland Data Record and Evaluation – West Lake. Second Edition. June 6,7,11 and July 19 & 25. Ecologistics Limited. Manuscript. 22 pp + 9 pp. supplement.
- Macdonald, I.D. 1987. Life Science Areas of Natural and Scientific Interest in Site District 6-15. Draft. Ontario Ministry of Natural Resources, Eastern Region, Kemptville SR OFER 8603. viii + 149 pp.



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The following nine images were taken from the larger FOD5-1 woodland block, clearly demonstrating that this is not a wetland. Greater resolution can be provided via attached files if requested.







The photo above is taken near the southwestern corner of the FOD5-1 woodland, looking down at the adjacent MAS2-1 wetland.

The following four images are from the smaller FOD5-1 woodland along the western edge of the property.



The top right image is from the woodland edge, looking down on the adjacent MAS2-1 wetland.