



Information Report

To: Mayor and Members of Council

From: Megan Rueckwald, Manager of Community Planning, County of Frontenac

Re: Palmerston Lake Life Science Area of Natural and Scientific Interest (ANSI)

Date Prepared: April 5, 2019

Date of Meeting: April 12, 2019

Introduction

At the March 29, 2019 Township of North Frontenac Council meeting, through resolution #165-19, Township Council directed staff to prepare a report that will: provide Council and residents with options to review and certify the type and location of the Palmerston Lake ANSI; provide options for the types of environmental studies that may need to be completed for any future development on lands within the ANSIs and cost estimates for this work; detail the process for permitting development within ANSIs; and provide Council with confirmation on the number and classification of Provincially and Regionally Significant ANSIs across North Frontenac.

Planning staff have prepared this report in response to Resolution #165-19. To improve the readability of the report, the report has been separated into 10 sections as outlined below. Township staff will be forwarding a copy of this report to all members of the public who submitted comments.

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Background

In 2018, Council of the Township of North Frontenac commenced a review of the Township of North Frontenac Comprehensive Zoning Bylaw #15-04. The main purpose of the update was to implement the policies of the new North Frontenac Official Plan that was approved in 2017. Through the review process members of the public expressed concern over the identification of an Area of Natural and Scientific Interest (ANSI) on the Land Use Schedule west of Ompah in the Former Township of Palmerston. At the November 23, 2018 Public Meeting, Council passed the following resolution:

Moved by Councillor Good, Seconded by Deputy Major Perry #536-18

BE IT RESOLVED THAT Council instructs the Planner and Clerk to look into the changes to the Environmental Protection Zones with Ministry of Natural Resources and public consultation process involved with these amendments.

Carried

Township and County planning staff prepared a letter to the Ministry of Natural Resources and Forestry sent December 7, 2018, requesting information regarding the classification of the ANSI and the notification process. Trevor Harris, A/District Planner, Bancroft District, with the Ministry of Natural Resources and Forestry replied to the Township January 8th, 2019, indicating that the ANSI was identified in 1989 as the Palmerston Lake Provincially Significant Life Science ANSI. Harris provided the Township with an excerpt from the "Life Science Areas of Natural and Scientific Interest in Site District 5-11" which contains the inventory checklist sheet compiled in 1989 describing the physical and biological features of the ANSI (Attachment 2).

On January 31, 2019, the Ministry sent correspondence to the Township informing the Township that the Ministry is researching historical information to confirm the status of the Palmerston Lake ANSI and that this information will be provided to the Township when it is available.

On February 8, 2019, planning staff presented a report for Township Council outlining the history of the file to date, the legislated framework regarding planning, the classification of ANSIs and information available on the Palmerston Lake ANSI. That day, the Township received correspondence from the MNR stating that the Palmerston Lake ANSI is identified as Provincially Significant in LIO (Land Information Ontario) as a result of an administrative error and will be updated to the correct designation of Regionally Significant (Attachment 1).

On March 29, 2019, Township Council passed Resolution #165-19 during the regular meeting:

Moved by Councillor Good, Seconded by Councillor Fowler #165-19

Whereas during the North Frontenac Zoning By-law Review process there has been significant discussion with respect to an Area of Natural and Scientific Interest (ANSI) identified as the Palmerston Lake ANSI;

And Whereas the Ministry of Natural Resources and Forestry (MNRF) is responsible for identifying natural heritage features such as Provincially Significant Wetlands, ANSIs, natural hazards, and significant woodlands and valleylands;

And Whereas the Ministry provided in correspondence dated February 8th, 2019, that the Palmerston Lake ANSI was incorrectly identified in the Land Information Ontario database and is in fact designated as Regionally Significant;

And Whereas the Palmerston Lake ANSI in North Frontenac is identified as 'Regionally Significant' in the County of Frontenac Official Plan that was approved by the Province in 2016;

And Whereas it is important for North Frontenac Township to have the most accurate information prior to the adoption of the Comprehensive Zoning By-law;

Now Therefore Be It Resolved That Council direct staff to prepare a report that will:

- (1) Provide Council and residents with options to review and certify the type and location of the Palmerston Lake ANSI;
- (2) Provide options for the types of environmental studies that may need to be completed for any future development on lands within ANSIs and cost estimates for this work;
- (3) Detail the process for permitting development within ANSIs; and
- (4) Provide Council with confirmation on the number and classification of Provincially and Regionally Significant ANSIs across North Frontenac.

Carried

Areas of Natural and Scientific Interest (ANSI)

The MNRF is responsible for identifying natural heritage features such as Provincially Significant Wetlands (PSW), ANSIs, natural hazards, and significant woodlands and valleylands. The 2014 Provincial Policy Statement defines Areas of Natural and Scientific Interest as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study, or education.

MNRF Background – Protection of ANSIs

ANSIs play an important role in the protection of Ontario's natural heritage. MNRF identifies two types of ANSIs (life science and earth science) on the basis of scientific surveys of the province's ecodistricts. Because these identified ANSIs are a critical complement to provincial parks and conservation reserves, such ANSIs represent important natural features that are not found in protected areas. In addition, ANSIs provide a focus for both public and private sectors to contribute to the protection of Ontario's natural heritage.

Identification

Identification of life science ANSIs is based on the assessment of natural areas within the context of ecological regions. This process includes the identification of major vegetation and landform patterns or themes occurring in the ecological site region or district, to characterize the original vegetation-landforms in the area. The following five selection criteria are used to evaluate potential ANSIs:

1. Representation – the representation of geological themes or landform-vegetation features in an eco-district
2. Condition – existing and past land uses, which are used to assess the degree of human-induced disturbances
3. Diversity – the number of assessed high-quality, representative features that exist within a site
4. Other ecological considerations – ecological and hydrological functions, connectivity, size, shape, proximity to other important areas, and so on;
5. Special features – for example, populations of species at risk, special habitats, unusual geological or life science features, and educational or scientific value.

Significant natural areas representing the same vegetation and landform themes are compared, and the sites best representing those themes are identified as life science ANSIs. Further information regarding ANSI identification can be found in the [Natural Heritage Reference Manual](#); information regarding the identification of ANSIs can be found in the [Identification and Confirmation Procedure for Areas of Natural and Scientific Interest](#).

Areas of Natural and Scientific Interest in North Frontenac

On March 22, 2019, Trevor Harris from MNRF provided the Township with a list of ANSIs within the Township of North Frontenac as well as two maps showing the locations of the ANSIs (Attachment 5). MNRF advised that Plevna Cedar Swamp, Snow Road Station Esker, Palmerston Lake and Fortune-Schooner ANSIs overlap with private land.

Confirmed ANSIs:

- Plevna Cedar Swamp, Life Science, Regional
- Snow Road Station Esker, Earth Science, Provincial
- Hungry Lake Barrens, Life Science, Provincial

Confirmed ANSI's within Madawaska Highlands Land Use Plan:

- Palmerston Lake, Life Science, Regional (following correction)
- Evergreen Mountain, Life Science, Regional (following correction)
- Summit Lake, Life Science, Provincial
- Fortune-Schooner, Life Science, Provincial
- Centennial Lake, Life Science, Provincial

Candidate ANSIs:

- Bishop Corners Schoolhouse, Earth Science, Provincial – Candidate
- Ore Chimney Mine, Earth Science, Provincial – Candidate
- Marble Lake Stromatolites, Earth Science, Provincial – Candidate

Palmerston Lake Life Science ANSI

In January 1989, the Palmerston Lake Life Science ANSI was confirmed by the Ministry of Natural Resources and Forestry as indicated in the Life Science Inventory Check-List (Attachment 2). At the time of compiling in 1989, the ANSI contained 60% private and 50% Crown land (source: Life Science Inventory Check-List)

The Palmerston Lake ANSI was identified as provincially significant marble-based wetland, upland and rock barren complex. The physical and biological features identified in the ANSI include many rare forms of flora including the very rare form *lineata* of the boreal calcicolous orchid *Amerorchis rotundiflora*, Calypso orchid, and the moss *Tomenthypnum falcifolium*. The ANSI is seated on marble, with calcareous-based hardwoods and mixed forest dominating uplands and a variety of calcareous wetlands occupying bedrock depressions. With regard to fauna, nesting ravens were observed on the extensions of bedrock along the contact with marble in Deep Bay where large cliffs occur, as well as a Great Blue Heron colony was noted in a beaver pond above the cliff. Further, an adult Cooper's Hawk, a species considered rare in Ontario as a breeding bird, was observed on suitable breeding territory along the west side of Palmerston Lake.

In 1994, a Gap Analysis was completed on behalf of MNR and indicated that the Palmerston Lake ANSI should be reduced to regionally significant status, as the features were represented in other ANSI's (analysis in Attachment 3). The MNR have advised that the Madawaska Highlands Land Use Plan 1997 confirmed the Palmerston Lake ANSI as regionally significant (Attachment 4). The Ministry advised planning staff to refer to the Preface on page ix, and page 8 of the Madawaska Highlands Land Use Plan for details regarding public consultation. They further advised that public consultation is also involved in the Forest Management Planning (FMP) process on Crown land. The FMP contains specific area of concern guidance for forestry operations within this Regionally Significant Palmerston Lake ANSI.

In 2011, Bancroft District staff instructed the Palmerston Lake ANSI be changed to provincial significance. Subsequently, MNR advised that this was an error based on incomplete information. The Ministry provided instructions for this change in 2011, but advised that the actual change in LIO did not occur until 2017. This accounts for how the County of Frontenac Official Plan, approved in 2016, reflected the Palmerston Lake ANSI as regionally significant. MNR staff have advised that the classification will be updated in LIO to regional significance based on this review.

Planning Analysis

Legislated Framework – Planning Act

The *Planning Act*, R.S.O. 1990, is provincial legislation that sets out the ground rules for land use planning in Ontario. Section 3 of the *Act* states that the Minister may from time to time issue policy statement that have been approved on matters relating to municipal planning that in the opinion of the Minister are of provincial interest. In respect of the exercise of any authority that affects a planning matter, section 3 of the *Planning Act* requires that decisions affecting planning matters “shall be consistent with” policy statements issued under the Act.

Provincial Policy Statement, 2014

The Provincial Policy Statement provides direction on matters of provincial interest related to land use planning and development. Section 2.1 Natural Heritage states that natural features and areas shall be protected for the long term. Section 2.1.5 states that *development* and *site alteration* shall not be permitted in: e) *significant areas of natural and scientific* interest unless it has been demonstrated that there will be no *negative impacts* on natural features or their *ecological functions*. Further, Section 2.1.8 states that *development* and *site alteration* shall not be permitted on *adjacent lands* to the *natural heritage features and areas* identified in policies 2.1.4, 2.1.5, 2.1.6 unless the ecological function of the *adjacent lands* has been evaluated and it has been demonstrated that there will be no *negative impacts* on the natural features or on their *ecological functions*.

The Ministry of Natural Resources and Forestry identifies and ranks ANSIs as being provincially, regionally, or locally significant. For the purposes of policies 2.1.5 (e) and 2.1.8 of the PPS, significant ANSIs include only ANSIs identified as provincially significant.

The terms in italics above are defined in the Provincial Policy Statement, 2014 as follows:

- Adjacent lands: means for the purposes of policy 2.1.8, those lands contiguous to a specific natural heritage feature or area where it is likely that development or site alteration would have a negative impact on the feature or area. The extent of the adjacent lands may be recommended by the Province or based on municipal approaches which achieve the same objective. The adjacent lands have been defined by the Province as 120 metres for life science ANSIs.
- Areas of Natural and Scientific Interest (ANSI): means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study, or education.
- Development: means the creation of a new lot, a change in land use, or the construction of buildings or structures requiring approval under the *Planning Act*,

but does not include: a) activities that create or maintain infrastructure under an environmental assessment process; b) works subject to the *Drainage Act*.

- Ecological Functions: means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems, and landscapes. These may include biological, physical, and socio-economic interactions.
- Negative Impact: means in regard to other natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions due to single, multiple or successive development or site alteration activities.
- Site Alteration: means activities, such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site.

The Provincial Policy Statement, 2014, supports improved land use planning and management, which contributes to a more effective and efficient land use planning system. The policies of the PPS may be complemented by provincial plans or by locally-generated policies regarding matters of municipal interest. Municipal official plans provide a framework for comprehensive, integrated, place-based and long-term planning that supports and integrates the principals of strong communities, a clean and healthy environment and economic growth, for the long term. The policies of the PPS represent minimum standards. The PPS does not prevent planning authorities and decision-makers from going beyond the minimum standards established in specific policies, unless doing so would conflict with any policy of the Provincial Policy Statement.

County of Frontenac Official Plan, 2016

The County of Frontenac Official Plan is a framework for guiding development in the County through the management and protection of the natural environment and by providing direction and influence on growth patterns. In Ontario, all planning decisions must conform to the County and Township Official Plans.

Section 7.1.4.2 of the County of Frontenac identifies ANSIs as a critical complement to Provincial Parks and Conservation Reserves as they represent important natural features that are not found in protected areas. The County recognizes the importance and value of regionally and provincially significant ANSIs and supports their protection. The Township Official Plans shall identify and protect those regionally or provincially significant ANSIs where no development shall be permitted in or adjacent to them unless it can be demonstrated that there will be no negative impacts on the ANSI and its ecological function. [Link to County of Frontenac Official Plan](#)

The policy of protecting both regional and provincially significant ANSIs at the same level was part of the recommendations made in the Frontenac County Natural Heritage Study (2012). The goals of the Natural Heritage Study included increasing the

understanding of natural heritage features and systems across the Frontenacs, develop land use planning information and policies that identify, protect and enhance the County's natural heritage features and systems, as well as recognize links between natural heritage features and systems. Appendix "1A" – Natural Heritage System of the County Official Plan (Attachment 6) outlines the key linkages throughout the County. The Palmerston Lake ANSI is shown as a connector that facilitates the linkages through deer yards and provincially significant wetlands. The area also represents a key linkage to further north deer/early season moose yards and other identified ANSIs.

The study identified a total of 45 ANSIs in Frontenac County: 32 Provincially Significant and 13 Regionally Significant. One of the reasons for treating the two types of ANSIs at the same level of protection is that a majority of these ANSIs form part of the regional linkage system that connect natural heritage areas within Frontenac and to other systems outside the County (as illustrated in Appendix 1A of the County Plan). The County used a similar approach in enshrining the 30 metre waterfront setback in the regional plan to ensure that all four Townships must meet this minimum standard, recognizing that waterfront protection is important to protecting water quality in all of the lakes and rivers in Frontenac.

The PPS allows for planning authorities to exceed standards of provincial land use policy. Section 4.9 of the PPS states:

"The policies of this Provincial Policy Statement represent minimum standards. This Provincial Policy Statement does not prevent planning authorities and decision-makers from going beyond the minimum standards established in specific policies, unless doing so would conflict with any policy of this Provincial Policy Statement."

Public consultation was an important part of the process in developing these policies. Two open houses were held prior to completing the 2012 Natural Heritage Study. Four drafts were prepared as part of the County Official Plan process, and consultation included ten open houses, three presentations to each Township Council, and more than 100 responses to an on-line survey.

Township of North Frontenac Official Plan, 2017

The purpose of the Township of North Frontenac Official Plan is to guide and direct future growth in a logical and orderly manner, to protect existing development from adverse effects, which may arise from incompatible development and redevelopment, and to ensure healthy and sustainable growth while encouraging economic development which will benefit all residents of the Township.

Section 4.12 Natural Heritage Features states that it is intended that particular features identified in North Frontenac will be conserved for their natural heritage value and shown on the Land Use Plan Schedule. Development and site alteration shall not be permitted on or within adjacent lands of an area of natural and scientific interest, unless it has been demonstrated through the preparation of an Impact Assessment as required in Section 4.12.2.F – Environmental Impact Assessment, that there will be no negative

impacts on the natural features or on the ecological functions. The Palmerston Lake ANSI is shown on the Land Use Schedule (Attachment 7).

Section 4.12.2 F. Environmental Impact Assessment – Council will require an impact assessment for development and site alteration proposed in designated Natural Heritage Features and adjacent lands. The Official Plan includes a guideline on the potential scope of an Environmental Impact Assessment including:

- (i) A description of the study area and landscape context;
- (ii) Description of the development proposal;
- (iii) Identification of those features and functions likely to be affected by the development proposal;
- (iv) Assessment of the potential impacts of the proposed development on key features and functions;
- (v) Identification of mitigation requirements and monitoring requirements, quantification of residual impacts (those that cannot be mitigated) if any; and
- (vi) Review and decision.

Options to Certify and Review the Type and Location of the Palmerston Lake ANSI

In Resolution #165-19, Township Council directed staff to provide Council and residents with options to review and certify the type and location of the Palmerston Lake ANSI. Planning staff are proposing the following options that may be considered by Council.

1. Township Council may request the Ministry of Natural Resources and Forestry to re-evaluate the status of the Palmerston Lake ANSI to certify and review the type of ANSI and re-evaluate the boundaries of the identified area.
Note: Comments have been received from the public that state that works, including forestry on Crown Land and mineral aggregate extraction on private lands, have occurred within the defined area which may have altered the status of the features previously identified. Without the completion of a detailed review, the potential impact on these features is not known. The MNRF is responsible for identifying natural heritage features which planning authorities obtain through Land Information Ontario (LIO).
2. Council may wish to undertake a Township-wide natural heritage study to review the type and location of ANSIs within the Township that are located on private lands to determine what level of development could be supported through demonstration that the development would have no negative impacts on the natural features or their ecological functions. Through this process the boundaries of the ANSIs could be reviewed and a request made to the Ministry to amend the mapping accordingly.
Note: The completion of a Township-wide study would come with a significant cost and may recommend that additional natural heritage features be identified within the Township.
3. Council may wish to undertake an environmental impact assessment to review the type and location of the Palmerston Lake ANSI on private lands to determine what level of development could be supported through demonstration that the development would have no negative impacts on the natural features or their ecological functions
Note: The completion of a study that only impacted private lands within the Palmerston Lake ANSI may not be equitable to other property owners who have identified natural heritage features within or in proximity to their properties.

Process for Permitting Development within an ANSI

Process

- 1) Prior to the submission of a building permit, purchase of property, or planning approval, the owner of the land reviews the zoning bylaw and official plan to learn about site specific provisions and policies that may impact the property. Should a natural heritage feature be identified, the interested party will reach out to Township staff to confirm the process for submitting the required studies and information.
- 2) Should a building permit or planning application be received, the Township Clerk/Planning Manager and Chief Building Official review the submitted building permit to ensure compliance with the Township Zoning Bylaw and conformity with the Township Official Plan. This process involves review of the zoning (e.g. permitted uses, setback requirements) as well as the official plan designation.
- 3) Should a natural heritage feature be identified on the subject lands or within the required setback, Township staff consult with planning staff to confirm any studies that are required prior to the issuance of a permit or planning approval. This includes Areas of Natural and Scientific Interest.
- 4) The applicant is informed that the proposed works (building/new lot creation/zoning amendment) are within or in proximity to an area containing natural features and that an environmental impact assessment is required. Planning staff would provide offer to set up a pre-consultation meeting with the owner/applicant to provide additional information. Dependent upon the feature identified, planning staff would encourage the owner/applicant to reach out to the appropriate agency prior to meeting with planning staff (e.g. MNRF or Mississippi Valley Conservation Authority).
- 5) At the pre-consultation meeting, planning staff would advise as to why an environmental impact assessment is required to be completed, the planning process and timelines associated with this as well as provide the owner/application with a list of private consulting firms that they may wish to contact.
- 6) The owner/applicant prepares and submits an environmental impact assessment as per the requirements in Section 4.12 Natural Heritage Features F. Environmental Impact Assessment in the Township of North Frontenac Official Plan. The study is reviewed and the response provided to the applicant.
- 7) Should the study submitted and review be favourable, the owner/applicant would be permitted to proceed with the development and implement the required mitigation measures (if any).

Cost Estimates

Township staff contacted a number of private consulting firms and requested an estimate of the time and cost associated with completing an environmental impact assessment. The scenario that staff requested an estimate for was a 2-5 acre piece of land that was to be developed with a dwelling and accessory structures within a Life Science ANSI. This was selected as it is representative of the lands that may be disturbed for the construction of a dwelling and accessory uses which is the common development within the area. The firms that replied indicated that the work would take 2-3 days and anticipated that the costs would be between \$2,000 - \$4,000. This is consistent with the reply received from the Conservation Authorities contacted who informed that for this scale of development they advise residents that the work will be between \$2,000 - \$5,000. Review of a larger piece of area to be disturbed or more intensive land use proposed may result in a greater cost to complete the required study. Please also be aware that there would be a review fee associated with the submission of the report. As of the time of writing, this fee had not been received but planning staff will inform Council of this at the April 12th Council meeting.

Implications for the Township of North Frontenac Zoning Bylaw Review

Illustrating the ANSI on the Township Zoning Bylaw Land Use Schedule provides greater transparency with the public and will lead to greater protection of natural heritage features. Often times before purchasing property, realtors and potential purchasers look to the Zoning Bylaw to determine setbacks and permitted uses and may not look at the Official Plan designation for the property; therefore, including the information on the zoning schedule increases awareness. Demonstrating that there will be no negative impacts will come through the form of an Environmental Impact Assessment. The Official Plan sets out guidelines for the assessment, while the scale of the development proposed and natural features identified will dictate the scope of the study required.

Should Township Council direct staff to remove the ANSI from the Zoning Bylaw Land Use Schedule, the requirement for the demonstration of no negative impacts on the natural features or their ecological functions would still be required prior to development within the ANSI. Unless the Township receives direction and analysis from MNRF advising that the area no longer meets its criteria as an ANSI, the designation will remain in place. In Ontario, all decisions and development must be consistent with the Provincial Policy Statement (2014) and conform to both the upper-tier official plan (County) and lower-tier official plan (Township).

The establishment of the Local Planning Appeal Tribunal (LPAT), formerly the Ontario Municipal Board, created the “Consistency/Conformity” for the review of appeals related to zoning bylaw amendments. For an appeal to proceed, it must be demonstrated that the provisions within the zoning bylaw are not consistent with the Provincial Policy Statement (2014) and do not conform with the upper and lower-tier official plans. Planning staff included the environmental protection zones on the Township Zoning Land Use Schedule to conform to the Township and County Official Plans.

Conclusion

Inclusion of the ANSI on the Township Land Use Schedule ensures a greater level of protection by increasing awareness; further, this is transparent with the public. The life science ANSI provides habitat for many species and contains rare flora within the marble-based wetland and upland and rock barren complex.

The correspondence provided from the Ministry of Natural Resources and Forestry on February 8, 2019, confirmed the status of the Palmerston Lake ANSI to be of regional significance. The County of Frontenac Official Plan provides the same level of protection to the regionally significant ANSIs as it does to provincially significant ANSIs; as such, removal of the Environmental Protection zone layer over the lands identified in the Township of North Frontenac Zoning Land Use Schedule will not remove the requirement for an environmental study prior to development. Therefore, Council may wish to proceed with the adoption of the Zoning Bylaw as this would not prevent Township Council and/or MNRF from continuing to review the Palmerston Lake ANSI.

Should an assessment be completed by the MNRF amending the boundaries or classification of the Palmerston Lake ANSI in the future, the official plans and zoning bylaw land use schedules can be amended accordingly. The Zoning Bylaw is not a static document and can be amended by way of the process detailed in the Planning Act.

Attachments

Attachment 1 – MNRF letter dated February 8, 2019

Attachment 2 – 1989 Area of Natural and Scientific Interest – Life Science Inventory Check-List

Attachment 3 – 1994 Gap Analysis

Attachment 4 – The Madawaska Highlands Land Use Plan, Final Draft (April 1997)

Attachment 5 – MNRF ANSI Maps

Attachment 6 – Appendix 1A – County of Frontenac Official Plan

Attachment 7 – Township Official Plan Land Use Schedule

February 8, 2019

Township of North Frontenac
6648 Road 506
Plevna, ON K0H 2M0
Attention: Planning Department

County of Frontenac
2069 Battersea Road
Glenburnie, ON K0H 1S0
Attention: Planning Department

Dear Municipal Staff,

**SUBJECT: Notification of updated status to 'Regionally Significant'
Palmerston Lake ANSI & Evergreen Mountain ANSI
Township of North Frontenac
County of Frontenac**

This letter is to provide notification that the Ministry of Natural Resources and Forestry (MNR/F), Bancroft District, has reviewed the current status of both the Palmerston Lake & Evergreen Mountain ANSI's (Areas of Natural and Scientific Interest).

Currently these ANSI's are identified as Provincially Significant in LIO (Land Information Ontario) data, however it has been determined that this designation was the result of an administrative error and will be updated to the correct designation of 'Regionally Significant'. The Regionally Significant status for these ANSI's is also reflected in the 1997 Madawaska Highlands Land Use Plan, and there is no information available to suggest that this status has officially changed since that time. Therefore, this change is not an official ANSI designation change it is simply a correction to the LIO data.

Land Information Ontario Warehouse

The status is now recognized as Regionally Significant and this change will soon be available through the Land Information Ontario Warehouse (LIOW) at:
<https://www.javacoeapp.lrc.gov.on.ca/geonetwork/srv/en/main.home>.

The information is stored under the 'ANSI – Life Science Areas of Natural and Scientific Interest' data class.

If you have any questions regarding these ANSI's, please do not hesitate to contact Trevor Harris, Bancroft District Planner, at 613-332-3940 x 206 or trevor.harris@ontario.ca.

Sincerely,

A handwritten signature in blue ink, consisting of a large, stylized initial 'J' followed by a long horizontal line.

Jesse Van Allen
Resources Operations Supervisor
Ministry of Natural Resources and Forestry
Bancroft District

AREA OF NATURAL AND SCIENTIFIC INTEREST - LIFE SCIENCE INVENTORY CHECK-SHEET

NAME Palmerston Lake	MAP NAME Clyde Forks	MAP NUMBER 31 F/2	UTM REF. 510850
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COUNTY, DISTRICT or REGIONAL MUNICIPALITY Frontenac	LAT. 45 ° 00 'N	LONG. 76 ° 53 'W	ALT. MIN. 256m	MAX. 351m	
LOCALITY by Ompah, Palmerston Tp.	NTS MAP SHOWING AREA BOUNDARIES 1:250,000				
TOWNSHIP Palmerston Tp. South Canonto Tp. Clarendon Tp. Miller Tp.					
LOTS Palmerston Tp.					
CONCESSIONS South Canonto Tp. Clarendon Tp. Miller Tp.					
AREA acres ca. 1600 ha					
OWNERSHIP 60% private; 50% crown					
ADMINISTRATION					
FOREST REGION AND DISTRICT					SITE REGION AND DISTRICT 5-11
MNR REGION AND DISTRICT East. - Tweed					CONSERVATION AUTHORITY
AERIAL PHOTOGRAPHS					
BASE MAP:					
YEAR	ROLL	FLIGHT LINE	NUMBERS		
1978	161	4467	80-86		
1978	161	4468	218-223		
1978	187	4469	52-59		
1978	154	4501	201-207		
1978	154	4502	239-245		

PHYSICAL AND BIOLOGICAL FEATURES

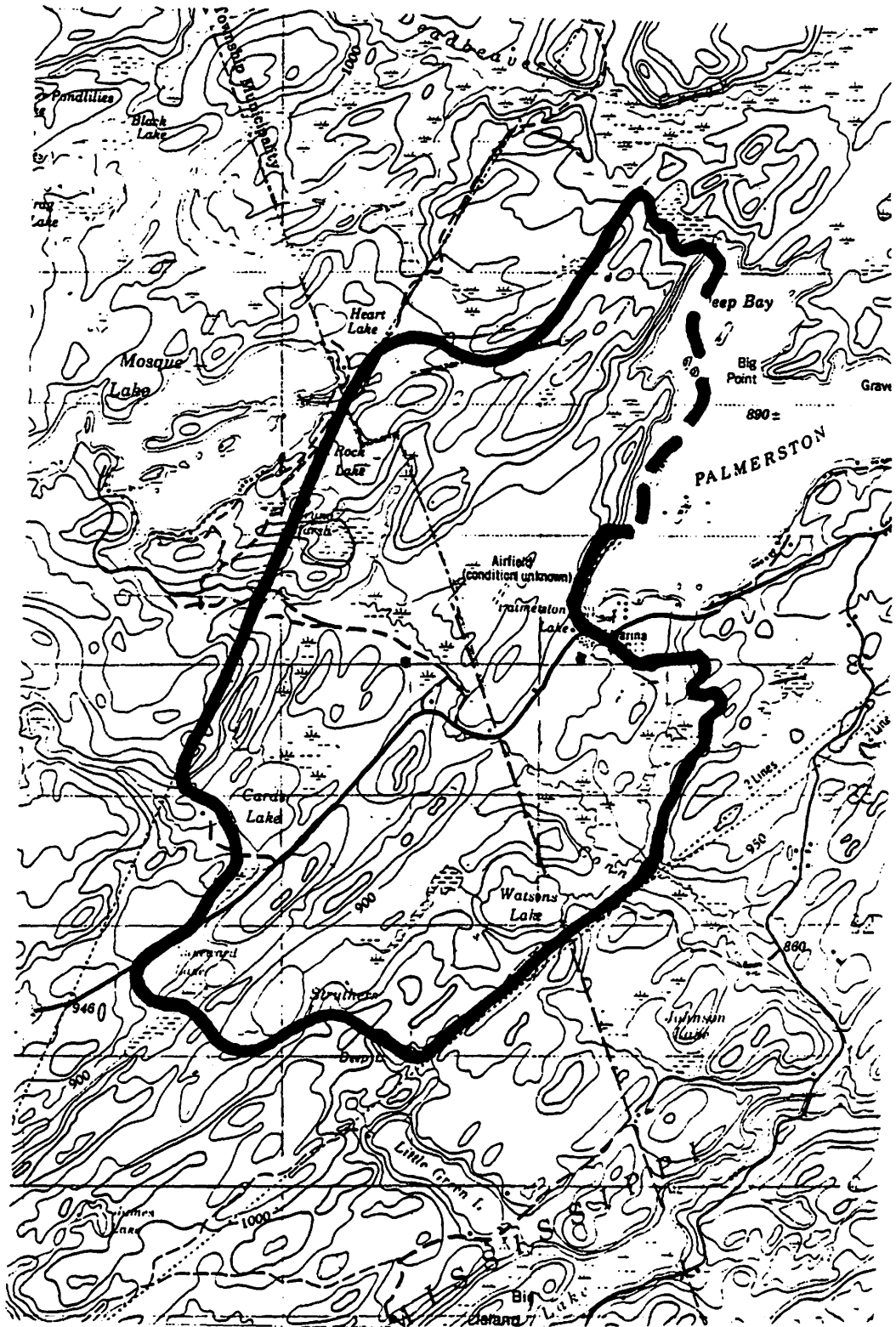
The small Cedar fen south of the marina at Ompah has long been known as the only southern Ontario site of the very rare forma lineata of the boreal calcicolous orchid Amerorchis rotundifolia which is rare in southern Ontario (Cuddy 1987; Whiting and Catling 1987). More recently the nationally rare Oak Fern (Gymnocarpium robertianum) was found here in large numbers. It is the only southern Ontario station known off the Great Lakes (Pryer and White 1983). The site is small and has been severely disturbed by logging, although the best Gymnocarpium stand remains untouched (pers. obser. 1988). Other rare flora elements include a stand of Calypso orchid (Calypso bulbosa) and the moss Tomenthypnum falcifolium, found here for the first time in southern Ontario (Cuddy 1987).

This area of the ANSI is seated on marble, with calcareous-based hardwoods and mixed forest dominating uplands and a variety of calcareous wetlands occupying bedrock depressions. They include peatlands (forested and open graminoid fens - the latter near Mosque Lake 31 C/15 513842 dominated by Potentilla fruticosa). Several sites south of Hwy 509 which splits the site, may also contain Amerorchis and Gymnocarpium. (cont'd)

DATA SHEETS ATTACHED	MAJOR INFORMATION SOURCES
PHYSICAL DESCRIPTION <input type="checkbox"/>	Cuddy 1987; this study
VEGETATION SUMMARY <input type="checkbox"/>	
EVALUATION SHEET <input type="checkbox"/>	
COMMUNITY DESCRS. <input type="checkbox"/>	
COMMUNITY COMP. LISTS <input type="checkbox"/>	
SUMMARY SPECIES LISTS <input type="checkbox"/>	
PHYSICAL FEATURES MAP <input type="checkbox"/>	
VEGETATION MAP <input type="checkbox"/>	
BIBLIOGRAPHY <input type="checkbox"/>	
PHOTOGRAPHS <input type="checkbox"/>	

EVALUATION AND PRIORITIES	
Provincially significant marble-based wetland, upland and rock barren complex.	
DATE COMPILED January 1989	COMPILER Daniel F. Brunton

Palmerston Lake



Scale 1: 50,000

The conditions that create this unusual and important fen and swamp features - viz, carbonate-rich water seeping through sand and gravel into a cold depression - are rare if not unique in Site District 5-11.

The marble bedrock is exposed commonly along the western shore of Palmerston Lake, forming extensive cliffs as high as 30m. Some areas are open rock while much of the east-facing rock barren is shaded. The nationally rare Purple Cliff-brake (Pellaea atropurpurea) was found here with a variety of uncommon calcicolous ferns including Asplenium trichomanes and A. rhizophyllum (Maidenhair Spleenwort and Walking Fern, respectively). A rich bryophyte flora is supported by these cliff habitats. A small seepage area at the south end of Deep Bay marks the northward limit of the marble area and supports a variety of calcicolous swamp species, including the only northern Frontenac Co. records for Sparganium minimum and Ranunculus gmelinii (this study; Beschel et al. 1970). Although this fen forest vegetation extends southwestward to include Cards Lake and a marble bedrock sill actually controls the level of that lake.

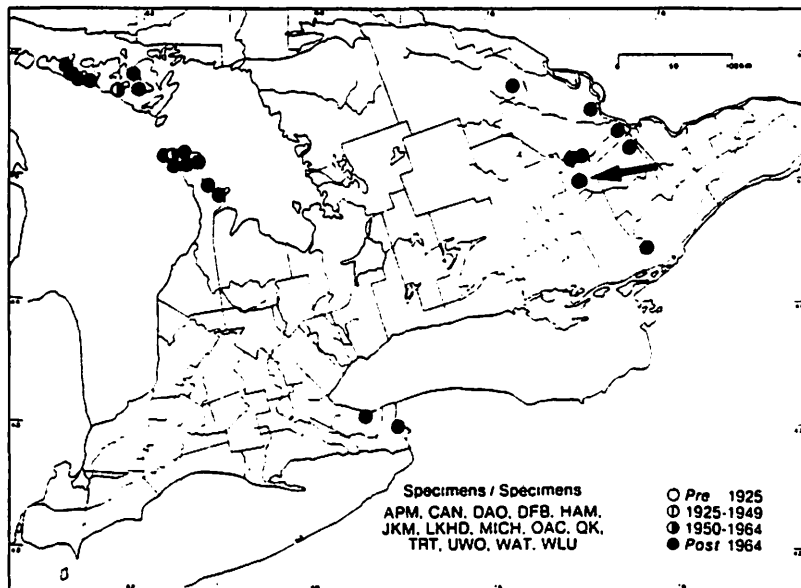
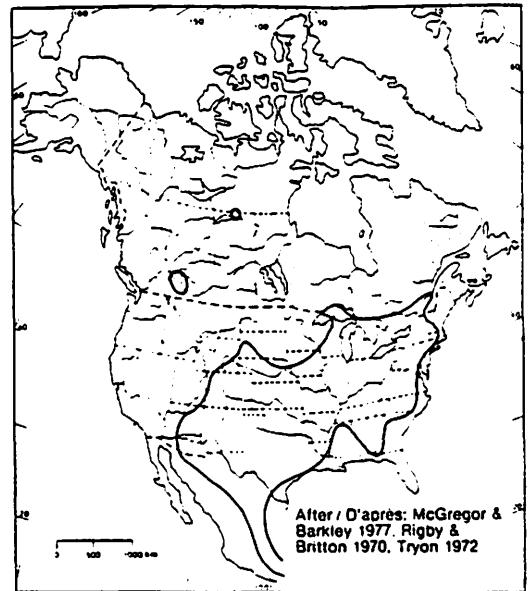
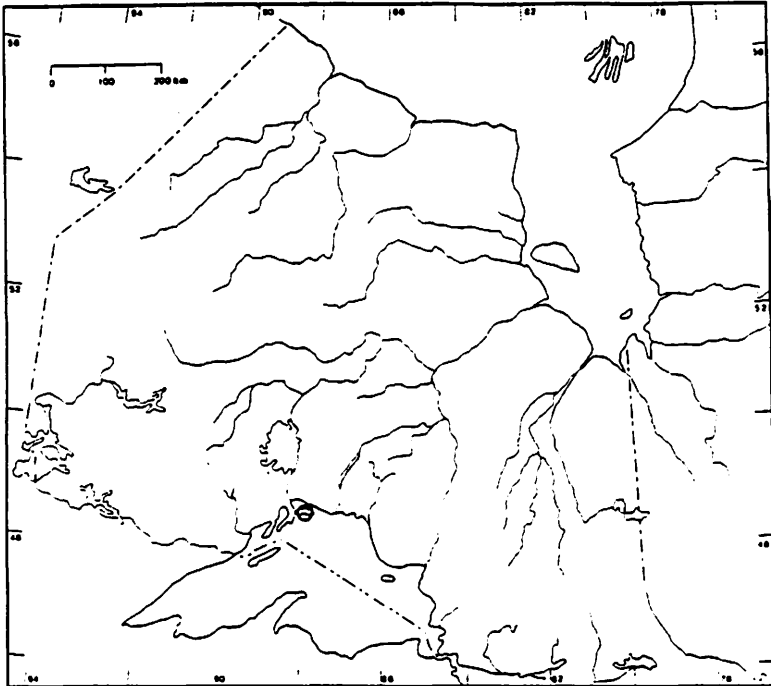
The flora appears to be unexceptional in that area, though typical of marble based wetland forest. Although nowhere near as rare as suggested by Reddoch (1983), calcareous fens, especially graminoid fens, are very unusual on the Canadian Shield of southern Ontario (pers. obs.; Riley 1988).

The upland areas underlain by granite bedrock (the higher areas towards Mosque Lake by the hydro-line) support young to medium aged hardwood and mixed forests, including rich Hemlock-Yellow Birch-Sugar Maple forests in wet mesic ravines. Acid peatlands, including a small kettle bog at 31 F/2 509863 contrast with the marble-based wetlands of the lower areas. Dry site forests of Red Oak, Trembling Aspen and Sugar Maple characterize hill tops. On the extension of this bedrock along the contact with the marble in Deep Bay (31 F/2 529866), large cliffs occur; Ravens nest here. A small Great Blue Heron colony was noted in a beaver pond above the cliff (pers. obser. - 2 nests at 31 E/2 525870). An adult Cooper's Hawk, a species considered rare in Ontario as a breeding bird (cf. Wier 1987), was observed on suitable breeding territory along the west side of Palmerston Lake in 1988 (pers. obs.).

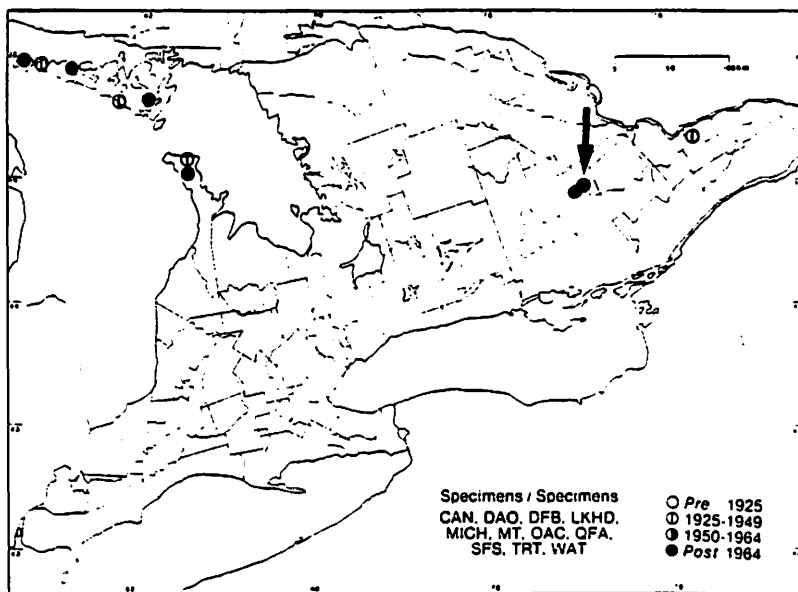
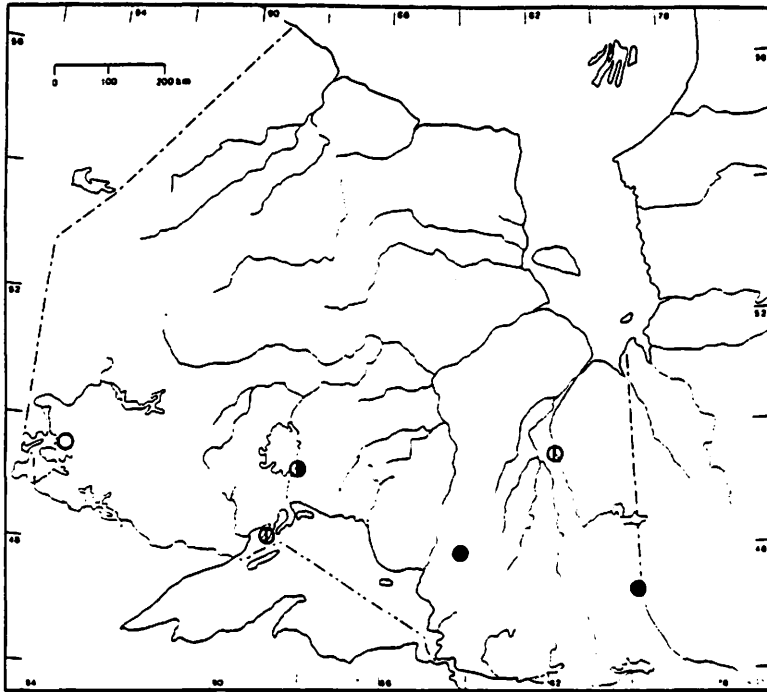
In addition to this rich and important vegetation and flora, the ANSI area is scenic. The off shore islands of Palmerston Lake by the marble cliffs bordering its western shore are particularly attractive. As well, some unusually large tree specimens were observed; several Yellow Birch at the south end of Deep Bay (31 F/2 529861) exceed 110 cm in diameter, although they are very short in stature. The richness and clarity of the lake water was indicated by the presence of literally tens of thousands of Mimic Shiners (Notropis volucellus) moving in vast schools in the shallows of Deep Bay (identification by B. Coad, National Museum of Natural Sciences, on specimens secured during this study).

The site is within Ground Moraine landform units (Noble 1988), with some similarity to the Schooner - Fortune Lakes site (less marble, no large marble cliffs, no fens, more coniferous forest).

Purple Cliffbrake (*Pellaea atropurpurea*) in Ontario and North America (Dickson and White 1983; personal observations)



Gymnocarpium robertianum in Ontario and North America
 (from Pryer and White 1983)



Gap Analysis for Site District 5E-11

Summary of Existing and Proposed Representation
Prior to Gap Analysis

The following list provides a brief summary of the biophysiological units (landform units) known to occur in Site District 5E-11, and the sites that already exist (i.e., provincial parks), or have been proposed (candidate ANSIs), to represent those landforms and their associated vegetation. In some cases, biophysiological units are completely unrepresented, and no candidates have been proposed (e.g., Ia-1). In other cases, protection of some features already exists, and proposed candidate ANSIs provide representation of other vegetation features not yet represented within the currently protected sites (e.g., Ia-37).

<u>Biophysiological Unit</u>	<u>Existing Sites and Candidates</u>
Ia- 1	no candidates
Ia- 2	" "
Ia- 3	" "
Ia- 7	" "
Ia- 8	Lochlin Bog (only candidate)
Ia-11	McCaw Bog & Barrens (within Bon Echo Prov. Park; sole example)
Ia-12	Constant Creek; Ashdad Fens (no site info. on latter)
Ia-18	Egan Chute Prov. Park (sole example)
Ia-19	no candidate
Ia-21	" "
Ia-23	White Lake Fen (only candidate)
Ia-31	no candidates
Ia-33	" "
Ia-35	" "
Ia-37	several candidates and two existing parks (no site info. for Plevna Cedar Swamp)
Ia-41	no candidates
Ia-42	Crotch Lake Pinery (only candidate)
Ia-45	Fortune-Schooner; Evergreen Mountain; Ferguson Lake
IIa- 1	no candidates
IIIa- 4	" "
IIIb- 1	" "
IIIb- 2	" "
IIIb- 4	Madawaska River Prov. Park Nature Reserve Zone (sole example)
IVb- 1	Conroy Marsh (only candidate)
IVb- 3	Egan Chute Prov. Park (sole example)
IVc- 2	no candidates
IVc- 3	" "

IVd- 1	Madawaska River Prov. Park Natural
	Environment Zone (sole example)
IVd- 2	Crowe River (only candidate)
VIIa- 1	no candidates
VIIa- 2	" "
VIIa- 7	" "
VIIa- 9	several candidates (Harlowe Bog, Lingham
	Lake, and Sharpe Bay Fen lack site
	info.)
VIIa-16	no candidates
VIIa-19	Long Lake Barrens; Kawartha Highlands
	Prov. Park
VIIa-20	Mount Moriah; Hungry Lake Barrens;
	Elzevir Peatlands
VIIa-27	Mazinaw Cliffs (only candidate)
VIIIa- 1	no candidates

Gap Analysis for Site District 5E-11

Summary/Conclusions

Recommended Provincially Significant Existing Sites/Candidates

The following lists provide summaries of the sites that should be considered Provincially Significant, as a result of the gap analysis. In cases where several sites are listed for a given biophysiological unit, each site contains one or more landform/vegetation features not found in the other sites within that list (e.g., Ia-37).

<u>Site</u>	<u>Feature(s)</u>
1. <u>Single Existing or Proposed Sites/Biophysiological Unit</u>	

Lochlin Bog	Ia-8
McCaw Bog & Barrens	Ia-11
Egan Chute	Ia-18
White Lake Fen	Ia-23
Crotch Lake Pinery	Ia-42
Madawaska River P.P. Nature Reserve Zone	IIIb-4
Conroy Marsh	IVb-1
Egan Chute	IVb-3
Madawaska River P.P. Nat. Env. Zone	IVd-1
Crowe River	IVd-2
Mazinaw Cliffs	VIIa-27

2. Provincially Significant Existing and Proposed Sites Selected from among Multiple Alternatives

Constant Creek Ia-12; more diverse, less disturbed, larger than Ashdad Fens

Centennial Lake Nature Reserve (including Black Donald Island); - boundary revisions may be necessary
Centennial Lake candidate ANSI;
Matawatchan Nature Reserve;
Egan Chute (including addition);
Silent Lake Prov. Park Nature Reserve Zones
Kawartha Highlands Prov. Park (also VIIa-19 representation)
Bottle Creek

Summit Lake (possible
reduction in size)
Lowrie Lakes (possible
reduction in size)
Griffith Uplands
(boundary modifications
needed)
Darling Twp.
Forest (possible
reduction in size)

Fortune-SchoonerIa-45; all features represented by Evergreen Mountain also
found in Fortune-Schooner candidate ANSI; same
true for Ferguson Lake candidate

Elzevir PeatlandsVIIa-9; each site contains some unique
Hungry Lake Barrensfeatures; Elzevir Peatlands and Hungry
Petroglyphs Prov. ParkLake Barrens also provide representation for VIIa-20
features

- several candidates (Harlowe Bog, Lingham Lake, and Sharpe Bay Fen)
considered by Brunton to be Regionally
Significant lack site information; when
available, these sites must be compared with
those listed above

Kawartha Highlands

Prov. ParkVIIa-19; each site provides best
Long Lake Barrensrepresentation of various features; upland communities,
including Hemlock representation, in Kawartha;
upland and wetland communities in Long Lake;
Kawartha Highlands also provides Ia-37
representation

Mount MoriahVIIa-20; each site provides best

Elzevir Peatlands(or sole) representation of several
Hungry Lake Barrensfeatures; Hungry Lake Barrens on this landform overlaps in
representation with the other two sites, but is
Provincially Significant on VIIa-9

Limited Occurrence of the Following Landforms Exists in the Madawaska
Highlands, for which no Candidates have been Proposed

No existing formal protection nor candidates exist for the following
biophysiographic units. Additional background work (aerial photo
interpretation, examination of land tenure, past land uses, etc.) is necessary
to determine whether there is any potential for conservation of
landform/vegetation features on these units. All of these units are small in
extent, and some are known to be cleared, developed, etc. A few of these
units also occur outside of the Madawaska Highlands planning area within Site
District 5E-11. In these cases, areas inside and outside of the planning area

must be compared, and if representation potential exists, the best site should be selected (using the selection criteria: representation, quality, diversity, ecological considerations, special features).

- Ia- 1 Calabogie Lake to Mile Lake and Bagot Long Lake
 (mainly Bagot Twp.)
- Ia- 3 small amount at Silver Creek (Brudenell Twp.)
- Ia- 7 small amount from Clontarf to Esmonde
 (Sebastopol/Grattan Twps.)
- Ia-35 Joes Lake to Clyde Lake (mainly Lavant Twp.)
- IIa-1 small area from Foymount to Brudenell (Sebastopol
 Twp.)
- IIIb-1 Combermere to Palmer Rapids (Raglan Twp.)
- IIIb-2 Palmer Rapids to Aumonds Rapids (Raglan Twp.)
 Highland Creek (Griffith Twp.)
 Castile to Cormac (South Algona Twp.)

Comments on Certain Sites in the Madawaska Highlands

Darling Twp.

- Forest:-** three unique cells (colder than normal, rock, open water; colder than normal, sand, saturated; warmer than normal, sand, mesic)
- these three cells all on the moist to wet side (only W/S/M could be a forest type)
- few other features supplement limited representation elsewhere in Site District; most of these are associated with wetter sites

Recommendation:- identify core around ponds as Provincially Significant
 - remainder should be deleted or considered Regionally Significant, depending on disturbance level, etc.

- Evergreen Mountain:-** virtually all cells of matrix represented by this candidate also found in Fortune-Schooner candidate
- site shows limited vegetation associations not yet known in Fortune-Schooner

Recommendation:- reduce to Regionally Significant site

- Ferguson Lake:-** no features not contained in either Fortune-Schooner or Evergreen Mountain candidate ANSIs

Recommendation:- reduce to Regionally Significant site

Griffith Uplands:- best representation of normal and warmer than normal, rock and thin sand, dry to mesic oak-mixed wood barrens on igneous rock

- good representation of Cedar swamps on igneous rock

Recommendation:- upgrade portions of this site (containing the features noted above) to Provincially Significant

- modify boundaries, if necessary, or treat remainder as Regionally Significant

- look at options for including some of landform IIIb-2, which is not presently represented anywhere in the Site District

Palmerston Lake:- area bisected by Hwy. 509; has been subjected to logging in certain sections; is traversed by road in northern portion

- most features noted by Brunton are also found in other candidates, especially Centennial Lake Nature Reserve and Centennial Lake candidate ANSI

- rarities comparable to those at Plevna Cedar Swamp

- gap analysis indicates few unique and few best representation features

- unique cells include: C/S/W, C/O/OW

- best representative cell: C/R/M (minor representation of this cell in Centennial Lake Nature Reserve and Centennial Lake candidate ANSI)

Recommendation:- Palmerston Lake candidate be reduced to regional status

- alternative: reduce size of candidate to include Deep Bay, cliffs, and hills north of Hwy. 509, perhaps also cold fen/swamp south of marina

Summit Lake:- most features identified in Site District 5E-11 report (including vegetation matrix) are better or as well represented at other sites, particularly Centennial Lake Nature Reserve, Centennial Lake candidate ANSI, and to lesser extents, Silent Lake NRZs and Matawatchan Nature Reserve

- major feature of this candidate is rich hardwood forests on loams

- warmer than normal, organic, mesic, wet mesic, and very wet sites are also best representatives

Recommendation:- Summit Lake candidate can be either reduced in size to contain mainly the rich hardwoods and warm organic sites, or zoning can be used to protect these features

Comments on Certain Sites - Not in Madawaska Highlands

Bottle Creek:- best representation of warmer than normal, sandy, wet and open water sites
- few other features that are not well represented elsewhere; these include normal, sand, very wet to saturated sites, and normal, loam, dry mesic and wet sites

Recommendation:- include sites containing best representatives and normal, sand and loam sites noted above in either a Provincially Significant ANSI or within Kawartha Highlands Prov. Park
- remainder of candidate can be reduced to Regional significance

Lowrie Lakes:- most features in this site are represented elsewhere; however, many of the features are situated in small Nature Reserve Zones in Silent Lake Prov. Park
- check into opportunities to add onto small Nature Reserve Zones with additional area in Lowrie Lakes area, especially for cooler than normal and normal, moist, loam sites

Recommendation:- include some of this candidate within Silent Lake Prov. Park, or maintain as Prov. Significant ANSI, at least for the cooler than normal, moist, loam sites
- remainder of candidate can be reduced to Regional significance

Plevna Cedar Swamp

Recommendation:- Plevna Cedar Swamp remain at Regional status, with possibility of upgrading if site-specific vegetation data become available

**The Madawaska Highlands
Land Use Plan**

*... managing sustainably
for the future...*

Final Plan
(April, 1997)

LOA-150

Approval Statement

The Madawaska Highlands is an extensive semi-remote area in south-eastern Ontario composed of rugged well-forested hills interspersed by hundreds of picturesque lakes. The scenic Madawaska River is also a dominant feature, traversing the Highlands from Algonquin Park to the Ottawa River several hundred kilometres downstream. A large portion of the Highlands area is Crown land which contain valuable resources that are utilized by both local communities and visitors to the area. The Madawaska Highlands Land Use Plan was developed to provide resource management direction for a 2100 square kilometre area of the Madawaska Highlands that contains 70% Crown land.

I am pleased to approve the Madawaska Highlands Land Use Plan, which will guide the future management of Crown lands within the Madawaska Highlands. The plan reflects this Ministry's goal to contribute to the environmental, social and economic well-being of Ontario through the sustainable development of natural resources. It will protect significant natural features of the area for the future while also providing for local economic opportunities through recreation, tourism, mining, and sustainable forest management.



A.J. Stewart
Regional Director
South-Central Region
Field Services Division

Executive Summary

The Madawaska Highlands planning area is a 2100 km² area located in south eastern Ontario made up of approximately 70% Crown land. The landscape of the Highlands is rugged with well forested hills and many waterbodies interspersed. The major watershed is the Madawaska River which links several lakes such as Centennial and Black Donald Lakes and collects water from hundreds of smaller lakes and rivers. The forest is a mixture of mostly middle-aged conifer and deciduous trees, the re-growth of forests following the cutting and fires of the late 1800's to early 1900's. Wildlife diversity reflects the mix of forest types with deer being the most abundant large vertebrate. Aquatic resources are plentiful with an abundance of lakes and rivers which contain Brook trout or other trout species that require cold, clean water for survival.

The Madawaska Highlands Land Use Plan has been prepared in response to the divergence of public opinion about how Crown lands and resources within the Highlands should be managed. The plan is based on an assessment of each of the resource use activities presently occurring or desired within the planning area. It provides basic direction for the use of Crown land throughout the planning area, and indicates specifically what land uses and activities can occur and where.

The land use plan was developed through a process which involved extensive public consultation. The 14 member Madawaska Highlands Advisory Committee, representing a wide range of users, provided advice during the development of the plan. In addition, opportunities for direct public participation in plan development occurred through two sets of public information centres and through the release of various tabloids and questionnaires.

The overall goal of the planning process is *"to establish a land use plan which locally interprets and puts into practice, the broader Ministry of Natural Resource's goal,"* of contributing to the economic, social, and environmental well being of the Province of Ontario through the sustainable development of natural resources. The three objectives of the planning process are to:

- ensure the long term health of ecosystems and protect natural heritage
- ensure continuing availability and sustainable development of natural resources
- establish a plan for future use of Crown land which attempts to resolve land use conflicts

The land use plan addresses the management of natural resources including vegetation, wildlife, fish and minerals and aggregates. Resource activities and their management have

been described for forestry, mining, aggregate extraction, hydro-electric power generation, hunting, trapping, angling, tourism and recreation activities such as snowmobiling, canoeing, hiking, camping and natural heritage protection. Both prior to and throughout the planning process, a range of issues were identified for these resources. In general, the public expressed concerns that the remote and natural character of the Highlands be maintained. The specific issues which relate back to the objectives of the land use plan included the following:

- ✓ • Natural heritage protection including protecting representative natural areas, protecting vulnerable, threatened and endangered species, and implementing provincial park objectives.
- ✓ • Resource sustainability for all resources in the Highlands to ensure the long-term health of ecosystems.
- ✓ • Land use conflicts over how resource activities should occur including development of access roads, incompatibility of land use activities, land disposition, and specific tourism and recreation issues.

The Madawaska Highlands Land Use Plan proposes that general Crown land strategies and specific management strategies for protected areas be used to achieve the overall plan goal and objectives as well as to address each of the identified resource issues.

General Crown land Strategies:

Recognition of the existing capability of MNR to manage the natural resources on the land base in accordance with legislation, policies, procedures and guidelines in a manner which ensures the continuing availability to and sustainable development of natural resources by all users. Additional measures have been proposed where necessary to address concerns for monitoring, level of access, public notification of management activities, and cooperative work with partners on education and research.

Specific Area Strategies:

Recognition and identification of five provincially significant life science Areas of Natural and Scientific Interest (ANSIs) within the planning area, and the incorporation of appropriate and required management practices to protect their significant values. Options for the ANSIs were presented to the public for their review and the majority of respondents preferred the larger options which permitted more multiple use. The five ANSIs, which make up 8,646 hectares or 4% of the Highlands area are Summit Lake ANSI, Fortune-Schooner ANSI, Griffith Uplands ANSI, Centennial Lake ANSI and Darling ANSI. In general, resource activities are permitted in Resource Management Zones of the ANSIs. In Core Protection Zones, forestry, mining and/or development of new roads is not permitted (except Darling permits sub-surface mining).

Traditional uses such as hunting, trapping, hiking, and camping are permitted in the ANSIs but off-road vehicles are restricted to designated trails (trappers excluded).

Plan Implementation and monitoring will occur following plan approval by the Regional Director of Central Region. Strategies in the plan will be implemented by Ministry area offices in priority sequence where possible. A citizen committee will be established to help monitor the plan. This Standing Advisory Committee will represent the broad range of interests for the management of the Highlands. They will meet on an annual basis, or more frequently if necessary, to monitor the plan's progress and work with Ministry staff to facilitate partnerships in implementation. Partnerships with groups or organizations interested in the Highlands will assist in carrying out projects or data collection. A five year report will be prepared on the status of plan implementation. The plan will be formally reviewed every ten years and at each review the plan will continue to provide direction for a twenty year horizon. Amendments to the plan may be considered as minor or major amendments and can be processed at any time. Minor amendments may be approved by the Ministry office as they do not affect public uses and are not controversial. The Standing Advisory Committee will be advised of all minor amendment proposals. Otherwise, amendments are classed as major and an appropriate public consultation process must be followed in the review procedures. The Standing Advisory Committee is to be consulted on review procedure for a major amendment.

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Preface

A citizen committee, the Madawaska Highlands Advisory Committee, was established at the beginning of the planning process to provide advice to the Ministry during the development of this draft Land Use Plan. The committee commented on and provided recommendations to the Ministry with respect to the material prepared by the Madawaska Highlands Planning Team. Due to the wide range of interests represented on the Advisory Committee, its recommendations were not necessarily endorsed by all committee members. The committee also provided advice on the methods of public consultation. Input received through public consultation sessions and the feedback from the Advisory Committee was used in the preparation of this Land Use Plan. The Ministry's Planning Team and Steering Committee were ultimately responsible for all decisions put forward in the plan.

1.0 Introduction

1.1 Location and Description

The Madawaska Highlands is a vast, somewhat remote geographic area located in south eastern Ontario. It is traversed by the Madawaska River as it flows from its headwaters deep in Algonquin Park to its outlet to the Ottawa River several hundred kilometres downstream at Arnprior. As its name suggests, the topography of the Highlands is rugged, with well forested hills rising sharply from the shores of the Madawaska River and any of the hundreds of lakes within the area. There are several communities located within the planning area. These include Dacre, Denbigh, Griffith, Ompah, Plevna, Calabogie, Palmer Rapids, Rockingham, Foymount and Cormac. The planning area is roughly bisected by Highway 41 and is also accessed by provincial Highways 132, 506, 509, 511 and 515.

For the purposes of this Land Use Plan, only a portion of the Highlands has been identified. The Madawaska River roughly bisects the planning area and is the principal drainage route. Secondary drainage is provided by the Mississippi River, located in the southeast corner of the Highlands. The boundaries of the actual planning area encompass an area of about 2100 square kilometres, approximately 70 % of which is Crown land. The boundary established includes those lands where marble is intermingled with gneissic bedrock.

For ease of definition, the boundary follows provincial, county, township or historic highways and roads wherever possible. As shown on the location map, Figure 1, the planning area is oriented in a north west to south east direction, and straddles the boundaries between three MNR administrative districts and two MNR regions. The northernmost half of the Planning area lies within Pembroke District, while most of the southern half lies within Bancroft District, both of which are part of MNR's Central Region. In contrast, the southeast corner of the planning area is located in Kemptville District, part of MNR's Southern Region. The Village of Combermere lies at the extreme northwest limit of the planning area while the northwest corner of Darling Township lies in the southeast. The northern boundary of the Planning Area follows the old Opeongo Road between Cormac and Dacre, while the southern boundary follows Provincial Highways and Township roads from Palmer Rapids to Denbigh, then on to the hamlets of Plevna and Ompah.

The Highlands make up a large, predominantly undeveloped area, located fully within Hills' (1959) ecological Site District 5E-11. This Site District is characterized by the presence of bedrock, consisting of highly erosion-resistant materials such as granite and marble, resulting

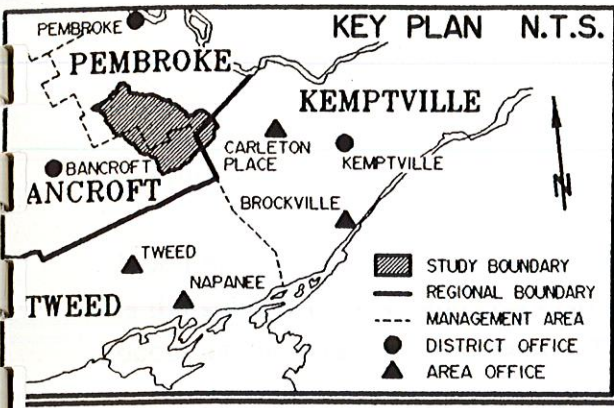
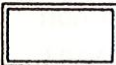



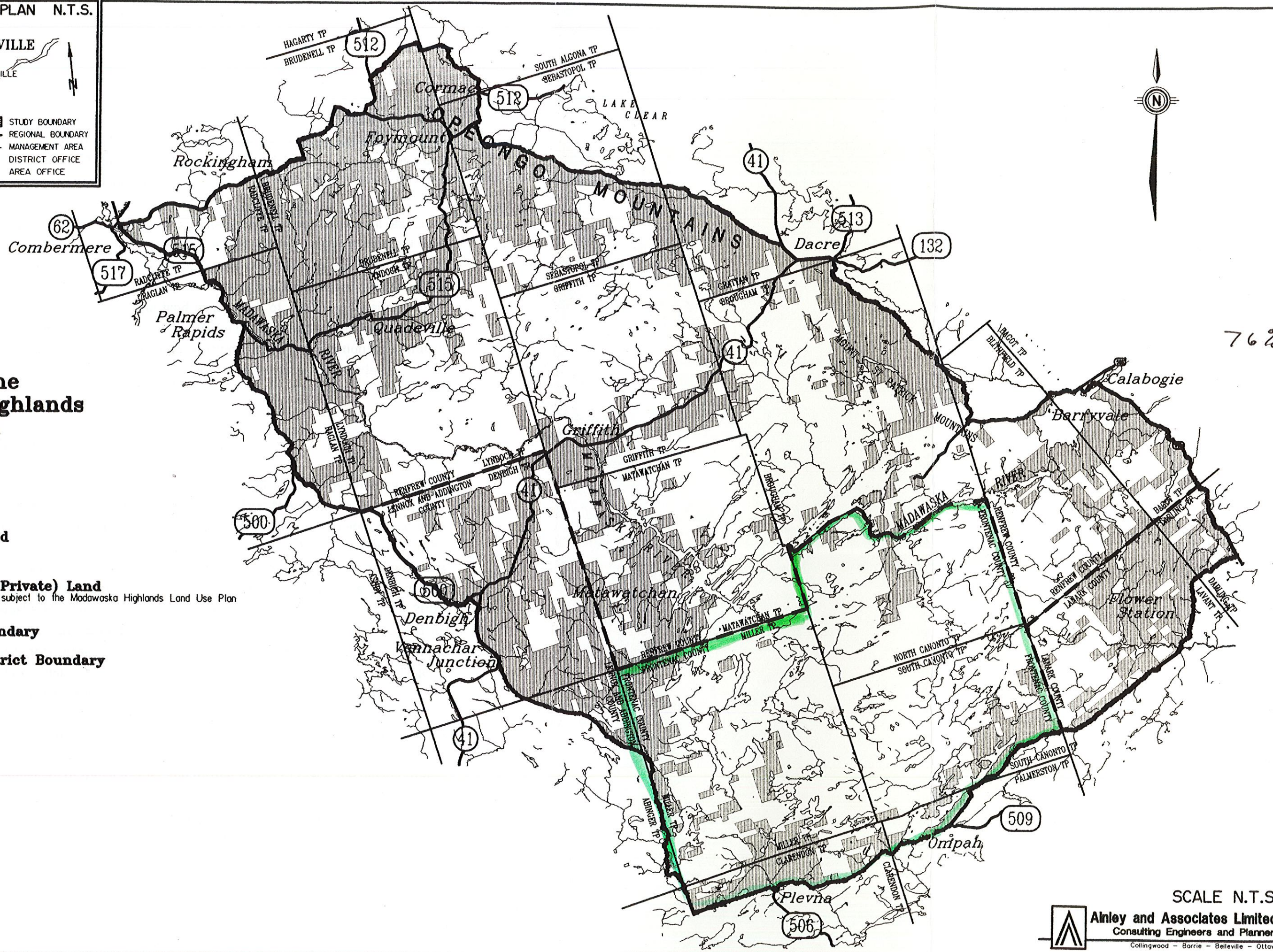


Figure 1:
Location of the
Madawaska Highlands
Planning Area

- Legend**
-  Crown Land
 -  Patented (Private) Land
This area is not subject to the Madawaska Highlands Land Use Plan
 -  Study Boundary
 -  M.N.R. District Boundary



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in irregular drainage patterns and poor soil development.

Much of the land within the Highlands is Crown land. It is the use of this Crown land which is the subject of this Land Use Plan. The plan will not dictate the uses which can or cannot occur on privately owned land. That control rests with municipalities as they exercise authority under Ontario's Municipal Planning Process.

The Crown lands within the Madawaska Highlands contain a wide range of natural resources which contribute to the natural heritage of the Province and which support a range of uses critical to the local economy and important to the economy of Ontario as a whole. Forestry is the principal economic activity within the Highlands and has been since before actual settlement by Europeans. A number of other land uses, each of which is dependent on a viable Crown land base, occur within the Highlands. These include hunting, fishing, trapping, snowmobiling, mining, boating, cottaging, hiking, canoeing, nature appreciation, ATV travel, cross country skiing, camping, education, hydro-electric development and tourism.

1.2 Historical Perspective

Prior to the arrival of Europeans in upper Canada, the Madawaska Highlands were inhabited, or at least used, by a number of different Algonquin speaking First Nations. Initial contact with non-Aboriginals occurred as the fur traders and missionaries moved into the area in the early 1800s. The explorer and map maker David Thompson was one of the first Europeans to explore the area when he visited it in approximately 1837. Early logging also began sometime during the 1830's and by 1840, the highly organized lumbering industry moved up into the reaches of the Madawaska Highlands above the village of Arnprior. By 1847, fully 2000 square miles of land, or two thirds of the area drained by the Madawaska River and its tributaries, were under timber lease. A few years later, the Opeongo Road was surveyed. This colonization road stretched 78 miles from Horton Township in the east, to the Village of Madawaska, not far from the present day boundary of Algonquin Park in the west.

Initially, it was the desire to harvest the huge red and white pine which spurred on the loggers. The British demand for square timbers was strong and the supply appeared limitless. Over time, it became necessary to travel further and further inland to reach the desired trees. Ultimately, this resulted in the construction of the Ottawa-Arnprior-Parry Sound Railway, an event which probably had one of the greatest influences on the development of the upper Madawaska River.

In later years, as the market for square timbers disappeared, along with their supply, it was replaced by an emerging demand for sawn lumber in the United States. Sawmills sprang up across the Highlands, bringing the first secondary industry to the area. No longer were the Highlands simply the source of raw materials. Now they supplied a semi-finished product to outside areas and hence, gained some additional economic benefit.

Between the 1880s and the 1920s, a new resource extraction activity developed - mining. It proved to be an additional source of income for those farmers who saw lumbering operations moving further and further from their homesteads, ending their ability to supplement their meagre farm income selling grain or working as shantymen. The Highlands proved to be a source of rose-tinted quartz and crystals of corundum. As a result, for fourteen years, Canada was the world's largest producer of corundum, a material used in the production of abrasives. It was produced mainly near the hamlets of Craigmont, Jewelville and Burgess Mines, until 1921 when production in Canada was terminated. The graphite mine at Black Donald was also important at one time as it was the only source of high quality flake graphite in North America.

By about 1920, the early years of overharvest, wasteful logging practices and ravaging fires had changed the landscape. Large areas of the Highlands became devoid of mature forest and commercial timber was replaced by poplar, other low quality hardwoods and immature forests of a number of tree species. This new timber supply contributed to the pulp industry which developed in the first two decades of the century with mills in both Cornwall and Trenton. It was at about this time that 'development' within the Highlands reached its peak in terms of amount of land cleared for agricultural use.

By the mid to late 1900's, the economic base of the Highlands began to shift once more. Forestry continued to be very important with an emphasis on harvesting, trucking as well as finished product production at mills within and just outside the Highlands. However, increasing mechanization also resulted in reduced employment opportunities. Growth in mining activity, new sawmills, or additional industrial development was also limited. Instead, local economies have seen an increase in the service and particularly tourist based industries, as well as greater growth of small business. The Highlands' natural attributes are probably its single most important tourism asset and appears to offer the greatest potential for economic stability. Municipal economic development plans have targeted cottaging and tourism as areas of future economic growth.

1.3 Why a Land Use Plan

The divergence of public opinion about how the Crown lands within the Highlands should be managed, the level of interest in the area by a range of users, and the need for the Province to identify and protect provincially significant Life Science ANSIs, suggested the need for development of a Land Use Plan for the area.

Use of Crown land and the management of specific natural resources within the planning area has historically been the responsibility of each of the various MNR districts in the area. Local management decisions are made within a context provided by government policy such as "Direction '90s... Moving Ahead 1995" which define the goal, objectives and supporting strategies of MNR. Strategic planning documents such as "The Coordinated Program Strategy for Southern Ontario" and more detailed district land use guidelines provide the land use direction, while forest management plans, park management plans and fisheries management plans provide the specific direction as to how individual resources are managed.

Diverse interest in the Highlands first surfaced during the 1970s, during the period when MNR was beginning to develop land use guidelines for each of the administrative districts in Ontario. From that time through the 1980s the Ministry was aware of growing issues in the Highlands surrounding the use of the area's resources and conservation of its natural heritage features.

In 1987, during the Timber Management Planning process for Carleton Place District, a request was made for an Individual Environmental Assessment of proposed timber operations in the northwest corner of Lavant Township (an area now considered part of the Madawaska Highlands Planning Area). The request stated that insufficient considerations were made in the plan for maintaining the remote character of the area proposed for harvest. That request was denied by the Ministry of the Environment and Energy in 1991.

In 1988, the Canadian Parks and Wilderness Society proposed formation of the Madawaska Highlands Regional Trust. The proposal suggested that management of the Crown lands within the broadly defined Madawaska Highlands be turned over to a newly created agency of the Provincial Government, a Trust Authority, with an emphasis on protection, compatible land use and tourism. Local public opposition to the Trust proposal was strong. The importance of maintaining current and traditional uses within the Highlands was clearly expressed by many of those living within or making use of the Madawaska Highlands.

At the same time, the Ministry was undertaking work to identify the natural heritage values of the area through a life science study of site district 5E-11. This was completed in 1990 and identified a number of potential representative core natural heritage areas (candidate ANSIs). This led to additional studies by White (1992) which confirmed that there were values that should be considered for protection through a planning process.

In May, 1993, the Minister formally announced that the Ministry of Natural Resources would commence preparation of the Madawaska Highlands Land Use Plan to deal with all of the land use issues. This Land Use Plan would provide general direction for use of all Crown land within the defined planning area in addition to that which is provided in the respective District Land Use guidelines covering the area. This plan would outline management direction, identify the natural heritage values that needed to be protected and determine how Crown land can be managed to meet the needs and desires of those using or wishing to make use of the area, while ensuring ecological sustainability.

1.4 Purpose of the Land Use Plan

Presently, land use and resource management activities on Crown land within the Madawaska Highlands are guided by the existing District Land Use Guidelines for Pembroke, Tweed, and Carleton Place (1983); by the Pembroke (1996), Mazinaw (1996) and Lanark (1993) Forest Management Plans; and by the fisheries management plans for Pembroke, Tweed and Lanark Districts (1988). Some conditions of the Class Environmental Assessment (E.A.) for Timber Management apply to the present forest management plans and full implementation of the E.A. provisions will take place as new plans are prepared in 1998 (Lanark) and 2001 (Pembroke and Mazinaw).

This plan will form an amendment to the existing Land Use Guidelines. It will provide more specific land use direction than is currently provided in strategic planning documents such as MNR's Coordinated Program Strategy for Southern Ontario or any of the District Land Use Guidelines. However, this plan will not provide the actual detail of how different resources will be managed. This detail will continue to be provided in specific resource management plans prepared for different resources within the Planning Area. For example, forest management plans and fisheries management plans will continue to be required.

The land use direction established in this plan will be carried back to each of the respective districts and will be used in both day to day resource management as well as in the development of future resource management plans.

The Madawaska Highlands Land Use Plan is unique in that the boundary of the Planning Area is, in general, ecologically and landform based; it is not based on MNR administrative units. The plan is based on an assessment of each of the various land and resource use activities presently occurring, desired or demanded within the planning area. This assessment considers the relationship between the various land uses and activities and the broad policies and strategic planning documents adopted by MNR.

The Madawaska Highlands Land Use Plan establishes basic land use direction for the Crown land within the entire planning area, including an indication of what specific land and resource use activities can occur and where. In addition, basic direction regarding regulation of those activities is also provided, where such direction is considered necessary for the appropriate use and development of the land.

The Federal and Provincial governments are currently negotiating with the Algonquins of Golden Lake First Nation on the Algonquin's land claim. The land claim covers much of the Ottawa River watershed including the Madawaska Highlands planning area. Although negotiations are still in progress, planning for the management of the area's resources must still occur to ensure sustainable use of the resources and economic stability. The Algonquins of Golden Lake were invited to participate in the process but declined due to the on-going land claim negotiations. They will be invited to participate in its implementation and future reviews of the plan. The land use plan will provide important resource management direction for the area. The plan can continue to be a valuable tool to guide future resource management upon the settlement of the land claim. The recommendations of this plan are in no way intended to prejudice the results of land claim negotiations.

1.5 The Planning Process

The process of developing the Madawaska Highlands Land Use Plan has been both long and complex. It involves the following steps:

- (i) definition of terms of reference
- (ii) identification of planning objectives
- (iii) collection and analysis of information; identification of problems and issues
- (iv) identification of options for management and selection of a preferred option
- (v) preparation of a draft plan (presented here)
- (vi) preparation of the final land use plan (to follow)
- (vii) approval of the land use plan

(viii) plan implementation and monitoring

Broad direction throughout the entire planning process has been provided by a Steering Committee, comprised principally of MNR District managers, area supervisors and regional advisors. Actual production of the land use plan has been the responsibility of a multi-disciplinary Planning Team, working in cooperation with the Madawaska Highlands Advisory Committee. The Planning Team is comprised of MNR staff drawn from each of the districts within the planning area who represent a wide variety of professions and experience and staff from the Ministry of Northern Development and Mines (see Appendix I).

The Madawaska Highlands Advisory Committee is composed of 14 individuals representing users throughout the Highlands with a wide range of views who have provided advice to the Ministry Planning Team. Public consultation has played a key role in the preparation of the plan and will continue in its implementation. Public input has occurred through the work and contacts of the Advisory Committee, through six public information centres and by distributing five information tabloids, fact sheets and questionnaires. Further information on the public consultation measures and summaries of public input are provided in Appendix II.

2.0 Goal and Objectives of the Land Use Plan

2.1 Goal

The GOAL of the Madawaska Highlands Land Use Planning process is to: *establish a detailed land use plan which locally interprets and puts into practice the broad goal of the Ministry of Natural Resources. This goal is to contribute to the economic, social and environmental well being of Ontario through the sustainable development of natural resources. The broad MNR goal will be addressed in a manner which recognizes local, regional and provincial land use planning objectives, needs and desires, within the limits of the Crown land base.*

Explanation: The Madawaska Highlands Land Use Plan will provide direction for the use of a large block of Crown Land. It is appropriate that such use occur within the broad resource management goal of MNR for the entire province. The plan includes and incorporates a range of information about the needs and desires of all those who use and benefit from the Highlands, whether they live locally, in the region or elsewhere within the province. As public land, many people have an interest in the Madawaska Highlands Planning Area.

2.2 Objectives

As a means of achieving the above long term goal, three specific objectives have been adopted. The Madawaska Highlands Land Use Plan will provide direction for land use within the Highlands which will:

1) Ensure the long-term health of ecosystems by protecting and conserving our valuable soil, aquatic resources, forest and wildlife resources and their biological foundations as well as protect natural heritage and biological features of provincial significance.

Explanation: Protecting and conserving the range of ecosystems (biodiversity) found in the Highlands is important to ecosystem health and is paramount to the ability of the area to sustain resource use and development for all time. The land use plan will include direction to ensure that future resource management decisions contribute to our ability to protect such ecosystems. As part of this objective, the plan will include specifics which will protect provincially significant natural features such as Provincially Significant ANSIs and other important values on Crown Land.

2) Ensure the continuing availability and development of natural resources on a sustainable basis to the broad spectrum of resource users.

Explanation: The Madawaska Highlands contain a tremendous range of natural resources. These resources have the potential to support an equally wide range of uses provided they are regulated. The plan will provide direction so that many land uses, including those already occurring and those which are desired by the public as a whole, can continue sustainably and in a manner which ensures the conservation of the area's biodiversity.

3) Establish a plan for future land use activities on Crown land within the Highlands that attempts to resolve land use conflicts.

Explanation: The emergence of land use conflicts, as well as questions regarding the sustainability of natural resources within the Madawaska Highlands, were two of the principal factors behind the decision to develop this comprehensive land use plan. As a result, taking steps toward the resolution of these conflicts, by identifying user needs and conflicts, recognizing the legitimacy of the different land uses, developing mechanisms to promote overall land use compatibility and allocating the land base for uses according to need and compatibility with other land uses is important to the success of the planning process. The land use plan will provide increased stability regarding uses which will occur on the land base and will provide a opportunity to continually assess the effects of land use change.

2.3 Planning Principles

The following planning principles have been applied in the development of the Madawaska Highlands Land Use Plan, achieving the above noted planning objectives.

1. The land use plan will promote maintenance of the rural/natural character of the Highlands.

The Highlands' rural/natural character is a quality most valued by local and non-local users. The plan includes strategies which will help maintain that quality.

2. Land use planning decisions made within the framework of this plan will contribute to the protection of the ecological health of the environment within the Highlands.

Protecting the ecological health of the environment means ensuring the long-term health of ecosystems by protecting and conserving our valuable soil, aquatic resources, forest and wildlife resources and their biological foundations as well as protecting natural heritage and biological features of provincial significance.

3. Public participation is an essential part of the planning process, the final plan and its implementation.

Development of the land use plan has included a number of opportunities for public consultation. Public input received during public consultation processes has been used in the development of the land use plan. The Madawaska Highlands Advisory Committee which includes broad representation of interests and users in the Madawaska Highlands has provided advice to the Ministry in the development of the land use plan. The plan has been developed fairly by providing public access to relevant information and options as well as explanations of reasons why decisions have been made. The public will also be involved in future resource management planning within the Highlands and with any changes proposed to the direction established within the plan.

4. Planning is a dynamic process; the plan should be made for the long term and it should also provide for future options.

The plan provides long term direction for land use within the Madawaska Highlands and thus, provides more stability in resource management planning. It also provides flexibility to adapt to future needs but not at the expense of resource sustainability. Therefore, it provides a framework within which future needs or changes can be assessed using mechanisms such as specified review periods, establishment of a standing advisory committee, and an amendment process.

5. The land use plan will integrate compatible land uses and activities wherever possible. The concept of multiple use should apply to the planning area, although, specific sites may not support all uses or activities.

Integrated land use planning simply means recognizing that there are many legitimate uses of Crown lands and natural resources, and that efforts should be made to accommodate all such uses. Here, "legitimate uses" are defined as those that are in keeping with the plan objectives. A wide variety of land uses now occur in the Highlands, and the future may well see demands for new ones. Many of these activities are compatible, in the sense that (1) the presence of one activity does not detract significantly from the quality and/or quantity of another; and (2) the cumulative effects of all activities do not compromise either the ecological health of the region or the sustainable use of existing natural resources; such uses can co-exist in the same location. On the other hand, there may be areas in the planning region where certain land-use activities are incompatible. Where possible, land uses will be combined; across the planning area, multiple use of the land base will be the norm. However, the need for areas which accommodate more limited uses is also recognized. Identifying and designating 'protected areas' such as ANSIs = is an essential part of allocating natural resources.

6. **The land use plan must be subject to existing legislation. This does not preclude proposing changes to MNR policy or regulation in order to implement recommendations in the plan.**

Resource management activities must conform with existing legislation. However, where possible, changes can be pursued at the regulation and or policy level to achieve plan objectives.

7. **The land use plan will take into account other government agencies' objectives. The MNR will uphold the objectives of the plan in reviewing and commenting on any proposals and/or operations by other government agencies in the Madawaska Highlands.**

Other government agencies, ministries and departments are concerned with land use activities in the planning area. The plan encourages closer communication with other agencies to gain a better understanding of their objectives, so that they can be recognized in the plan. The land use plan also identifies areas where other government agencies can contribute to the objectives of the plan which will be pursued during plan implementation. For example, tourism development and protection of cultural values can be pursued in conjunction with Ministry of Economic Development, Trade and Tourism, as well as the Ministry of Citizenship, Culture and Recreation. Similarly, mining issues should be addressed in conjunction with the Ministry of Northern Development and Mines.

8. **The land use plan will be implemented, monitored and evaluated. It will also facilitate the development of partnerships in these areas.**

In order to ensure that the land use plan objectives are achieved, the plan includes an implementation schedule as well as a monitoring program and method of evaluating success in achieving objectives. Monitoring will be carried out so information is available to review and assess how the plan's objectives are being met. To achieve the objectives of the land use plan, it will also be necessary to develop partnerships with other agencies, groups, associations and local communities interested in the use and long term protection of the Highlands. Opportunities for local involvement in plan implementation, data collection and monitoring have been provided.

3.0 Natural Resources within the Highlands

3.1 Resources

The Crown lands within the Madawaska Highlands contain a wide range of natural resources which support an equally wide range of land use and resource management activities. The following section provides information about the natural resources located within the planning area.

3.1.1 Physical Setting

The Madawaska Highlands is distinctive for its rugged, well forested hills which rise above many waterways linked by the Madawaska River.

The area is situated within the Humid High Cool Temperate Ecoclimatic Region of the Cool Temperate Ecoclimatic Province (Ecoregions Working Group 1989). Summers tend to be warm, and winters are cold and snowy with total precipitation lower in winter than in summer. Maximum mean monthly precipitation occurs in the late summer. The mean annual temperature for this Ecoclimatic Region is 4.2°C. Since this Ecoclimatic Region encompasses a larger area than just the Highlands, it is likely that the mean temperatures and growing season in the Madawaska Highlands are slightly higher and longer than these averages. The higher elevations of this upland area result in slightly cooler local temperatures than the lowland areas immediately surrounding it. The mean number of frost-free days is 117, with the last spring frost usually occurring between May 15 and June 1, and the first fall frost usually falling between September 15 and October 1. The mean daily temperature in July is 18.7°C and the mean daily temperature in January within this Ecoclimatic Region is -18.8°C. However, in the Highlands, the mean daily temperature in January is probably slightly less severe, between -10°C and -12.5°C (Energy, Mines and Resources Canada 1981). The mean total annual precipitation is 796 mm. The prevailing winds are generally from the west and southwest in the summer and from the north and northwest in the winter.

The Madawaska Highlands area is situated in the Grenville Province of the Canadian Shield. The predominant rocks of the area, granitic gneisses, are approximately 1.2 to 1.3 billion years old. However, there are also younger rocks of volcanic origin, interlayered among these granitic gneisses and marbles (crystalline limestones), which are also frequent in the Highlands. The younger interspersed volcanic rocks are about 1 billion years old. All of the rocks in the Highlands have been modified by additional forces of change, including folding,

faulting, and erosion. The gneisses are of mixed origin, some being derived from igneous and others being of sedimentary origin. The marbles were derived from sedimentary rocks, and because they have undergone changes under pressure and heat, are known as metasediments. The modified volcanic rocks are known as metavolcanics (Davidson 1986).

The topography of the Highlands originated from fault-block mountains created by a series of north-west running fault lines. One of the evident fault lines forms the northeastern boundary of the study area, along the Mt. St. Patrick scarp. Another is close to the southwestern boundary, and is known as the Plevna fault (Chapman and Putnam 1984). Drainage throughout the Highlands follows these fault lines. Glacial forces re-shaped the landscape by eroding and rounding the mountains and creating many outwash deposits and ice contact features from meltwater flowing along valleys. The highly erosion-resistant materials of granite and marble have resulted in irregular drainage patterns and poor soil development. Surface drainage is provided by many lakes, creeks and rivers, most prominently, the Madawaska River, which flows out of the Algonquin Highlands southeasterly to the Ottawa River.

Thin overburden covers the bedrock of the Precambrian uplands. Soils range from loamy sand to sandy loam and are usually stony and bouldery. Areas of deep sands and gravels are found throughout the area, deposited by glacial run-off in the valleys of present rivers and streams. There are a variety of landform units in the planning area of which ground moraines are the most prevalent. Outwash plains are also found within the area and to a lesser extent, end moraines, deltaic sand plains, and bedrock landform units (Noble 1983).

3.1.2 Land based resources

Minerals and Aggregates

The Madawaska Highlands contain a wide variety of minerals, several of which have been mined in the past. More detail is provided in Section 3.2.4, which briefly reviews the mining and aggregate industry. In recent years, exploration work has been conducted on gold, zinc and industrial mineral deposits. Several mining and mineral processing operations are located just outside the planning area.

Aggregates are a non-renewable resource essential for many human activities. They consist of either consolidated or unconsolidated sand, gravel or rock deposits suitable in the production of asphalt and concrete or as a material for road construction and maintenance. Information regarding the location and quality of aggregates on the Crown land portion of the Highlands is very limited and is usually only available for areas which have sustained historic

road development. These resources are typically of low quality, suitable mainly as road bed material.

Vegetation

The Madawaska Highlands planning area is made up of large tracts of contiguous forest, wetlands, creeks, ponds and lakes. Developed or settled areas are few. Approximately, 70% or 1540 square kilometres, of the planning area is comprised of publicly owned (Crown) land.

The forests within the Madawaska Highlands are within the Middle Ottawa Section of the Great Lakes-St. Lawrence Forest Region (Rowe 1972), which consists of both conifer and hardwood forest types. Approximately 84% of the Crown land within the planning area is forested with Poplar, Red Oak, White Pine, and Sugar Maple dominated forests each making up about 20% of the forested area. The remaining 20% includes forests dominated by White Cedar, Red Pine, White Birch, Balsam Fir or Hemlock. These forest types may also contain Balsam Fir, White and Black spruce, Red Maple, Basswood, Black and White Ash, White and Yellow Birch, Beech and Larch. The forest types of the Madawaska Highlands are described in detail in each of the Forest Management Plans prepared for the Crown Forest Management Units in the planning area. However, Table 1 shows an area summary by forest type for the Madawaska Highlands planning area.

Studies of Forest History (Forest History of Eastern Ontario; Keddy, C. 1993, Mazinaw Management Unit Draft Forest Management Plan, 1996-2015) suggest that the forest type distribution present now is quite different from that present prior to European settlement. As a result of human impacts on the landscape the forest cover has changed significantly. The forests were selectively harvested for high value products, first for white pine square timber and lumber and subsequently for hardwood veneer, sawlogs and pulpwood. Large areas of the Highlands were also cleared for agricultural use or burned, often repeatedly, by man-caused wildfire. As a result, there have been major declines in several forest types, including: mixed Hemlock/White Pine, mixed Maple/White Pine, White Pine, Hemlock and mixed Maple/Elm. Correspondingly, there have been major increases in Poplar, Red Oak and White Birch. Those species which have increased in quantity are those which generally respond favourably to moderate or severe disturbances such as fire and which were not the prime objective of early logging activity. However, those species which become established after major disturbance may be less well adapted to growth and development on some sites than those species which were originally present. Further information on forest history is available in District Forest Management Plans.

Table 1. Area (hectares) Summary by Forest Type for the Madawaska Highlands

Area Summary by Forest Type in the Madawaska Highlands			
Species	Protection Forest (shallow sites & islands excluded from management)	Production Forest	Total Area (ha)
Black Ash	4	215	219
White Ash	0	6	6
Balsam Fir	0	1477	1477
Basswood	0	441	441
Beech	0	134	134
White Birch	51	3305	3556
Yellow Birch	11	116	127
Cedar	0	4668	4668
Hardwood	0	36	36
Hemlock	0	1021	1021
Larch	0	52	52
Hard Maple	56	22528	22584
Soft Maple	0	518	518
Red Oak	1020	25463	26483
Poplar	592	24763	25355
Red Pine	0	4501	4501
Scots Pine	0	4	4
Jack Pine	0	14	14
White Pine	9	26558	26567
Black Spruce	0	115	115
White Spruce	0	666	666
TOTAL	1,743	116801	118544.0

The distribution of age classes within the forest types is also indicative of past disturbances in the Madawaska Highlands (Table 2). The forest consists primarily of stands ranging in age from 61-120 years which have resulted from the logging and land clearing practices around the turn of the century. However, forest age classes may also include remnant older trees that were not previously harvested.

Forest fires play a major role in determining forest composition, structure and dynamics. Periodic wildfires permit the regeneration and growth of species which have developed biological adaptations to fire such as thick, fire-resistant bark. Different tree species are adapted to different frequencies and intensities of fire. The introduction of human activities altered the traditional frequency and intensity of fires in the Madawaska Highlands. The results of these changes in fire cycles, together with logging and land clearing activities resulted in changes the changes in forest cover described previously. These two changes to recent fire history can be separated into two main periods.

(1) 1840s to the start of modern fire suppression in the 1920s: This early period was characterized by a more frequent fire cycle than naturally occurred. The effect of logging, land clearing and repeated subsequent fires resulted in a decrease in white pine and hemlock and an increase in oak and poplar during this period. It is this period which resulted in the establishment of the forest types which we see today.

(2) Fire suppression period beginning in the 1920s: In this period, suppression of wildfire allowed the forests to grow to the age classes we see today. Fire suppression is beginning to result in a number of successional changes to the forest, most of which are currently expressed in understorey composition. These include the recruitment of white pine under poor quality red oak and poplar stands, recruitment of hard maple under better quality white pine, poplar and oak stands, and recruitment of Balsam Fir in most forest types. The continued removal of fire as a natural disturbance could have the effect of shifting parts of the forest away from fire-adapted species such as oak and pine, toward tolerant hardwoods such as Sugar Maple. With time (another hundred years or so), the influence of fire suppression could be expressed in overstorey composition. However, current forest management practices, including the use of prescribed fire which mimic processes of natural disturbance, will have an important influence on the composition of the future forest.

Wildlife

Wildlife populations associated with forest and wetland habitats in the Highlands are typical of the Great Lakes-St. Lawrence Forest Region. The planning area is located in a transitional zone, with some southern species, such as southern flying squirrel, nearing their northern

TABLE 2. *Production Forest By Working Group (Forest Type)/Age Class

Age	0	1-20	21-40	41-60	61-80	81-100	101-120	121-140	141-160	161-180	Total by WG
AB	8			37	45	87	28	10			215
AW						6					6
B	8		8	439	508	514					1477
BD					201	188	47	5			441
BE					33	95		6			134
BW	10	15		394	1910	1098	65	13			3505
BY		5			23	43	45				116
CE	82	166		91	1228	1624	808	620	36	13	4668
N		13			5	18					36
HE					78	587	252	18	81	5	1021
L	2				25	21	4				52
MH	243	119	235	1495	7721	10370	2091	198	33	23	22528
MS	5			27	229	246	7	4			518
OR	154	541	4	125	10040	13098	1501				25463
PO	180	2084	283	1502	14040	6204	425	45			24763
PR	2	275	350	137	779	2282	646	30			4501
PS			4								4
PJ	7		7								14
PW	204	1229	113	1737	6433	14111	2311	381	39		26558
SB					15	53	29	18			115
SW	14	123		46	372	104	7				666
TOTAL	919	4570	1004	6030	43685	50749	8266	1348	189	41	116801

AB = Black Ash Ce = Cedar OR = Red Oak
 AW = White Ash H = Hardwood PO = Poplar
 B = Balsam Fir He = Hemlock PR = Red Pine
 BD = Basswood L = Larch PS = Scots Pine
 BE = Beech MH = Hard Maple PW = White Pine
 BW = White Birch MS = Soft Maple SB = Black Spruce
 BY = Yellow Birch SW = White Spruce

*Production forest includes BS (Barren and Scattered), NSR (Not Sufficiently Regenerated), PFR (Protection Forest Reserve) and REG (Production-Regular). PF (Protection Forest was excluded).

Working Group = an aggregate of stands, including potential forest areas assigned to this category, having the same predominant species, and managed under the same rotation or cutting cycle and broad silvicultural system.

limits, and other northern species, such as moose, nearing their southern limits. Agricultural habitats make up only a small area. A list of vertebrates is included in Appendix III which lists species known to inhabit the Highlands. For the purpose of this section, only land-based wildlife will be described, including specific reference to selected species.

For large vertebrates, habitat in the Highlands favours deer, a situation largely created since the time of European settlement and the clearing and cutting of forests. Moose are not abundant in the Highlands and most now appear as scattered individuals or groups across the planning area.

The deer population density is estimated to be between 1.3 and 7.0 deer per square kilometre. These densities are comparable to and at times higher than deer population densities elsewhere in both the region and the province. Aerial surveys and field observations have identified close to 50 % of the planning area as a significant deer yard. Deeryard protection and appropriate forest management contribute to the maintenance of sustainable deer populations. If we use the estimated population densities, the 2,100 km² Highlands study area could have a population ranging from 3,000 to 15,000 animals. The herd fluctuates with environmental factors and harvest pressure over time and varies between the management units.

Information about black bear population densities is not well known, but are estimated at approximately 0.2-0.4 per square kilometre for the Central Region in this type of habitat.

Furbearers include fisher, marten, otter, weasels, raccoon, and squirrels. Beaver have been at high population levels due to a reduction in the trapping efforts over the last five years. Red fox also are notably abundant. Their high densities could be associated with MNRs extremely successful rabies vaccination program underway in eastern Ontario. The relative abundance of most species is unknown although there appears to be an abundance of suitable and optimal habitat.

Other mammals include wolves, coyotes, porcupines and several species of bats, shrews, moles, and voles (Appendix III).

A preliminary study of bird populations in 1993 identified about 188 species during the breeding season in the Highlands planning area. Not all of these species would actually have been nesting in the area, however. The majority of the area contained within the Madawaska Highlands was found to support 95 to approximately 110 breeding bird species during the period of the Breeding Bird Atlas project (Cadman et al. 1987). The most frequently observed

species in forested habitats during the 1993 study were Red-eyed vireo, Ovenbird, Black-throated Green Warbler, Veery, Black-capped Chickadee, Yellow-rumped Warbler, Winter Wren, Black-and-white Warbler, Hermit Thrush, and American Robin. Appendix IV lists the most common species and their associations with forest stand types.

3.1.3 Water based resources

Water resources in the Madawaska Highlands are plentiful with numerous wetlands, many small lakes and rivers tied into the Madawaska and Mississippi River watersheds. The Highlands are especially known for the small, isolated lakes which support various trout species. There are about 150 lakes within the planning area with almost three-quarters of these lakes containing coldwater species such as trout. Brook trout are the most common coldwater species in the Highlands. They occur mainly in the smaller, less accessible waterbodies. The Highlands also contains 14 lake trout lakes, many of which contain native lake trout populations and demonstrate significant levels of natural reproduction. The warmwater lakes include some of the larger, more prominent waterbodies in the Madawaska Highlands planning area, including Centennial, Black Donald, Norcan and Calabogie Lakes. Species such as walleye, northern pike, smallmouth bass, largemouth bass and even muskellunge reside in warm-water lakes and also in many of the coldwater lakes along with the resident trout species. Many rivers and streams also contain sportfish which contribute to the resource base. Although many small creeks in the planning area harbour populations of naturally reproducing brook trout, many others have been degraded and are no longer suitable for this species. Larger warmwater streams and rivers such as the Madawaska River support locally significant walleye, bass and pike populations. A list of fish species present in the waterbodies of the Madawaska Highlands is included in Appendix III.

3.1.4 Natural Heritage Resources

The natural heritage resources within the Madawaska Highlands planning area represent the diversity of life and earth science values found in this part of Site District 5E-11. Specifically, the local marble bedrock in the study area creates situations for specialized vegetation occurrences that are unusual and only found in this part of the site district. Key natural heritage components within the Highlands include parks, Areas of Natural and Scientific Interest, old growth forests, provincially significant wetlands as well as vulnerable, threatened or endangered species and their habitats. Table 3 identifies vulnerable, threatened or endangered (VTE) species known or suspected to occur in the planning area.

Table 3. Vulnerable, Threatened and Endangered Species in Madawaska Highlands
<p>Rare and Vulnerable: native species that are in small but fairly stable populations and could be in restricted areas of Ontario. These species need to be monitored periodically for evidence of a possible decline.</p> <p>Red-shouldered hawk Cooper's Hawk Southern Flying Squirrel Eastern Bluebird</p>
<p>Threatened: native species that are declining across their range and are likely to become endangered unless some action is taken to help the species.</p> <p>Ginseng</p>
<p>Endangered: native species that are threatened with immediate extinction across its range (species in brackets do not breed here but may use the area occasionally).</p> <p>Bald Eagle (Eastern Cougar) (Golden Eagle) (Peregrine Falcon)</p>

Note: This list may vary over time as new species are added or change categories.

3.1.5 Cultural Heritage Resources

The Madawaska Highlands planning area contains a remarkable profusion and diversity of cultural heritage resources which, together, span and illustrate the entire history of human occupation of the region, extending back more than eight thousand years. The majority of the significant cultural heritage resources to be found within the Madawaska Highlands planning area are primarily related to the following periods and/or themes: i) the pre-contact Aboriginal occupation of the region (ca. 6,000 BC to ca. AD 1600); ii) the exploration and fur trade era (ca. AD 1600 to 1800); iii) the early years of Euro-Canadian settlement (ca. 1800 to 1900); iv) the logging era (ca AD 1820 to 1910; v) the railway era (ca 1885 to 1923), and; vi) recreational land use activities (ca 1918 to present). Typical sites types may include portages, camps/campsites, homesteads, villages, dumpsites, resource extraction sites, trails and roads, sacred sites, burial sites and structures or engineering works in the logging and railway era.

3.2 Resource Uses, Management and Issues

The resources of the Madawaska Highlands are important from an environmental, economic and social perspective. Use of the Crown land, which is the subject of this Land Use Plan, is regulated by the Ministry of Natural Resources on behalf of all the people of Ontario. Through appropriate planning, use and management, this land will contribute to the achievement of the goal and objectives of the Madawaska Highlands Land Use Plan. The primary challenge in Crown land management is to achieve an optimum balance between environmental, social, cultural and economic benefits resulting from the use and protection of crown land for both present and future generations. The management of resources needs to be carefully planned to ensure that the forests, wildlife and fisheries habitat and recreational resources are maintained, mineral and aggregate resources can be used and watershed, cultural and heritage values are protected.

Both prior to and throughout the development of this land use plan, a variety of issues regarding the use of natural resources within the Highlands, have been identified. Although some of these issues were known before the planning process was initiated, the majority were identified or confirmed during one of the opportunities for public involvement provided during the planning process. A detailed account of the public involvement process used in developing this land use plan is provided in the Appendix II. The following section identifies those issues which could be addressed through this land use planning process. Issues have been separated under the appropriate objectives of the land use plan.

3.2.1. Ecological Sustainability

Ensuring ecological sustainability is an important role of the Ministry of Natural Resources. This means that as stewards of Crown land resources, the Ministry must provide wise management of our natural heritage to ensure the long-term health of our ecosystems. It also means providing benefits from those resources both locally and globally while enabling present and future generations to meet their material and social needs. Wise management includes both conservation and protection to be effective. Most importantly, it means ensuring that our natural resources are used in a sustainable manner. Like a bank account, the principle, our natural resources, must be protected and the interest, the allocation of resources, utilized efficiently and fairly. An ecosystem approach to management attempts to capture the range of social, cultural, economic and ecological values that ultimately define human-ecosystem relationships.

Improving our knowledge base on how ecosystems function and relate to each other will ultimately help us. When one part of an ecosystem is affected, not only are other components of that ecosystem affected but other ecosystems may be affected as well. Given this complex nature of ecosystems, our limited understanding of their relationships, composition, structure and function and how our activities impact on them, it requires that we use a conservative approach to resource use.

The challenge is to plan for the use and management of the Madawaska Highland resources and still provide for flexibility to adapt to new information as it becomes available so that ecological sustainability is achieved. Without ecological sustainability, the overall goal for the Highlands, sustainable development, can not be achieved.

3.2.2. Natural Heritage

A key component of ecosystem sustainability is the conservation of biodiversity. A contribution to the conservation of biodiversity is made through the protection of representative samples of life (or life forms) and the management of the land base in a manner considered to be sustainable.

Protected areas are important because they provide social (e.g.recreation, spiritual), environmental (e.g. research, conservation) and economic (medical, ecotourism, recreation) value to society.

Studies have been undertaken to systematically describe the natural diversity in the Highlands and identify the best potential candidate areas to provide minimal representation of this heritage. Many of these values were initially identified through the reconnaissance of site district 5E-11 and subsequent report by Brunton (1990) and further refined by White (1992). This work specifically identified three existing and eight potential areas which could provide representation of the biodiversity of the planning area.

Old growth forests are a recognized value within the planning area. Studies on the distribution of old growth red and white pine forests have identified remnant forest sites which are 121 years or older on a variety of landform types. These isolated occurrences amount to only 153 hectares and are found both within existing provincial parks (8 hectares), and on the Crown land base (145 ha). These pine old growth values and other old growth forest types are considered an important component of ecosystem biodiversity for the planning area. When the evaluation of old growth sites is completed across all of the Site Districts, the sites will

need to be formally recognized and protected through a public process.

Wetlands also add to the array of values that are included within a representative natural heritage areas system. The most ecologically important wetlands are selected for protection. Significance of wetlands is determined through a process of inventory and analysis in accordance with a standard wetland evaluation process. Although some wetlands in the Madawaska Highlands have been evaluated, few have ranked as provincially significant. Joe's Lake Wetland in Lavant Township was found to be a provincially significant wetland.

Candidate representative natural heritage areas are identified through a scientific process called 'gap analysis'. Briefly stated, 'gap analysis' is the approach whereby natural heritage features are assessed based on landform, vegetation, soils, species and geography to determine whether or not some of those features require conservation. Representative areas can then be protected in a variety of ways. These can include more permanent legislated approaches like provincial parks (Provincial Parks Act) and conservation reserves (Public Lands Act) and policy and planning approaches like ANSI designation, private land stewardship and land trusts.

The protection approach selected is dependant on the sensitivity of the values to be protected and their tolerance for use. Provincial parks provide the highest and most demanding level of protection with varying use restrictions. Conservation reserves are secondary in strength since they are more permissive of alternative uses; policy approaches are even more flexible. The appropriate protection mechanism is normally selected and approved through a public planning process.

The Madawaska Highlands Planning Area contains natural features and areas important for conservation, nature appreciation, education and scientific study. To date only two approaches have been used to protect these features/areas - Provincial Parks and Areas of Natural and Scientific Interest (ANSI).

Provincial parks, particularly nature reserve parks, provide the greatest amount of protection of natural areas and there are currently two nature reserve parks within the study area:

Centennial Lake Provincial Park is a 545 hectare nature reserve made up of five separate parcels of land in Brougham Township. The largest portion is an upland area around Oakhill Lake and three small island parcels, on Black Donald Lake. The reserve protects representative pine, oak and maple forests as well as rare plants and habitats growing on marble outcrops. The park is used by hikers, and campers with some unauthorized vehicular use also present.

The park was regulated in 1988, and is presently managed in accordance with an approved interim management statement.

Matawatchan Provincial Park, is also a nature reserve, encompassing a 65 hectare forest at the south end of Hutson Lake in Matawatchan Township. It protects mature tolerant hardwood forest, including old hemlock stands, as well as plant communities growing on marble outcrops. Few people visit the reserve because of its inaccessibility, however access roads are nearing the outer park boundaries.

The Lower Madawaska River Provincial Park protects a 21 kilometre stretch of the Madawaska River. Outside of the park the remainder of the river, and its rapids and river ecosystems, have been long altered by man-made reservoirs created for power generation. The park is known for its white water rapids, scenic falls, recreational canoeing and kayaking. An estimated 15,000 people use the park in the summer. The 1200 hectare park includes a variety of topography and forests of pine, some of which are over 100 years old. The park is divided up into zones including development, access, historical, nature reserve and natural environment. The latter provides for camping at designated campsites as well as trails and some other facilities. There is an approved management plan for the park.

A number of candidate Areas of Natural and Scientific Interest (ANSIs) also provide interim protection for other representative natural features and values. These areas contain a range of both typical (common) habitats as well as unusual or unique features and are considered to be "representative" within Hills Site District 5E-11. Section 4.2.1 has identified the candidate ANSIs that are found in the Madawaska Highlands Planning Area. These candidate ANSI's have been withdrawn from resource management activities under the control of the ministry, for a number of years to ensure that options for natural heritage area protection were retained. This has included cessation of forest harvesting, aggregate removal and land disposition until appropriate management plans are prepared.

The protected habitats of the Madawaska Highlands are linked by contiguous forest cover. They are generally not "islands of green" surrounded by farms or developed lands like many southern protected areas. Forest operations and other uses of Crown land continue to maintain a range of habitats for wildlife species in the intervening lands in the Highlands. Areas of Concern associated with waterbodies, wildlife habitat and other features protect habitat throughout the managed forest landscape and to some degree link up natural habitats along shoreline reserves. Wetland policy guidelines apply to all identified wetlands outside of protected natural heritage areas. Vulnerable, Threatened and Endangered Species/Habitat guidelines, legislation and policy guidelines apply to all identified values. Silvicultural guidelines

ensure that biodiversity concerns are accounted for in forest management. Planning Act Policies and guidelines also work towards protecting important natural resources and heritage features.

NATURAL HERITAGE ISSUES:

(i) The need to identify and protect important or representative natural heritage features/areas located within the planning area.

(ii) The need to protect vulnerable, threatened and endangered species and their habitat. There is general support for such protection but varying opinions about the degree of habitat protection which should be provided through parks, ANSIs, old growth forests or reserves. Outside of protected areas, there is general support for protecting sensitive areas and wildlife habitat.

iii) The need to implement provincial park objectives, policies and regulations within provincial parks in the Madawaska Highlands planning area. A number of non-conforming uses continue in the existing provincial parks within the Madawaska Highlands including use of all-terrain vehicles, trucks, and hunting as boundaries for the park are not visibly marked on the ground and access to the outer boundaries of the Park is available.

3.2.3 Forestry

Forest Industry

The forest industry relies on the supply of timber from the forests on Crown land. Wood is supplied to industry at a regulated rate which ensures maintenance of a sustainable wood supply. Crown wood from the Madawaska Highlands provides fibre for 6 large sawmills, 5 pulp and paper mills and 3 veneer and pole plants. These industries are located outside the Highlands area in Eganville, Palmer Rapids, Lanark, Pembroke, Portage du Fort, Trenton, and Cornwall.

Across Central Ontario, including the Madawaska Highlands, the sustainable productive capacity of Crown land forests is barely sufficient to meet the current demand for quality sawlogs by the existing sawmills. In contrast, there are large amounts of under-utilized low quality wood available in Central Ontario. The productive capacity of the forests in the Highlands has been strongly affected by historic logging, agricultural land clearing practices and past large scale disturbances. As a result, many of the forests within the Highlands

contain an unnaturally high percentage of diseased and defective trees, producing low quality wood products.

Primary products of timber harvesting are high value white pine and hardwood sawlogs, and hardwood veneer logs, supplying about 60 % of the raw materials needed by the local sawmill industries. A secondary product of forest management is a large volume of low quality wood used by the pulp and paper and fuelwood industries.

Forest Sustainability

The forest industry is dependant on a predictable, sustainable supply of timber from the Highlands land base. It is also recognized that a healthy, diverse forest ecosystem is essential to the environmental, economic, social and cultural well-being of communities within and surrounding the Highlands.

It is therefore of importance that we ensure that the forests of the Madawaska Highlands and their associated benefits are sustainable. The sustainability of forests can be broken down into three primary components:

1. Sustainability of Forest Ecosystems (Biodiversity and Ecosystem Productivity)
2. Sustainability of Timber Supply
3. Sustainability of Wildlife Habitat

Table 4 shows the variety of mechanisms involved in ensuring forest sustainability for each of the 3 components. It identifies:

i) Measurable Indicators: Indicators are quantifiable measures of the forest which can be analysed and compared with baseline data at a management unit level. These indicators are used in forest management planning to select a preferred management option from several alternatives by analysing the impacts. They also evaluate the results of past forest management operations. Appendix V includes a more detailed explanation of measurable indicators.

ii) Resource Management Strategies: Strategies for resource management are the primary mechanism for achieving forest sustainability. They encompass a broad variety of activities, but the four major categories are legislation, policy, planning and implementation. These strategies are documented within the Crown Forest Sustainability Act (CFSA) and its manuals, MNR policy statements, Forest Management Plans, and Resource Management Implementation Manuals and Guidelines.

Table 4. Mechanisms for Ensuring Forest Sustainability

Tools	Sustainability of ...		
	Forest Ecosystems	Timber Supply	Wildlife Habitat
Measurable Indicators Forest Management Plans (1998-2003 for Lanark and 2001-2006 for Pembroke and Mazinaw)	1) Landscape Diversity: Landscape Pattern Index (spatial) ^{1,2} 2) Forest Diversity: Forest Diversity Index ^{1,2} 3) Forest Disturbance: Frequency /Distribution of Clear Cut sizes ² 4) Forest Condition and Ecosystem Productivity: Net Primary Productivity	1) Production Forest Available for Timber Production ^{1,2,3} 2) Wood Supply Analysis: Volume Production by Species and Product (Maximum Allowable Depletion, MAD) ^{1,2,3} 3) % available harvest area which is actually utilized by forest unit ^{1,2,3}	Habitat Supply Analysis for 1) Red-shouldered hawk ^{1,2,3} 2) White-tailed deer ² 3) Pileated woodpecker 4) Pine Marten ¹
Examples of Resource Management Strategies In: 1) Legislation 2) Policy 3) Forest Management Planning 4) Implementation	<ul style="list-style-type: none"> •CFSA: Forest Operations and Silvicultural Manual: Part 1, Section 3, "Managing Biodiversity" •Conservation Strategy for Old Growth Red and White Pine Forest Ecosystems for Ontario •Planning harvest allocations and silvicultural practices to mimic natural disturbance patterns •Including the retention of old growth features in silvicultural prescriptions 	<ul style="list-style-type: none"> •CFSA: Forest Operations and Silviculture Manual: Part 2, Section 3 - "Silviculture Practices" •Provincial Silvicultural Guides •Silvicultural Ground Rules •Silvicultural Tree Marking in Tolerant Hardwoods and Pine Forests 	<ul style="list-style-type: none"> •CFSA: Forest Operations and Silvicultural Manual: Part 2, Section 3 - "Fish and Wildlife Habitat Management" •Featured Species Policy •Operational Prescriptions for Areas of Concern •Area Inspections of Areas of Concern
Information and Monitoring Support	<ul style="list-style-type: none"> •Forest Resource Inventory •Establishment of Benchmark Forest for management unit •Soils/Climate Data 	<ul style="list-style-type: none"> •Forest Resource Inventory •Regeneration Surveys •Growth and Yield Program •Timber Scaling and Billing Reports •Mill licence Returns 	<ul style="list-style-type: none"> •Forest Resource Inventory •Fish and Wildlife Management Plans • Population Monitoring

¹ - already contained in the current Pembroke Timber Management Plan for 1996-2001
² - already contained in the current Timber Management Plan for Mazinaw Unit for 1996-2001
³ - already contained in the current Timber Management Plan for Lanark Management Unit for 1993-1998

As an example, the CFSA Operations and Silviculture Manual documents the MNR's approach to fish and wildlife habitat management in forestry operations, including the policy of designating provincially and locally featured species for special consideration in Forest Management Planning. During the planning process, components of these "featured" species habitat which could be affected by forest management operations are specifically identified as Areas of Concern (AOC - See Page 34). Management prescriptions which will mitigate possible effects are prepared for each AOC. Each AOC is clearly identified in the forest and in Forest Resource Licence conditions to ensure that the objectives of the Forest Management Plan are achieved on the ground. Ongoing monitoring (area inspections) of forestry operations in or adjacent to the AOC ensure that licensees or silvicultural operators adhere to the conditions.

iii) Information and Monitoring Support: Measurable indicators and Resource Management Strategies must be based on accurate and current information if they are to be relevant. This information must be collected, maintained and regularly updated. Information needs include broad landscape level data such as the forest resource inventory and specific forest/population level data such as regeneration and wildlife population surveys. It is only through this information that the effectiveness of resource management strategies and the measurable indicators of forest sustainability can be truly assessed.

The following paragraphs describe some of these mechanisms used to achieve forest sustainability.

Planning

All forest management activities on Crown land within the Highlands are planned for and implemented through Forest Management Plans. Forest management planning is one of the most important tools used to define the direction and techniques for achieving sustainable forests. In the forest management planning process, direction is provided by local objectives and strategies and policies derived from higher levels of government planning and decision-making (e.g. Land Use Plans, Policy Framework for Sustainable Forests, etc.).

There are three management plans which affect forest operations and management in the Highlands: Lanark Crown Management Unit, Mazinaw Crown Management Unit and Pembroke Crown Management Unit. The forest management planning process is prepared for a 20-year period, providing long-term direction for the management of the forest, and outlines detailed operations for the first 5-year period. This process is repeated at five-year intervals.

Forest Management Practices

Forest management practices are implemented within the planning area to meet many objectives. The most traditional and tangible of those is to ensure a sustainable supply of trees for high quality forest products. A secondary objective is to provide a supply of low quality materials for use as pulp or as fuelwood.

Provincial Silviculture Guides give direction for the types of silvicultural system and prescriptions (harvest + renewal + maintenance) used to sustain each forest type (working group or forest unit) found on the planning area. Cutting prescriptions are designed to mimic processes of natural disturbance and regeneration for growth and renewal of a diversity of high value forest types. For example, selection harvest is used in areas of all-aged forest to emulate natural disturbance processes of localized wind damage or disease as might occur in a maple-beech forest. In contrast, even-aged cutting systems, such as shelterwood harvest or clear cutting, are used in forest types biologically adapted to regeneration and growth following moderate to severe levels of disturbance such as those created by fire. Examples of these forest types are white pine, red oak or poplar. Where possible, forest harvest prescriptions are designed to favour natural regeneration of the desired species, although in some cases, tree planting or removal of undesirable tree species must be used to ensure regeneration of the desired species.

In general, the silviculture program is oriented toward maintaining or enhancing the productivity of existing forests while ensuring the renewal of a diversity of native trees, on sites to which they are adapted. Partial cutting systems are an important mechanism to ensure renewal of most of the major commercial forest types and to improve the overall quality of the stand, to provide a higher proportion of high quality sawlogs in the future.

Across the planning area, approximately 30-35 % of the eligible stands are harvested using the selection (all-aged) system, 55-60 % are harvested using the shelterwood (even aged) system, while 10-15 % of the stands are harvested using the clearcut (even aged) system.

Integrated Resource Management

The philosophy and practice of integrated resource management is incorporated in Forest Management Planning. Integrated resource management seeks to coordinate resource management programs and activities so that long-term benefits are optimized and conflicts between users and uses are minimized. This approach ensures that forest management activities do not unreasonably detract from other forest users and uses in order to achieve its objectives.

A number of mechanisms are used to achieve this integration, one of the most important being an extensive public consultation process that encourages input from all users and stakeholders. Sound logging practices and strict operating and construction guidelines for roads, bridges and trails have also been developed consistent with long term forest sustainability.

Another important mechanism is 'area of concern' planning where resource features, land uses or values that occur on the landbase and which might be affected by forest management activities are identified. Such features are labelled as 'areas of concern' (AOC) and are defined as "geographically-defined areas of value to other users/uses which could be affected by forest management operations, including road construction, and which may require modification to 'normal' forest operations (See previous discussion under Forest Sustainability; Resource Management Strategies).

For each AOC, or AOC type identified within the planning area, alternative management strategies to mitigate or eliminate possible effects of forest management activities are proposed. Options may include setting areas aside as a 'reserve' (not cutting), modifying harvest, renewal or maintenance operations, modifying road locations or restricting activities to specific times of year. The final option selected is the one which best protects the identified value. There are a number of provincial guidelines for the protection of other resource features that are used to develop prescriptions for the protection of certain features. These include guidelines for fish habitat, deer habitat, red-shouldered hawk, heronries, and tourism values to name a few. Also, plant species identified in the Atlas of Rare Vascular Plants of Ontario are part of the values databases of each district and are protected during timber management operations through the AOC planning process.

Each AOC is clearly identified in the forest and in Forest Resource Licence conditions to ensure that the objectives of the Forest Management Plan are achieved on the ground.

Implementation, Monitoring, and Reporting

The monitoring and reporting program is an integral component of plan implementation. An area inspection program monitors achievement of silvicultural prescriptions and protection of Areas of Concern. Other surveys such as the Forest Resource Inventory and forest regeneration surveys also help assess the status of the forest condition and the achievement of management objectives. Information needs include broad landscape level data such as the forest resource inventory and specific forest/population level data such as regeneration surveys.

Monitoring and reporting are essential components of an adaptive approach to forest management. With its inherent evaluation, it will identify the potential need to alter our management strategies to better achieve our goals and objectives. Reporting is conducted annually and at the end of the five-year term. An assessment of the success of the plan in achieving forest sustainability is done through an examination of measurable indicators and analysis of changes in the forest condition. For example, MNR has developed indicators of biodiversity which will be incorporated into all forest management plans as a method of measuring and monitoring biodiversity.

FORESTRY ISSUES:

(i) Paramount to the future of forest management and all the benefits which accrue from it is the sustainability of the forest. This was identified as a key issue by the public. The Ministry of Natural Resources must demonstrate that its management of the forest is sustainable. An important component of this demonstration is the continued protection and preservation of forest land biodiversity.

(ii) Timber harvest and processing is one of the most important industrial activities in the Highlands. At present, productive capacity of the forests on Crown land is barely sufficient to meet the demands for quality sawlogs by local sawmills. Current management practices will result in a long term increase in this productive capacity. However, removal of areas from the eligible land base could affect the ability of the Highlands to meet the demand of local industry.

(iii) The construction and use of new forest access roads and trails, more than any other activity on Crown land, has the potential to dramatically alter land use patterns. For example, in order to harvest timber resources, access roads must be constructed and maintained. Construction of new roads provides access to lands and resources which have historically been considered 'remote.' While some resource users enjoy the benefits associated with increased access, others consider increased accessibility to be unacceptable because of the environmental and land use changes which often result.

Access to wildlife and fish populations, and the increased potential for harvest and over-harvest which results from improved accessibility is a concern in the area. Increased access can increase pressure on wildlife and fish populations, as well as generate conflict between users. Trapping is conducted extensively over the area, and requires, to some extent, access to remote areas by snow machine or ATV. The development of new access roads and trails has the potential to change the amount and type of use in a specific area.

Closure of roads and trails to public use can help maintain the remoteness or general inaccessibility of a specified area, while reduction or elimination of road maintenance, can, in the long term reduce the accessibility of an area to the general public. Reducing or eliminating maintenance of public access points to water has the potential to reduce the accessibility of different lakes to the full range of those who may wish to use them. Striking a balance between full accessibility and protection of remote land use experiences is an important issue identified by the public to be addressed in the plan.

3.2.4 Mining & Aggregate Industry

Mining

Mining activity is limited at this time. However, there is a long history of mineral exploration and mining in the Madawaska Highlands and adjacent areas. Within the Highlands, mineral occurrences and deposits of corundum, graphite, feldspar, uranium, molybdenum, gold, zinc, copper, iron, nickel, zircon, apatite and marble are well documented. Among the best known past-producing mines of the Highlands are the Black Donald graphite mine, a key North American source of this strategic commodity during the Second World War. Other well known mines were the O'Brien, Spain, Jamieson and Ross molybdenum mines, and the Martel, Bluff Point, Thompson, Campbell and Caldwell iron mines. The former Craigmont corundum mines, which were the world's major source of supply in the early 1900's, and which were again an important source during the Second World War, are located very close to the planning area.

At present there are no producing mines in the area, but advanced exploration for gold, zinc and industrial minerals has recently occurred in the south-east corner of the Highlands. Four current mining operations and two mineral processing mills are located just outside the planning area.

The actual process involved in developing a mine is fairly complex. Initially, exploration work is carried out in areas which have been 'staked' by individuals or companies. If preliminary exploration indicates that significant mineral potential exists in an area, a lease may be issued for more advanced exploration. A lease is required before a property can go into mine production. Production can only commence once public notice has been issued, a mine closure plan has been developed and financial assurances for rehabilitation have been approved by MNDM.

Aggregate Resources:

Although demand for aggregates within the Highlands is not extensive, supplies are needed for road construction and maintenance activity, particularly in support of the forest industry. Some of this demand is met by extracting resources from private lands; the balance is met through the extraction of material from Crown land.

Removal of aggregate resources from Crown lands within the Highlands is controlled by the Ministry of Natural Resources. Before such removal can occur, an Aggregate Permit must be issued, under the authority of the Aggregate Resources Act. Issuance of this permit amounts to a disposition of the rights to Crown resources and as such, carries with it obligations under the Provincial Environmental Assessment Act. Before permits are issued applications are reviewed internally by MNR staff to ensure that extraction is compatible with or at least will not affect, adjacent crown land values, uses or users. In addition, consultation with local municipalities, other government agencies and the public may occur. Applicants are required to indicate how extraction sites will be rehabilitated once the extraction of material is complete and how any potential environmental effects will be mitigated. Financial securities are also provided by the applicant.

Aggregate permits can take a number of forms, ranging from permits to extract small amounts of material, for very specific and short term activities, to permits which allow long term extraction of material for large scale development and maintenance projects/activities.

MINERAL AND AGGREGATE ISSUES:

(i) As subsurface resources, it is difficult to determine the extent of the minerals and aggregate resources found within the Highlands. It is also difficult to determine how much of a specific commodity will be necessary in the future to make its extraction viable. In order to provide for future mining opportunities, as much crown land as possible should be kept available for mineral or aggregate resource exploration or extraction. At the same time however, sustainability of the entire ecosystem was identified by the public as an important mining-related land use issue.

ii) Some of the public also indicated that mineral or aggregate extraction is considered incompatible with certain other Crown land uses. Therefore another issue related to extraction of minerals or aggregate is determining where, due to the need to protect other resource features, extraction should not be permitted.

3.2.5 Hydro-electric power generation

The Madawaska River is a dominant physiographic feature in the planning area. The river has undergone great changes since the turn of the century. Dams, slides and booms that were built on the river to aid timber drives in the 1800's have been replaced by dams designed for generation of electricity. The river now includes 7 major dams and 5 generating stations, all managed to provide "peaking" power. Generators are run on the river during peak demand times, creating discontinuous flows on the river.

There are 3 major dams and generating stations in the planning area. The massive Mountain Chute dam flooded 3440 hectares (8500 acres) of river, land and lake to create Centennial and Black Donald Lakes. The lake is now considered a warmwater environment that is used extensively for outdoor recreation. The reservoir stores water that is used during the winter to generate electricity at the five stations downstream. A drawdown of up to 5.5 metres occurs towards the end of winter, to provide flood control and storage for the spring freshet. A weir on Mackie Creek was built to prevent warmwater fish species from migrating into the trout fishery of Round Schooner Lake.

The Barret Chute dam, upstream of Calabogie Lake, was built in the 1940's to supply power during wartime. It now backs up water to the foot of the Mountain Chute dam and affects water levels on Norcan Lake. The Calabogie station is the oldest on the river being 1920's vintage. An upgrade and rebuilding of the generating station has been planned and an environmental assessment of this expansion was prepared in 1993. Plans to redevelop the site are now pending.

Ministry of Natural Resources staff have been working with Ontario Hydro and local residents to improve management of the river for values other than the production of electricity. A series of guidelines are in place to provide suitable flows and water levels for waterfront property owners, as well as for fish, furbearers and waterfowl. MNR and Hydro are currently working on a full review of the river system that takes in a broad range of river values up and down the Madawaska.

HYDRO-ELECTRIC ISSUES:

i) The effect of water fluctuations from hydro-electric dam operations on both fisheries and wildlife populations and/or their habitat was identified as a concern.

3.2.6 Wildlife-Related Activities

Wildlife in the Highlands is managed for both consumptive and non-consumptive uses. The majority of field activity is related to monitoring harvest activity and wildlife populations and studying habitat condition.

Wildlife management in the Province is guided by a variety of policies and directives. No single document provides overall direction. Managers take some guidance from the Provincial Wildlife Strategy documents. The overall goal of the wildlife program is to ensure 'a diversity of healthy ecosystems and associated wildlife populations and habitats which provide sustainable social, cultural and economic benefits for all people'. (Wildlife Working Group, 1991. Looking Ahead: Toward a wildlife strategy for Ontario).

Wildlife populations rise and fall with the subtle shifts in habitat quality, environmental factors, or forest-based human activity. In the opinion of MNR, the conservation concerns of habitat elimination, forest fragmentation, population isolation and reduction in blocks of contiguous cover do not apply in the Highlands in the same way that they might in parts of Southern Ontario. Therefore, conservation of wildlife focuses on sustainable habitats for all wildlife and sustainable uses such as harvests through the following:

1. Habitat protection and management during timber operations.

Recently, the Class Environmental Assessment for Timber Management provided a comprehensive review of how wildlife must be considered in timber management operations. This now applies to the Crown lands within the planning area. Timber management plans prepared for the Pembroke, Mazinaw, and Lanark Management Units applied some of the principles of the Environmental Assessment such as habitat supply analysis for selected wildlife species. However, Assessment requirements will apply completely at the next stage of planning for each management unit.

There are also site specific protection of critical habitats for vulnerable, threatened, endangered species or wildlife 'featured' for management, such as white-tailed deer. Timber operations are managed so as to provide an array of habitats for these species. Specific Area of Concern (AOC) Guidelines exist, which target the conservation of particular species and their critical habitats. White-tailed deer are a featured species in the area. Deeryard protection and appropriate forest management sustain a healthy deer herd. Intensive habitat management projects such as strip cutting in pine and patch cutting in cedar have been directed at enhancing deer populations in the past. Except in extreme emergencies, the Ministry of Natural Resources no longer feeds deer on a supplementary basis, instead depending on

habitat management to ensure production of appropriate food supplies. Several groups of local residents however, continue the practice in a number of locations.

2. Managing sustainable harvests of game species.

Wildlife harvests are managed under the Game and Fish Act, Migratory Birds Convention Act and other legislation related to game species. The quantity and distribution of harvests among hunters and trappers, as well as the seasons and types of animals harvested are covered under this legislation. Conservation Officers and front line staff are most involved in monitoring harvest. Deer hunting is probably the most prevalent type of hunting although small game, bear and moose hunting are also important. The Ministry of Natural Resources regulates this activity through the issuance of licenses as well as by establishing quotas regarding the number of a particular species which can be killed. This quota system may also establish age and gender limitations. Deer yard surveys, hunt camp surveys and provincial mail surveys are data sources used to set harvest targets and quotas. There are opportunities to increase the data collected through the use of volunteers.

Hunting

The fall deer hunt is provincially renowned. Table 5 shows examples of annual deer harvest in Wildlife Management Units 58 and 63 which make up the majority of the study area. The 'Canontos' study of deer and deer harvest in the core of the Highlands planning area is well known to many hunters and local residents. The results of this study, which lasted from 1953 until the present day, are still in preparation, but do provide a picture of the deer hunt. In the 230 square kilometre research area, hunters spent an average of 3,000 to 4,000 hunter-days annually on the hunt. During the last decade of the study hunters from permanent camps made up about 75 % of the hunters, with the remaining 25 % being day-hunters or those based in temporary camps.

Table 5. Estimated deer harvests in Wildlife Management Units (WMU) in the Madawaska Highlands Planning Area (based on post-hunt questionnaire surveys).

WMU	1986	1988	1990	1992	1994
58	1510	1904	2294	1418	1939
63	2200	2950	3800	4805	4520

About 20 Bear Management Areas encompass the Highlands study area in whole or in part. Hunts in the spring make up about 50% of the harvest, with specific hunts and incidental harvest of bears during the deer hunt making up the remainder.

Small game and waterfowl hunting is common in the Highlands. There is little management activity associated with small game so population data are not available. Aerial surveys of nesting pairs of ducks have been conducted by the Canadian Wildlife Service in parts of the study area.

Trapping

Beaver and muskrat comprise the bulk (about 80 %) of the animals harvested, with fisher, fox, otter, and mink making up most of the remainder (about 15%). Marten, which have recently been identified as a 'locally featured species' require special consideration in forest management. Very few marten have been harvested within the planning area recently, although there appears to be an abundance of suitable and optimal habitat in the form of older conifer stands. Studies are currently underway to better understand the distribution and status of marten in the study area.

Appendix VI lists the furbearer harvest from most of the study area for the period 1990-1993. About 40 registered traplines cover the Crown land planning area in whole or in part. Approximately 50 registered trappers and trapper helpers harvest furbearers on these Crown lands. As well, approximately 150 resident trappers harvest furbearers on private lands surrounding the Crown land area of the planning area.

3. Managing, enhancing or restoring populations of vulnerable, threatened and endangered species and their habitat. These species receive special attention and consideration in crown land management. Conservation efforts include monitoring and surveying habitat, protecting known habitat on Crown land as well as ensuring habitat conservation and stewardship on private lands, developing species awareness programs, establishing partnerships between MNR and local naturalists and experts to assist in surveying vulnerable, threatened or endangered species. Definitions of the terms 'vulnerable, threatened and endangered' as well as details regarding conservation strategies for specific species are included in Appendix VII.

WILDLIFE-RELATED ISSUES:

(i) The sustainability of wildlife populations and wildlife habitat was considered to be a key concern for wildlife management in the Madawaska Highlands. Forest management was seen as an important wildlife management tool and maintenance of diverse forest communities was considered essential to maintaining species diversity.

ii) Hunting is an activity traditionally associated with the Madawaska Highlands. It occurs across the entire planning area. As a regulated activity, hunting has been recognized as a legitimate, long-term and sustainable use of land and wildlife in the planning area.

There is some concern over the lack of information and data necessary to adequately manage wildlife species and ensure that harvest levels are sustainable. Concerns were also expressed regarding the need to create wildlife sanctuaries or 'no hunting areas' within the Planning Area.

(ii) Trapping is an activity which has historically occurred across the entire planning area. It is regulated to some degree by the Ministry of Natural Resources through issuance of trapping licenses and by setting quotas on the number of various species a trapper can or must harvest. Quotas are not applied to all species.

3.2.7 Fisheries Resources

The fisheries resources of the Madawaska Highlands offer significant recreational and economic benefits to Ontarians. The sportfish resources of the Highlands make it a popular destination for anglers. Although ease of access to waterbodies is an important consideration for many anglers, other seek less accessible waters which offer solitude, less crowding, a feeling of remoteness and the likelihood of a less intensively angled fishery. Patterns of use by anglers in the Highlands also vary through the seasons, with many lakes which are normally remote being readily accessed by snowmobile in the winter. Tourist establishments and other businesses catering to anglers in the planning area have capitalized on the variety of angling experiences available to their clients in the Highlands.

The Madawaska Highlands has a long history of intensive sportfish management. This reflects the area's strong attraction to anglers for the varied and high quality fisheries which are available. Fisheries management, both within the Highlands, and the Province as a whole, is guided by the principles and strategies contained in the "Strategic Plan for Ontario Fisheries" (SPOF and SPOF II). These publicly developed and approved documents are designed to help protect aquatic ecosystems and rehabilitate those which are now degraded. Their overall goal, consistent with the goal of the Madawaska Highlands Land Use Plan, is to protect healthy aquatic ecosystems which provide long term benefits to help satisfy society's need for a high quality environment, wholesome food, employment, income and cultural heritage.

The specifics regarding the implementation of the preceding guiding principles are contained within the various Fisheries Management Plans which encompass the planning area. These plans, which were originally approved in the late 1980's have been kept reasonably current through incorporation of various approved plan amendments. Management actions which flow from the above noted guiding principles include fish habitat management and protection as

well as fish population management.

Almost three-quarters of the 150 waterbodies supporting recreational fishing in the Madawaska Highlands planning area are managed for coldwater species. The brook trout is the most common coldwater species in the Highlands, occurring mostly in smaller, more remote waterbodies. Brook trout populations in the Madawaska Highlands are maintained primarily by Ministry put and take stocking programs due to the general lack of suitable spawning habitat available for these fish. Stocking programs are still conducted routinely. Other coldwater species stocked by the MNR include lake trout, rainbow trout, brown trout and splake. These species are also stocked on a put and take basis in lakes with suitable water quality for the purpose of providing angling recreation where other coldwater species cannot be sustained naturally.

On those lakes which contain naturally reproducing trout populations, management techniques employed to protect existing populations include the regulation of angling seasons, size limits, and catch limits.

The warmwater fisheries can normally be maintained through natural reproduction, so most management efforts for these species focus on the protection and rehabilitation of various components of fish habitat. A significant warmwater fishery concern revolves around the management of water levels and flows in a way which accommodates the natural reproductive processes of these species. The current review of water management practices at the various dams along the Madawaska River will hopefully enhance the quality of the walleye fisheries in the lakes which are affected by these dams.

In addition to the sport fishery, the planning area contains 41 baitfish management areas in which licensed commercial harvesters have exclusive baitfish harvesting privileges. These harvesters derive income from the sale of baitfish either directly to anglers or to baitfish retailers, and report their annual catch to the local Ministry office. Future demands for baitfish can likely be met without jeopardizing local resources, although more precise harvest records and improved scientific insights regarding baitfish management are desirable to ensure the perpetuation of baitfish populations.

The protection and proper management of fish habitat is vital for the perpetuation of fisheries resources, and also for the maintenance of the local ecosystem. In recognizing this, the local Ministry of Natural Resource offices direct considerable effort toward the inventory, protection and enhancement of fish habitat. Fish habitat inventory projects include lake and stream surveys, water quality monitoring etc. Fish habitat protection is also carried out through

enforcement and plan input and review of proposals which may affect fish habitat and monitoring for compliance of imposed conditions of approval. There are also guidelines and policies for safeguarding fish habitat from activities such as timber management, dock or boathouse construction and water level fluctuations. Where fish habitat problems or limitations exist, projects, such as the creation of spawning sites or removal of migration route blockages are undertaken, often in cooperation with local clubs, to rehabilitate or enhance habitat.

Fish population management programs are also an important component of local fisheries management and include the application and enforcement of fishery regulations such as catch and possession limits, open seasons and size limits which are designed to maintain harvests within sustainable limits. In recent years, the role and biological implications of the Ministry's fish stocking program has been more closely scrutinized to determine if the benefits being derived are sustainable. An emphasis on habitat protection and rehabilitation is sometimes more effective. Local staff often in cooperation with local groups or clubs monitor and assess fish populations through surveys and studies such as netting projects, surveys of anglers, and spawning surveys.

AQUATIC RESOURCES ISSUES:

(i) The maintenance of fisheries in the Madawaska Highlands was considered to be a key issue. Concern was related to both the maintenance of natural fish populations as well as angling opportunities.

ii) Operation of Ontario Hydro dams across the planning area can result in wide fluctuations in water levels which can in turn result in temporary fisheries habitat destruction, sometimes during critical periods. Public concern was expressed for the negative impacts of dam operations on fisheries and the need for mitigation.

3.2.8 Land Management

The presence of each of the preceding resources has resulted in demand for the Crown lands within the Highlands to support a wide range of recreational uses or activities. There are four major ways of managing Crown land recreational or tourism activities and these are:

- i) Retaining Crown title to ensure effective stewardship.
- ii) Disposing of Crown lands where appropriate.
- iii) Environmental protection.
- iv) Protection of human life and property.

Each of the preceding components has the potential to affect land uses within the Highlands. For example, with respect to ensuring effective stewardship of the land base, MNR considers issues such as the development of new roads, trails and water access points, as well as the need to address unauthorized occupations of Crown land or applications for quit claims. Applications for the disposition of Crown land, through direct sale, lease, or land use permit, may be considered, subject to the provisions of this land use plan and include such considerations as:

- disposition will not result in unacceptable environmental effects
- disposition contributes to the economic growth of the Province and local communities
- disposition contributes to social, recreational and cultural community development
- disposition provides revenue to the provincial treasury

LAND DISPOSITION ISSUES:

- i) Disposition of the right to use Crown Land, through the issuance of land use permits, leases or through direct sale is considered acceptable only under particular circumstances. Public concern has been expressed for the type and extent of development permitted to occur on Crown land and the need to protect the natural and remote character of the Highlands. The majority feel that development should be encouraged through the private sector and on private land.

3.2.9 Tourism/Recreation

The Madawaska Highlands' scenic Crown land areas provide numerous opportunities for a variety of tourism or recreational experiences. The majority of experiences take advantage of the natural and remote landscape.

Off-road Vehicles

The use of all-terrain-vehicles (ATVs) is associated with hunting or trapping and it is also its own recreational activity. Use of ATV's provides relatively easy access to remote areas of Crown land. Four-wheel drive vehicles mainly use existing roads or passable areas on Crown land. However, some are also used for recreational sport to traverse rough terrain. Dirt bikes are also used both on and off-trail in the Highlands. There are no current restrictions on use except where roads are closed to vehicular traffic.

Snowmobiling

This is a popular winter activity in the Highlands which significantly contributes to the local economy of many communities in the Highlands area. There are a number of formal, groomed

snowmobile trails traverse the area. Use of snowmobiles provides access to some areas which are almost inaccessible at other times of the year. Designated snowmobile trails are authorized by MNR through the issuance of a land use permit. Most snowmobilers restrict their travel to trails and waterbodies, although anglers and trappers may deviate from that.

Canoeing

Opportunities for canoeing within the Highlands are plentiful, although canoe tripping occurs mainly in the Madawaska River Waterway Park. The Fortune-Schooner lakes area supports some canoeing activity, as may any of the hundreds of waterbodies within the Highlands. Potential for development of new canoe tripping routes is quite limited.

Hiking/Skiing

At present, hiking and cross-country skiing are not particularly well developed activities within the Madawaska Highlands. The existing nature reserves may serve as focal points for hiking activity as does Evergreen Mountain, just east of the Fortune-Schooner lakes ANSI.

Camping

Crown land camping is fairly common within the Highlands, particularly during the summer months and the autumn deer hunting season. As public awareness about the various ANSIs increases, such activity may increase across the planning area throughout more of the year.

Power boating

The Madawaska Highlands contain a number of large lakes where power boating is very popular. Power boat use includes small motored boats, larger boats used for lake touring, water skiing and fishing and small personal watercraft such as jet-skis or sea-doods.

Aviation

Land and seaplanes are often used to access the Madawaska Highlands for tourism and recreational activities such as fishing.

TOURISM AND RECREATION ISSUES:

- i) Many Crown land uses and activities are compatible. For example, the use of all terrain vehicles and the activity of hunting often go hand in hand due to the increased ease of accessibility which results from use of ATVs. Similarly, recreational canoeing and hiking tend to be associated with one another. Some recreational activities like snowmobiling and hiking/biking can make use of the same recreational resources in alternate seasons. Overall, public input indicated that most uses are considered compatible or that the land base could

continue to support many different uses in the same location, if trails were designated for some specific uses.

ii) Similarly, a number of Crown land recreation activities are also compatible with resource extraction activities. For example, roads created for logging purposes can provide access routes desired by hunters and anglers. In contrast however, hunters and anglers desiring more remote and often higher quality recreational experiences, may not agree with the need to allow free and open public use of logging roads, or may suggest limi

3.2.10 Cultural Heritage

The protection and conservation of cultural heritage resources is governed by the Ontario Heritage Act and administered by the Ministry of Citizenship, Culture and Recreation (MCZCR). Formal archaeological research within the Madawaska highlands planning area has been very limited. As a result, very few sites have been documented and registered on the MCZCR's Provincial Archaeological Sites Database. Although many archaeological sites are reported by members of the public, usually as a result of accidental finds, most are identified by professional archaeologists in the course of their field investigations. Many archaeological records have been focused primarily on the pre-contact and fur trade period Aboriginal sites but in recent years, archaeological interests has increased in the investigation and documentation of early Euro-Canadian settlement, commercial and industrial sites.

It is important that archaeological and historical sites be located, inventoried and documented prior to undertaking any activities which might have an adverse effect upon their integrity. Therefore, prior to any development or resource extractive activity taking place on Crown lands, including provincial parks, cultural heritage site assessments are conducted by licensed archaeological consultants in order to identify all significant sites and any potential impacts to them. Where such potential impacts are identified, the site is protected through the Area of Concern process (as used in forest management operations) or the site is documented in order that the area may be cleared of heritage concerns and development allowed to proceed. The specific location of cultural heritage sites are kept confidential to protect the integrity of the site.

CULTURAL HERITAGE ISSUES:

i) Effective protection and conservation of cultural heritage resources is a difficult challenge in land use planning because by their very nature, most archaeological sites are buried and therefore invisible to the untrained eye.

4.0 Land Use and Resource Management Strategies

The preceding section identified a number of resource uses, their management and issues identified by the public about resource activities. This section will provide land use and management strategies for resources across the land base to address those issues identified. The resource direction and strategies proposed take one of two possible forms:

- general management strategies which may be applied to any resource or resource use within any portion of the planning area
- area specific strategies which apply only to specified portions of the Crown land base.

The Ministry of Natural Resources is responsible for the management of Crown land throughout the Highlands and has been for many years. As described previously, each of the resources within the Highlands has historically been managed by MNR in accordance with a wide range of provincial policies, procedures and legislation. In this capacity, the Ministry has developed a wide range of techniques to manage the use of Crown land in a manner which ensures the sustainability of natural resources while providing for the accrual of economic, social and recreational benefits. These techniques, which have been referenced previously, will continue to apply to resource management throughout the planning area. However, additional management strategies will be implemented to address general issues across the land base.

4.1 General Management Strategies

4.1.1. Natural Heritage

There were a broad range of issues related to the objective of Ecosystem Protection ranging from concern for how resource management activities are carried out in the Highlands to identifying and protecting more of its natural heritage values. Therefore, the following strategies will be implemented:

- *continue normal MNR management of resources and resource users but enhance existing approval requirements and conditions where there is public concern over land use disposition.*

Through its approval of various activities on Crown land, MNR has the opportunity to set specific requirements or conditions on activity proponents. For example, prior to granting the right to extract crown resources such as aggregate material from Crown land, MNR can

require the proponent to seek comments from the public potentially affected by the proposed activity. In order to address identified public concerns, MNR's application of requirements will be maximized with respect to some land uses, across the planning area.

- *MNR, in partnership with interested groups including local groups/individuals will develop an ANSI and 'protected areas' monitoring program to ensure that ANSIs receive the appropriate protection and use.*

- *MNR will produce a summary report showing 'no-cut' areas (either protected areas or areas with little or no logging potential) to visually present the range of natural areas within the Highlands.*

- *Support partnerships with public organized groups to ensure the development and delivery of an information program intended to promote protection of natural values within the Highlands for the benefit of all users.*

- *Provide guidelines for the identification, management and protection of regionally significant candidate ANSIs in all resource management plans, including Forest Management Plans and other Crown land uses (see Appendix VIII).*

- *There are currently three provincial parks within the planning area. Appropriate boundary marking will be undertaken to enable enforcement of parks policies with regard to non-conforming uses in the nature reserve class of park.*

- *Inventories and evaluations will continue to identify wetland, old growth forests and VTE species/habitats in the planning area. Strategies will be pursued to ensure that these values are protected in support of ecosystem sustainability and biodiversity conservation with appropriate public consultation processes.*

4.1.2 Forestry

Sustainability of the forest resources was identified as both an objective and a key issue in the Madawaska Highlands. Although the Ministry practices sustainable forestry, the need for a means to monitor or measure that sustainability was identified.

Strategy:

- *Sustainability targets have been established to help monitor the state of the forest and additional targets may be established where required.*

Table 6 provides a set of sustainability targets for the area of the Madawaska Highlands which will be incorporated into associated Forest Management Plans. Some are specific targets which can be measured using indicators (eg. No net loss of red-shouldered hawk nesting habitat), while others exist as Resource Management Strategies which are implemented through Forest Management Plans but are not readily measurable (eg. Retention of large diameter trees in tolerant hardwood selection management). Two levels of targets are referenced in the chart. The Baseline target represents the minimum acceptable level for the particular criteria. The Optimal target represents an attainable level, but one which may be subject to certain constraints. For example, a minor increase in the area of the white pine working group is dependent on silvicultural funding for re-establishment of white pine on poor quality poplar sites. The predicted targets for a time-line of 20 years and a rotation period (60-140 years depending on species) has also been shown. Appendix IX describes the rationale for selecting each criteria and their respective targets.

4.1.3 Mining and Aggregate Extraction

Mining was a concern on the land base with respect to the objectives of ecosystem health and sustainability of resources both mineral and non-mineral. Public notification will help interested parties participate in the process of planning mineral exploration. Through their participation they can ensure appropriate measures will be taken to protect the long-term health of the landscape without unnecessarily withdrawing land base from mineral exploration.

Strategy:

- *MNR will seek cooperation of MNM to ensure that the public is notified of proposals to engage in advanced mineral exploration prior to commencement of such activity.*

- *MNR will continue to follow the management directions set out by the Aggregate Resources Act and Ministry policy in managing Crown land aggregate resources.*

Table 6. Sustainability Targets for the Madawaska Highlands					
Criteria	Related Measurable Indicator	Target			
		Baseline		Optimal	
		20 yrs	Rotation	20 yrs	Rotation
Sustainability of Forest Ecosystems Area of Working Groups and as a component of Working Groups for:	FRI Updates and Landscape Diversity Indices				
White Pine/Red Pine:	"	No net loss	No net loss	Minor ↑	Moderate ↑
Hemlock:	"	No net loss	No net loss	Minor ↑	Moderate ↑
Poplar/Birch:	"	Minor ↓	Minor ↓	Minor ↓	Moderate ↓
Even-aged Tolerants (Yellow Birch/White Ash/Basswood etc):	"	No net loss	No net loss	Minor ↑	Minor ↑
Uneven-aged Tolerants (Maple-Beech):	"	Minor ↑	Moderate ↑	No change	Minor ↑
Cedar:	"	No change	No net loss	No net loss	No net loss
Spruce:	"	No change	Minor ↑	Minor ↑	Moderate ↑
Jack Pine:	"	No change	Minor ↓	No net loss	No net loss
Balsam Fir:	"	Minor ↓	Minor ↓	Minor ↓	Moderate ↓
White Pine/Red Pine: Percentage of Area of White Pine/Red Pine in Age Class 121 +	"	Minor ↑ over one rotation		-----	
Tolerant Hardwood (All-aged Hardwood stands): Age class distribution/structure of stands	----	↑ the maximum diameter of trees retained during silviculture on specific stand and site conditions		-----	
Clear cut size	Frequency/Distribution of Clear Cut sizes	Not to exceed 100 ha. Adjacent clear cuts not permitted within 5 years or until stand is Free-to-grow.		-----	
Sustainability of Timber Supply Product Percentage of Sawlogs	Volume in Product	50% sawlogs:50% pulp		-----	
Oak: Area of Red Oak Working Group and as a component of other WGs	Production Forest Available	Moderate decrease over one rotation		No net loss	
Sustainability of Wildlife Habitat Deer Range: winter habitat - conifer cover interspersed with hardwood regeneration	Habitat Supply Analysis (HSA)	Maintenance of habitat quality of core deer concentration areas.		-----	
Deer Range: Fall habitat - Red Oak and beech forests	HSA	Moderate decrease in Oak over one rotation.		No net loss in Red Oak	
Red-shouldered Hawk - Nesting Habitat	HSA	No net loss.		Minor increase in area of suitable and optimal habitat classes.	

Working Group = An aggregate of stands, including potential forest areas assigned to this category, having the same predominant species, and managed under the same rotation or cutting cycle and broad silvicultural system.
 Relative Values = Minor - 0 to 10% Moderate - 10 to 25%
 Rotation = The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage or maturity.

4.1.4 Wildlife Management

The sustainability of wildlife populations and their habitat, under the natural heritage and sustainability objectives, was the key issue identified by the public for wildlife management. The need for greater information on the effects of many land uses on the sustainability of resources within the Highlands was also noted. Development and implementation of "effects monitoring" programs, by those who use and benefit from the Highlands will assist in present and future resource management processes. Therefore, the following strategies for the management of wildlife in the Highlands will be implemented:

General Strategies:

- *through implementation of existing MNR policy, procedures and legislation, vulnerable, threatened and endangered species will be provided with protection.*
- *continue to focus management within the Highlands to ensuring sustainable habitats for wildlife and sustainable uses of wildlife as outlined in Section 3.2.4.*
- *hunting will continue to be permitted across the Madawaska Highlands. Monitoring programs will be encouraged in cooperation with local hunt clubs and other organized groups to provide an ongoing assessment of the status of wildlife populations.*
- *enforce existing regulations with respect to hunting and trapping within Provincial Parks. No hunting or trapping is permitted within Matawatchan and Centennial Lake Nature Reserve Provincial Parks.*
- *trapping will continue to be permitted across the Madawaska Highlands. Monitoring programs will be encouraged in cooperation with local trappers to provide an ongoing assessment of the status of wildlife populations.*
- *local area offices will seek partnerships with groups or organizations interested in carrying out wildlife research and identify research needs (see Appendix X).*

4.1.5 Fisheries Management

Fisheries issues were found within all three plan objectives. There were concerns related to the sustainability of populations and habitat such as water level fluctuations and use concerns

such as the maintenance of remote angling experiences. Therefore, a number of strategies were identified to address the range of issues including the continuation of normal management practices with a focus on remote angling experiences and placing a greater emphasis on monitoring, research and information collection.

Strategies:

- ***MNR will carry out normal fisheries management to ensure the maintenance and improvement of fisheries habitat and populations.***
- ***MNR will identify remote lakes and remote lake areas where new vehicle access will remain limited (see section 4.2.2).***
- ***MNR continue to work with Ontario Hydro to maximize fisheries (and other wildlife) protection in managing waterways with hydro-electric development.***
- ***MNR will seek partnerships with groups or organizations interested in carrying out fisheries monitoring and research for both sport and non-sport fisheries and identify research needs (see Appendix X). Criteria and accepted data collection methods will be provided by the Ministry.***

4.1.6 Land Disposition

Land disposition issues, under the land use conflict objective, were related to development on Crown land. There was general concern for maintaining the natural and remote experiences people enjoy in the Highlands without significantly increasing the pressure on its resources. Therefore, the following strategies for land use disposition will be implemented in the Highlands:

- ***In reviewing applications for disposition of Crown land (e.g leases, land use permits), local area offices will continue to use regional guidelines for land use disposition in conjunction with the considerations outlined in section 3.2.8 of this plan.***
- ***Crown land recreational camps will continue to be permitted in the Madawaska Highlands. No new LUPs will be issued to allow creation of new private camps. Existing camps may be repaired or reconstructed as necessary. Relocating camps may be considered in cases where reconstruction is necessary. Proposals for development of commercial 'camp' facilities for public use will be reviewed under the Ministry's land use disposition process.***

4.1.7 Off-road vehicle use (including construction of new recreation trails)

The use of off-road vehicles and its impact on the environment and other users were the main concerns raised by the public for this activity. Although primarily related to the land use conflict objective, its environmental effects also link it to the other two objectives. There are several ways to mitigate these impacts including: spatial or temporal (timing) separation, monitoring, education and partnerships. Education is an important means of resolving conflicts so use can occur cooperatively between all those who share a stake in the management of land in the Highlands. Education program can include such items as:

- the importance of user respect for other users
- improving user ethics
- ways to minimize conflict between user groups
- ***Off-road vehicle use is permitted, under existing controls, across the Madawaska Highlands except where use is specifically restricted to designated trails/roads or specifically prohibited (see section 4.1.13 and 4.2.1).***
- ***Construction of new trails for off-road vehicles is generally permitted across the planning area, subject to obtaining a permit from MNR to do so. Exceptions are noted in Sections 4.1.13 and 4.2.1.***
- ***MNR will seek partnership arrangements with activity proponents and others in order to assess level of activity and its effects on the land base as well as develop and deliver a program to educate participants about the need to respect other users and protect the environment.***

4.1.8 Motorboating

Motorboating issues were primarily related to the land use conflict objective and to a small degree, environmental concerns. The Ministry of Natural Resources has a limited responsibility in this area except where natural resources are affected by the use and access is created by resource management operations on Crown land. Therefore, the following strategies will be implemented:

- *limiting large motor boat access to Crown land lakes through the access road strategy provided in section 4.1.13.*

- *MNR will cooperate with affected municipalities and property owners if they request the Federal Department of Transport to impose boat speed restrictions on smaller lakes within the Highlands.*

- *MNR will cooperate with lake users who seek voluntary acceptance and compliance with a ban on 'personal watercraft' (jet skis, sea doos) on smaller lakes within the Highlands.*

- *MNR will cooperate with local cottaging associations or other groups interested in developing and delivering a boater awareness program within the Highlands.*

4.1.9 Snowmobiling

There were very few significant issues concerning snowmobiling in the Highlands. In fact, many respondents felt that the network of trails was well organized and managed effectively. There were some concern expressed for the quantity and location of future development of trails in the Highlands. Managing the future development of trails would fall under the land use conflict objective and be handled similarly to other trail development proposals on Crown land. Therefore, the following strategy will be implemented:

- *applications for new trail development will reviewed under the land disposition process outlined in section 4.1.6 in conjunction with the "Criteria for Establishing Recreational or Snowmobile Trails within the Madawaska Highlands" contained in Appendix XI.*

4.1.10 Hiking, canoeing, camping

The level of ecotourism activities such as hiking, canoeing and camping appear to be presently low, however interest has been expressed for the development of such facilities. In some areas use has increased to such a degree that over-use is a concern. To address these issues under the Land Use Conflict objective the following strategies will be implemented:

- *MNR will cooperate with groups or individuals interested in carrying out interior or campground site management including surveying camping sites on high use lakes and posting over-used sites as 'no camping' where required while encouraging use of existing campsites.*

- *MNR will consider the physical, environmental and social carrying capacity of the resources in approving new areas for the future development of trails (including portage trails) and campsites.*

- *MNR will encourage partnerships to market, develop or manage such recreational facilities and activities.*

4.1.11 Cottaging

The impact of cottaging on the lake environment and reduction in the natural quality of the Highlands from use of Crown land for future cottage development were the primary cottage issues. The following strategies were proposed to address the Land Use Conflict objective:

- *the disposition of Crown land for cottaging purposes, within the Highlands is strongly discouraged. Exceptions to this general direction include cases where small blocks of Crown land, surplus to MNR's needs between existing privately owned, developed or developable lands. Any disposition of cottage lots must follow the amendment process for this plan.*

- *In addition to areas of concern and reserves that provide partial buffers from logging activity, on lakes with high concentration of cottages, visual impacts of logging can be eliminated or reduced by application of skyline reserves or equivalent modifications to the harvest patterns and activity may be restricted to week-day or off-season periods. Such areas will be identified in Forest Management Plans.*

4.1.12 Tourism

Tourism was considered to be an important future economic base for the Highlands but one which the public felt should be concentrated in the private sector and have minimal impact on the natural and remote character of the Highlands. To satisfy this issue under the Ecosystem Health objective and the Land Use Conflict Objective, the following strategy will be implemented:

- *MNR will participate in any forums on tourism and ecotourism development in the Highlands, with the intent to exchange information and promote use of the Highlands in a sustainable manner.*

4.1.13 Construction and Use of Access Roads

Development of new access roads was key to the public's concern for conserving the natural and remote character of the land base and it bridged all three objectives. Access could potentially create more pressure on a resource and thus affect its sustainability. Improved access also leads to more use and possibly negative effects on ecosystem health. Finally, since some users want more access while others prefer remote experiences, access can change the character of the landscape and result in land use conflict. To address these issues and satisfy all objectives, the following strategies will be implemented:

- use of existing roads and trails will continue to be permitted across the Madawaska Highlands planning area. However, to maintain the natural and remote character of the Highlands area, access roads will be maintained at close to current levels. New roads developed for commercial resource (e.g. forestry, mining) extraction will be closed to access during and following operations. A 'new road' will be defined based on the existing level of use. For example, if there is no current level of access, the new road will be closed to all public motorized vehicle traffic. If a new road is built over an existing road used for cars, trucks and other road vehicles including all-terrain traffic, then all uses will continue to be permitted. New roads built over existing trails will continue to allow use by all terrain vehicles and snowmobiles only. Closure of 'new roads' will be identified in Forest Management Plans and available for public review. If public response demonstrates that a 'new road' would provide environmental (i.e. has less environmental impact than an alternate route) or economic benefits to the community, the road may be permitted to remain open to all or some types of vehicles. The construction of new trails will be reviewed by local MNR offices and be considered with the same criteria.

- the "Guidelines for the review of applications to construct roads over Crown land in the Madawaska Highlands" will apply throughout the entire planning area and will form the basis for decisions regarding new access road construction and use. A copy of these guidelines is attached as Appendix XII.

- No new forest access roads may be constructed within 90 metres of lakes greater than 10 hectares or lakes less than 10 ha having significant ecological or recreational values in order to protect and maintain existing lake access characteristics. The following three variations from this general policy are possible, subject to case specific determination:

- the size of the minimum setback may be INCREASED where additional protection is needed or additional access planning has been carried out in Forest Management Plans.
- new access roads, which may be closed to motorized public travel, may be constructed

within the 90 setback if it is demonstrated that no other economically feasible alternatives exist and the affected lake will not be seriously jeopardized.

- new access roads may be constructed to provide planned access to lakes, in accordance with MNRs Class EA for Small Scale Projects.

4.1.14 Aviation

The continued use of land and seaplanes in the area of the Madawaska Highlands was considered to be important for tourism and to allow access for recreational activities by communities and the public. Therefore, the following strategy will be implemented:

- MNR will continue to allow access by land and seaplanes to the Madawaska Highlands for tourism and recreational activities.

4.1.15 Culturage Heritage

The protection of irreplaceable cultural heritage values is considered to be an important consideration in resource management activities both by the Ministry and the public. To satisfy this issue under the Land Use Conflict Objective, the following strategy will be implemented:

- MNR will continue to identify and protect cultural heritage values through the forest management planning process and through the Area of Concern process during resource management activities. The guidelines, *Timber management Guidelines for the Protection of Cultural Resources; Conserving Ontario's Archaeological heritage* will continue to be used.

- MNR will ensure that archaeological inventories are carried out prior to any proposed major development or ground level or sub-surface resource extraction operations of Crown land. MCZCR archaeological staff will be consulted in order to develop the best approach to the assessment, inventorying and mitigation of impacts to known and potential cultural heritage resources. Assessment and mitigation work will be undertaken according to the standards established by MCZCR and final reports accepted before proposed work may proceed.

- Wherever possible, the public will be encouraged to add to the database of significant cultural heritage resources and MCZCR notified of new sites.

4.2 Area Specific Strategies

4.2.1 Areas of Natural and Scientific Interest (ANSIs)

4.2.1.1 Introduction and description

The first objective of the planning study includes the requirement to "protect natural heritage and biological features of provincial significance." The process to achieve this objective, is the identification and formal designation of provincially significant representative natural heritage areas. These are areas which represent the life science history of different parts of the province of Ontario. Such identification falls within the broad mandate of the Ministry of Natural Resources. It includes the formal recognition of unique features/areas within the Highlands and the development of management direction to ensure that specific values of the features and areas are protected.

Early in the planning process work was initiated by the Ministry to determine which (and if so, what portion) of the eight known candidate ANSIs were the 'best' representatives of the biodiversity of site district 5E-11 and the study area. These most representative areas would then be identified as provincially significant ANSIs and the others as regionally or locally significant. A 'gap analysis' study by Crins (1994), was completed for this planning process, and has refined the representation requirements, in addition to the representative values found within existing provincial parks. Of the eight original candidate ANSIs proposed within the planning area, five were confirmed to be of provincial significance and therefore appropriate for recognition and protection (see Figure 2). These provincially significant ANSIs include:

- i) Summit Lake
- ii) Fortune-Schooner
- iii) Griffith Uplands
- iv) Centennial Lake
- v) Darling Township

The other three candidate ANSI's (Ferguson Lake Escarpment, Palmerston Lake, Evergreen Mountain) were determined to be of regional or local significance and their values will be identified and managed through resource management planning processes. Guidelines for the management of regionally significant ANSIs are included in Appendix VIII.

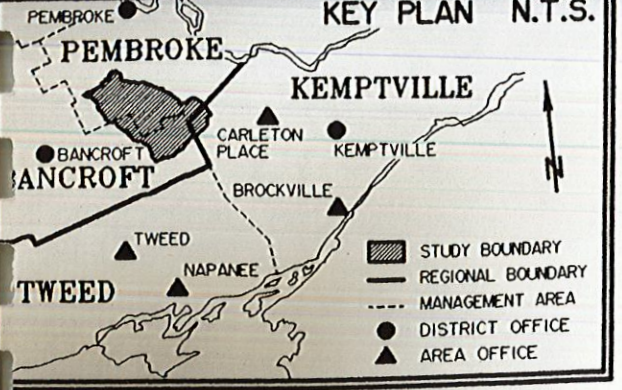
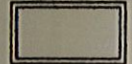

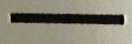
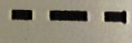

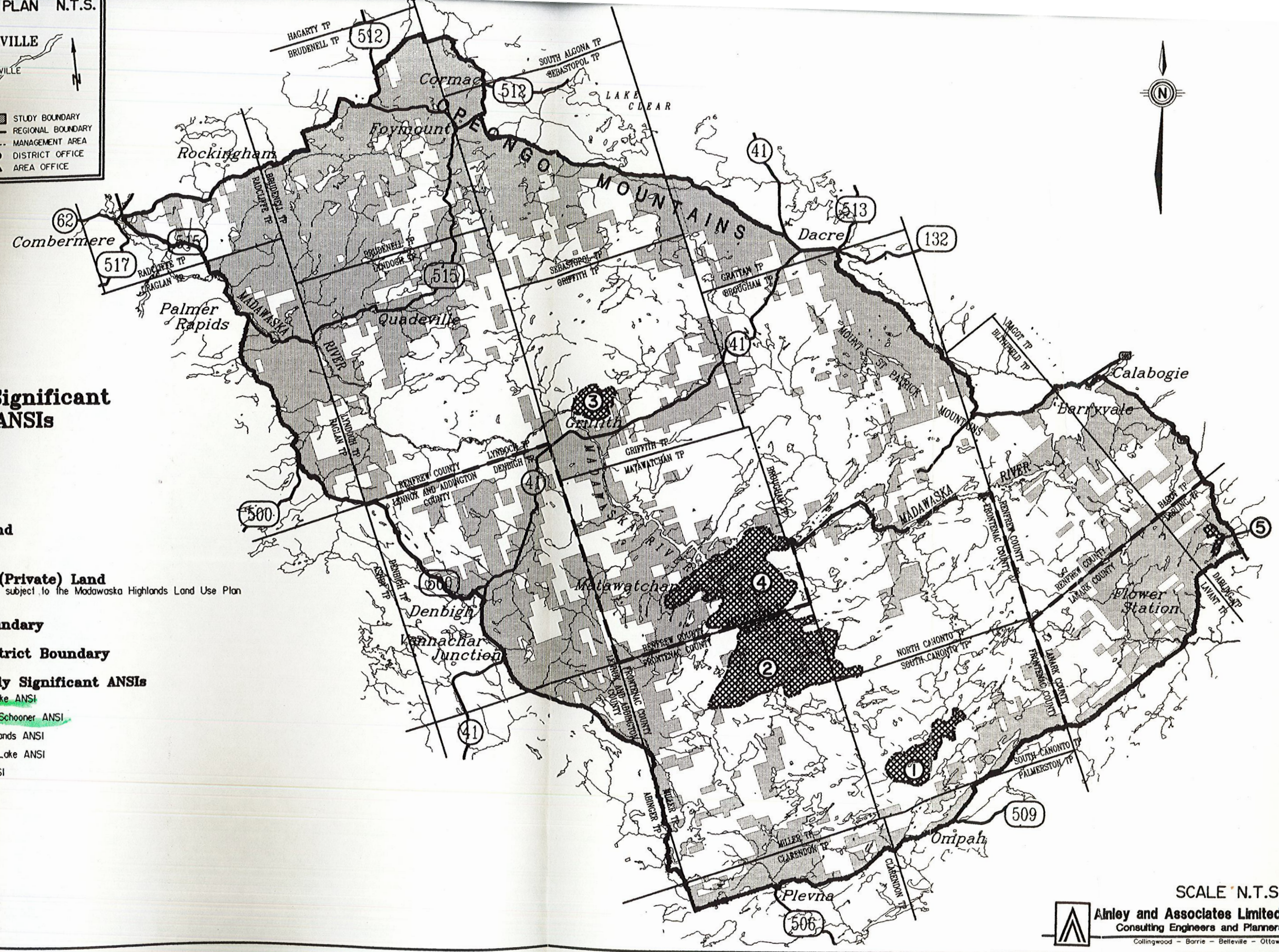


Figure 2:
Location of Provincially Significant Life Science ANSIs

Legend

-  Crown Land
-  Patented (Private) Land
This area is not subject to the Madawaska Highlands Land Use Plan
-  Study Boundary
-  M.N.R. District Boundary
-  Provincially Significant ANSIs
 - ① Summit Lake ANSI
 - ② Fortune - Schooner ANSI
 - ③ Griffith Uplands ANSI
 - ④ Centennial Lake ANSI
 - ⑤ Darling ANSI



Area Descriptions

A brief description of the values within these ANSIs and the rationale for their selection is provided below.

i) **Summit Lake ANSI**

The Summit Lake ANSI (see Figure 3) contains a provincially significant forest of rich, shade-tolerant, upland hardwoods on both igneous and marble substrate. In addition, it contains Dwyer Marsh, an extensive wetland comprised of fen and marsh communities. A relatively undisturbed upland forest is located in the southern half of the ANSI; Dwyer Marsh is situated in the north part. The area is adjacent to and includes two main access roads to North and South Canonto Townships with several other roads and trails throughout. Both a Crown land recreation camp and a water control dam are also located within the ANSI. The Summit Lake ANSI excludes the adjacent mining lease.

ii) **Fortune-Schooner ANSI**

The Fortune-Schooner ANSI (see figure 4) contains a provincially significant upland forest complex on granite. The granite-based forested uplands include dry site forests of red maple, red oak, white pine, red pine and trembling aspen on outcrop knolls and slopes. Shade-tolerant hardwood forests of sugar maple, beech, hemlock and yellow birch are on mesic, loamy sites of valleys and lower slopes. The large cliff and rock slope barrens of granite at Round Schooner Lake and the small marble cliff outcrop along Fortune Lake support significant plants such as the regionally rare smooth cliffbrake fern (*Pellaea glabella*). Shoreline communities are also important features of this ANSI.

Fortune-Schooner consists of 95% Crown land and includes two access roads and three marine access points. The three major lakes (total of 600 hectares) support a variety of sport fish species. Lake trout are stocked in Round Schooner Lake and brook trout are stocked in two smaller lakes within the ANSI. A bear management area and two traplines cover part of the area. The ANSI supports hunting, camping, hiking, boating and angling and a number of baitfish blocks. A number of tourist operators also operate in the area on private land. Forested lands northeast of Fortune Lake have been managed for timber production in the past.

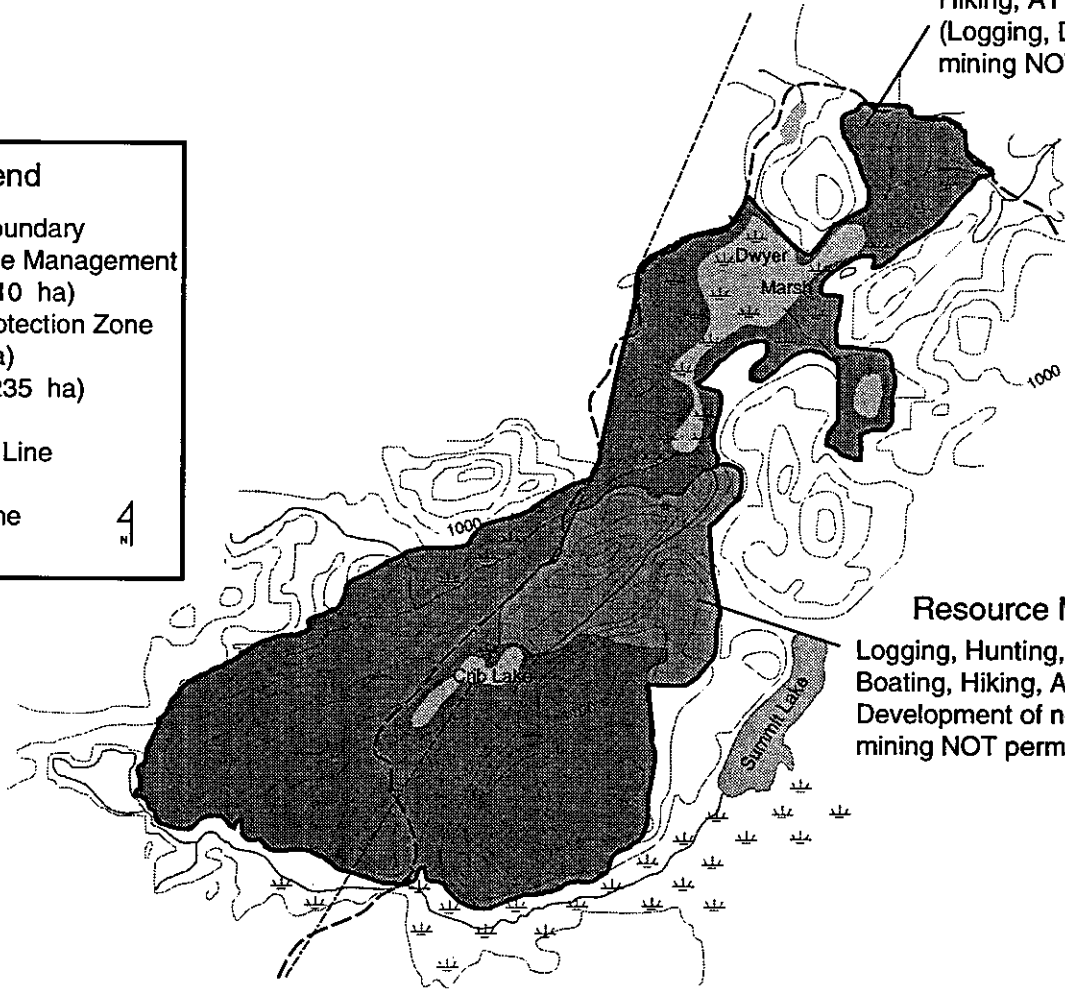
Figure 3

Summit Lake ANSI

Legend

- ANSI Boundary
- Resource Management Zone (110 ha)
- Core Protection Zone (875 ha)
- Water (235 ha)
- ▤ Wetland
- Contour Line
- - - Road
- - - Hydro-line

4
N



Core Protection Zone
 Hunting, Trapping, Angling, Boating, Hiking, ATVs, and Snowmobiles Permitted (Logging, Development of new roads, and surface mining NOT permitted)

Resource Management Zone
 Logging, Hunting, Trapping, Angling, Boating, Hiking, ATVs, Snowmobiles, and Development of new roads Permitted (Surface mining NOT permitted)

0 500 1000 m
SCALE

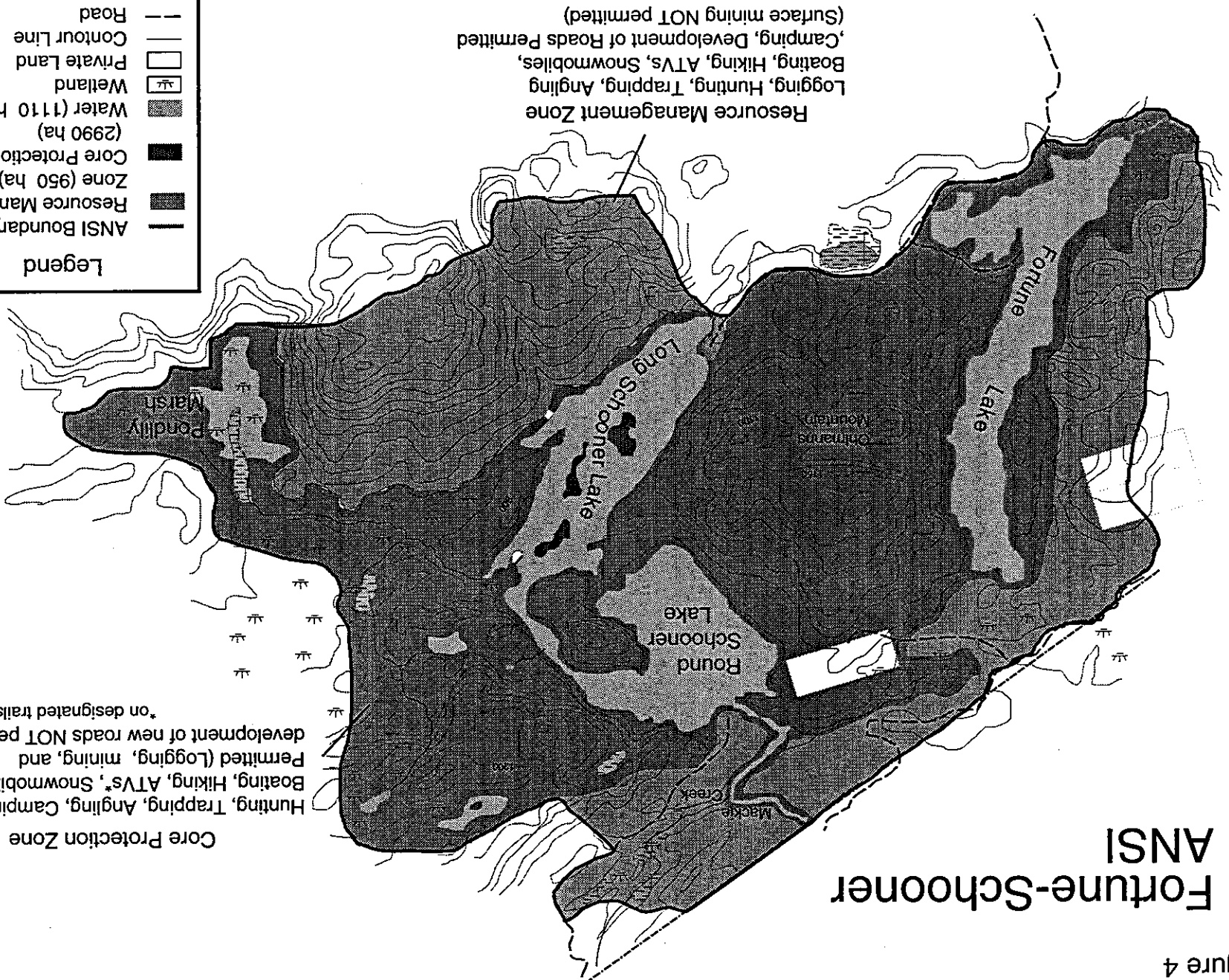
Figure 4

Fortune-Schooner ANSI

Legend

- ANSI Boundary
- Resource Management Zone (950 ha)
- Core Protection Zone (2990 ha)
- Water (1110 ha)
- ▤ Wetland
- Private Land
- Contour Line
- - - Road
- - - Hydro-line

4
N



Resource Management Zone
 Logging, Hunting, Trapping, Angling, Boating, Hiking, ATVs, Snowmobiles, Camping, Development of Roads Permitted (Surface mining NOT permitted)

Core Protection Zone
 Hunting, Trapping, Angling, Camping, Boating, Hiking, ATVs*, Snowmobiles* Permitted (Logging, mining, and development of new roads NOT permitted *on designated trails only)

0 500 1000 m
SCALE

Figure 5

Griffith Uplands ANSI

iii) Griffith Uplands ANSI

The Griffith Uplands ANSI (see figure 5) protects a typical forest of trembling aspen, red oak and white pine on open bedrock clearings and rock barrens. Cedar swamps and wetlands are also found in the site. Much of the area is underlain by igneous rock, but a wide band of marble bedrock extends in a north-south direction through the Griffith Uplands, adding diversity to the site.

The area has had relatively little past high intensity disturbance. There are no active mines or staked areas and hunt camps are not present on the site. The ANSI boundary includes portions of private land. Crown land zoning options and the regulation of land use will not apply to these lands. Recreational uses of the area include hunting, trapping, berry-picking, fishing, hiking, camping, ATV travel and snowmobiling. The municipal planning process will dictate how private lands within the Highlands are used in accordance with local Official Plans, Comprehensive Zoning By-laws and the Provincial Policy Statement.

iv) Centennial Lake ANSI

The Centennial Lake ANSI (see figure-6) includes a provincially significant aquatic complex, and uncommon plants and regionally significant upland forest. Red and white pine, red oak and red maple dominate the marble-based uplands of the site. Along the south shore and north of Mackie Creek are wetlands, small bogs, bog forests and small peatlands. Upland plant communities contain uncommon southern species such as New Jersey tea (*Ceanothus herbaceus*), Kalm's grass (*Bromus kalmii*), Cooper's milkvetch (*Astragalus neglectus*), reflected rock-cress (*Arabis holboellii*), woodland sunflower (*Helianthus divaricatus*), and balsam ragwort (*Senecio pauperculus*). Shoreline and aquatic plant communities contain the rare grass-leaved water plantain (*Alisma graminea*), long-stemmed waterwort (*Elatine triandra*), as well as rich mixtures of pondweeds (*Potamogeton* species) and other aquatic plants. The topography, limited access and relatively little development or disturbances have kept the area in a predominantly natural state. However, shoreline vegetation communities have been affected by changing water levels which result from management of the lake for electrical generation.

Most of the forest within the ANSI has been harvested within the past 50-75 years. There are no active mines or staked areas. Four active hunt camps are located in the area and spring bear hunting occurs in the eastern portion. No private land is contained within the ANSI. Recreational uses of the area include hiking, boating, hunting, trapping, fishing, camping and snowmobiling.

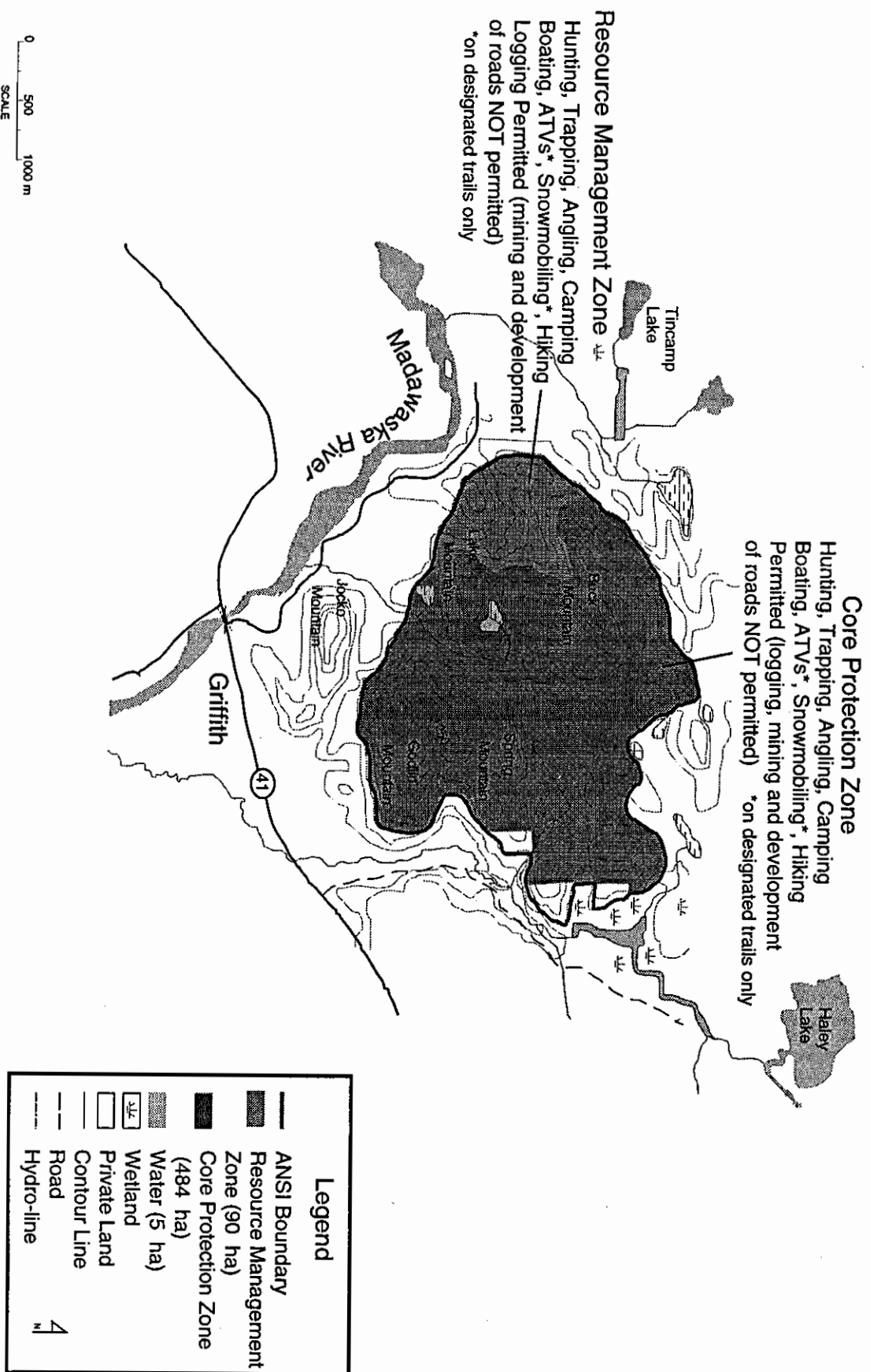
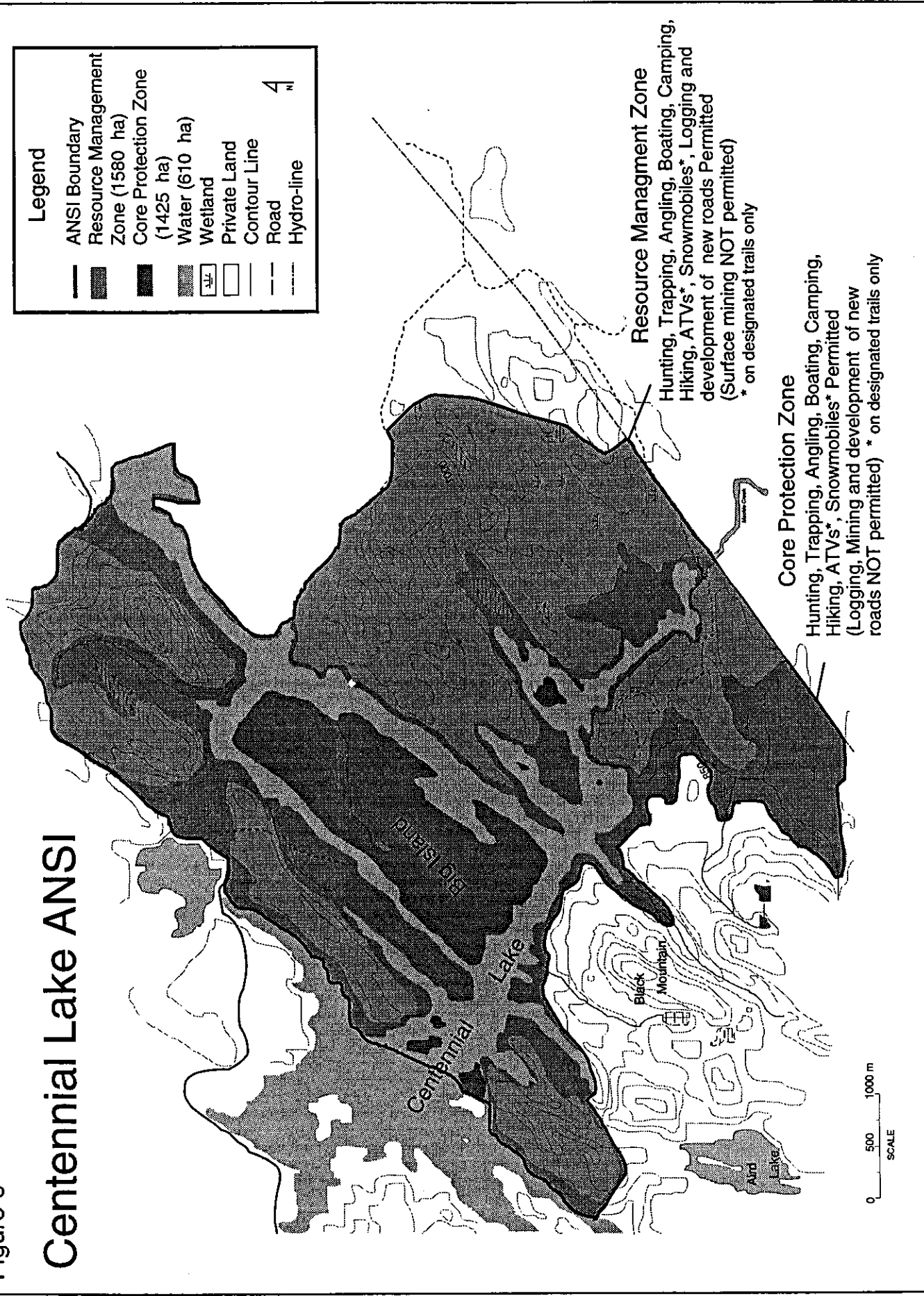


Figure 6

Centennial Lake ANSI



v) Darling ANSI

The Darling ANSI (see Figure 7) protects examples of colder than normal marble based wetlands and small lakes which support uncommon calcium-loving plants and aquatic vegetation. Little Green and Minnow Lake contain uncommon shoreline plants including the Bird's eye primrose (*Primula mistassinica*). The mature shade-tolerant forests surrounding these lakes are dominated by sugar maple, yellow birch, red oak, basswood, butternut and beech. Rare plants include provincially threatened ginseng (*Panax quinquefolium*) and the regionally rare hoary vervain (*Verbena stricta*). The ANSI contains private land along a large portion of the shoreline areas with mostly cottages developed. Recreational uses include hunting, trapping, boating and fishing. The area also contains a significant mineral deposit and there is an existing mining lease covering a large area in which the Darling ANSI is included. Significant exploratory work and investment has occurred in the area on the lease. Some forest management has occurred on the Crown land forests just outside the ANSI.

Management Strategies

Once the relative importance of the provincially significant ANSIs was confirmed, specific management strategies were proposed as part of the Madawaska Highlands Land Use Plan. These will ensure the continued protection of these areas' values while supporting compatible use.

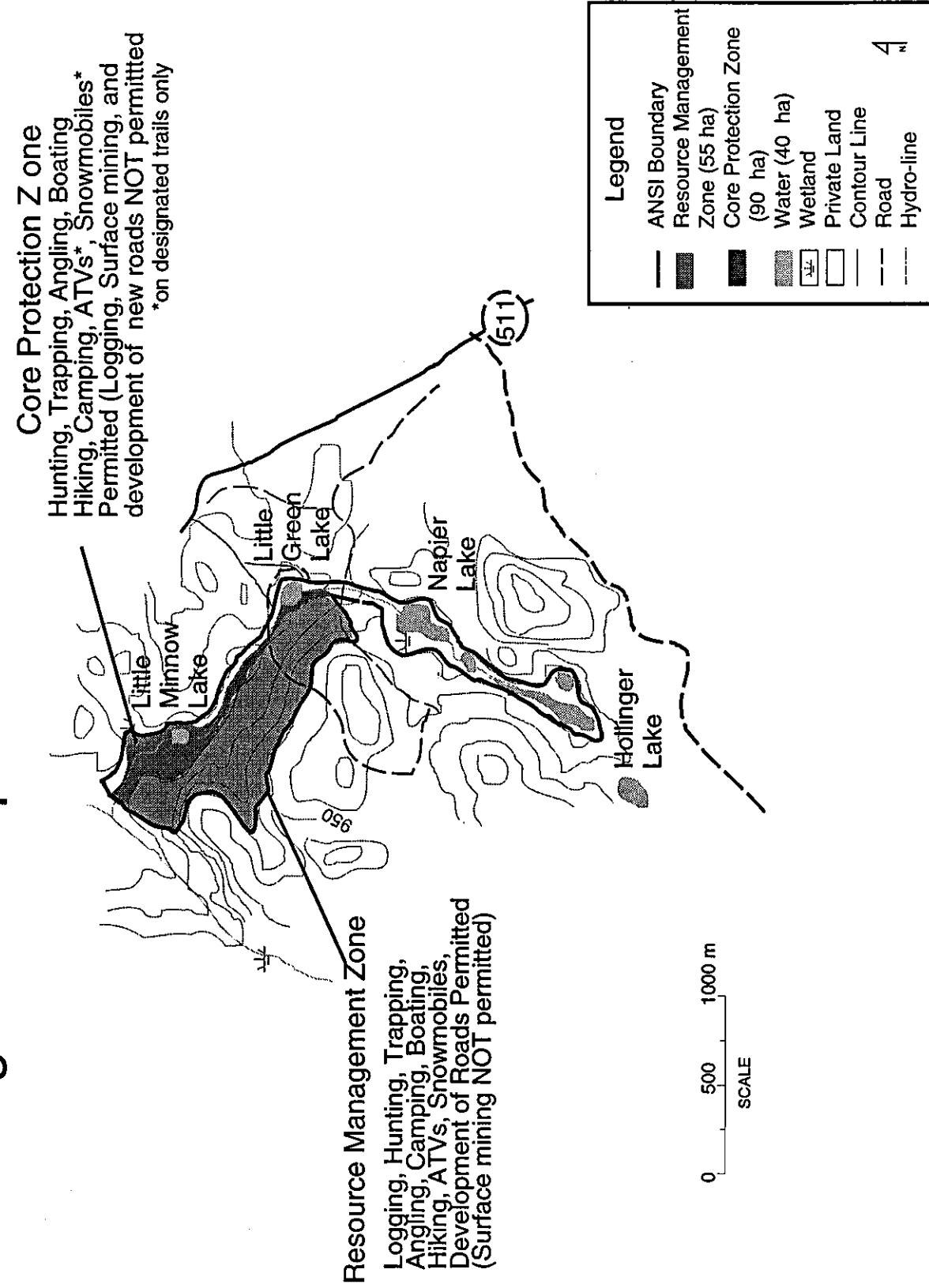
i) Zoning

The designation of natural heritage areas as ANSIs recognizes that these areas play an important role in protecting Ontario's natural heritage. However, designation does not mean that all current and future normal use of the areas should cease. Some resource uses in ANSIs are considered compatible with protection of ANSI values. For example, scientific research is encouraged within ANSIs. Some land uses or activities, while not necessarily compatible with each other, are considered by MNR to have no real negative effect on the features to be protected. In contrast, some land uses and activities should not occur within portions of ANSIs due to the damage to the feature or loss of integrity which would result. To ensure the protection of the natural heritage values and permit compatible uses, three different zones are available for application in ANSIs.

Core Protection Zone: that portion of an ANSI where some uses are prohibited in order to protect the natural heritage values and allow natural processes to function freely. Core Protection Zones do not permit logging and mining. Activities such as hunting, trapping,

Figure 7

Darling Township ANSI



boating, use of ATVs and snowmobiles, fishing, hiking, skiing and camping are permitted but some conditions may apply. In addition, wildlife or fisheries habitat management activities which do not affect the features which the ANSI is intended to protect, are permitted.

Resource Management Zone: that portion of an ANSI which can accommodate specific land use and resource management activities such as wildlife, fisheries, recreation and forest management. These activities may be regulated to ensure maintenance of specific natural heritage values while providing for economic and recreation activities. Mining may be permitted but only sub-surface extraction, originating and with all associated structures located outside the ANSI. Recreational activities including hunting, trapping, boating, use of ATVs and snowmobiles, fishing, hiking, skiing, and camping are permitted.

Access Zone: that portion of the an ANSI where development and support facilities for access are located including existing access roads and facilities.

Input received through public consultation was used to determine zone boundaries as well as the size of the ANSIs. Options with different sizes and uses for the ANSIs were proposed by the Ministry to the public. The options provided different levels of protection but were based on what size was considered sufficient for protection of the ANSI values and what uses could be permitted which would not significantly impact on the values. In general, public opinion preferred the larger ANSI boundaries which contained more multiple uses. The zoning for each ANSI is illustrated in Figures 3-7.

ii) Specific Strategies

Based on the zoning categories outlined above, a number of general strategies are proposed to protect the various values within the different zones shown in each of the ANSIs. These include:

- prohibition of certain activities or land uses which are incompatible with the required protection of values
- separation of heritage appreciation activities and more consumptive resource management activities by having them occur at different times
- modified resource management practices e.g. forest management
- identifying research and resource monitoring needs

Each of the strategies are considered appropriate for use within all of the ANSIs. Therefore, the following land use or management direction is provided with respect to ALL provincially significant ANSIs unless stated otherwise. A summary is provided in Table 7.

Hunting:

- * hunting is permitted
- * existing Crown land recreation camps are permitted and may be rebuilt if damaged or need replacement. Reconstruction of recreation camps cannot exceed current dimensions. Location of new construction may be in the same location or preferably in a location outside the ANSI. Significant upgrades (such as hydro installation) will not be permitted.
- * no new Crown land recreation camps will be permitted
- * temporary hunt camps are permitted in Resource Management and Core Protection Zones unless the area is posted 'no camping'. The impact of campsites in the Core Protection Zone will be monitored.
- * access will be restricted to designated trails or existing permanent roads (see Access)
- * Bear management area boundaries will not be affected but Ministry staff will work with BMA operators to re-locate bear bait stations that may conflict with high use recreational areas.

Trapping:

- * trapping is permitted
- * existing trapper cabins permitted
- * new trapper cabins not permitted
- * trappers will be encouraged to use designated trails (see Access) for ATV or snowmobile access

Angling:

- * angling permitted in ANSIs
- * fish populations will be surveyed for any vulnerable, threatened or endangered species (e.g. river redhorse sucker in Centennial Lake), with an emphasis on developing an 'action plan' for their protection.
- * fish stocking is permitted

Forestry:

- * in Core Protection Zone - no harvesting
- * in Resource Management Zones - the general forest management strategy will be to use partial cutting systems except where forest restoration objectives are specifically proposed. Prescriptions will ensure maintenance of existing forest community representation and restore under-represented stand types or historic forest communities (i.e. pine) where feasible. Special effort will be made to reduce potential impacts of logging.
- * maintain old growth elements in all stands where feasible. Resource Management Zones to be considered for examination and survey work for future old growth stands in all

working groups.

- * Small (50 hectare maximum) patch clear-cutting allowed for specific habitat management or silvicultural purposes provided that biodiversity is maintained. Visibility analysis required prior to operational prescription, where there are recreational values.
- * Apply seasonal restrictions to minimize impacts, damage and access to Resource Management Zones. Logging (including road construction, cutting and skidding) will be permitted between October 1 and March 31 unless demonstrated that logging operations in alternate seasons would be of greater benefit to the protection of natural values in the ANSI or to sustain the natural vegetative community. Regeneration and tending (non-cutting) treatments would be permitted from September 1 to March 31. Non-mechanized treatments, such as prescribed burning or tree planting, can occur at any time.
- * favour natural regeneration over planting.
- * encourage use of low impact skidding machinery or use of horses if feasible.
- * Broadcast spraying of herbicides is not permitted but use of herbicides is permitted for spot treatment of stumps, stems or groups of stems, in combination with manual tending.
- * minimal tertiary road development for logging access is permitted with abandonment of roads once operations are complete. Road will be closed to use and allowed to rehabilitate naturally.
- * prior to forest operations botanical inventories will be carried out to determine where rare, threatened or endangered plant/plant communities require protection. These small-scale sites will be protected through AOCs.
- * no aggregate extraction within the ANSIs; however, if necessary, borrow pits (defined as very small localized extractions within or immediately adjacent to the road right-of-way) may be permitted for the development of tertiary (temporary) roads, provided material used has no earth science representation value. Guidelines will be established for pit development including size, separation and rehabilitation.

Vegetation Protection

- * Fire suppression may be carried out in ANSIs for ecological protection or to protect adjacent values (for example, to protect private land, timber, or recreational values). If protection is not necessary, a "let burn" policy will apply.
- * Fire may be used as a management tool to perpetuate forest communities. Where small scale prescribed burning is desired, a fire management plan will be prepared for the ANSI.
- * Protection from insect infestation may be required to protect adjacent Crown and private land values. Spraying will be permitted using biological controls only.
- * before making a decision on biological disease control assessments will be undertaken to determine the ecological implications of control versus economic impacts on adjacent forest values if not controlled.

Mining:

- * no surface mining permitted
- * sub-surface mining originating, and with all associated structures located, outside the ANSI is restricted to Resource Management Zones within Centennial, Fortune-Schooner, Summit and Darling and in the Core Protection Zones of Darling.
- * no surface mining structures or related facilities will be permitted. In the Darling ANSI, sub-surface mining and associated critical structures only would be allowed in the Resource Management Zone, the latter only where economics require such and where a full EIA is completed to mitigate and reduce any detrimental effects.
- * pursue withdrawal of mining rights where required in Resource Management or Core Protection Zones

Note: The Darling ANSI is contained within an existing mining lease where significant investment and commitments have been made in the area in preliminary exploration; continued work is permitted under the lease. Efforts to achieve the management provisions outlined above will have to be undertaken in cooperation with the mining company and the Ministry of Northern Development and Mines. Preliminary discussions have been initiated.

Aggregate Resource Extraction:

- * extraction of aggregates is not permitted with the exception of small 'borrow pits' within Resource Management Zones for forest management purposes
- * 'Borrow pits' are defined as extractions of small amounts of aggregate material for the purposes of access road construction or maintenance
- * the following limitations apply to development of 'borrow pits':
 - * they are permitted only where no practical alternative source for material exists outside the ANSI
 - material must be extracted from within the 10 metre road right-of-way
 - the acceptability of removing material from outside the right-of-way will be determined on a case specific basis
 - the number of borrow pits permitted is limited to a total of five per kilometre of road
 - the maximum size of borrow pits is 6 metres by 10 metres along the road right-of-way
 - all side slopes must be rehabilitated to a 1:1 slope immediately following extraction and re-vegetated
- * the use of old borrow pit sites as timber landings is encouraged
- * techniques to minimize disturbance along the road right-of way, and reduce the amount borrow material extracted are encouraged

Access - Trails

- * identify existing trails used by hunters, trappers and others
- * evaluate impact of trails on representative ANSI values
- * designate and sign multiple use trails on ground (e.g. for ATVs, snow machines, mountain bikes, horses and hikers) and seek voluntary compliance by trail users. Existing trails may be considered for designation with trappers excepted.
- * designate and sign trails for non-motorized, non-mechanized use and seek voluntary cooperation
- * in Core Protection Zones no new trails are permitted unless necessary to protect features already affected by existing trails. In this case, new trails will be approved, provided other, more damaging trail can be effectively closed and rehabilitated
- * in Resource Management Zones new trails must be proposed under LUP system and meet minimum guidelines such as avoiding representative or significant sites.

Access - Roads

- * in Core Protection Zones no new roads permitted unless necessary to protect features already affected by existing roads. In this case, new roads may be approved, provided other, more damaging trail can be effectively closed and rehabilitated
- * in Resource Management Zones no new permanent (i.e. primary and secondary) road development except as noted above. Tertiary roads permitted where identified values are protected. New tertiary roads will not be maintained and may be gated, ditched or bermed to minimize access.
- * existing permanent roads will remain open to use. Road maintenance may be carried out on an 'as needed' basis by the ministry or other partners with tenure to the area.

Camping:

- * camping is permitted on designated camp sites
- * existing camping sites will be identified and evaluated
- * post sites 'no camping' if over use becomes a problem
- * campsite evaluation and designation will be undertaken on a need basis for development of sites in conjunction with non-motorized trails, multi-use trails and water routes .

Boating:

- * boating is permitted
 - * aquatic vegetation inventory of Centennial Lake will be carried out to determine where important plant communities need to be protected.
- (see also Access-trails, and Access-roads sections above)

Table 7. Resource Management and Use in the Madawaska Highlands

GENERAL CROWN LAND (outside of ANSIs)		AREAS OF NATURAL AND SCIENTIFIC INTEREST			
Activity	Permitted?*	Comments	Activity	Permitted?*	Comments
Hunting	Yes	except parks	Hunting	Yes	all zones
Hunt camps	Yes	except parks	Hunt camps	Yes	" "
Trapping	Yes		Trapping	Yes	" "
Angling	Yes		Angling	Yes	" "
Fish Stocking	Yes		Fish stocking	Yes	
Forestry	Yes	sustainability indicators for monitoring	Forestry - Core Zone - Resource Management Zone	No Yes	with conditions
Mining	Yes	public notification prior to advanced exploration	Mining - Core Zone - Resource Management zone	No Yes	sub-surface only for Darling no mining in Griffith
Aggregates	Yes		Aggregate - Core Zone - Resource Management Zone	No Yes	borrow pits only
Access Roads	Yes	use of existing roads permitted. New roads will be recommended for closure subject to Forest Management Plan review.	Access trails - Core Zone - Resource Management Zone	Yes Yes	No new trails in Core Zone. ATV and Snowmobiles permitted on designated trails only
Access Trails	Yes	use of existing trails permitted. New trails reviewed for approval by local MNR office.	Access roads Core Zone - Resource Management Zone	No Yes	No new roads in Core Zones. Use of existing roads is permitted.
Camping	Yes	except where posted 'no camping'	Camping	Yes	Except where posted "no camping"
Boating	Yes	speed limits may be set by municipalities	Boating	Yes	

*use is permitted in accordance with existing legislation, regulations and policies

5.0 Implementation, Monitoring and Plan Review

5.1 Implementation

Implementation Process

This land use plan provides direction to and will be implemented by each of the three MNR districts whose boundaries include portions of the planning area (Pembroke, Bancroft and Kemptville) and by Parks Ontario. Land use direction provided within this plan will have a direct affect on all specific Ministry resource management planning activities (e.g. Forest Management Planning) since decisions made in these plans must conform with the Madawaska Highlands land use plan.

With respect to the more specific strategies included in this plan, the following priorities will be pursued through implementation:

1. Boundary delineation of Matawatchan and Centennial Lake Nature Reserves and posting of these areas as no trapping and hunting.
2. Delineation of provincial ANSI boundaries on the ground.
3. Establishment of a Standing Advisory Committee.
4. Continue negotiations with Ontario Hydro on managing the natural resources along waterways containing hydro-electric development.
5. Initiate discussions with local groups/individuals to assist in monitoring the impacts from various uses on the local environment. Monitoring efforts to include:
 - the effects of ATV use on the landscape.
 - minimum set-backs for road construction adjacent to remote lakes to ensure maintenance of remote lake character. A data collection strategy will be developed in consultation with the Standing Advisory Committee.
6. Initiate discussions with local partners (hunt clubs, trappers, naturalist groups) to provide information on wildlife and fish populations in the area. Information collected must meet MNR's information gathering and recording standards.
7. Initiate discussions with local groups on educational programs for off-road vehicles, motorboats and campers.

Objective Achievement

At the outset of the planning process, one overall goal and three specific objectives were established. The intent was that each should be addressed, and through plan implementation, ultimately achieved. Although it is not yet possible to assess the plan's success in achieving the overall goal and objectives, the following techniques have been used in the plan to address each of the previously stated objectives, and hence, address the overall goal of the plan.

1. Recognition of the existing capability of MNR to manage the natural resources of the land base, in accordance with legislation, policies, procedures, and guidelines, in a manner which ensures the continuing availability to, and sustainable development of natural resources by all users.
2. Recognition and identification of provincially significant life science ANSIs within the planning area and the incorporation of appropriate and required management to protect significant values.
3. Development of management strategies intended to protect and maintain existing characteristics and use patterns, in the face of access road development, in a manner which reduces or eliminates the potential for land use conflict, while permitting a wide range of land uses.

Impacts of Objective Achievement

The meeting of the plan objectives will have an impact on the nature of resource availability for a variety of uses. Some assessment of this impact has been undertaken.

This assessment has concentrated on the negative implications of withdrawing land from the available (for harvest) forest land base, in order to protect provincially significant life science ANSIs. ANSIs are one aspect of the plan which will result in a direct reduction in resource activity. No quantitative assessment of the positive implications of ANSI protection has been carried out such as ecotourism benefits. Currently, approximately 17 % of the Crown land base is not harvested because it is considered ineligible (i.e barren rock, low quality forest) or it is located in reserves of Areas of Concerns. Table 8 below summarizes the combined core protected area secured by provincial parks and designated provincial ANSIs.

Table 8. Summary of protected areas within the Madawaska Highlands.

Protected Area	Total Land Area (ha)	Core Protected Area (ha)
Madawaska River Provincial Park	1200	
Natural Environment Zones		956
Nature Reserve Zone		138
Centennial Lake Provincial Park	545	545
Matawatchan Provincial Park	65	65
Centennial Lake ANSI	3005	1425
Griffith Uplands ANSI	571	484
Fortune-Schooner ANSI	3940	2990
Summit Lake ANSI	985	875
Darling ANSI	145	90
Total Area Protected	10 456	7568

The new provincial ANSIs represent approximately 8,650 hectares or 4% of the land base. However, with the exclusion of private land, water, harvestable areas and unforested land, the ANSIs will result in a permanent withdrawal of 3,600 hectares, or 3.0 % of the forested landbase from that which is currently eligible for harvest. This land withdrawal translates into a very small reduction in the maximum allowable depletion (MAD) for the three Crown Management Units in the Highlands.

Achievement of the plan's objectives will be continuously monitored and evaluated. In addition, it will be assessed at the Standing Advisory Committee's annual meetings which monitor the plan's implementation and at the ten year review period of the plan. All amendments considered for the plan must also be evaluated on the basis of how the plan's objectives would be achieved.

5.2 Monitoring

Monitoring of the implementation of the Land Use Plan will be coordinated by the MNR and will be carried out on an annual basis in cooperation with a Standing Advisory Committee in order to assess the effectiveness of the plan in achieving its goal and objectives, as well as to collect information. Monitoring will be carried out to assess how effective sustainable resource management activities are being carried out as well as if ANSIs are successfully being protected. For example, research on the vegetative communities in the ANSIs to

compare with areas outside the ANSI and monitoring if the restriction of ATVs to designated trails is successfully working to prevent the creation of new trails.

The Standing Advisory Committee, made up of citizens representing a cross-section of interests and geographic areas within and on the periphery of the Madawaska Highlands, will be formed immediately following the final approval of the Madawaska Highlands Land Use Plan. The SAC will consist of approximately 7 members selected through a public selection process whereby individuals will be asked to apply through written application. Members of the existing Advisory Committee may apply for representation on this committee. The complete Terms of Reference for the Standing Advisory Committee will be available upon release of the plan.

The SAC will be responsible for ensuring the monitoring the implementation of the plan. They will also provide advice to the Ministry on new development projects within the Madawaska Highlands and hearing amendment applications and appeals. To carry out these duties the SAC will be asked to convene at least once annually or more frequently if required to hear development proposals or amendment applications. Members of the SAC will serve a three to five year term with rotations of three at a time. A report on the results of monitoring the plan will be prepared every five years.

5.3 Plan Review and Amendment

The Madawaska Highlands Land Use Plan will plan for twenty year horizon with a minimum review period of ten years. At each ten year review period, the plan may be renewed for another twenty year horizon. The ten year review period permits a regular confirmation of the long-term direction of the plan and provides the opportunity to assess past performance. It provides the flexibility to accommodate changes in circumstances. It will ensure the continuing relevance of the plan's contents and provide an opportunity to evaluate proposed changes representing a significant departure from the original direction and intent of the plan.

During the term of the plan, circumstances may change which will require the plan to be amended. Amendments to the approved plan permit changes which do not alter the overall intent of the plan i.e changes which are consistent with the goals, objectives and principles of the plan. An amendment to the plan may be requested at any time. Upon submission to a local MNR area office, requests for an amendment are classified as either minor or major in nature. A request to consider an amendment may also be denied based on the following considerations: level of existing development, ownership, ecological studies showing impacts

on natural values, whether it is contrary to the plan's objectives and principles or should be considered during a full public review of the plan. If such requests are denied, proponents have the option of appealing the decision to the District Manager. The District Manager will submit the appeal to the Standing Advisory Committee for their review and recommendations. The District Manager makes the final decision whether or not to proceed with further consideration of the amendment proposal. The District Manager considering the proposal will consult with the District Managers of other administrative Districts within the Highlands.

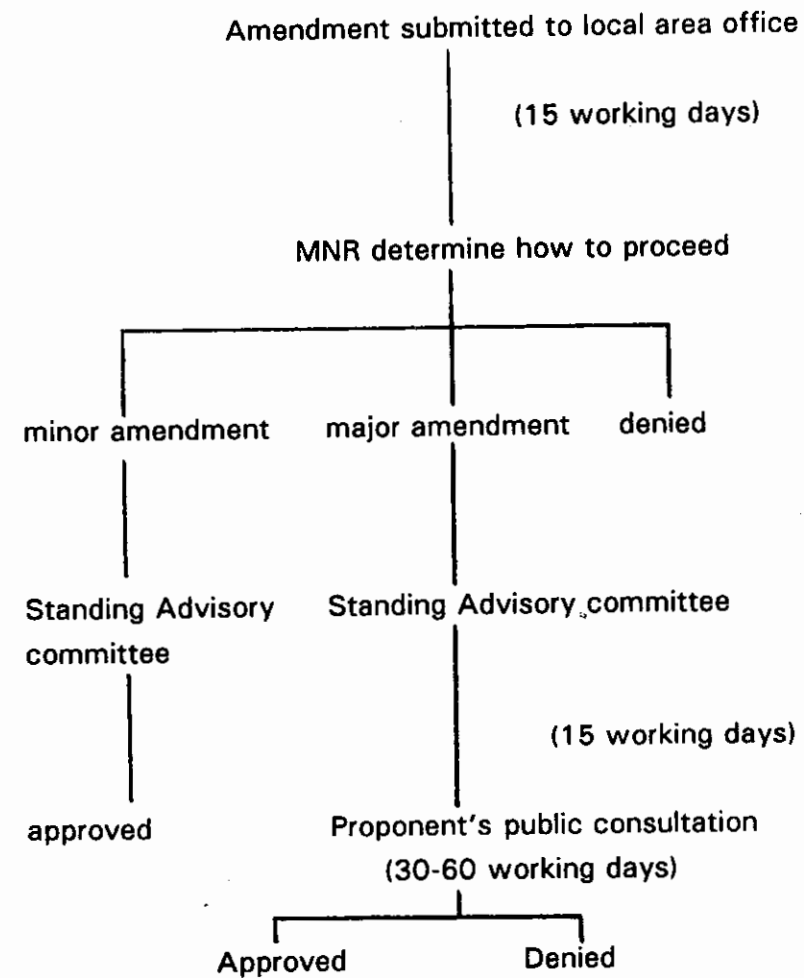
Minor

Minor amendments are those changes to the plan which do not alter the original intent of the plan or have a negative effect on the public or adjacent landowners or have any significant environmental impacts. For example, formal designation of an existing trail used by hikers as a hiking trail. In a minor amendment process, the local area office will review the proposal and render a decision (with possible conditions) within 15 working days. The Standing Advisory Committee will be advised of all minor amendments being processed and their views will be considered in the review process. The minor amendment is noted in the records and incorporated at the ten year review period.

Major

Major amendments are those changes requested which do not affect the plan's intent, but which may have an affect on the public or adjacent landowners, have significant environmental impacts or involve the development of an area that may potentially be controversial. A major amendment process will consist of the local area office reviewing the proposal and requesting the advice of the Standing Advisory Committee on public consultation requirements and treatment of the request. The Standing Advisory Committee will review the Ministry's request within 15 working days. Depending on the type of project proposed, public consultation requirements may range from a minimum of contacting key stakeholders involved in the original plan production and advertisements to holding public information centres. The proponent has 30-60 working days to complete the required public consultation. The local area office will make a decision on the proposal, following its review of public feedback. A major amendment is formally included within the plan document at the time of its approval.

Amendment Request & Review Process



The final plan and all major plan amendments will be recommended by the District Managers of Pembroke, Bancroft and Kemptville for approval by the Regional Director of the region.

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APPENDICES

APPENDIX I

Madawaska Highlands List of Committees

Madawaska Highlands Advisory Committee Members:

Scott Findlay, Eddie Heideman, Henry Hogg, Dianne Isaacs, Bill Kennett, Ron Lemke, Jack O'Dette, Ron Pethick, Valerie Popkie, Caroline Schultz, John Shaw, Barbara Sproule, Alvin Stone, Bob Yach (Facilitator: Gerry Lee, Chair: Monique Rolf von den Baumen)

Planning Team Members:

Pembroke District: Mike Bohm (Area Supervisor), Monique Rolf von den Baumen (Planner), Mark Stabb (Biologist), Doug Henson (Forester)
Bancroft District: Tom Corbett (Area Supervisor), Rick Calhoun - Chair (District Planner), Vince Ewing (Biologist), Jan Smiegelski (Forester)
Kemptville District: Jim McCready (Area Supervisor), Martin Streit (Forester)
Ministry of Northern Development & Mines: Paul Kingston (Resident Geologist), Chris Papertzian (Staff Geologist).

Steering Committee Members:

Dave Watton (Manager Regional Planning), Bill Crins (Regional Ecosystem Ecologist), George Moroz (Natural Heritage Advisor), Brian O'Donoghue (Strategic Planning Advisor), Ray Bonenberg (Pembroke District Manager), Cindy Blancher-Smith (A/Bancroft District Manager), Jim McCready (Lanark Area Supervisor), Tom Corbett (Mazinaw Area Supervisor), Mike Bohm (Madawaska Area Supervisor), Monique Rolf von den Baumen - Chair (District Planner, Pembroke).

APPENDIX II

Summary of Public Consultation

The Madawaska Highlands Land Use Plan has been developed in a manner involving extensive opportunities for public consultation and involvement. The Madawaska Highlands Advisory Committee was formed at the beginning of the planning process and has served as a vehicle for the conveyance of ideas between MNR and the public interested in the management of the crown lands within the planning area. Comprised of 14 individuals, the Advisory Committee represents a broad range of individuals with differing backgrounds, experience and interest, representing local, regional and provincial perspectives.

Public notification of the planning process and an invitation to participate was first extended through tabloids released in June, 1993. One year later, another tabloid was released with updated information and a questionnaire asking for the public's views on current issues in the Madawaska Highlands. A summary of those comments are attached.

Direct input regarding the management of the planning area was first elicited from the general public during three public information open houses, which were held in Plevna, Dacre and Carleton Place in the autumn of 1994. Through completion of two separate questionnaires, interested individuals were able to advise MNR staff and the Advisory Committee of their concerns and opinions about how the lands and resources within the planning area should be managed. A summary of those views are attached.

The second formal opportunity for the public to review material and express opinions occurs now, during the public's review of the Draft Land Use Plan.

Naturally, throughout the entire planning process, MNR has also received and accepted letters from individuals expressing their opinions about the planning process and its outcome.

Once the current public comment period concludes, MNR staff and the Advisory Committee will review the information received and use it to finalize the plan. The final plan will be available to the public for inspection only, for a period of thirty days, following its approval by the Regional Director.

Appendix III
List of Vertebrates in Madawaska Highlands

Common Name	Latin Name	Family	Class
COMMON LOON	<i>Gavia immer</i>	Gaviidae	1
PIED-BILLED GREBE	<i>Podilymbus podiceps</i>	Podicipedidae	1
AMERICAN BITTERN	<i>Botaurus lentiginos</i>	Ardeidae	1
LEAST BITTERN	<i>Ixyobrychus exilis</i>	Ardeidae	1
GREAT BLUE HERON	<i>Ardea herodias</i>	Ardeidae	1
GREEN-BACKED HERON	<i>Butorides striatus</i>	Ardeidae	1
CANADA GOOSE	<i>Branta canadensis</i>	Anatidae	1
WOOD DUCK	<i>Aix sponsa</i>	Anatidae	1
GREEN-WINGED TEAL	<i>Anas crecca</i>	Anatidae	1
AMERICAN BLACK DUCK	<i>Anas rubripes</i>	Anatidae	1
MALLARD	<i>Anas platyrhynchos</i>	Anatidae	1
BLUE-WINGED TEAL	<i>Anas discors</i>	Anatidae	1
AMERICAN WIGEON	<i>Anas americana</i>	Anatidae	1
RING-NECKED DUCK	<i>Aythya collaris</i>	Anatidae	1
HOODED MERGANSER	<i>Lophodytes cucullat</i>	Anatidae	1
COMMON MERGANSER	<i>Mergus merganser</i>	Anatidae	1
RED-BREASTED MERGANSER	<i>Mergus serrator</i>	Anatidae	1
TURKEY VULTURE	<i>Carthartes aura</i>	Cathartidae	1
OSPREY	<i>Pandion haliaetus</i>	Accipitridae	1
BALD EAGLE	<i>Haliaeetus leucocep</i>	Accipitridae	1
NORTHERN HARRIER	<i>Circus cyaneus</i>	Accipitridae	1
SHARP-SHINNED HAWK	<i>Accipiter striatus</i>	Accipitridae	1
COOPER'S HAWK	<i>Accipiter cooperii</i>	Accipitridae	1
NORTHERN GOSHAWK	<i>Accipiter gentilis</i>	Accipitridae	1
RED-SHOULDERED HAWK	<i>Buteo lineatus</i>	Accipitridae	1
BROAD-WINGED HAWK	<i>Buteo platypterus</i>	Accipitridae	1
RED-TAILED HAWK	<i>Buteo jamaicensis</i>	Accipitridae	1
AMERICAN KESTREL	<i>Falco sparverius</i>	Accipitridae	1
MERLIN	<i>Falco columbarius</i>	Accipitridae	1
PEREGRINE FALCON	<i>Falco peregrinus</i>	Accipitridae	1
GRAY PARTRIDGE	<i>Perdix perdix</i>	Phasianidae	1
RING-NECKED PHEASANT	<i>Phasianus colchicus</i>	Phasianidae	1
SPRUCE GROUSE	<i>Dendragapus canaden</i>	Phasianidae	1
RUFFED GROUSE	<i>Bonasa umbellus</i>	Phasianidae	1
VIRGINIA RAIL	<i>Rallus limicola</i>	Rallidae	1
SORA	<i>Porzana carolina</i>	Rallidae	1
COMMON MOORHEN	<i>Gallinula chloropus</i>	Rallidae	1
KILLDEER	<i>Charadrius vociferu</i>	Charadriidae	1
SPOTTED SANDPIPER	<i>Actitis macularia</i>	Scolopacidae	1
UPLAND SANDPIPER	<i>Bartramia longicaud</i>	Scolopacidae	1
COMMON SNIPE	<i>Gallinago gallinago</i>	Scolopacidae	1
AMERICAN WOODCOCK	<i>Scolopax minor</i>	Scolopacidae	1
RING-BILLED GULL	<i>Larus delawarensis</i>	Laridae	1

Common Name	Latin Name	Family	Class
HERRING GULL	<i>Larus argentatus</i>	Laridae	1
COMMON TERN	<i>Sterna hirundo</i>	Laridae	1
BLACK TERN	<i>Chlidonias niger</i>	Laridae	1
ROCK DOVE	<i>Columba livia</i>	Columbidae	1
MOURNING DOVE	<i>Zenaidura macroura</i>	Columbidae	1
BLACK-BILLED CUCKOO	<i>Coccyzus erythrophth</i>	Cuculidae	1
EASTERN SCREECH-OWL	<i>Otus asio</i>	Strigidae	1
GREAT HORNED OWL	<i>Bubo virginianus</i>	Strigidae	1
BARRED OWL	<i>Strix varia</i>	Strigidae	1
LONG-EARED OWL	<i>Asio otus</i>	Strigidae	1
NORTHERN SAW-WHET OWL	<i>Aegolius acadicus</i>	Strigidae	1
COMMON NIGHTHAWK	<i>Chordeiles minor</i>	Caprimulgidae	1
WHIP-POOR-WILL	<i>Caprimulgus vocifer</i>	Caprimulgidae	1
CHIMNEY SWIFT	<i>Chaetura pelagica</i>	Apodidae	1
RUBY-THROATED HUMMINGB	<i>Archilochus colubri</i>	Trochilidae	1
BELTED KINGFISHER	<i>Ceryle alcyon</i>	Alcedinidae	1
RED-HEADED WOODPECKER	<i>Melanerpes erythroce</i>	Picidae	1
YELLOW-BELLIED SAPSUCK	<i>Sphyrapicus varius</i>	Picidae	1
DOWNY WOODPECKER	<i>Picoides pubescens</i>	Picidae	1
HAIRY WOODPECKER	<i>Picoides villosus</i>	Picidae	1
BLACK-BACKED WOODPECK	<i>Picoides arcticus</i>	Picidae	1
NORTHERN FLICKER	<i>Colaptes auratus</i>	Picidae	1
PILEATED WOODPECKER	<i>Dryocopus pileatus</i>	Picidae	1
OLIVE-SIDED FLYCATCHER	<i>Contopus borealis</i>	Tyrannidae	1
EASTERN WOOD-PEWEE	<i>Contopus virens</i>	Tyrannidae	1
YELLOW-BELLIED FLYCATC	<i>Empidonax flavivent</i>	Tyrannidae	1
ALDER FLYCATCHER	<i>Empidonax alnorum</i>	Tyrannidae	1
WILLOW FLYCATCHER	<i>Empidonax traillii</i>	Tyrannidae	1
LEAST FLYCATCHER	<i>Empidonax minimus</i>	Tyrannidae	1
EASTERN PHOEBE	<i>Sayornis phoebe</i>	Tyrannidae	1
GREAT CRESTED FLYCATCH	<i>Myiarchus crinitus</i>	Tyrannidae	1
EASTERN KINGBIRD	<i>Tyrannus tyrannus</i>	Tyrannidae	1
HORNED LARK	<i>Eremophila alpestri</i>	Alaudidae	1
PURPLE MARTIN	<i>Progne subis</i>	Hirundinidae	1
TREE SWALLOW	<i>Tachycineta bicolor</i>	Hirundinidae	1
NORTHERN ROUGH-WING	<i>Stelgidopteryx serr</i>	Hirundinidae	1
BANK SWALLOW	<i>Riparia riparia</i>	Hirundinidae	1
CLIFF SWALLOW	<i>Hirundo pyrrhonota</i>	Hirundinidae	1
BARN SWALLOW	<i>Hirundo rustica</i>	Hirundinidae	1
GRAY JAY	<i>Perisoreus canadens</i>	Corvidae	1
BLUE JAY	<i>Cyanocitta cristata</i>	Corvidae	1
AMERICAN CROW	<i>Corvus brachyrhynch</i>	Corvidae	1
COMMON RAVEN	<i>Corvus corax</i>	Corvidae	1
BLACK-CAPPED CHICKADEE	<i>Parus atricapillus</i>	Paridae	1
RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>	Sittidae	1
WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>	Sittidae	1
BROWN CREEPER	<i>Certhia americana</i>	Certhiidae	1
HOUSE WREN	<i>Troglodytes aedon</i>	Troglodytidae	1

Common Name	Latin Name	Family	Class
WINTER WREN	<i>Troglodytes troglod</i>	Troglodytidae	1
SEDGE WREN	<i>Cistothorus platens</i>	Troglodytidae	1
MARSH WREN	<i>Cistothorus palustr</i>	Troglodytidae	1
GOLDEN-CROWNED KING	<i>Regulus satrapa</i>	Muscicapidae	1
RUBY-CROWNED KINGLET	<i>Regulus calendula</i>	Muscicapidae	1
EASTERN BLUEBIRD	<i>Sialia sialis</i>	Muscicapidae	1
VEERY	<i>Catharus fuscescens</i>	Muscicapidae	1
SWAINSON'S THRUSH	<i>Catharus ustulatus</i>	Muscicapidae	1
HERMIT THRUSH	<i>Catharus guttatus</i>	Muscicapidae	1
WOOD THRUSH	<i>Hylocichla mustelin</i>	Muscicapidae	1
AMERICAN ROBIN	<i>Turdus migratorius</i>	Muscicapidae	1
GRAY CATBIRD	<i>Dumetella carolinen</i>	Mimidae	1
NORTHERN MOCKINGBIRD	<i>Mimus polyglottos</i>	Mimidae	1
BROWN THRASHER	<i>Toxostoma rufum</i>	Mimidae	1
CEDAR WAXWING	<i>Bombycilla cedrorum</i>	Bombycillidae	1
LOGGERHEAD SHRIKE	<i>Lanius ludovicianus</i>	Laniidae	1
EUROPEAN STARLING	<i>Sturnus vulgaris</i>	Sturnidae	1
SOLITARY VIREO	<i>Vireo solitarius</i>	Vireonidae	1
YELLOW-THROATED VIREO	<i>Vireo flavifrons</i>	Vireonidae	1
WARBLING VIREO	<i>Vireo gilvus</i>	Vireonidae	1
PHILADELPHIA VIREO	<i>Vireo philadelphicu</i>	Vireonidae	1
RED-EYED VIREO	<i>Vireo olivaceus</i>	Vireonidae	1
GOLDEN-WINGED WARBLER	<i>Vermivora chrysopte</i>	Emberizidae	1
TENNESSEE WARBLER	<i>Vermivora peregrina</i>	Emberizidae	1
NASHVILLE WARBLER	<i>Vermivora ruficapil</i>	Emberizidae	1
NORTHERN PARULA	<i>Parula americana</i>	Emberizidae	1
YELLOW WARBLER	<i>Dendroica petechia</i>	Emberizidae	1
CHESTNUT-SIDED WARBLER	<i>Dendroica pensylvan</i>	Emberizidae	1
MAGNOLIA WARBLER	<i>Dendroica magnolia</i>	Emberizidae	1
CAPE MAY WARBLER	<i>Dendroica tigrina</i>	Emberizidae	1
BLACK-THROATED BLUE	<i>Dendroica caerulesc</i>	Emberizidae	1
YELLOW-RUMPED WARBLER	<i>Dendroica coronata</i>	Emberizidae	1
BLACK-THROATED GREEN WAR	<i>Dendroica virens</i>	Emberizidae	1
BLACKBURNIAN WARBLER	<i>Dendroica fusca</i>	Emberizidae	1
PINE WARBLER	<i>Dendroica pinus</i>	Emberizidae	1
BAY-BREASTED WARBLER	<i>Dendroica castanea</i>	Emberizidae	1
BLACK-AND-WHITE WARBLER	<i>Mniotilta varia</i>	Emberizidae	1
AMERICAN REDSTART	<i>Setophaga ruticilla</i>	Emberizidae	1
OVENBIRD	<i>Seiurus aurocapillu</i>	Emberizidae	1
NORTHERN WATERTHRUSH	<i>Seiurus noveboracen</i>	Emberizidae	1
MOURNING WARBLER	<i>Oporornis philadelp</i>	Emberizidae	1
COMMON YELLOWTHROAT	<i>Geothlypis trichas</i>	Emberizidae	1
WILSON'S WARBLER	<i>Wilsonia pusilla</i>	Emberizidae	1
CANADA WARBLER	<i>Wilsonia canadensis</i>	Emberizidae	1
SCARLET TANAGER	<i>Piranga olivacea</i>	Emberizidae	1
NORTHERN CARDINAL	<i>Cardinalis cardinal</i>	Emberizidae	1
ROSE-BREASTED GROSBEAK	<i>Pheucticus ludovici</i>	Emberizidae	1
INDIGO BUNTING	<i>Passernia cyanea</i>	Emberizidae	1

Common Name	Latin Name	Family	Class
RUFIOUS-SIDED TOWHEE	<i>Pipilo erythrophtha</i>	Emberizidae	1
CHIPPING SPARROW	<i>Spizella passerina</i>	Emberizidae	1
CLAY-COLORED SPARROW	<i>Spizella pallida</i>	Emberizidae	1
FIELD SPARROW	<i>Spizella pusilla</i>	Emberizidae	1
VESPER SPARROW	<i>Poocetes gramineus</i>	Emberizidae	1
SAVANNAH SPARROW	<i>Passerculus sandwic</i>	Emberizidae	1
GRASSHOPPER SPARROW	<i>Ammodramus savannar</i>	Emberizidae	1
SONG SPARROW	<i>Melospiza melodia</i>	Emberizidae	1
LINCOLN'S SPARROW	<i>Melospiza lincolni</i>	Emberizidae	1
SWAMP SPARROW	<i>Melospiza georgiana</i>	Emberizidae	1
WHITE-THROATED SPARROW	<i>Zonotrichia albicol</i>	Emberizidae	1
DARK-EYED JUNCO	<i>Junco hyemalis</i>	Emberizidae	1
BOBOLINK	<i>Dolichonyx oryzivor</i>	Emberizidae	1
RED-WINGED BLACKBIRD	<i>Agelaius phoeniceus</i>	Emberizidae	1
EASTERN MEADOWLARK	<i>Sturnella magna</i>	Emberizidae	1
RUSTY BLACKBIRD	<i>Euphagus carolinus</i>	Emberizidae	1
COMMON GRACKLE	<i>Quiscalus quiscula</i>	Emberizidae	1
BROWN-HEADED COWBIRD	<i>Molothrus ater</i>	Emberizidae	1
NORTHERN ORIOLE	<i>Icterus galbula</i>	Emberizidae	1
PINE GROSBEAK	<i>Pinicola enucleator</i>	Emberizidae	1
PURPLE FINCH	<i>Carpodacus purpureu</i>	Emberizidae	1
HOUSE FINCH	<i>Carpodacus mexicanu</i>	Emberizidae	1
RED CROSSBILL	<i>Loxia curvirostra</i>	Emberizidae	1
WHITE-WINGED CROSSBILL	<i>Loxia leucoptera</i>	Emberizidae	1
PINE SISKIN	<i>Carduelis pinus</i>	Emberizidae	1
AMERICAN GOLDFINCH	<i>Carduelis tristis</i>	Emberizidae	1
EVENING GROSBEAK	<i>Coccothraustes vesp</i>	Emberizidae	1
HOUSE SPARROW	<i>Passer domesticus</i>	Emberizidae	1
MASKED SHREW	<i>Sorex cinereus</i>	Soricidae	2
AMERICAN WATER SHREW	<i>Sorex palustris</i>	Soricidae	2
SMOKEY SHREW	<i>Sorex fumeus</i>	Soricidae	2
PIGMY SHREW	<i>Microsorex hoyi</i>	Soricidae	2
SHORT-TAILED SHREW	<i>Blarina brevicauda</i>	Soricidae	2
HAIRY-TAILED MOLE	<i>Parascalops breweri</i>	Talpidae	2
STAR-NOSED MOLE	<i>Condylura cristata</i>	Talpidae	2
LITTLE BROWN BAT	<i>Myotis lucifugus</i>	Vespertilionida	2
KEEN'S BAT	<i>Myotis keenii</i>	Vespertilionida	2
SMALL-FOOTED BAT	<i>Myotis leibii</i>	Vespertilionida	2
SILVER-HAIRED BAT	<i>Lasionycteris nocti</i>	Vespertilionida	2
EASTERN PIPITRELLA	<i>Pipistrellus subfla</i>	Vespertilionida	2
BIG BROWN BAT	<i>Eptesicus fuscus</i>	Vespertilionida	2
RED BAT	<i>Lasiurus borealis</i>	Vespertilionida	2
HOARY BAT	<i>Lasiurus cinereus</i>	Vespertilionida	2
EASTERN COTTONTAIL	<i>Sylvilagus floridan</i>	Leporidae	2
SNOWSHOE HARE	<i>Lepus americanus</i>	Leporidae	2
EUROPEAN HARE	<i>Lepus europaeus</i>	Leporidae	2
EASTERN CHIPMUNK	<i>Tamias striatus</i>	Sciuridae	2
WOODCHUCK	<i>Marmota monax</i>	Sciuridae	2

Common Name	Latin Name	Family	Class
GREY OR BLACK SQUIRREL	<i>Sciurus carolinensi</i>	Sciuridae	2
AMERICAN RED SQUIRREL	<i>Tamiasciurus hudson</i>	Sciuridae	2
SOUTHERN FLYING SQUIRR	<i>Glaucomys volans</i>	Sciuridae	2
NORTHERN FLYING SQUIRR	<i>Glaucomys sabrinus</i>	Sciuridae	2
AMERICAN BEAVER	<i>Castor canadensis</i>	Castoridae	2
DEER MOUSE	<i>Peromyscus manicula</i>	Muridae	2
WHITE-FOOTED MOUSE	<i>Peromyscus leucopus</i>	Muridae	2
GAPPER'S RED-BACKED	<i>Clethrionomys gappe</i>	Muridae	2
SOUTHERN BOG LEMMIN	<i>Synaptomys cooperi</i>	Muridae	2
MUSKRAT	<i>Ondatra zibethicus</i>	Muridae	2
MEADOW VOLE	<i>Microtus pennsylvan</i>	Muridae	2
NORWAY RAT	<i>Rattus norvegicus</i>	Muridae	2
HOUSE MOUSE	<i>Mus musculus</i>	Muridae	2
MEADOW JUMPING MOUSE	<i>Zapus hudsonius</i>	Dipodidae	2
WOODLAND JUMPING MOUSE	<i>Napaeozapus insigni</i>	Dipodidae	2
AMERICAN PORCUPINE	<i>Erethizon dorsatum</i>	Erethizontidae	2
COYOTE	<i>Canis latrans</i>	Canidae	2
WOLF	<i>Canis lupus</i>	Canidae	2
RED FOX	<i>Vulpes vulpes</i>	Canidae	2
AMERICAN BLACK BEAR	<i>Ursus americanus</i>	Ursidae	2
RACCOON	<i>Procyon lotor</i>	Procyonidae	2
AMERICAN MARTEN	<i>Martes americana</i>	Mustelidae	2
FISHER	<i>Martes pennanti</i>	Mustelidae	2
ERMINE	<i>Mustela erminea</i>	Mustelidae	2
LONG-TAILED WEASEL	<i>Mustela frenata</i>	Mustelidae	2
AMERICAN MINK	<i>Mustela vison</i>	Mustelidae	2
STRIPED SKUNK	<i>Mephitis mephitis</i>	Mustelidae	2
RIVER OTTER	<i>Lontra canadensis</i>	Mustelidae	2
LYNX	<i>Lynx lynx</i>	Felidae	2
BOBCAT	<i>Lynx rufus</i>	Felidae	2
WHITE-TAILED DEER	<i>Odocoileus virginia</i>	Cervidae	2
MOOSE	<i>Alces alces</i>	Cervidae	2
COMMON SNAPPING TURTLE	<i>Chelydra serpentina</i>		3
PAINTED TURTLE	<i>Chrysemys picta</i>		3
MAP TURTLE	<i>Graptemys geographi</i>		3
BLANDING'S TURTLE	<i>Emydoidea blandingi</i>		3
WOOD TURTLE	<i>Clemmys insculpta</i>		3
EASTERN BOX TURTLE	<i>Terrapene carolina</i>		3
SPINY SOFTSHELL	<i>Trionyx spiniferus</i>		3
COMMON GARTER SNAKE	<i>Thamnophis sirtalis</i>		3
NORTHERN WATER SNAKE	<i>Nerodia sipedon</i>		3
REDBELLY SNAKE	<i>Storeria occipitoma</i>		3
SMOOTH GREEN SNAKE	<i>Opheodrys vernalis</i>		3
RINGNECK SNAKE	<i>Diadophis punctatus</i>		3
MILK SNAKE	<i>Lampropeltis triang</i>		3
MUDPUPPY	<i>Necturus maculosus</i>		4
EASTERN NEWT	<i>Notophthalmus virid</i>		4
JEFFERSON SALAMANDER	<i>Ambystoma jefferson</i>		4

Common Name	Latin Name	Family	Class
YELLOW-SPOTTED SALAMAN	Ambystoma maculatum		4
EASTERN REDBACK SALAMA	Plethodon cinereus		4
FOUR-TOED SALAMANDER	Hemidactylum scuta		4
TWO-LINED SALAMANDER	Eurycea bislineata		4
AMERICAN TOAD	Bufo americanus		4
SPRING PEEPER	Hyla crucifer		4
GRAY TREEFROG	Hyla versicolor		4
STRIPED CHORUS FROG	Pseudacris triseria		4
NORTHERN CRICKET FROG	Acris crepitans		4
WOOD FROG	Rana sylvatica		4
NORTHERN LEOPARD FROG	Rana pipiens		4
PICKEREL FROG	Rana palustris		4
GREEN FROG	Rana clamitans		4
MINK FROG	Rana septentrionali		4
BULLFROG	Rana catesbeiana		4
SILVER LAMPREY	Ichthyomyzin unicus	Petromyzontidae	5
LAKE STURGEON	Acipenser fulvescen	Acipenseridae	5
LONGNOSE GAR	Lepisosteus osseus	Lepisosteidae	5
BOWFIN	Amia calva	Amiidae	5
RAINBOW TROUT	Salmo gairdneri	Salmonidae	5
BROWN TROUT	Salmo trutta	Salmonidae	5
BROOK TROUT	Salvelinus fontinal	Salmonidae	5
LAKE TROUT	Salvelinus namaycus	Salmonidae	5
CISCO, LAKE HERRING	Coregonus artedii	Coregoninae	5
LAKE WHITEFISH	Coregonus clupeafor	Coregoninae	5
ROUND WHITEFISH	Prosopium cylindrac	Coregoninae	5
RAINBOW SMELT	Osmerus mordax	Osmeridae	5
MOONEYE	Hiodon tergisus	Hiodontidae	5
CENTRAL MUDMINNOW	Umbra limi	Umbridae	5
NORTHERN PIKE	Esox lucius	Esocidae	5
MUSKELLUNGE	Esox masquinongy	Esocidae	5
NORTHERN REDBELLY DACE	Phoxius eos	Cyprinidae	5
FINESCALE DACE	Phoxinus neogdeus	Cyprinidae	5
LAKE CHUB	Couesius plumbeus	Cyprinidae	5
CARP	Cyprinus carpio	Cyprinidae	5
BRASSY MINNOW	Hybognathus hankins	Cyprinidae	5
GOLDEN SHINER	Notemigonus crysole	Cyprinidae	5
EMERALD SHINER	Notropis atherinoid	Cyprinidae	5
COMMON SHINER	Notropis cornutus	Cyprinidae	5
BLACKCHIN SHINER	Notropis heterodon	Cyprinidae	5
BLACKNOSE SHINER	Notropis heterolepi	Cyprinidae	5
SPOTTAIL SHINER	Notropis hudsonius	Cyprinidae	5
ROSYFACE SHINER	Notropis rubellus	Cyprinidae	5
SPOTFIN SHINER	Notropis spilopteru	Cyprinidae	5
MIMIC SHINER	Notropis volucellus	Cyprinidae	5
BLUNTNOSE MINNOW	Pimephales notatus	Cyprinidae	5
FATHEAD MINNOW	Pimephales promelas	Cyprinidae	5
BLACKNOSE DACE	Rhinichthys atratul	Cyprinidae	5

Common Name	Latin Name	Family	Class
LONGNOSE DACE	Rhinichthys catarac	Cyprinidae	5
CREEK CHUB	Semotilus atromacul	Cyprinidae	5
FALLFISH	Semotilus corporali	Cyprinidae	5
PEARL DACE	Semotilus margarita	Cyprinidae	5
LONGNOSE SUCKER	Catostomus catostom	Catostomidae	5
WHITE SUCKER	Catostomus commerso	Catostomidae	5
SILVER REDHORSE	Moxostoma anisurum	Catostomidae	5
RIVER REDHORSE	Moxostoma carinatum	Catostomidae	5
SHORTHEAD REDHORSE	Moxostoma macrolepi	Catostomidae	5
BROWN BULLHEAD	Ictalurus nebulosus	Ictaluridae	5
CHANNEL CATFISH	Ictalurus punctatus	Ictaluridae	5
AMERICAN EEL	Anguilla rostrata	Anguillidae	5
BANDED KILLIFISH	Fundulus diaphanus	Cyprinodontidae	5
BURBOT	Lota lota	Gadidae	5
BROOK SILVERSIDE	Labidesthes sicculu	Atherinidae	5
BROOK STICKLEBACK	Culaea inconstans	Gasterosteidae	5
THREESPINE STICKLEBACK	Gasterosteus aculea	Gasterosteidae	5
NINESPINE STICKLEBACK	Pungitius pungitius	Gasterosteidae	5
TROUT-PERCH	Percopsis omiscomay	Percopsidae	5
ROCK BASS	Ambloplites rupestr	Centrarchidae	5
PUMPKINSEED	Lepomis gibbosus	Centrarchidae	5
BLUEGILL	Lepomis macrochirus	Centrarchidae	5
SMALLMOUTH BASS	Micropterus dolomie	Centrarchidae	5
LARGEMOUTH BASS	Micropterus salmoid	Centrarchidae	5
BLACK CRAPPIE	Pomoxis nigromacula	Centrarchidae	5
YELLOW PERCH	Perca flavescens	Percidae	5
SAUGER	Stizostedion canaden	Percidae	5
WALLEYE	Stizostedion vitreu	Percidae	5
RAINBOW DARTER	Etheostoma caeruleu	Percidae	5
IOWA DARTER	Etheostoma exile	Percidae	5
FANTAIL DARTER	Etheostoma flabella	Percidae	5
LEAST DARTER	Etheostoma microper	Percidae	5
JOHNNY DARTER	Etheostoma nigrum	Percidae	5
LOGPERCH	Percina caprodes	Percidae	5
FRESHWATER DRUM	Aplodinotus grunnie	Sciaenidae	5
MOTTLED SCULPIN	Cottus bairdi	Cottidae	5
SLIMY SCULPIN	Cottus cognatus	Cottidae	5
SPOONHEAD SCULPIN	Cottus ricei	Cottidae	5

APPENDIX IV

Common Bird species and
their Associations with Forest Stand Types of the Madawaska Highlands

Forest "Working Group"	Common Bird Species
White Pine	Black-throated Green Warbler Ovenbird Red-eyed Vireo Veery Yellow-rumped Warbler Winter Wren Black-capped Chickadee White-throated Sparrow Solitary Vireo Chipping Sparrow Chestnut-sided Warbler
Hard Maple	Red-eyed Vireo Ovenbird Veery American Robin Black-throated Green Warbler Least Flycatcher Black-throated Blue Warbler American Redstart Wood Thrush Eastern Wood Pewee
Poplar	Red-eyed Vireo Black-capped Chickadee Ovenbird Black-throated Green Warbler Veery Black and White Warbler Black-throated Blue Warbler Magnolia Warbler Chestnut-sided Warbler Hermit Thrush

Red Oak	Red-eyed Vireo Hermit Thrush Black-capped Chickadee Ovenbird Black-throated Green Warbler American Redstart Chipping Sparrow Yellow-rumped Warbler Black and white Warbler Dark-eyed Junco
Eastern Hemlock	Black-throated Green Warbler Ovenbird Red-eyed Vireo Veery Solitary Vireo Yellow-rumped Warbler Black and white Warbler Least Flycatcher Winter Wren
White Cedar	Black-throated Green Warbler Winter Wren Ovenbird Northern Waterthrush Yellow-rumped Warbler Nashville Warbler Black and white Warbler American Robin Black-capped Chickadee

*Species are listed in approximate order of frequency (i.e. number of stands where each species was encountered)

APPENDIX V

Forest Sustainability - Measurable Indicators

Section 3.2.1 introduces the mechanisms of Measurable Indicators used in forest management planning to achieve the forest sustainability objectives. A summary of these indicators is provided below.

1) Sustainability of Forest Ecosystems

The measurable indicators for forest ecosystem sustainability address two criteria: biodiversity and ecosystem productivity. There are three indicators of biodiversity which measure landscape diversity, forest diversity and forest disturbance. They are designed to monitor both the pattern of the forest and aspects of species composition.

These indicators are used to ensure consistency with Crown Forest Sustainability Act (CFSA) principles of conserving biological diversity and using forest management practices which emulate natural disturbances and landscape patterns. To provide a baseline for evaluating management alternatives, managers establish a "benchmark" of how the forest might develop over time in the absence of human intervention. This requires a detailed review of historical evidence of forest structure and composition and natural disturbance.

The indicator of net primary productivity is a measure of forest productivity, the rates of flora and fauna production. Climate and basic soil data are considered in addition to forest information in this measurable indicator.

2) Sustainability of Timber Supply

Sustainability of timber supply is assessed by three measurable indicators. "Production Forest Available for Timber Production" provides an analysis of what forest lands can be managed for timber production. Areas such as Provincial Parks, Core Protection Zones of ANSIS, non-productive forests, protection forests (shallow soils, islands), inaccessible lands or lands designated for other land uses are ineligible to support forest management activity.

Once the "eligible" or manageable" forest has been defined, wood supply analyses (Maximum Allowable Depletion (MAD)) are conducted for each of the major forest types. These analyses help determine short term harvest levels which will ensure maintenance of a long term wood supply. Calculations are based on forest growth characteristics on different site types as well as forest product requirements. This information is used to calculate "rotation ages" for each forest type - the number of years required to grow a forest to produce the desired forest product. Long term wood supply analyses must consider how well different forest types regenerate using different harvest methods. For example, a sustainable level of white pine sawlogs can only be drawn from a mature white pine forest if forest management approaches ensure continuous regeneration of white pine to form future forests.

The third indicator of timber supply, "Percent of available harvest area which is actually utilized", indicates to what degree society is using the available wood from the managed forest. It can provide an indication of surplus timber resources which are available for society's benefit.

3) Sustainability of Wildlife Habitat

Wildlife habitat supply analyses (HSA) measure the amount of habitat available for selected

APPENDIX VI

**Furbearer Harvests for Portions
of the Madawaska Highlands**

Registered Traplines

Years	Beaver	Mink	Marten	Otter	Fisher	Muskrat	Raccoon	Squirrel	Weasel	Fox	Wolf	Coyote	Bear
1990/91	195	20	0	10	25	27	4	0	0	4	0	0	1
1991/92	293	10	1	15	38	3	3	1	2	11	1	10	0
1992/93	246	16	1	16	54	87	5	0	0	34	9	7	0

Resident Trappers (Private Land Trappers)

Years	Beaver	Mink	Marten	Otter	Fisher	Muskrat	Raccoon	Squirrel	Weasel	Fox	Wolf	Coyote	Bear
1990/91	504	70	0	20	20	139	14	3	11	28	0	10	0
1991/92	623	88	0	39	49	37	40	7	10	68	2	24	0
1992/93	507	55	1	50	66	457	30	11	11	68	3	18	0

Total - Registered Traplines and Resident Trappers

Years	Beaver	Mink	Marten	Otter	Fisher	Muskrat	Raccoon	Squirrel	Weasel	Fox	Wolf	Coyote	Bear
1990/91	195	90	0	30	45	166	18	3	11	32	0	10	1
1991/92	293	98	1	54	87	40	43	8	12	79	3	34	0
1992/93	246	71	2	66	120	534	35	11	11	102	12	25	0

Data Source: Ontario Ministry of Natural Resources. Annual Printouts from Fur Harvest Reporting System Database.

species of wildlife. Some HSA are provided for species which require a wide variety of habitats (e.g. White-tailed Deer) as a means of providing for a diversity of wildlife. Other HSA are carried out for species with specific habitat requirements of concern (e.g. Pileated Woodpecker) or species with populations of concern (e.g. Red-shouldered Hawk).

APPENDIX VII

Conservation Strategies for Selected Species in the Madawaska Highlands

Red-shouldered Hawk, Cooper's Hawk

- Monitor known nests and identify potential nest sites during tree marking.
- Potential nests are examined during breeding season.
- If active the nest gets a 150 metre (7ha) no-cut reserve, plus a 150 metre (21 ha) Area of Concern (AOC) where logging can occur, but is restricted somewhat. No roads or landings in reserve or in the Area of Concern (AOC). No cutting is allowed in the AOC from March 1 to July 31.
- Encourage conservation on private lands.

Southern Flying Squirrel

- Keep accurate records of distribution (with help from trappers, naturalists, Ontario Mammal Atlas etc.)
- Protect nest trees when found during marking.
- Apply cavity tree guidelines in tree marking: at least 6 large diameter cavity trees per hectare should be retained
- Encourage conservation on private lands.

Eastern Bluebird

- Apply cavity tree guidelines and encourage cavity tree retention in forest operations.
- Promote use of nesting boxes for conservation purposes.
- Encourage awareness and conservation on private lands

Ginseng

- Survey for known populations and keep accurate records of distribution on Crown lands.
- Protect habitat where known.

Bald Eagle

- Monitor known populations.
- Protect habitat where appropriate.
- Increase awareness.
- Consider reintroductions where appropriate.
- Foster trapping techniques that reduce incidental captures.

Golden Eagle

- Monitor wintering populations
- Increase awareness
- Foster trapping techniques that reduce incidental captures.

Peregrine Falcon

- Document reported observations during the nesting season.
- Monitor potential nest sites for activity.

Eastern Cougar

- Document reported observations

APPENDIX VIII

Guidelines for the Management of Regionally Significant ANSI's

In the Madawaska Highlands it will be important that the integrity of the Regionally Significant ANSIs be maintained and the features/values which make them significant are protected. This will be accomplished on Crown land in the following manner:

1. Regionally Significant ANSIs will be identified in all resource and other Crown Land plans.
2. Natural heritage values that make an ANSI regionally significant will be identified and prescriptions developed to protect those values/feature(s).
3. Forest harvesting may continue if prescriptions are developed which protect the natural heritage values/features. Such prescriptions may include winter harvesting, winter access, extended rotation periods, controlled access, establishment of Areas of Concern and the development of silvicultural prescriptions which are designed to perpetuate the existing forest community type with no loss of biodiversity.
4. Mining activities will be considered on a case by case basis in the context of maintenance of identified natural heritage values.
5. Hunting, trapping and the development of recreational trails will be permitted as long as the integrity of the natural heritage values is not compromised.

APPENDIX IX

Rationale for the Selection of Criteria and Targets for Sustainable Forest Management in the Madawaska Highlands

Sustainability Targets were established for three objectives; the sustainability of forest ecosystems, timber supply and wildlife habitat. Criteria were identified for each objective but in some instances, a criteria in one objective also satisfied another objective concurrently. For these criteria, targets were set as Baseline and Optimal. In some situations, only baseline targets were established because there is no identified optimal target available at this time.

Sustainability of Forest Ecosystems

Various criteria were identified to measure the sustainability of forest ecosystems; representation of working group, age class structure and prescription. The amount of area for all working groups was identified to give an idea of the future state of the forest. Given the disturbance history of the area and abundance of species such as poplar and birch which are favoured under those conditions, the future state of the forest is anticipated to change towards more tolerant and pine species. As a result, there are increases in White Pine/Red Pine and Tolerant Working Groups and corresponding decreases in the Poplar/Birch Working Groups. From an ecosystem representation point of view, key working groups are Hemlock, White Pine/Red Pine and Cedar (including their component in other working groups) because they are species which have shown a decline in this area based on historical land patterns (as described in section 3.1.2). Since they have been declining the baseline target is to have no net loss and the optimal is to increase their representation. Hemlock was forecasted to have a moderate increase while White Pine/Red Pine is minor because Hemlock currently represents a much smaller total area so an increase in its area would show a much larger increase overall.

The amount of White Pine/Red Pine in age class 121+ and the age class distribution and structure of Tolerant Hardwoods have also been identified as less than in historical land patterns. Since there is no identified optimal target for how much old growth should be present, a baseline target of minor (0-10%) increase in area over 20 years has been established for White Pine/Red Pine and an increase in diameter size for tolerant hardwoods recommended on sites where conditions will facilitate good growth.

The size of clear cuts was identified as the fifth criteria because of concerns for the impact of clear cuts on the forest ecosystem. A maximum size limit of 100 hectares was established recognizing that clear cuts up to 100 hectares can contribute to deer habitat (Timber Management Guidelines for the Provision of White-tailed Deer Habitat, 1992). The majority of clear cuts in all three Crown Management Units are below 50 hectares. The attached Figure ___ shows the distribution of clear cut sizes in the Mazinaw Area Crown Management Unit. A diversity of clear cuts sizes will continue to be planned based on stand composition,

site conditions and economic considerations. Planned clear cuts ranging in size from 50 ha to 100 ha will be identified to local citizen committees in the Timber Management Planning process. Any amendments to the Forest Management Plans which involve changes in prescription resulting in 50-100 ha clear cuts will also be identified to the local citizen committee.

Sustainability of Timber Supply

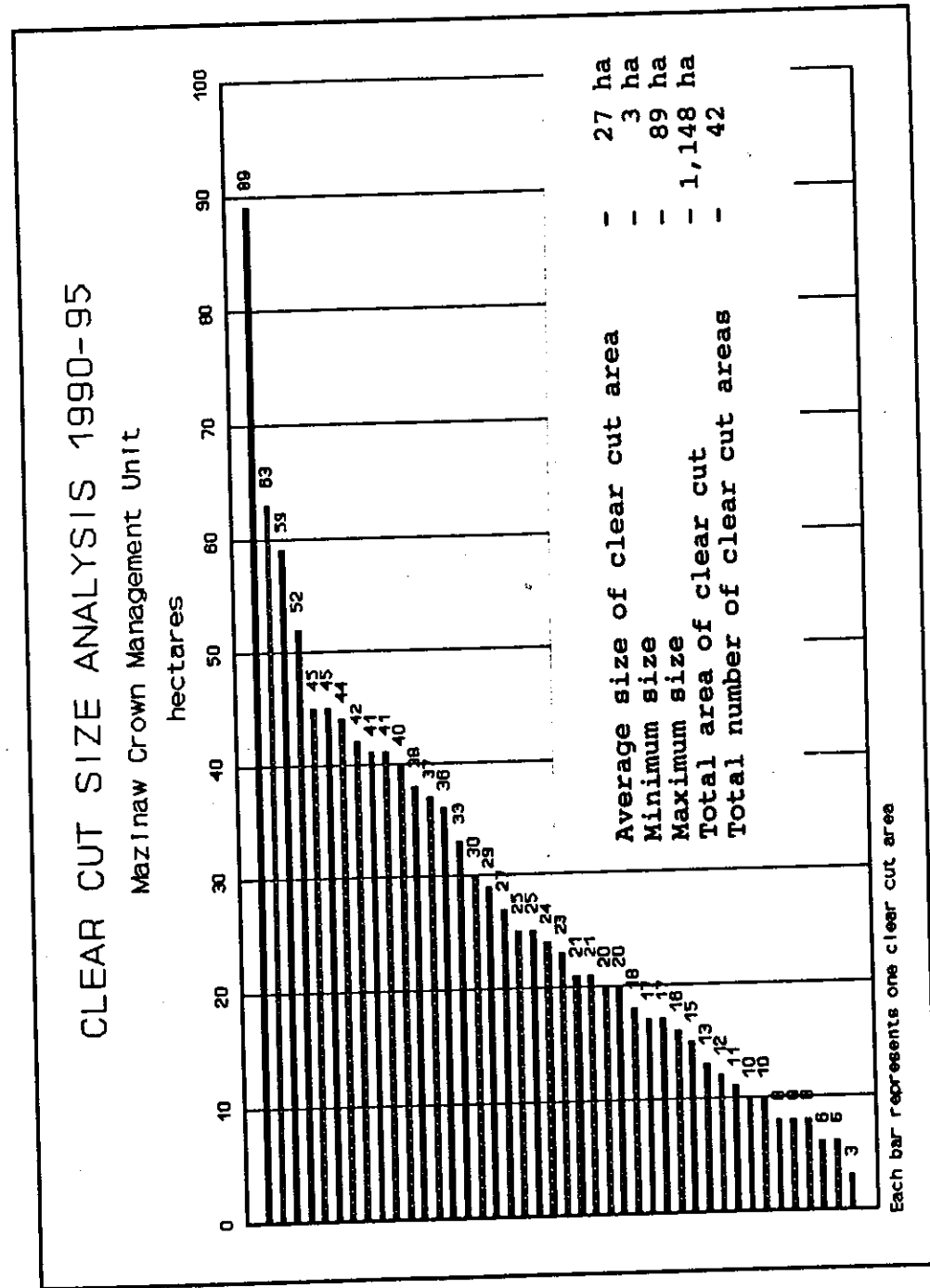
Product percentage of sawlogs (sawlogs:pulp ratio) was included as an indicator for sustainability of timber supply because as described in section 3.2.3 productive capacity is barely sufficient to meet the current demand and there is under-utilized low quality wood. As silvicultural prescriptions are implemented across the land base, it is felt that there will be additional gains in product quality. This will be measured at the management unit level. A reasonably accurate longer forecast could not be determined because of the differences between management units.

The area of Red Oak Working Group and the component of Red Oak in other working groups was identified as the key criteria for timber supply. Red Oak was selected because its market value is high and rarely fluctuates. In fact, it has the highest timber value and it also provides an important component of deer habitat. Therefore, the optimal target is to have no net loss in area. However, a moderate decrease in Red Oak has been set as a baseline target because: 1) the abundance of Red Oak is much higher than it has been historically; 2) Red Oak is sometimes situated on site conditions suitable for other competing species likely to replace it; and 3) replacement by other species is being encouraged to address the Forest Ecosystem sustainability objective mentioned above.

Sustainability of Wildlife Habitat

Sustainability targets for wildlife habitat were based on deer and red-shouldered hawk habitat using Habitat Supply Analysis. For deer, a baseline target of maintaining the quality of conifer cover mixed with hardwood regeneration in core deer concentration areas was established. An optimal target was not provided because there is no optimal conditions targets available. Summer deer range targets reflect the targets for Red Oak established in Sustainability of Timber Supply. There is an optimal target of no net loss with a baseline of moderate decrease over one rotation. The red-shouldered hawk optimal target reflects the target established for Sustainability of Forest Ecosystems to increase the age class of tolerant hardwoods. By increasing the distribution and age structure of tolerant hardwoods, red-shouldered hawk habitat can be increased. A baseline target is to have no net loss.

size of clear cut areas.



APPENDIX X

Wildlife and Fisheries Research Needs/Opportunities

Wildlife

- comparisons of wildlife communities between managed and unmanaged forests
- summer range of deer using deeryards
- movement and habitat association of moose in deer dominated ranges like the Highlands
- marten and fisher distribution; movements and habitat associations
- winter habitat information on overwintering eagles in the Highlands
- water level changes and its impact on muskrat/beaver activity
- timber wolves in the highlands; habitat suitability impacts of timber harvest, hunting/trapping/general recreation
- comparison of pre-settlement versus present day wildlife communities in the Highlands
- long-term habitat suitability modelling - What does the future hold for wildlife in the Highlands?
- influence of bear baiting stations and the spring bear hunt on black bear population and activity/home ranges; impacts on human safety

Fisheries

- ecology and status of River Redhorse sucker (Vulnerable species) in the Madawaska River
- survey of fish communities in "pristine" lakes that have been unaffected by stocking
- genetic diversity of brook trout streams and habitat needs of native stocks
- impact of stocked game fish on resident fish communities
- socio-economic review of remote versus road accessible fisheries
- impacts of outboard motors and other water oriented motorized vehicles on fish, wildlife and their habitat
- impacts of annual water drawdowns on fish habitat
- how far should forest roads be located from the edge of a waterbody?
- what are the most effective ways for volunteers to contribute fisheries/wildlife information for long-term monitoring programs

Vegetation

- analysis of appropriate clear cut sizes based on historical disturbance patterns
- ecology and status of provincially significant aquatic plant communities in Madawaska River system

APPENDIX XI

Criteria for Establishing Recreational or Snowmobile trails within the Madawaska Highlands

The growing interest in a variety of competing recreational trail uses, particularly snowmobiling, has initiated the need to identify procedural guidelines to evaluate proposals for the use of Crown lands. Accordingly a process has been developed which for all practical purposes can be applied within the boundaries of the Madawaska Highlands. These guidelines are needed to consider, in an integrated manner, a broad range of social, economic, and environmental values to be addressed within the Highlands. These guidelines are intended to implement and accommodate the creation and maintenance of all of the existing or future recreational trails within the Highlands.

Throughout the Province the Ministry of Natural Resources is supportive of initiatives to develop trails, where specific features and the need for access to them, supports construction through a proper planning process. Any trails established by private or commercial interest must be addressed under the Environmental Assessment Act through M.N.R. 26/7. (Consult the E.A. Procedures Manual for further information.)

The maintenance of recreation trails on Crown land by private individuals or agencies are also reviewed and issued under section 14 of the Public Lands Act which deals with the issuance of Work Permits issued by M.N.R. Prior to approving work permit applications, the applicant may be required to obtain a number of approvals/permissions (e.g. Lakes and Rivers Improvement Act, approval to cross private land, highway crossings, etc.).

For new trail proposals, or those requiring significant change in use and upgrading (e.g. widening) the M.N.R. District will ensure that the proponent follows a planning process which:

- clearly identifies the purpose and rationale for the proposal/undertaking;
- identifies and evaluates all reasonable alternatives;
- consults with interest and aboriginal groups, affected property owners, government agencies, and the public;
- compiles a development plan identifying the selected alternative and environmental mitigation measures.
- is held responsible for implementing, monitoring, and managing the project.

A complete description of the trail planning, review and approval process is outlined in Attachments dated August, 1994 (M.N.R.) and Provincial Policy LM 7.01.06 dated Oct. 29th, 1993 "Authority for Recreation Trails on Crown land".

APPENDIX XII

Guidelines for the review of Applications to Construct Roads over Crown land within the Madawaska Highlands Planning Area

These guidelines are based on the principles outlined in Direction 90s: A Crown land and Water Management Philosophy for the Central Region." They outline the procedures which will be used by all Area Teams to assess road proposals within the Madawaska Highlands Planning Area. This will ensure that:

- all applications are reviewed in a consistent manner across the planning area
- public consultation forms part of the decision making process where necessary
- long term implications on the management of Crown land and resource sustainability are considered.

In addition to these guidelines, each Area Team may implement more specific access strategies for specific geographic areas through other planning process such as Forest Management Planning of Fisheries Management Planning, provided the minimum standards provided herein are met.

A. GENERAL PRINCIPLES

1. The guidelines apply to all applications to construct roads on Crown land subject to the following exceptions and variations:

- primary and secondary roads which are reviewed through the FMP process
- MNR access roads which are planned and constructed in accordance with a Class EA
- tertiary logging road proposals, except those to be located within contentious areas and/or areas of concern as defined in Forest Management Plans and Annual Work Schedules are exempt from the following conditions of the Application Review Procedures:
 - Internal Circulation of Work Permit (Section (C) 2.)
 - Public Consultation (Section (C) 3. (c))
 - Completion of a Use Management Strategy (Section (C) 1. (a))
- public authority (Municipal, County, MTO) road proposals will also be exempt from the public consultation portion of these guidelines as these agencies have their own EA Act obligations.

2. A use management strategy must be prepared for each road proposal as outlined in policy RA 2-4 of the Access Roads Manual

3. Roads on Crown land will generally be open for public use except where specifically identified in a land use plan or other resource management plans. Tenure will usually not be granted. (See section A. 6 for exceptions.)

4. Applications to construct roads on Crown land will be denied if:

- there are anticipated direct or indirect, immediate or future adverse effects on resources or the environment which cannot be easily addressed or mitigated, or,
- the road proposal is inconsistent with local land use or resource management plans, or,
- no public benefit is derived from construction of the road.

5. Access to Private Land

a) Applications to construct roads on Crown land for the sole purpose of accessing private land will be denied, in addition to the criteria in # 4, if:

- a reasonable private land alternative exists, or
- if the private land owner refuses to formally allow the Crown to cross his/her property in order to access other crown land for resource management purposes, or
- if it is determined that road access to a remote area or waterbody would be inconsistent with the character or community standards of the area or waterbody.

b) An application to construct a road to access private land for the sole purpose of logging will only be approved, in addition to the criteria in # 4 and 5 (a), subject to the condition that the road be physically abandoned when logging is completed. Whenever feasible, the construction of a road limited to winter use only is the preferred option.

c) An application to construct a road to private land in connection with new development will only be approved, in addition to the criteria in #4 and 5(a), if the road is built to MTO standards and is formally assumed by the municipality.

6. Revenue as a Public Benefit

Revenue can be considered a public benefit in situations where the access created does not benefit the public, MNR etc. in any other way. The means to collect the revenue is through the issuance of a Land Use Permit (10 year term) for the road at an annual or one-time fee based on market value (Table A or D of Policy LM 10.01.02). An agreement pursuant to Section 54.(2) of the Public Lands Act would also have to be entered into if public use of the road is desired.

As an alternative, an easement may be granted for the road at an annual or one-time fee based on market value since this form of tenure does not grant exclusive use. However, a survey at the applicant's expense would be required.

Tenure in the form of a patent or lease will be issued for Public Authority roads in accordance with Provincial Land Management policies.

7. The term "environment" used in these guidelines shall be as defined in the Environmental Assessment Act.

(* Part C, Application Review Procedure, Part D, References, and Appendices are contained in the original document)

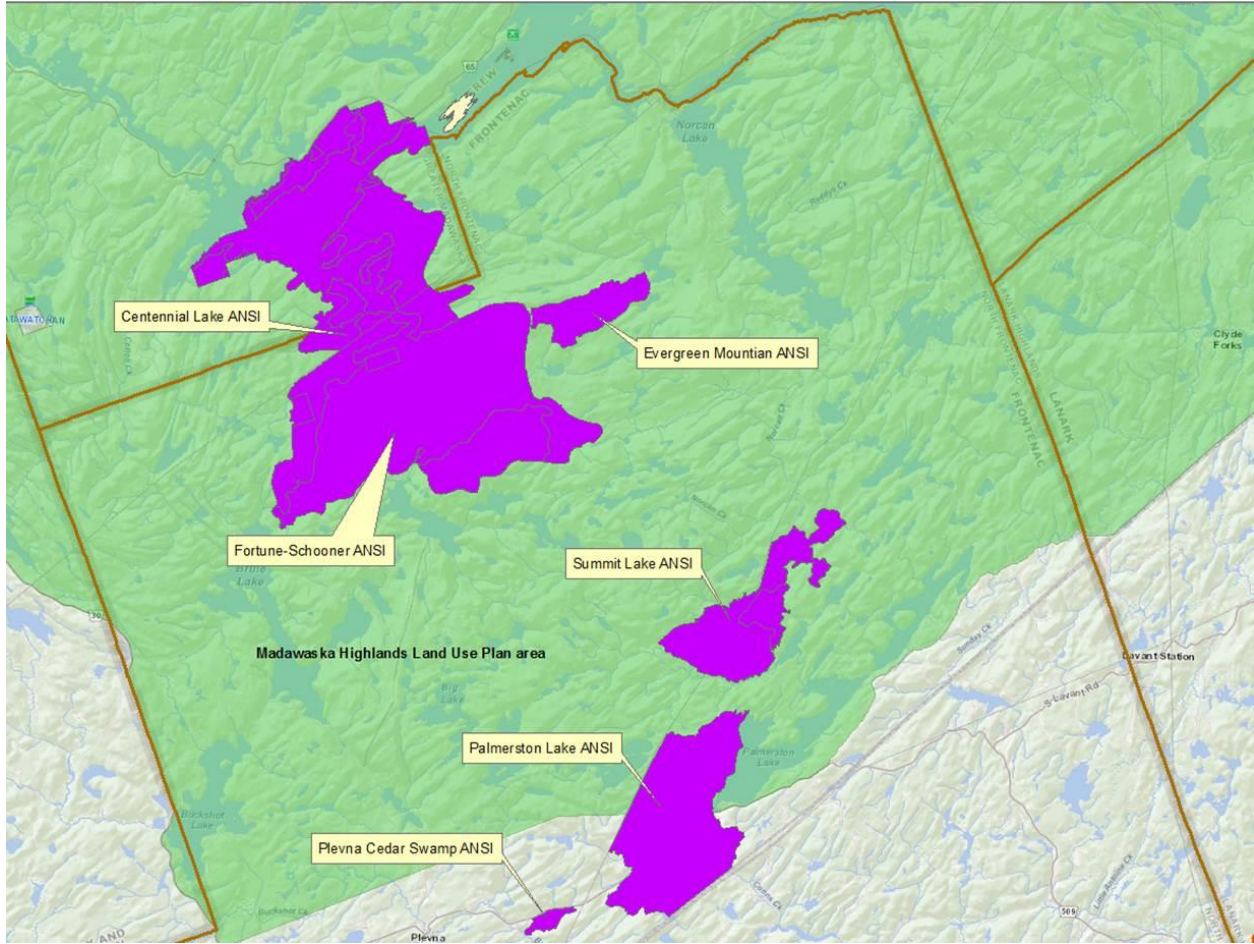


Image provided from the Ministry of Natural Resources and Forestry, March 22, 2019.

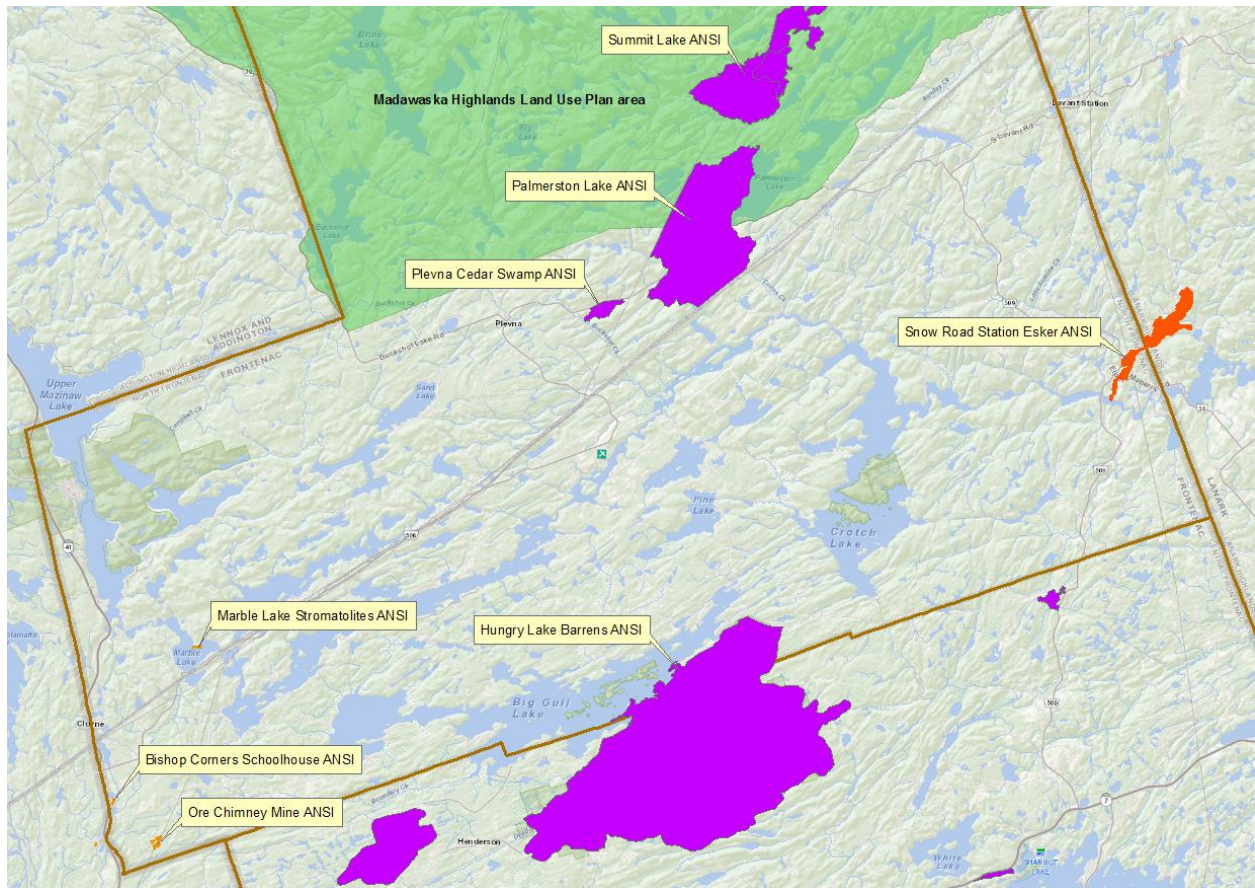
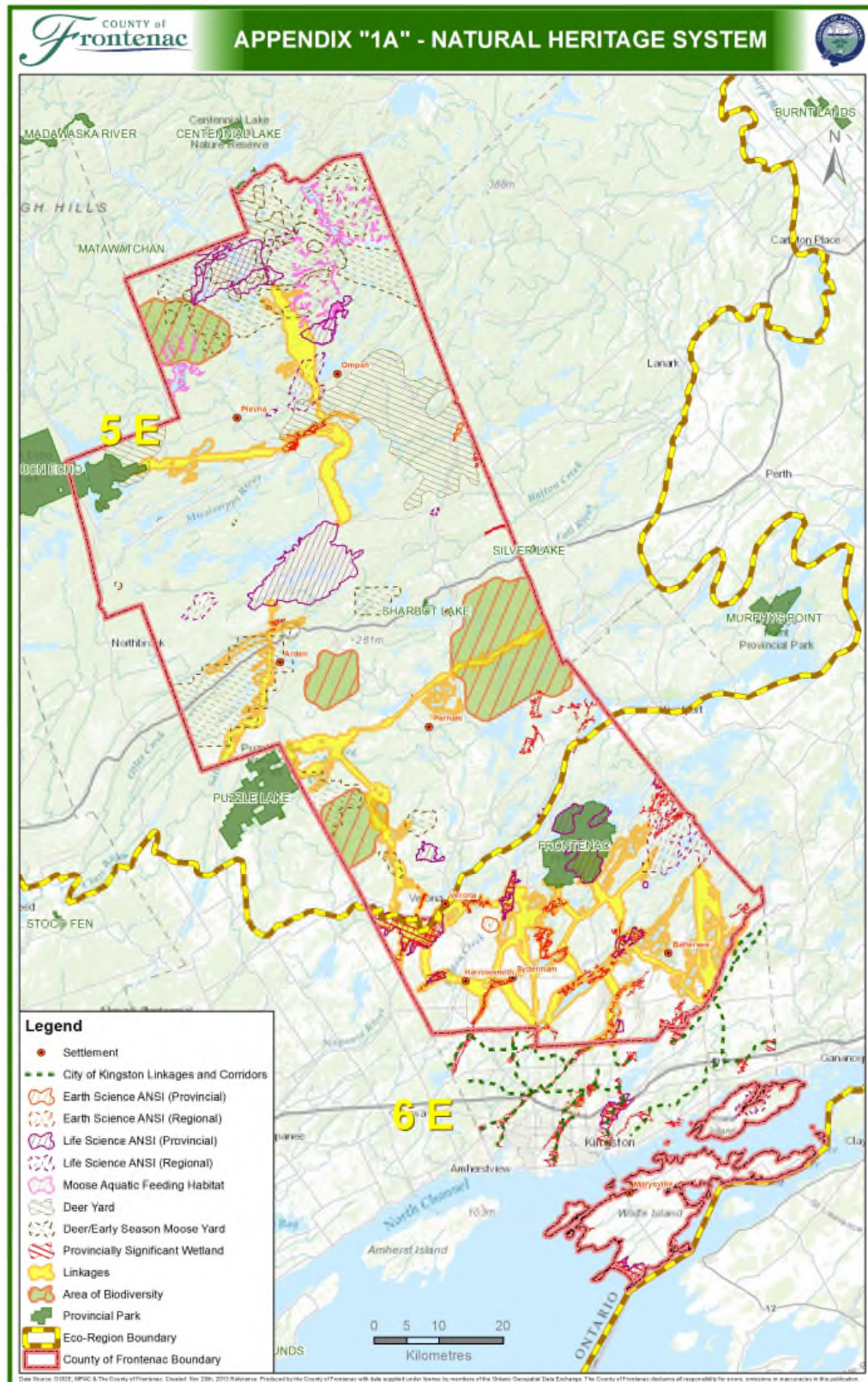


Image provided from the Ministry of Natural Resources and Forestry March 22, 2019.



(MMAH Approval dated January 11, 2016)



Legend

- At Capacity Lake
- Lake Trout Lake At Capacity
- Lake Trout Lake Not At Capacity
- Abandoned Mines Inventory System (AMIS)
- Waste Disposal Facility
- Mineral Deposit Inventory (MDI)
- River/Stream
- Waterbody
- Property / Lot Fabric
- Hamlet
- Watershed Boundary
- Provincial Park
- 500m Influence Area
- Moose Early Wintering Area
- Deer Wintering Area
- Provincially Significant Wetland (PSW)
- Area of Natural and Scientific Interest (ANSI)
- Mineral Resource Area
- Mineral Aggregate Resource
- Organic Soils
- Crown Land
- Rural
- Waterfront Area
- Rural Cooperative Area
- Conservation Area
- Township / Ward Boundary
- Ontario's Living Legacy**
- Bon Echo OLL
- Maczinnaw OLL

