

**CUMULATIVE ENVIRONMENTAL EFFECTS AND
SCREENING UNDER THE CANADIAN
ENVIRONMENTAL ASSESSMENT ACT**

**WORKSHOP PROCEEDINGS
ENVIRONMENT CANADA • ONTARIO REGION
February 18-19, 1993
Burlington, Ontario**

**Prepared For:
The Federal Environmental Assessment Review Office and
The Environmental Assessment Branch, Environment Canada**

Prepared By:

Katherine Davies' D.Phil.
Ecosystems Consulting Inc.
1363 Norview Crescent
Orleans, Ontario
K4A 1Y6
(613) 837-6205

March 1993

TABLE OF CONTENTS

1.	INTRODUCTION	4
2.	CASE STUDIES	6
3.	APPLYING THE APPROACH OUTLINED IN THE DRAFT REFERENCE GUIDE ON ADDRESSING CUMULATIVE ENVIRONMENTAL EFFECTS	15
4.	ENVIRONMENT CANADA PROCEDURES FOR ASSESSING CUMULATIVE ENVIRONMENTAL EFFECTS DURING SCREENING	19
5.	SUGGESTIONS AND RECOMMENDATIONS TO FEARO, DOE (HQ) AND DFO/DOE (REGIONAL)	23
	APPENDIX A: SCHEDULE OF WORKSHOPS	25
	APPENDIX B: WORKSHOP AGENDA AND LIST OF PARTICIPANTS ...	26
	APPENDIX C: ENVIRONMENT CANADA - BURLINGTON CASE STUDIES	34

1. INTRODUCTION

The Canadian Environmental Assessment Act (CEAA) received Royal Assent on June 23, 1992, and will be proclaimed in 1993. Amongst other things, the Act requires that:

“Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

*(a) the environmental effects of the project.. **and** any cumulative environmental effects that **are** likely to **result** from the project in combination with other projects or activities that have been or will be **carried** out;*

*(b) the significance of the effects **referred** to in paragraph (a);”*
(section 16(1)).

The Federal Environmental Assessment Review Office (FEARO) is currently preparing a ‘Guide to the Canadian Environmental Assessment Act’ which provides guidance on how to conduct environmental assessments under the Act, including the assessment of cumulative environmental effects. As well, a more detailed Reference Guide on addressing cumulative environmental effects has been drafted as a supporting document to the Guide to the CEAA. However, FEARO recognises that approaches and methods for assessing cumulative environmental effects are evolving rapidly and that any guidance offered should reflect best current practice. The Guide to the CEAA and the Reference Guide will be updated as new information becomes available.

To complement its work to date and to provide the best practical advice possible, FEARO in cooperation with other federal departments and agencies is examining how cumulative environmental effects can be considered in screenings of projects during federal environmental assessments. The departments and agencies that are participating in this initiative are:

- Environment Canada;
- Transport Canada;
- The National Capital Commission (NCC);
- The Canadian International Development Agency (CIDA);
- The Department of Indian Affairs and Northern Development;
- The Department of Fisheries and Oceans; and
- The Department of Energy, Mines and Resources.

The workshops focus on the assessment of cumulative environmental effects at the screening level of the environmental assessment process. Screening is the most routine of the four tracks of the environmental assessment process (the others are comprehensive study, mediation and panel review) and is required for most smaller projects or projects that are thought to be less likely to cause any significant adverse environmental effects. Class screening, in which the environmental effects of a class of projects is assessed, is part of the screening track. The vast majority of federal environmental assessments (more than 95 percent) are conducted at the screening level. Also, smaller projects that are subject to screening can be important contributors to cumulative environmental effects. In addition, there are special issues associated with addressing the cumulative environmental effects of small projects as opposed to larger ones, such as the extent of the proponent responsibility.

Each participating department or agency selected several case studies of projects that have been subjected to screening under the Environmental Assessment and Review (EARP) Guidelines Order (1984). For each case study, brief written background materials are prepared (see Chapter 2 and Appendix C). The case studies are then presented at a series of 1-2 day workshops with staff from the department or agency involved. The case studies are used as a basis for discussing how the cumulative environmental effects of projects could be addressed in screening.

There is at least one workshop being held by each participating department or agency. **Two** departments (i.e., Environment Canada and the Department of Fisheries and Oceans) are holding several joint workshops in different regions of the country. The Schedule of Workshops is shown in Appendix A.

This report summarises the results of the Environment Canada - Ontario Region workshop, held in Burlington, Ontario on February **18-19, 1993**. Staff from the Department of Fisheries and Oceans Canada (Fisheries and Habitat Management) were invited to participate in this workshop. It is intended to summarise the discussions, rather than to provide detailed minutes. The agenda and list of participants for this workshop are shown in Appendix B. As well as this report, a set of 'consolidated proceedings' will be prepared.

The final 'consolidated proceedings' will be distributed to all participants from all workshops in March **1993**. As well, a final interdepartmental workshop will be organised to discuss common themes in assessing cumulative environmental effects in screenings, as well as inter-departmental collaboration and co-operation on this subject. This will probably be in April or May 1993. Subsequently, **FEARO's** Guide to the CEAA and Reference Guide on cumulative environmental effects will be revised to take into account the outcome of this initiative.

2. CASE STUDIES

Each department or agency participating in this initiative was asked to select several recent examples of projects subjected to screening under the EARP Guidelines Order (1984). In most cases, these case studies represented the range of different types of projects screened by the department or agency, as well as different-sized projects and projects in different types of ecosystems.

For each case study, brief written background materials were prepared summarising:

- The project;

- The project's environmental effects;
- The screening decision reached; and
- How, and to what extent could any cumulative environmental effects be addressed.

To assist in the preparation of the background materials and to familiarise the workshop participants with the subject of assessing cumulative environmental effects in environmental assessments, copies of a background paper on cumulative environmental effects and the draft Reference Guide prepared by FEAR0 were distributed to all workshop participants in advance.

The following case studies were presented at the Environment Canada - Ontario Region workshop held in Burlington:

- Park Management Plan - Pukaskwa National Park, Lake Superior;
- In-Water Works Approved Under Heritage Canal Regulations - Trent - Severn Waterway;
- Modifications to the Upper Niagara River; and
- Mattagami River Hydro electric Developments.

The background materials are shown in **Appendix C**. Some of the main issues discussed for each case study are outlined below.

Park Management Plan - Pukaskwa National Park, Lake Superior

This case study focussed on an environmental assessment of the Park Management Plan for Pukaskwa National Park on Lake Superior. The screening report identified:

- 'Valued ecosystem components' in the Park;
- The project options;

- The environmental effects of the project options;
- Mitigation options; and
- The potential cumulative impacts.

The potential cumulative impacts examined in the screening report included:

- Increasing isolation and fragmentation (***'island effect'***) of the Park ecosystem by the trail system and facilities inside the Park, as well as by forestry and mining activities external to it;
- Degradation of fringe areas of trails, campgrounds and other facilities, when cumulative disturbances exceed the natural assimilative capacity of the affected ecosystem; and
- Impacts on the ecosystem from other activities external to the Park (e.g., mining, forestry, fishing, hunting, etc) in combination with activities inside the Park.

Three major issues were discussed following the presentation of this case study:

- In most if not all National Parks, including Pukaskwa, there is a dichotomy between the need to protect and enhance the natural resource base on one hand and providing opportunities for public access and recreation on the other. National Parks are managed for both objectives, however, public access and recreational facilities can be associated with adverse cumulative environmental effects that impair the natural resource base;
- There is a recognition that the nature and extent of the cumulative environmental effects in National Parks are partially attributable to stresses occurring outside the Park boundaries. Thus, to manage the cumulative environmental effects inside National Parks effectively it is necessary to consider activities occurring outside them that can affect the Parks. To do this, it is essential to have the support and cooperation of nearby land owners. At Pukaskwa, there is a lot of provincial Crown land nearby. However, the Province is being cautious about the concept of a greater Pukaskwa Park ecosystem, because of the jurisdictional and management implications;

- There is a high fire risk in Pukaskwa and other National Parks because of the accumulated biomass. Logging has not been permitted, and in any case many areas can not be logged because they are not easily accessible. As well, forest fires have been suppressed. It is proposed to deal with the accumulated biomass by allowing controlled burns in specified areas. However, these will produce relatively large amounts of carbon dioxide and other greenhouse gases. Thus, it is necessary to balance the cumulative effects of controlled burns versus uncontrolled forest fires. It was also pointed out that periodic fires are essential to the health of forest ecosystems and that dead and decaying trees provide valuable habitats for many species of insects, birds, animals and plants.

In-Water Works Approved Under Heritage Canal Regulations - Trent-Severn Waterway

Environment Canada is required to review all in-water works proposed for the Trent-Severn Waterway. This role results from its regulatory authority under the Heritage Canal Regulations of the *Department of Transport Act* and its land management responsibilities for the federal beds of the waterbodies comprising this Historic Canal. Up to 2,000 applications are reviewed annually. They include the construction of docks, boathouses, retaining walls and dredged access. Most of the proponents are landowners. There are some municipal projects.

The Trent-Severn Waterway is currently experiencing severe development pressures. As well, there are many aboriginal peoples living along the Waterway who want to protect their traditional way of life. The following cumulative environmental effects have been identified by Environment Canada staff:

- Congestion of boat traffic;
- Algal blooms and eutrophication;
- Unauthorised dredging or filling;
- Fragmentation of ecosystem components and decreased biodiversity;
- Increased demand on municipal services;

- Increased demand on federal services and concurrent stressing of the ability of the federal agency to effectively deliver its services to existing clients;
- Additional development at the same or adjacent site, once services are in place;
- Toxic chemicals;
- Additional uses beyond the ability of resource management agencies to control; and
- Socio-economic effects on aboriginal people.

To deal with these cumulative environmental effects, the Waterway staff have focussed on understanding the cumulative environmental effects of development in the Waterway, rather than attempting to address these issues on a project-by-project basis. Specifically, they have developed a lake capacity model, based on the 'boatable' potential of an area. This takes into account the existing level of boating in an area and its environmental conditions. It is a form of constraint mapping as it identifies areas with no further development potential. Similarly, areas with development potential can also be identified. Projects that would lead to increased boating in areas that have already met or exceeded their 'boatable potential' are not given the necessary approvals.

There are, however, several weaknesses in the present system:

- The approach outlined above must deal with the right of riparian access (the right to boat access to one's property). Which takes precedence, environmental protection or the right to riparian access?
- Native groups want a larger role in environmental assessment in many areas of the Waterway. Native concerns focus on the effects of development on traditional lifestyles in general and on lands used for hunting and fishing in particular;
- There is a need to integrate the lake capacity model into planning and land use decisions made by municipalities;

- Most projects are already designed when they enter an environmental assessment process. Thus, there is relatively little scope to consider alternatives and mitigation measures, especially as many of the proponents are small, private land owners;
- Lake capacity models should also take account of nutrient loadings (this is being done in Rice Lake); and
- SCREENER does not currently include an assessment of cumulative environmental effects. It should be updated to reflect the requirements of the new Canadian Environmental Assessment Act.

Modifications to the Upper Niagara River

The Niagara River is an International Boundary Water and any activities affecting the water levels, quantity and quality of the River are governed by the Boundary Waters Treaty 1909, as well as other federal and provincial legislation, such as the federal *Navigable Waters Protection Act*. However, there have been numerous ‘minor’ modifications to the River shoreline, and federal agencies have generally been unsuccessful in preventing **infilling** in the Niagara River. There have been significant modifications to the Upper Niagara River for at least 170 years, primarily to facilitate navigation (canals, docks etc), cross-border transportation (bridges), hydro power development and land creation (**infilling** to utilise water lots).

In 1983, Environment Canada conducted a hydraulic analysis of the Upper Niagara River to determine the cumulative environmental effects of the modifications on water levels in Lake Erie. The results indicated that a rise of 43 mm could probably be attributed to river modifications conducted between 1918 and 1983. Several modifications, including the Black Rock Canal and the International Railway Bridge were constructed earlier, so the cumulative effects of their presence on water levels was not considered.

Recently, the Canadian National Railway (CNR) applied for a permit under the Navigable Waters Protection Act to carry out emergency repairs to the International Railway Bridge.

The proposed remedial works would involve the encasement of two undermined pier footings using steel sheet pilings and mass concrete. The proposed works would increase the pier size and consequently its hydraulic resistance, resulting in changes in flows and levels downstream.

The following potential cumulative environmental effects were identified:

- Progressive changes in the status quo of Lake Erie water levels;
- Change in power generating potential of downstream hydro power stations;
and
- Change in micro climate due to changes in the regime of the River or Lake Erie.

These cumulative environmental effects all have international implications because the Niagara River is a boundary water.

Two main issues were discussed following this case study. These were:

- It is often difficult to establish baseline environmental conditions, taking into account the cumulative environmental effects of past projects and activities. How far back in time is it necessary to go to identify the cumulative effects of past projects and activities in intensively developed and modified areas? It is not **possible to** describe 'pristine' environmental conditions before development, and the existing environment does not represent an acceptable baseline; and
- The repair work to the bridge would only cause a very, very small change in the level of Lake Erie, but it is a cumulative environmental effect, both in temporal terms and in combination with other factors. The cumulative effects on water levels are an ongoing cause of concern to shoreline property owners. At what point does a very, very small change in level (possibly unmeasurable) become important?

Mattagami River Hydro electric Developments

The Mattagami River in northern Ontario is a tributary of the Moose River, which drains into James Bay. There are several hydro electric stations on the river. The Groundhog and Kapuskasing Rivers join the Mattagami River 20-30 kilometres upstream of the Little Long hydro electric station. The drainage area of the Mattagami River at the Kipling station is about 35,000 km². The Missinabi River joins the Mattagami River about 90 km downstream where the two rivers combine to become the Moose River. Upstream of this, the River drains a total area of about 60,000 km².

Ontario Hydro is proposing to expand and/or redevelop several existing hydro electric stations on the Mattagami River including:

- Little Long - expansion;
- Smokey Falls - redevelopment;
- **Harmon** - expansion; and
- Kipling - expansion.

All stations, except for Smokey Falls, operate as 'peaking' plants during average **flow** conditions.

A provincial environmental assessment has been **prepared** by Ontario Hydro, and a federal EARP environmental assessment is currently being completed by the Department of Fisheries and Oceans and Transport Canada. The following issues have been identified in the federal EARP screening:

- Erosion and sedimentation in the River during construction and peaking operations;
- Destruction or degradation of fisheries and habitat by facility operations and overfishing during construction;
- Degradation of water quality due to construction activity;

- Destruction of forestry and vegetation due to construction activity;
- Disruption of native traditional activities during construction;
- Socio-economic effects on adjacent communities during construction;
- Preservation of heritage resources from construction activity;
- Dislocation, disturbance of wildlife habitat and excessive hunting during construction; and
- Further disruption to navigation (recreational canoeing - currently disrupted downstream of Kipling GS).

This case study raised several interesting issues including:

- There is insufficient baseline data to determine the cumulative environmental effects of existing projects and activities (e.g., hydraulics, benthos). However, the proponent is unwilling to commit large amounts of funds to study the environment at this time. Instead, Ontario Hydro has suggested collecting baseline information during the construction phase of the project. However, this makes it difficult to do an adequate environmental assessment of the cumulative environmental effects prior to construction;
- It is important for the responsible authority to take an active role in scoping the cumulative environmental effects that will be addressed in the environmental assessment. This includes identifying issues and setting boundaries. Proponents do not always scope environmental assessments broadly enough;
- In this case, the project definition was limited to the incremental effects of the expansion/redevelopment activities. This narrowed the scope of the environmental effects that could have been considered;
- The *Dominion Water Power Act* allows the hydraulic potential of rivers to be exploited. This is not always consistent with the need to protect and enhance environmental quality;

- As well as examining the cumulative environmental effects of the Mattagami proposals, it would be helpful to assess the cumulative environmental effects of Ontario Hydro's rate structure. One of the effects of the current rate structure is the emphasis on 'peaking' operations, but these have important cumulative environmental effects on fish and fish habitat;
- Sometimes the contractors retained by proponents are not given the details of the mitigation measures required; and
- There is a need to ensure consistency when scoping the issues and boundaries associated with different projects of the **same** type (e.g., hydro electric projects).

3. **APPLYING THE APPROACH OUTLINED IN THE DRAFT REFERENCE GUIDE ON ADDRESSING CUMULATIVE ENVIRONMENTAL EFFECTS**

Following the presentation and discussion of the case studies, the approach outlined in the draft Reference Guide on addressing cumulative environmental effects was discussed. The workshop participants applied the approach proposed in the draft Reference Guide using the case study of hydro electric development in the Mattagami River. This part of the workshop was led by the Department of Fisheries and Oceans.

Scoping

The workshop participants agreed that scoping should consist of identifying issues and setting boundaries. However, it is also important to define the project during scoping. In the case of hydro electric development on the Mattagami River, Ontario Hydro limited the project to the expansion/redevelopment activities, and the cumulative environmental effects on Adams Creek were not considered. Workshop participants agreed that this limited the comprehensiveness of the environmental assessment.

As well, it was agreed that the responsible authority should be fully involved in scoping and not rely on the proponent's judgement alone. The geographic boundaries were set for this assessment by Ontario Hydro (and agreed to by the Department of Fisheries and Oceans).

In retrospect the boundaries were too small and as a result some important cumulative environmental effects were not included, especially some socio-economic effects. The responsible authority should also identify the issues to be examined in the environmental assessment. These can be the 'valued ecosystem components'. For this case study the ice going out from the Moose River to James Bay was an important event for the native groups living there. It was pointed out that people that prepare environmental assessments are often unfamiliar with the unique conditions and circumstances of the receiving environment, such as the importance of this event to the native people. Indeed in many cases, environmental assessment practitioners have never even visited the project's site and are not usually aware of the cumulative environmental effects caused by past and present projects and activities.

Although it is important to identify stakeholders and solicit their input in scoping, this may not always be possible. In the case of hydro electric development in the Mattagami River, local native groups did not want to talk to Ontario Hydro about the proposals at all or to be involved with the environmental assessment initially. This was because of their perception that Ontario Hydro was being inflexible and unsympathetic to their concerns.

The workshop participants also discussed the need for, and substance of baseline environmental data to assist in scoping. It can be hard to identify issues and set the boundaries without access to baseline environmental data on the receiving environment. For the Mattagami proposals, the baseline environmental data available were not adequate. In particular, better information was needed on River hydraulics and benthic communities in the project's receiving environment downstream.

Lastly, the participants agreed that it is important to be as explicit as possible in the environmental assessment guidelines so that the proponent is clear about what is expected in the environmental assessment regarding cumulative environmental effects.

Assessing the Interactions Between the Environmental Effects of the Project

The Mattagami proposal consists of the expansion or redevelopment of four separate hydro electric generating stations. While the proponent had in some cases looked at interactions between the environmental effects of different activities associated with the project, there were several notable exceptions. In particular, the combined effects of fish entrainment were not examined. As well, workshop participants were concerned that the changes in water levels were called ‘environmental influences’ by the proponent, not ‘environmental effects’. The cumulative effects of changing water levels on fish and fish habitat are very important.

Identifying Past and Future Projects and Activities and Assessing the Interactions Between the Environmental Effects of the Project and Past and Future Projects and Activities

Ontario Hydro did not explicitly identify any past or future projects and activities, or consider their environmental effects. However, it did examine the baseline environmental conditions, but as mentioned above, the Department of Fisheries and Oceans was of the opinion that the baseline data used were insufficient to adequately characterise the receiving environment.

Workshop participants discussed what constitutes past and future projects and activities. Past projects and activities in the area that could have been addressed include existing mining, forestry and hydro electric activities. Future projects and activities include a proposed kaolin mine and timber management plans.

Mitigation and Follow-up Monitoring

The federal EARP screening identifies mitigation measures. However, it is important to ensure that mitigation? measures are implemented. Contractors and sub-contractors must be aware of any mitigation measures required in an environmental assessment approval. Sometimes the responsible authority can require the proponent to hire an independent ‘expert’ to ensure implementation, however, the independent expert must be familiar with the project, its receiving environment and the environmental assessment. Under the new Act the responsible authority must ensure that mitigation measures are implemented.

The workshop participants also discussed the need for, and requirements of a follow-up monitoring program. While this is not required for screening under the new Canadian Environmental Assessment Act, there was a consensus at the workshop that follow-up monitoring would probably be appropriate for a project of this size. In particular, any follow-up monitoring program should have clear objectives that relate back to the ‘valued ecosystem components’. As well, the program should contain ‘action levels’, so that if the results of the follow-up monitoring program indicate that the project is causing an unacceptable effect in one of the ‘valued ecosystem components’, then specific remedial or preventive measures must be implemented by the proponent.

For the Mattagami project, one of the conditions suggested by the Department of Fisheries and Oceans is to establish a multi stakeholder committee with representatives of Ontario Hydro, the Ministry of Natural Resources, First Nations, Ministry of the Environment and the Department of Fisheries and Oceans to resolve the outstanding issues.

Determining Significance

In the provincial environmental assessment, Ontario Hydro determined the ‘significance’ of the environmental effects by balancing the socio-economic benefits of the project with its adverse environmental effects. On the basis of this balancing, Ontario Hydro determined that the project was needed, despite the adverse environmental effects that it would cause. This approach could not be used under the Canadian Environmental Assessment Act because significant adverse environmental effects can only be justified in a public review process (mediation or panel review), *not* by the proponent. The responsible authority is always responsible for determining significance.

In conclusion, the workshop participants agreed that although Ontario Hydro had not really examined the cumulative environmental effects of the Mattagami project, the approach outlined in the draft Reference Guide could be used to do this.

4. ENVIRONMENT CANADA PROCEDURES FOR ASSESSING CUMULATIVE ENVIRONMENTAL **EFFECTS** DURING SCREENING

Environment Canada is currently developing Departmental procedures to implement the new Canadian Environmental Assessment Act, including the requirement to assess cumulative environmental effects. A representative from Environment Canada (HQ) described the Department's responsibilities under the new Act, outlined its procedural aspects and discussed the relationship between headquarters and the regional offices. These three issues were illustrated using Figures 1, 2 and 3, respectively. It should be noted that the figures originate from documents that are still under review and that Figures 1 and 2 are schematic interpretations and simplify the environmental assessment process somewhat.

FIGURE 1
ENVIRONMENT CANADA RESPONSIBILITIES

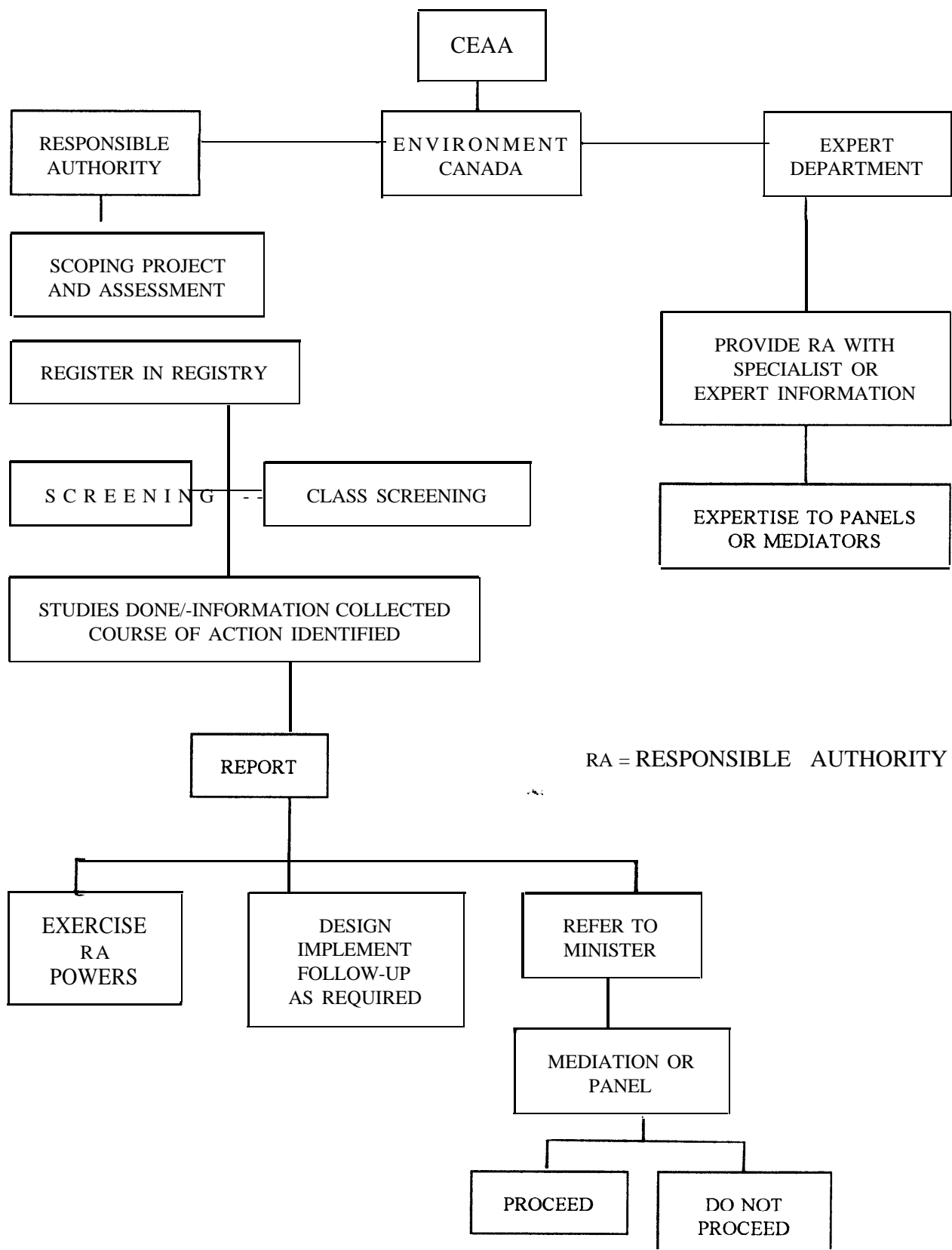
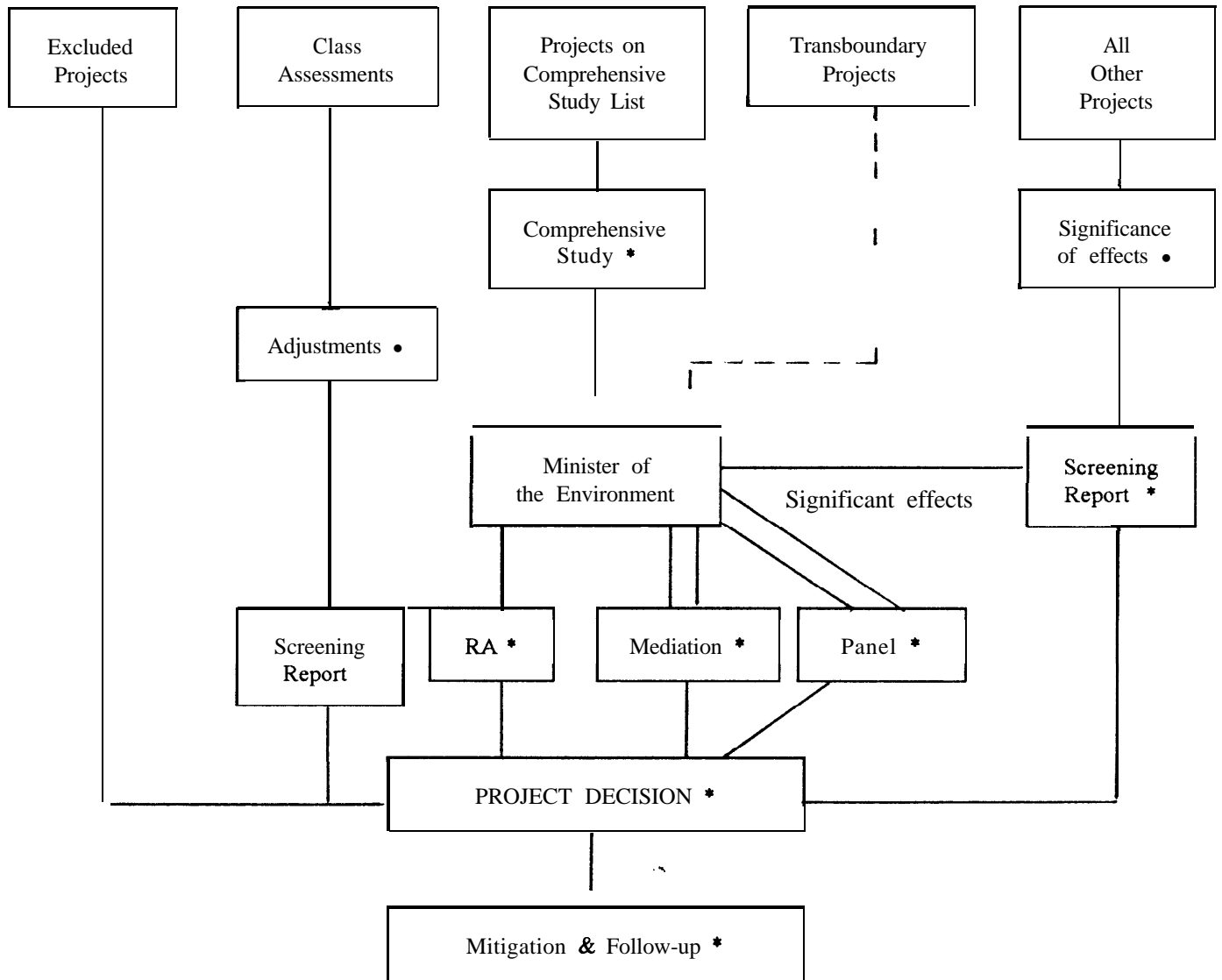


FIGURE 2

A SIMPLIFICATION OF THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT PROCESS



*Cumulative environmental effects considered

FIGURE 3

CORPORATE RESPONSIBILITIES FOR ENVIRONMENTAL ASSESSMENT
IN ENVIRONMENT CANADA

ADM C&P and other ADM's Accountable for Compliance (line management)



- Facilitate Environment Canada Compliance with CEAA
- Evaluate Environment Canada Effectiveness in Implementing CEAA
- Developing National Policies Procedures and Training for CEAA
- Liaison with DOE Legal Services
- Liaison with FEARO, **OGD's**, Boards and Regional Linkages as Required
- One-window Approach with Senior Management for Development and Approval of Comprehensive Environment Canada Positions and EA Reviews

- Facilitate Regional Compliance with CEAA
- Evaluate Regional Effectiveness in CEAA
- Delivery of Corporate Policies, Procedures and Guidelines in the Region
- Liaison with FEARO, **OGD's**, Other Services for Regional Coordination of EA Delivery
- Develop Regional Environment Canada Position for Public Review
- CEAA Implementation at Regional Level

EACC - HQ

- Coordinate National EA Issues and Provide a Forum for National Consultations
- Ensure Effective Information Exchange between HQ and Regions Consistent with Communications Plan
- Integration of EA with Departmental and Service Initiatives
- Advise on Corporate EA Responsibilities

EACC - REGIONS

- Advise REG C&P on Corporate CEAA Responsibilities
- Ensure Effective Information Exchanges with HQ Consistent with Communications Plan
- Convey Environment Canada Legal and Policy Advice in the Regions
- Advise on EA Policies, Procedures and Training Strategies

5. SUGGESTIONS AND RECOMMENDATIONS TO FEARO, DOE (HQ) AND DOE/DFO (REGIONAL)

The workshop participants made several suggestions and recommendations to FEARO, DOE (HQ) and DOE/DFO (REGIONAL) regarding assessing cumulative environmental effects in compliance with the new Canadian Environmental Assessment Act. These are summarised below.

5.1 FEARO

- The Reference Guide should provide more guidance on how to apply the proposed approach for assessing cumulative environmental effects. Specifically it should include more information on methods for assessing cumulative environmental effects.
- There is a need for factsheets to explain to proponents how to assess cumulative environmental effects under the new Act.
- There should be consistency between federal and provincial environmental assessment processes with regard to assessing cumulative environmental effects. Regional environmental assessment practitioners should be involved in consultations on the federal-provincial 'harmonisation' agreements, currently being negotiated by FEARO and the provinces.

5.2 DOE (HQ)

- There is a need for nationally applicable policies, procedures and methods for assessing cumulative environmental effects.
- There is a need for guidance on the Department's role as an 'expert' department, with regard to assessing cumulative environmental effects. For example, it is likely that many responsible authorities will ask Environment Canada either how they should assess the cumulative environmental effects of a project, or expect the Department to assess the cumulative environmental effects as part of its advice.
- There is a need for responsible authorities to receive further training on how to assess cumulative environmental effects.

- There is a need for a Departmental policy on a consistent approach to defining future projects and activities that should be considered when assessing cumulative environmental effects.
- SCREENER should be updated to facilitate assessments of cumulative environmental effects.
- There is a need to review previous Environment Canada environmental assessments that addressed cumulative environmental effects either explicitly or implicitly and learn from them.
- There is a need for guidance on involving native peoples in assessments of cumulative environmental effects and accessing their traditional knowledge.

5.3 DOE/DFO (REGIONAL)

- There is a need to examine the relationship between the class assessment process of the Ontario Environmental Assessment Act and the class screening process established under the new Act. It may be possible to use elements of provincial class assessment reports in federal class screening reports.
- There is a need for regional, multi-departmental guides or class screening reports on how to assess the cumulative environmental effects of different types of projects e.g., hydro electric, roads, etc. There should be national consistency in regional guides/class screening reports.
- There is a need for environmental assessment practitioners to have better access to departmental scientists and researchers. Specifically, their knowledge and advice could facilitate assessments of cumulative environmental effects. As well, the operational need for assessments of cumulative environmental effects should be better reflected in research priorities.
- There is a need to ensure that the effectiveness of mitigation measures is documented and that this information is available to other environmental assessment practitioners.

APPENDIX A

SCHEDULE OF WORKSHOPS

<u>DEPARTMENT</u>	<u>LOCATION</u>	<u>DATE</u>
Transport Canada	Ottawa	November 10
National Capital Commission	Ottawa	November 26-27
Canadian International Development Agency	Ottawa	December 8-9
Department of Fisheries and Oceans	Ottawa	January 12
Environment Canada/Department of Fisheries and Oceans	Dartmouth	January 14-15
Environment Canada/Department of Fisheries and Oceans	Vancouver	January 25-26
Department of Indian Affairs and Northern Development	Vancouver	January 28-29
Energy, Mines and Resources	Ottawa	February 4-5
Environment Canada and other federal departments and agencies	Quebec	February 15-16
Environment Canada/Department of Fisheries and Oceans	Burlington	February 18-19

APPENDIX B

ENVIRONMENT CANADA - ONTARIO REGION WORKSHOP AGENDA AND LIST OF PARTICIPANTS

WORKSHOP AGENDA CUMULATIVE ENVIRONMENTAL EFFECTS AND SCREENING UNDER THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)

Thursday, February 18, 1993

9:30 am - 4:00 pm

Friday, February 19, 1993

8:30 am - 12:00 noon

North Seminar Room (2nd Floor)

Canada Centre for Inland Waters

867 Lakeshore Road

Burlington, Ontario

DAY ONE

8:30 am	Welcome, Review of Agenda and Purpose of Workshops
8:40 am	Introductions
8:45 am	Update on the Canadian Environmental Assessment Act (CEAA) <ul style="list-style-type: none">• Regulations• Procedural Manual
9:00 am	Cumulative Environmental Effects and the Act
9:10 am	Review of previous workshops
9:20 am	Presentation and discussion of first case study
10:30 am	Coffee
10:45 am	Presentation and discussion of second case study
11:20 am	Presentation and discussion of third case study
12:10 pm	Lunch
1:15 pm	Presentation and discussion of fourth case study

2:45 pm	Coffee
3:00 pm	Procedures and methods for assessing cumulative environmental effects during screening <ul style="list-style-type: none"> · Setting boundaries · Examining interactions · Identifying past and future projects
3:30 pm	Group discussion on procedures and methods
4:00 pm	Adjourn

DAY TWO

8:30 am	Review of Day One
9:00 am	Applying the Approach Outlined in the Reference Guide
10:00 am	Departmental (DOE) Procedures for Assessing Cumulative Environmental Effects During Screening
10:30 am	Coffee
10:45 am	Recommendations and Suggestions to FEARO, DFO and Environment Canada
11:30 am	Concluding Remarks
12:00 noon	Adjourn

WORKSHOP PARTICIPANTS

1. ENVIRONMENT CANADA

Bob Alyea
Environment Canada
Canadian Parks Service
Trent-Severn Waterway
P. O. Box 567
Peterborough, Ontario
K9J 6Z6

Tel: (705) 742-9267
Fax: (705) 742-9644

Jim Barlow
Environment Canada
Natural Resource Conservation
Canadian Parks Service
Ontario Region
111 Water Street East
Cornwall, Ontario
K6H 6S3

Tel: (613) 938-5931
Fax: (613) 938-5785

Bill Bien*
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4948
Fax: (416) 336-8901

Pauline Brown
Environment Canada
Environmental Protection
Ontario Region
25 St. Clair Avenue East, 7th Floor
Toronto, Ontario
M4T 1M2

Tel: (416) 973-1063
Fax: (416) 973-7509

Joan Chamberlain
Environment Canada
Natural Resource Conservation
Canadian Parks Service
Ontario Region
111 Water Street East
Cornwall, Ontario
K6H 6S3

Tel: (613) 938-5937
Fax: (613) 938-5785

Fred Conway
Environment Canada
Scientific Services Division
Atmospheric Environment Service
Ontario Region
25 St. Clair Avenue East, Room 301
Toronto, Ontario
M4T 1M2

Tel: (416) 973-6074
Fax: (416) 973-1161

*Departmental contact

Rob Dobos
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4953
Fax: (416) 336-8901

Len Fal kiner
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6 rlington, Ontario

Tel: (416) 336-4947
Fax: (416) 336-8901

Kerry Dolan
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4954
Fax: (416) 336-8901

Ron Fordyce
Environment Canada
Port Meteorological Office
Atmospheric Environment Service
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6420
Fax: (416) 336-4797

Caroline Dunlop
Environment Canada
Wildlife Conservation and
Environmental Quality
Canadian Wildlife Service
Ontario Region
49 Camelot Drive
Nepean, Ontario
K1A 0H3

Tel: (613) 952-2411
Fax: (613) 952-9027

Kathleen Hedley
Environment Canada
Scientific Services Division
Atmospheric Environment Service
Ontario Region
25 St. Clair Avenue East, Room 301
Toronto, Ontario
M4T 1M2

Tel: (416) 973-6797
Fax: (416) 973-1 161

Peter Lewis
Environment Canada
Scientific Services Division
Atmospheric Environment Service
Ontario Region
25 St. Clair Avenue East, Room 301
Toronto, Ontario
M4T 1M2

Tel: (416) 954-2896
Fax: (416) 973-1161

Wayne Mitchell
Environment Canada
Canadian Parks Service
Trent-Severn Waterway
P. O. Box 567
Peterborough, Ontario
K9J 6Z6

Tel: (705) 742-9267
Fax: (705) 742-9644

Laurie Maynard
Environment Canada
Ontario Region
Canadian Wildlife Service
70 Fountain Street East
Guelph, Ontario
N1H 3N6

Tel: (519) 766-1593
Fax: (519) 766-1750

Ted Moenig
Environmental Assessment Branch
Environment Canada
Place Vincent Massey, 15th Floor
351 St. Joseph Boulevard
Hull, Quebec
K1A 0H3

Tel: (819) 953-1524
Fax: (819) 953-4093

Robert **McCrea**
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4642
Fax: (416) 336-4609

Bob Myslik
Environment Canada
Inland Waters Directorate
Ontario Region
75 Farquhar Street
Guelph, Ontario
N1H 3N4

Tel: (519) 821-0110
Fax: (519) 821-5002

Jim Norris
Environment Canada
Canadian Parks Service
Trent-Severn Waterway
P. O. Box 567
Peterborough, Ontario
K9J 6Z6

Tel: (705) 742-9267
Fax: (705) 742-9644

Jeff Robinson
Environment Canada
Canadian Wildlife Service
Ontario Region
152 Newbold Court
London, Ontario
N6E 1Z7

Tel: (519) 681-0486
Fax: (519) 686-9348

Philip Raczynski
Environment Canada
Scientific Services Division
Atmospheric Environment Service
Ontario Region
25 St. Clair Avenue East, Room 301
Toronto, Ontario
M4T 1M2

Tel: (416) 973-5850
Fax: (416) 973-5665

Hamish St. Rose
Environment Canada
Environmental Protection
Ontario Region
25 St. Clair Avenue East, 7th Floor
Toronto, Ontario
M4T 1M2

Tel: (416) 973-1809
Fax: (416) 973-6985

John Ramsey
Environment Canada
Canadian Parks Service - HQ
25 Eddy Street
Hull, Quebec
K1A 0H3

Tel: (819) 953-8059
Fax: (819) 994-5140

Mike Shaw
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4957
Fax: (416) 336-8901

Chuck Southam
Environment Canada
Inland Waters Directorate
Ontario Region
P. O. Box 5050
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4955
Fax: (416) 336-8901

Alan Waffle
Environment Canada
Environmental Protection
Ontario Region
25 St. Clair Avenue East, 7th Floor
Toronto, Ontario
M4T 1M2

Tel: (416) 973-1809
Fax: (416) 973-6985

2. DEPARTMENT OF FISHERIES AND OCEANS

Ed DeBruyn
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6436
Fax: (416) 336-4819

Sandra George
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4870
Fax: (416) 336-4819

Laura Denick
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6237
Fax: (416) 336-4819

Gareth Goodchild
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6285
Fax: (416) 336-4819

Wayne Hyatt
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6236
Fax: (416) 336-4819

Karen McCabe
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-6235
Fax: (416) 336-4819

Debra Myles
Department of Fisheries and Oceans
Fisheries and Habitat Management
867 Lakeshore Road
Burlington, Ontario
L7R 4A6

Tel: (416) 336-4722
Fax: (416) 336-4819

3. FEARO

Carmen Drouin
Analyst, Process Development
Federal Environmental Assessment
Review Office
Fontaine Building, 13th Floor
200 **Sacre** Coeur
Hull, Quebec
K1A 0H3

Tel: (819) 953-8591
Fax: (819) 994-1469

4. FACILITATOR

Kate Davies
Ecosystems Consulting Inc.
1363 **Norview** Crescent
&leans, Ontario
K4A 1Y6

Tel: (613) 837-6205
Fax: (613) 837-7547

APPENDIX C
ENVIRONMENT CANADA
CASE STUDIES

1. PARK MANAGEMENT PLAN - PUKASKWA NATIONAL PARK. LAKE SUPERIOR

The following is based on information taken from the report entitled: 'Environmental Screening Assessment of a Park Management Plan, Review Concept, Pukaskwa National Park, October 1991, LGL Ltd.' - *"The revised National Parks Act (1988) and the Canadian Parks Service (draft policy both require that a formal review of park management plans take place every five years. A management plan for Pukaskwa National Park was last prepared in 1982, and therefore a review of the Park Management Plan has been initiated to comply with legislation and policy. Additionally, in the past few years more information has been gathered on the natural resources of Pukaskwa National Park, and recent changes in regional land use (i.e., mining and logging activities) are affecting the park's resources."* (From Introduction)

BACKGROUND INFORMATION ON PROJECT

The 'project' in the Management Plan is the development of park facilities for the benefit of the public, while protecting its unique natural resources for all time, in accordance with Canadian Parks Service's 'Park Purpose and Objectives (1991)'.

Pukaskwa National Park was established in 1978, and encompasses an area of 1,878 km² along the shore of Lake Superior as shown in Figure 1. The Park's proximity to major towns and highway access is also shown in Figure 1. The Park is representative of the Central Boreal Uplands natural regions of Canada, and the five ecodistricts included within its boundaries are shown in Figure 2. Various cultural resources have been discovered in the Park, notably the archeological sites such as the Pukaskwa Pits on the cobble beaches of Lake Superior dating from circa 1000 A.D.

The Park reflects the dynamics of a number of ecological processes such as climate, fire, insects and disease; as well as impacts attributable to man's activities. Fire and logging have had profound influences on the plants and animals in the Park; approximately one fourth of the Park was burnt in 1936, an additional one tenth of the Park was logged in the first half of the 20th century.

Some of the Park's natural resources identified as 'valued ecosystem components' (VECs) are:

Forest and vegetation

- Beach Thistle (Oiseau Bay);
- Arctic-alpine plants - Northern Twayblade and Franklin's Ladyslipper (Hattie Cove); Sweet **Cicely**, Slender Rockcress, Rough Stalk Bluegrass, Sea Lyme-grass, two other grasses, and mountain **Bilberry** (found along coast); and
- Jack Pine stand with at least four intermingled fire-initiated age classes within a relatively small area.

Fisheries and Wildlife

- Lake Trout, potentially self-sustaining (Buchanan Lake near Otter Cove);
- Great Blue Heron rookeries (on coastal islands);
- Herring Gull colonies (on numerous bald rock islands along coast); and
- Woodland Caribou (habitats along coast and on coastal islands).

Other mammals in the Park considered important include:

- Moose;
- White-tailed deer;
- Beaver;
- Timber wolf;

- . Black bear;
- . Lynx; and
- . Red fox.

The designated environmentally sensitive areas and management ones, identified to help protect the VECs in the Park, are shown in Figures 3, 4 and 5. The Zone 1 sites require 'Special Preservation'. Motorized access is allowed to Zone 4 areas. There are two areas of non-conforming use - the potential access route and docking facility associated with the mineralized zone near Playter Harbour, and an Ontario Hydro transmission corridor located in the northern and northwestern portion of the Park. By agreement, Ontario Hydro has access to this corridor via the Umbata and Regan Roads off Highway 176.

Park uses and activities include hiking/walking, canoeing, boating, camping, nature observation, photography, sightseeing, picnicking, sport fishing, swimming, cross-country skiing, and snowshoeing. In 1990, over 18,000 people used the Park; of these, over 10,000 used the campground, over 6,000 used the day use facilities, and approximately 1,700 visited the backcountry.

Hunting and trapping is not allowed, except by members of the Robinson-Superior Treaty Band who traditionally engaged in these activities.

The location and extent of Park facilities and structures are shown in Figures 6 and 7. Access to the Park is controlled at Hattie Cove where the day use facilities are located. Uncontrolled access is via- the Lake Superior shoreline, Pukaskwa and White Rivers, and several backcountry roads.

As the Park does not include complete watersheds, impacts from activities adjacent to, and upstream of the Park, can have significant impacts on VECs within the Park.

- Of particular concern is mining activity at the **Hemlo goldfield** (described as the single largest gold deposit in North America). Treated effluent from the mining activity will be discharged to the White River watershed.
- Other mining exploration and development is occurring along the eastern Park boundary near Mishubishi Lake. The major short term impact of this activity is to increase Park access at Widgeon Lake.
- Forestry activity near the boundaries of the Park are also of concern. Concerns are: increased Park access, decline in water quality, increased fire hazard, herbicide drifting; and in particular, the 'island effect' caused by clear cutting and the resultant isolation of the Park ecosystem.
- Potential for hydroelectric development at Umbata Falls, White River.
- Pulp and paper mill effluent discharges to Lake Superior from mills at Marathon and Terrace Bay could potentially affect coastal ecosystems.
- Sport fishing along the Lake Superior shoreline of Park, particularly in May, causes a disturbance to Zone 1 areas and competition for coastal trail campsites.
- Acid precipitation, originating from outside the area could adversely affect forests and the poorly buffered lakes and streams in the Park.

PROPOSED OPTIONS

The proposed Park developments will not be carried out if the impacts identified during screening cannot be mitigated to adequately maintain the integrity of the ecosystem.

Proposed Park developments include:

- Coastal Marine Operation Base at Pulpwood Harbour;
- Small Group Wilderness Campground;

- Expanded Parking in Hattie Cove Area;
- Limited Trail Development in the Hattie Cove Area;
- Loop Trail Development for the White River Area;
- Backcountry use:
 - Coastal corridor (semi-primitive facilities)
 - White and Pukaskwa River corridors (primitive facilities)
 - Lurch-Birch-Louie Lake area and interior activity area (primitive facilities); and
- Designate Otter Cove as Aircraft Landing Point in Park.

Developments/activities outside the Park, which have a potential impact on the Park ecosystem:

- New developments may be subject to an environmental assessment or screening by provincial and/or federal agency.
- Options are limited for existing developments/activities.

MAJOR ISSUES/CONCERNS IDENTIFIED BY SCREENING

- Potential for adverse effects on ecosystem if the location of the development is not carefully chosen, and if construction is not carried out in environmentally sound manner.
- In the long term, improved access to environmentally sensitive areas, could severely degrade that ecosystem. Also, increased use of all facilities could potentially overload assimilative capacity of the ecosystem along proposed development corridors.
- Noise disturbance from aircraft operations at the Aircraft Landing Point and its effect on wildlife.

- Sedimentation from infilling required for Pulpwood Harbour development, and potential for fuel and sewage spills during operation.
- Increased risk of forest fires due to more camper activity in backcountry areas and other areas with increased access.

MITIGATION OPTIONS (FOR RECOMMENDED ALTERNATIVE)

- Careful siting of facilities, trails and temporary work areas.
- Application of environmentally sound construction techniques.
- Use of hardened trail surfaces in appropriate areas and barriers to discourage off trail diversions.
- Education of the Park visitors on the sensitivity of the Park ecosystem and on environmentally responsible behaviour. Regulation of camp fires.
- Monitoring to detect impacts before they become significant, and modifying development/activity to reduce potential impacts.

POTENTIAL CUMULATIVE IMPACTS (IF NOT FULLY MITIGABLE)

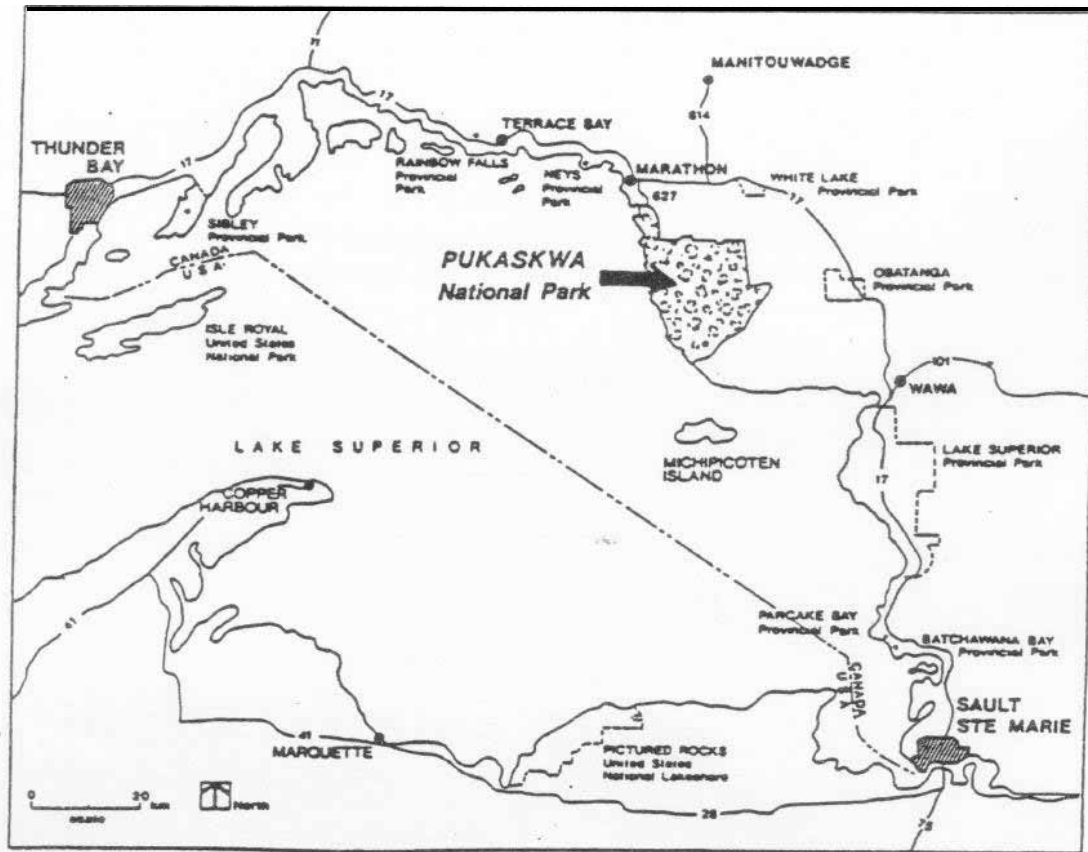
- Increasing isolation/fragmentation ('island effect') of ecosystem by trail system and facilities; and by forestry and mining activity external to Park.
- Degradation of fringe areas of trails, campgrounds and other facilities; if cumulative disturbances exceed the natural assimilative capacity of the affected ecosystem.
- Impacts on ecosystem due to other activities external to the Park (mining, forestry, fishing, hunting, etc) in combination with Park activities.

SCREENING DECISION

- Further trail development at Hattie Cove is not desirable due to significant impacts.
- Impacts due to development in other areas are insignificant or mitigable. A data deficiency in the backcountry areas precludes a comprehensive assessment on the sensitivity of the ecosystem to development.
- Options are limited for developments, forestry, and other activities outside the Park boundaries. It will be necessary for Parks Canada to communicate with the responsible mining and forestry companies; and with the relevant provincial agencies, in order to develop institutional arrangements to minimise adverse impacts on the Park.



PUKASKWA NATIONAL PARK IN ITS CANADIAN CONTEXT



PUKASKWA NATIONAL PARK IN ITS REGIONAL CONTEXT

Figure 1. Location of Pukaskwa National Park (from Canadian Parks Service 1989).

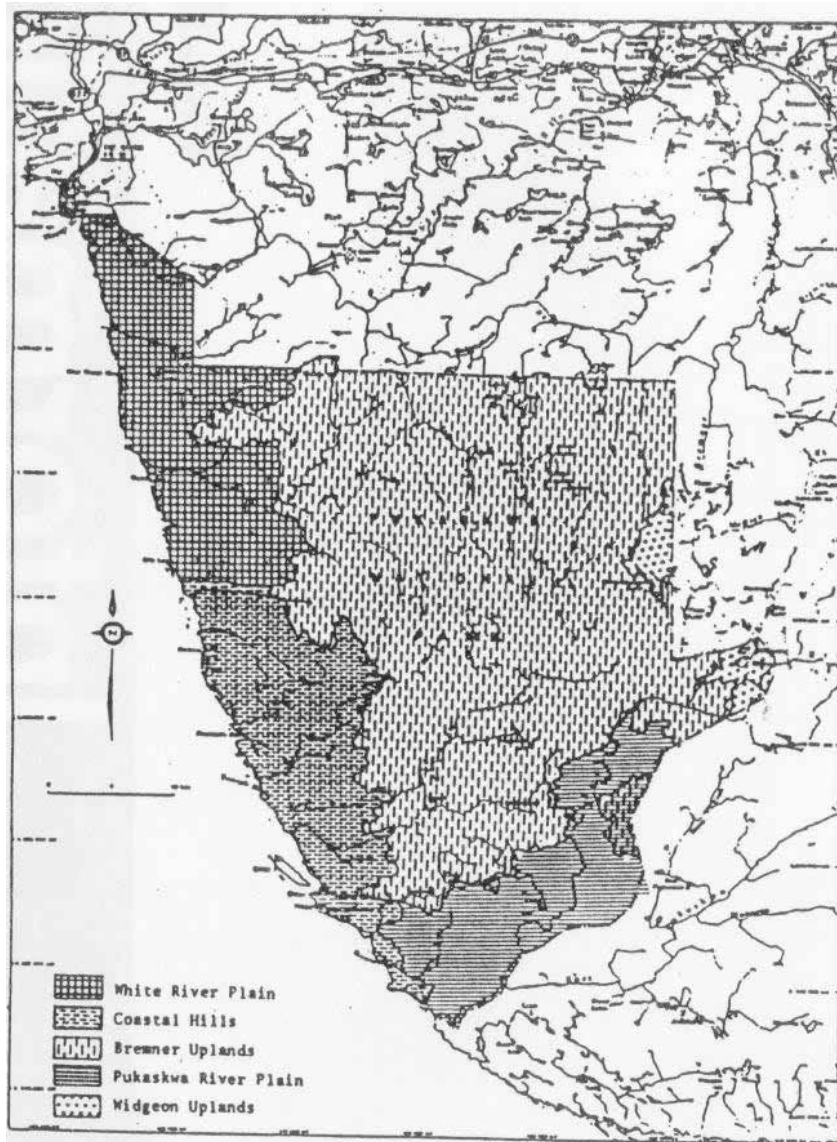


Figure 2. Ecodistricts of Pukaskwa National Park (from Canadian Parks Service 1989).

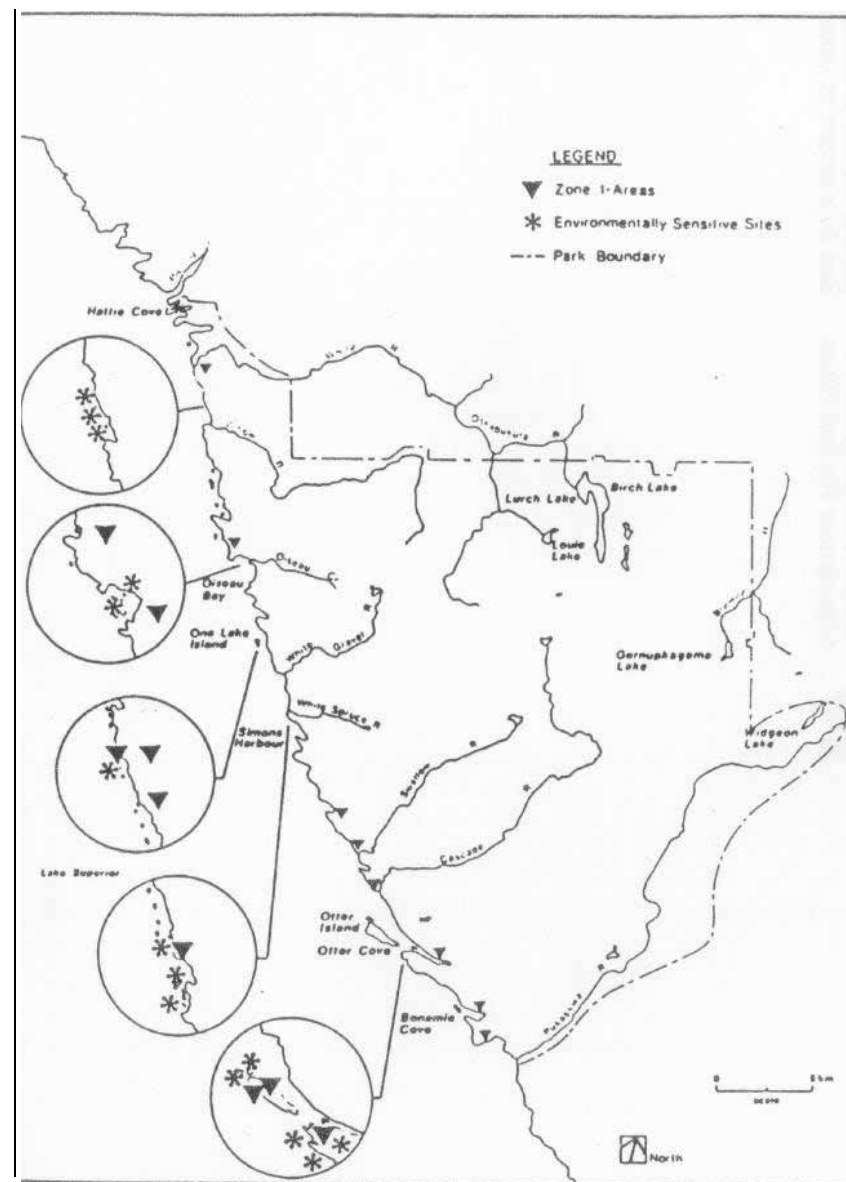


Figure 3. Existing Zone I Areas and Environmentally Sensitive Sites (from Canadian Parks Service 1989).

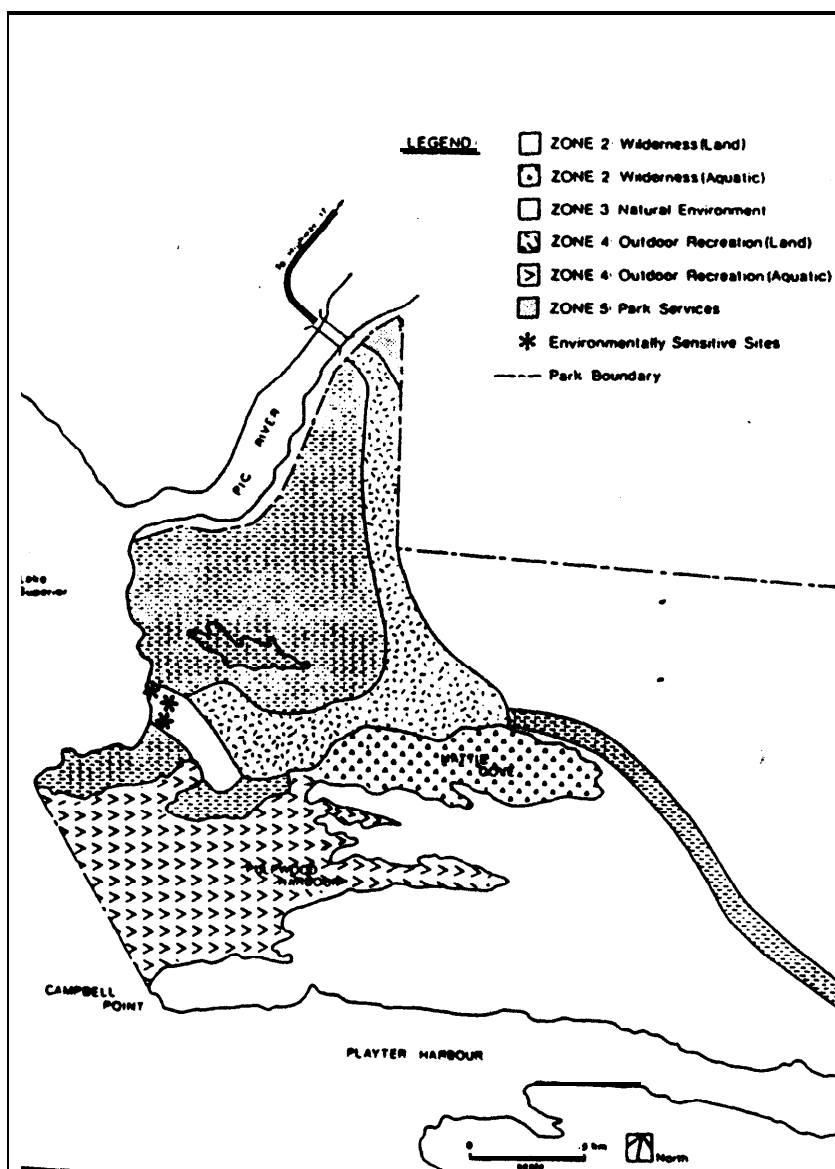


Figure 4. Existing zoning plan for Hattie Cove (from Canadian Parks Service 1989).

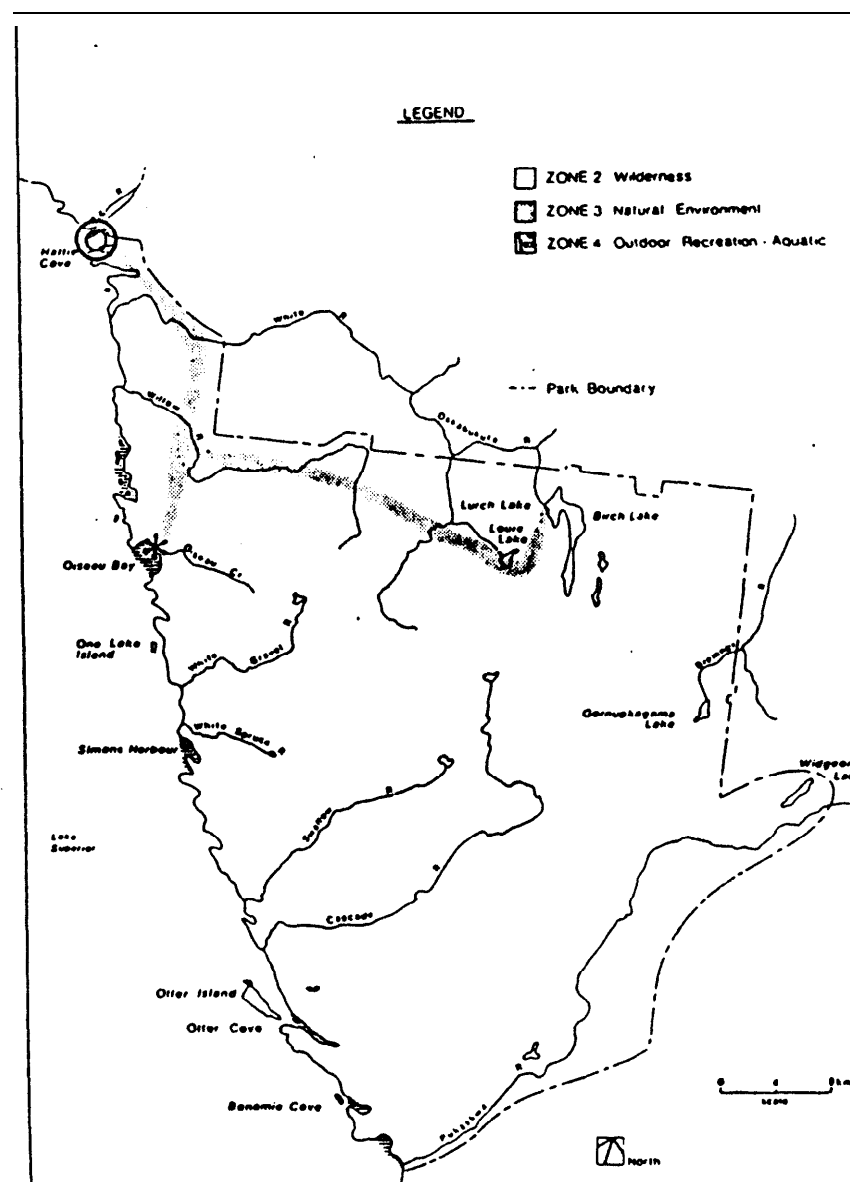
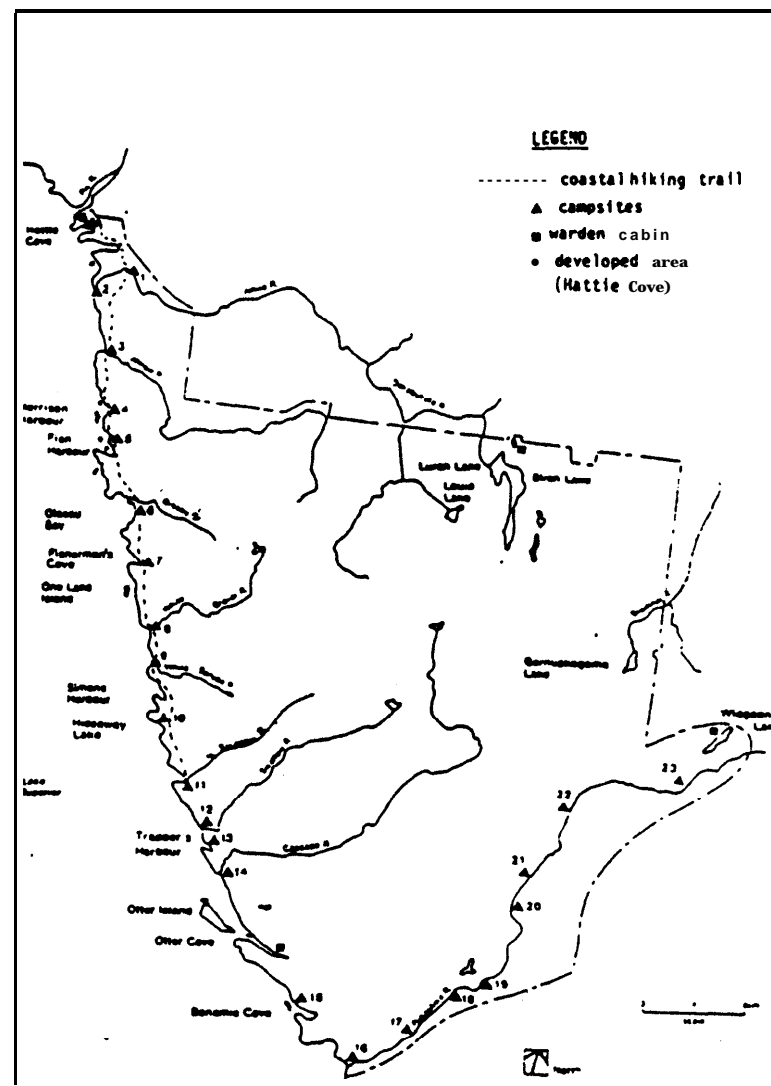
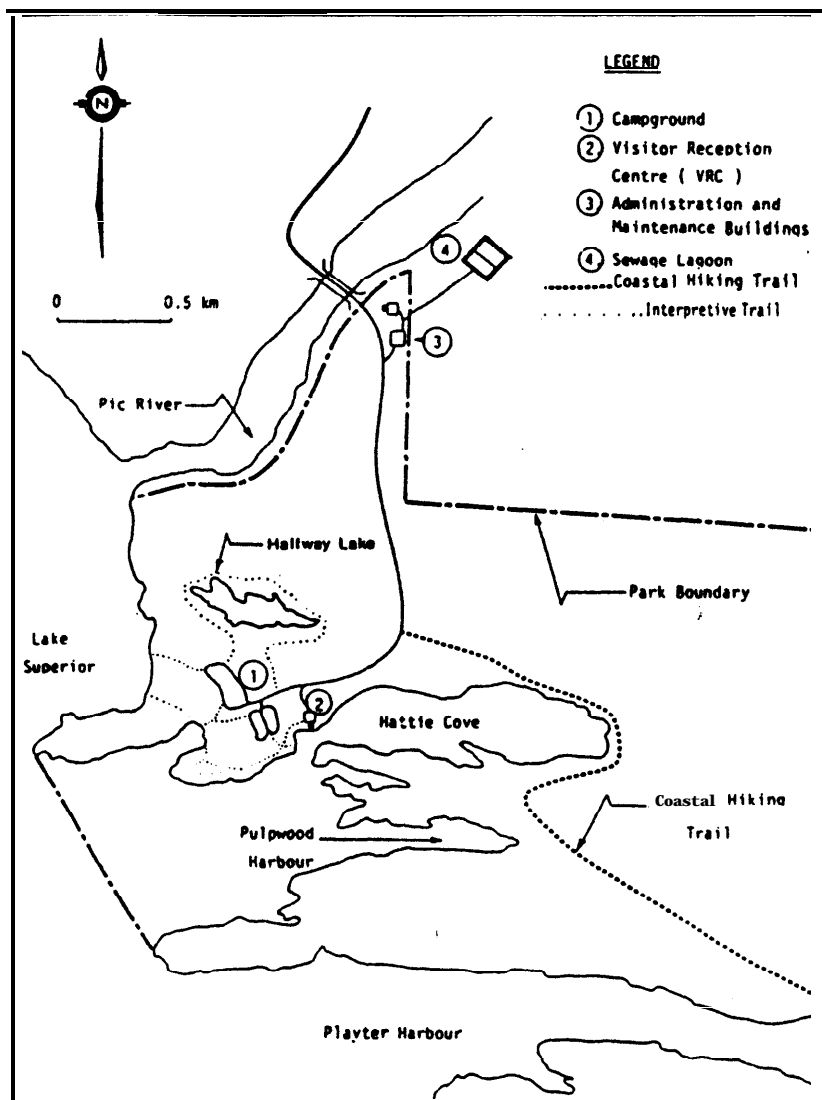


Figure 5. Existing zoning plan, Zones II to IV (from Canadian Parks Service (1989). Zone I areas are indicated on Figure 3; detailed zoning of Hattie Cove is shown in Figure 4.



2. IN-WATER WORKS APPROVED UNDER HERITAGE CANAL REGULATIONS - TRENT-SEVERN WATERWAY

The Trent-Severn Waterway is actively involved in review of in-water works proposed for the major recreational waterbodies of south-central Ontario. This role results from regulatory authority under the Heritage Canal Regulations of the Department of Transport Act and land management responsibilities for the federal beds of the waterbodies comprising this Historic Canal.

During the past ten years, Waterway staff have greatly increased their technical and professional ability to review in-water works. Up to 2,000 applications for proposed works are reviewed annually. These works are almost always proposed by an outside proponent. They may be for an individual owning a shoreline recreational property. Docks, boathouses, retaining walls and dredged access are the common types of projects. Some municipal projects are occasionally reviewed, such as an outfall for storm water run-off or for a sewage treatment plant. Sometimes, such approvals are part of a much larger project which includes upland property under municipal jurisdiction e.g., shoreline subdivision requiring water access, a communal docking area, and **outfalls** for storm waters.

It is in the context of workload, complexity and operational implementation that this paper will be presented. Staff find they are being challenged to keep up with existing workload under the many new procedures and policies being implemented. Complexity occurs at the Waterway because of the multi-jurisdictional nature and heightened involvement of articulate and concerned interests including the many aboriginal peoples residing along the Waterway. This complexity adds to the care and thoroughness with which environmental assessments must be undertaken. Additional considerations of incremental impacts may exceed the ability of staff to continue providing excellent service.

This session addresses cumulative impacts for a large federal area of land management responsibility. The area is under intensive pressures for development and use. Direct and penetrating questions are raised, including:

- What consideration of cumulative impacts must be made by an individual property owner as the outside proponent, and/or of the municipal or provincial agency which may also be involved?
- What role must or should the federal government take in extending its review to areas of jurisdiction normally thought of as being delegated to Ontario?
- What consideration must be given to riparian rights?
- Are there any 'teeth' to ensuring compliance and monitoring by the proponent, and is enforcement a viable option?
- Is the federal government adequately prepared to deal with socio-economic consideration of aboriginal people in a heavily settled part of southern Ontario? and
- As provincial agencies continue to diminish their involvement in providing advice but increase in their enforcement actions, will the federal land manager be placed in an increasingly awkward position?

BACKGROUND

The Trent-Severn Waterway is an Historic Canal within the Canadian Parks Service. Approximately 4,500 kilometres of shoreline occur in a corridor of federally administered waterbodies linking Lake Ontario (Bay of Quinte) to Lake Huron (Georgian Bay). Along this corridor are approximately 90,000 shoreline properties.

The federal lands administered by the Waterway include 38 lakes and rivers covering approximately 1,500 km². These waterbodies include 260 wetlands, some of the best fishing areas in Ontario for warmwater species, and many shoreline and underwater cultural resources including a nationally significant underwater archaeological site.

Designated by the Historic Sites and Monument Board as being of national importance, the Trent-Severn Waterway is mandated to protect the natural resources and historic resources within its jurisdiction. The Waterway takes the lead role in coordination of review and

approval or proposed in-water works, and to protect wetlands, natural shorelines and navigation. Other federal and provincial agencies are involved for their particular expertise or specific jurisdiction. However, such involvement is in a streamlined and **centralized** process which avoids an overly complex, costly and cumbersome bureaucratic approach.

While not as stringent in ensuring protection and presentation as for the National Parks, Historic Canals such as the Waterway nevertheless have a highly visible and potentially pivotal roles. In ecosystem management and protection, four roles are present:

1. A regulatory role by virtue of the Heritage Canal Regulations. This gives the Superintendent the power to **direct** others, and to approve in-water works specified as being either a ‘dredge or fill operation’;
2. A land management role for the beds of these waterbodies and those upland properties including lockstations and reserve lands. While some administrative arrangements have been made with Ontario to largely divest the federal role regarding Lakes Simcoe and Couchiching, the remainder of the navigable portion of the Waterway is clearly vested as federal lands;
3. Water level management role by virtue of the 126 dams in two watersheds (Trent and Severn watersheds) which control the level and flows of the 38 navigable waterbodies and 45 reservoir lakes and associated rivers; and
4. Lead agency on behalf of Environment Canada in the Severn and Trent watershed, demonstrating environmental stewardship and commitment to local implementation of the Green Plan and federal policies affecting wetlands, fish habitats, water quality and other environmental resources.

CUMULATIVE IMPACTS

Computer modelling is underway of some limits to capacity and cumulative environmental impacts. Cumulative impacts of concern to the long-term protection and enjoyment of the natural resources comprising the Waterway, include:

- Congestion of boat traffic, and impacts upon a safe and enjoyable use of the water surface by a variety of recreationists;

- Algal blooms and eutrophication caused by excessive nutrient loading. These nutrients are a major environmental problem, originating from run-off from a variety of sources, including storm water outfalls, and decay of aquatic vegetation treated with Reglone A, malfunctioning or overcapacity of sewage treatment plants under license through the outfall being on the federal bed, and backwashing of water treatment plants similarly under license;
- Unauthorized dredging or filling as a result of encroachment from new development, or more likely, an individual property owner in a previously approved development who pleads 'ignorance' of the law in the event he/she is caught;
- Fragmentation of ecosystem components and decreased biodiversity which threaten the long-term stability of aquatic ecosystems;
- Increased demand on municipal services (e.g., waste disposal site, roads) as a result of federal approval for the in-water portion of an upland development. This can affect the quality of life, and may be a strong incentive for local residents to take action in opposition of a planned development;
- Increased demand upon federal services and concurrent stressing of the ability of the federal agency to effectively deliver its services to existing clients;
- Additional development at the same or adjacent site once services are in place, thereby causing additional nutrient loading, incremental encroachment, visual impacts and increased demand upon municipal service;
- Toxins which are too expensive or difficult to remove from an approved process or facility e.g., organochlorines in discharge of sewage treatment plant or process water as licensed by the Waterway, Reglone A by-products, creosote from railway ties, arsenic and other materials from other types of preserved wood;
- Additional uses beyond ability of resource management agencies e.g., approval of a resort in area where fishing is already difficult to monitor or control and the fish stock is declining; and
- Socio-economic impacts upon aboriginal people living in the six reserves beside the Waterway. Decreased are the distribution and abundance of the natural resources (wild rice, fish, furbearers) of traditional value to them.

STUDY AREA - SOCIO-ECONOMIC CONSIDERATIONS

The Waterway is adjacent to the Golden Horseshoe, and is the single most important tourist attraction in east-central and north-central Ontario. The Kawartha Lakes, Lake Simcoe and Severn River together comprise one of the major boating areas in Canada.

The workload and complexity of reviewing such works are already very demanding. Substantial political involvement often results, as well as added responsibilities for dealing with 'hot' issues such as the six First Nations living along the Waterway, and federal-provincial jurisdictional differences. Recently, legal aspects have increasingly become evident as Waterway staff have begun laying charges for environmental protection, and similarly have been subject to prosecution under Provincial regulations.

In terms of the level of public awareness and interest in the Waterway, each year:

- Over 1 million land based visitors, and an excess of 250,000 boaters visit the lockstations of the Waterway;
- Many millions more appreciate the water resources as summer residents in areas separate from the lockstations;
- Tens of thousands of anglers travel to the Waterway specifically for the excellent opportunities for walleye, muskellunge and panfishes;
- Depending upon the Waterway are **10** houseboat rental companies, 145 marinas, hundred of resorts, campgrounds and trailer-parks, and five cruise line companies along with many other tourism-oriented attractions; and
- Also depending upon the Waterway are many property owners expecting to sever or subdivide additional lots from their waterfront property. Partners in this are often the local municipality, interested in the tax revenues and associated economic spin-offs.

The social importance is reflected in its use as an identity for many towns and villages. Peterborough, for example, is known as the **Liftlock** City, after the Waterway's unique **liftlock** now designated a National Historic Site. Many of these communities owe their existence and

prosperity to the presence of the Waterway. Often, the town focus and green space is provided by lockstation grounds and other Waterway lands.

The importance of the Waterway to local and regional economies is significant. Direct expenditures by land based visitors, with an average expenditure of \$76.51 per day results in spending of over \$76,500,000 per year. Boaters spend an average of \$70.82 per day, which adds \$4,378,700 to local economies. As multiplier effects take hold, the economic benefits increase. Much of these expenditures rely upon the environmental quality and attractiveness of the Waterway.

The importance of the Waterway to the six Indian Reserves is only now beginning to be understood as co-management proposals and federal fiduciary responsibilities are being articulated.

MAJOR ISSUES/CONCERNS

The Trent-Severn Waterway has a relatively small program in resource management and protection which is not commensurate the tasks at hand. To be a responsible regulatory authority and a leader of environmental stewardship, staff face burn-out and frustration from dealing with new initiatives under the Green Plan and other programs at a time when they are only able to do less as a result of diminishing fiscal and human resources.

Water quality and fish populations of the Waterway are increasingly showing stresses. Shoreline development and recreational uses are increasing. Ironically many of the recent shoreline residents and users are demanding that measurable improvements be undertaken regarding water quality at swimming beaches, productivity of fish populations and abundance of wild rice.

During public consultation of the Waterway's Management Plan, a strong sentiment was commonly expressed regarding deterioration of the natural environment. Native leaders of Curve Lake First Nation also raised an issue of the apparent inability of all levels of

government to maintain and protect traditional resources (fish, wild rice and furbearers) and water quality. A growing awareness is evident in the inability of governments - all governments - to deliver on promises of improved environmental quality. Many shoreline residents are seeking new avenues of intervening in environmental matters. At Curve Lake First Nation, co-management is being sought of the entire waterbodies of interest to the First Nation.

The concern for real and measurable improvements in environmental quality can be placed into at least three perspectives. Put in environmental assessment terminology, there are many residual and incremental impacts which are adversely affecting existing users and will undoubtedly impair the potential for future generations to enjoy and utilize these waterbodies. From a policy perspective, however, it is difficult to clearly establish whether the proponent or regulatory agency must bear the costs and responsibility in considering such impacts. From a political perspective, various means are being sought to address these concerns, of which consideration of cumulative impacts is only one alternative. Each of these perspectives is attempting to overcome the limitations in existing processes and commitments of funds and staff.

FACTORS INFLUENCING DECISION-MAKING

In implementing any widespread program regarding cumulative impacts, recognition should be given to the often subtle and complex factors -affecting decision-making. The scope and focus of environmental assessment is affected whenever articulate individuals are able to resent their case to senior Departmental representatives, have recourse to the Courts, or use their own political influence for a hearing. Frankly put, the Trent-Severn Waterway has many such factors present.

Considerations should include:

- A. Some computer modelling and other studies regarding capacity are suggesting the current density of shoreline settlement may be exceeding the ability of some waterbodies to sustain a safe and enjoyable environment. Yet which of the existing residents is going to accept an environmental assessment requiring that he/she leave his/her property in a natural state and not use the waterfront?
- B. Many municipalities are reluctant to place adequate controls upon the size and extent of development, often waiting for clear directions from more senior levels of government as to standards which must be adhered to for control of nutrients and surface run-off, setbacks and retention of shoreline vegetation, and protection of natural features not directly considered to be nationally or provincially significant;
- C. More senior levels of government also seem reluctant to take the necessary steps to ensure long-term protection of the natural resources from incremental impacts and residual impacts. Recent federal policies regarding fish habitat and wetlands are important improvements, as are the provincial wetland policies. These nevertheless require careful interpretation, omit many ecological aspects, and are cumbersome to enforce;
- D. Increasing recourse to Ministerial involvement and the Courts is becoming evident along the entire length of the Waterway wherever a citizen is not satisfied with the efforts made by the Waterway to protect their interests; and
- E. Several Ontario ministries are downsizing many traditional programs for environmental management, and are less involved in providing advice and assistance to other levels of government.

OPTIONS FOR PROPOSED IN-WATER WORKS

Several alternative approaches are feasible for responding to the issues and concerns, including:

Increased Referral to Other Federal Agencies

e.g., Refer all applications affecting fish habitat to **DFO-F&HM**, all wetlands related applications to EC-CWS, all contaminated sites to EC-C&P. This

would be regardless of the severity or significance of the issue.

Require Proponent to Undertake More Comprehensive EAs Including Public Consultation. and More Expensive Mitigation

e.g., Every private property owner proposing a hardened shoreline must undertake the studies needed to demonstrate no adverse cumulative impacts.

Bond posted for environmental compliance, certified 'expert' to document compliance (at expense of proponent), 'Cadillac' mitigative measures rather than 'volkswagen'.

Inform local municipalities of this program, and brief **MPPs** and **MPs** so as to increase their understanding and attempt to encourage their support.

Increase Staffing and Undertake a More Aggressive Monitoring Program and Enforcement

e.g., Withhold approval where past compliance is documented, even if a previous owner of the property actually did the unacceptable work.

Remove fill, cancel **waterlot** license, require compensation through agreement with **DFO-F&HM** or whoever will handle wetlands.

Lay information against consulting company, contractor and/or other government agency where they are involved in illegal undertakings.

Use **Technology** to Become More Efficient in Decision Making

e.g., Develop a comprehensive geographic information system and expert system (such as **SCREENER**) related to approval of in-water works.

Require a higher educational standard for local staff who would increasingly represent the headquarters, or provide training.

Increase capital expenditures for resource management studies, ecosystem monitoring, and natural resource management plans.

Just **Say No** and Do Not Entertain Any Further Discussion of a Proposed Development

e.g., Develop zoning, comprehensive guidelines for water use, and **site-specific** policies similar to Official Plans.

Where an area is too sensitive, clearly indicate no further consideration will be given to development proposals.

From a human resource perspective, some relief from the workload and cumulative pressures is needed. If some of these alternatives are not implemented, a question arises of whether existing staff should endeavour to subsidize through extra-ordinary efforts the inherent inability of the government to effectively deal with the underlying problems.

IMPLICATIONS FOR SCREENING DECISIONS

The above discussion provides the context in which screening decisions may be made. Each proposed in-water work taken in isolation can be given an adequate level of scrutiny and care to details. Cumulatively, the available human and fiscal resources may be unable to effectively address the needs. While advice is being given to be thorough and check with others (FEARO, 1992), this is not always practical with the existing level of human and fiscal resources. Inevitably, some procedural error or mistake will result, or extensive discussions will be needed with less supportive persons either at more senior levels in the agency or from the political realm.

While the Department states that it encourages risk taking, this appears to be only acceptable in some instances. Perhaps the risk of attempting to do too much for cumulative impact assessment may result in staff not making acceptable decisions from either a process, policy or political perspective. While there is a need for someone to be the 'guinea pig' in developing standards and setting precedents, perhaps this should be other than those who traditionally have tended to be at the forefront of implementing environmental protection.

More screening decisions may end up being referred to more senior positions in offices at Burlington, Toronto or Ottawa. Any complaints from the applicants regarding the delay and costs to them would similarly be referred, as would any Ministerial inquiry. While it may be questionable as to whether the quality of environmental protection is being enhanced, this is a system of accountability which places the onus upon those providing functional direction and policies.

SUMMARY

Many proposed in-water works involve complex jurisdictional overlaps. Consistency in policy and standards within any level of government is not necessarily present. Coordination between levels of government can become a very challenging task, particularly if the levels of government are not agreeing on the fundamental principals by which each is attempting to implement sustainable practices and ecosystem management. Referral to more senior levels of the Department or elsewhere in the federal government may assist them in understanding the complexity of these issues and providing clearer direction.

As with any referral, Waterway staff would take particular care in ensuring that all available information are presented, and in ensuring that every opportunity is made to bring attention to promises of the Green Plan, Remedial Action Plans, and other initiatives that are emerging. Some considerations include:

- Concerns for cost of delay and environmental studies to be born equally, regardless of whether a ‘little guy’ or ‘influential persons’ are involved, or even another governmental agency;
- Catching the big cumulative impacts and deliberately ignoring the little cumulative impacts which incrementally may be more a factor in changing environmental quality;
- Encouraging compensation, thereby allowing less **rigor** in the assessment provided some net benefit accrues to **establish** priorities e.g., enhancement of fish habitat without consideration of other habitat needs;
- Requesting that research scientists and other ‘experts’ clearly state a position as to whether or not sufficient information is available for a scientific, defensible decision;
- Ensuring referral wherever Aboriginal people are involved. Such referral would be based upon the potential for adverse socio-economic and cultural impacts which require careful consideration of the consequences and accountability.

While the above are only possibilities, they are indicative of some of the issues involved in reaching a decision during the screening stage. Perhaps sufficient standards and detailed guidelines will be available to fully implement the consideration of cumulative impacts. Perhaps there will be a sufficient increase in fiscal and human resources to ensure that an adequate review is undertaken of each and every application. For without such signs, some staff may question whether there is a sufficient commitment and support for them to take on yet another responsibility.

3. MODIFICATIONS TO THE UPPER NIAGARA RIVER

BACKGROUND INFORMATION ON PROJECT

The Niagara River is an International Boundary water and any activities affecting the water levels, water quantity and quality fall under the Boundary Waters Treaty 1909 administered by the International Joint Commission in addition to the other federal and provincial legislation having jurisdiction. However, this has not adequately controlled the construction of 'minor' modifications to the river shoreline. Provincial and federal agencies have generally been unsuccessful in preventing infilling in the upper Niagara River. Federal involvement is usually limited to Transport Canada (Coast Guard), and Fisheries and Oceans Canada, who review applications for licenses under the Navigable Waters Protection Act (NWPA), and Fisheries Act, respectively. More stringent requirements for EARP screening, and the advent of Bill C-13, will likely result in more federal control of infilling and other development activities.

During the recent past (from 1970), **infilling** activity on the Niagara River shoreline near Fort Erie has received close scrutiny by Environment Canada and the United State Army Corps of Engineers (in support of the International Niagara Working Committee). The shoreline landfills were undertaken mainly by Niagara Hardware and Lumber Ltd. and Agrette Ltd. (Nicholl's Marina); which are located about 650 metres downstream of the Peace Bridge within the narrowest section of the river. The cumulative infilling activity in this area, from 1926 to date, have resulted in 55 metres of encroachment into the Niagara River. Full

utilization of the available shoreline water lots would increase this encroachment by 24 metres.

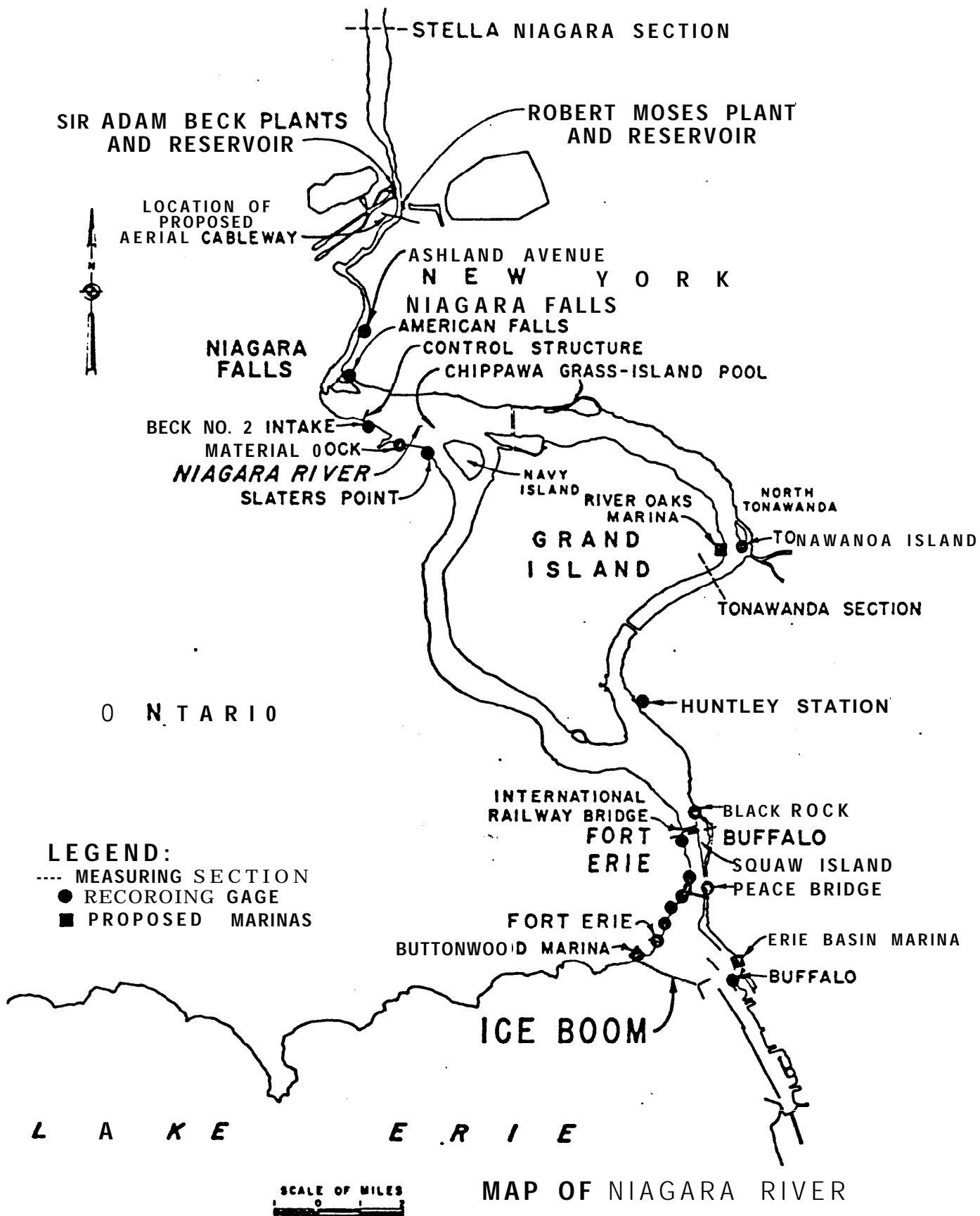
Significant modifications to the upper Niagara River have been in progress for at least 170 years, primarily to facilitate navigation (canals, docks, etc), cross border transportation (bridges), hydro-power developments, and land creation (**infilling** to utilize water lots). A map showing the Upper Niagara River is shown in Enclosure 1.

All of the Niagara hydro-power developments are centred around Niagara Falls (see Enclosures 6 and 7) and have virtually no impact on Lake Erie water levels.

The major structures and dykes constructed in the upper Niagara River from 1930 to 1969 are shown in Enclosure 6. Most of the flow from the hydro generating stations on both sides of the border, is diverted upstream of the Chippawa-Grass Island Pool control structure, and discharged at various locations downstream of Niagara Falls.

The major concerns on modifications to the upper Niagara River are presently focussed from the reach from the Lake Erie outlet to Frenchman's Creek, just upstream of Grand Island. The significant changes to the shoreline in this are, during the period 1918 to 1981 are shown in Figure 1.

The first major modification to the natural system occurred on the United States (U.S.) side of the river in the early 1800s. The first major development was the Black Rock Canal (servicing Buffalo), which was constructed around 1828 and was modified sometime after 1918. This canal ultimately diverts additional flow from Lake Erie to the Niagara River downstream of Squaw Island (See Figure 2). Additional filling has further expanded the upstream portion of Squaw Island into the river. On the Canadian side of the River the presence of several water lots along the shoreline (shown in Figure 2) has stimulated extensive infilling, as seen in Figure 1. Therefore, there is a potential threat of continued **infilling** along the shoreline to fully utilize those lots.



The River is relatively steep and narrow in the vicinity of the Peace Bridge, and it flattens and widens out appreciably downstream to the International Railway Bridge. The International Bridge was completed in 1873 and the Peace Bridge completed in 1925. Both bridges have an impact on the river hydraulics due to the piers and abutments constructed on the river bed to support the bridges. Recently CNR has applied for a permit under the NWPA to carry out repairs to the bridge piers of the International Railway Bridge. The proposed remedial works involved encasement of two undermined pier footings using steel sheet piling and mass concrete. The proposed works would increase the pier size, and consequently, its hydraulic resistance.

PROJECT OPTIONS

- | | |
|-----------------------------|--|
| Infilling - | Withhold NWPA approval, remove fill, expropriation of property and water lots, deepen channel (bedrock) to compensate. <ul style="list-style-type: none"> • Some fill already in place and buildings, etc. constructed on fill. |
| Bridges - | Mitigate further hydraulic impacts by: minimising size of piers and remedial works; deepening or widening channel. <ul style="list-style-type: none"> • Two bridges already in place. |
| Hydro Developments - | Trade offs against more costly and polluting alternatives for power generation. <ul style="list-style-type: none"> • Minimal adverse effects. • Hydro stations already in place. |
| Navigation - | Forgo economic benefit of any future canal system. Minimize any bypass flow in canal (US) (there is a proposed scheme to use the canal for emergency additional flow in times of high Lake Erie levels). <ul style="list-style-type: none"> • Canal already in place. |

MAJOR ISSUES/CONCERNS IDENTIFIED BY SCREENING

In 1983, Environment Canada carried out a hydraulic analysis on the upper Niagara River (upstream of Grand Island), in order to determine the impact of the cumulative river modifications on Lake Erie water levels. The results are summarized in Table 1, and indicated that a rise of 43 millimetres was estimated on Lake Erie, due to river modifications

from 1918 to 1983. The International Railway Bridge and the Black Rock Canal were constructed prior to the inception of the Boundary Waters Treaty (1909) and their presence were therefore included in baseline conditions.

Some impacts due to change in flow and ice regime for upper Niagara River:

- Change in Lake Erie water levels from baseline.
- Change in flow velocity, erosion and sedimentation potentials.
- Impact on hydro power generating potential.
- Impact on navigation of small craft.
- Impacts on fisheries habitat.

MITIGATION OPTIONS (FOR RECOMMENDED ALTERNATIVE)

The recommended course of action for modifications proposed to the upper Niagara River are limited to those which can maintain the status quo for hydraulic conditions. This is necessary in order to also maintain the status quo on Lake Erie where development and shoreline activity over prior years has adapted to baseline conditions and could be severely impacted by significant change. The mitigation options include, but are not limited to:

- Prohibition of land fill to critical flow areas.
- Limiting remedial work to maintain existing hydraulic resistance.
- Compensation for loss of hydraulic capacity by dredging (costly).
- Compensation for change in ice regime due to change in hydraulics (may not be feasible).

POTENTIAL CUMULATIVE IMPACTS (IF NOT FULLY MITIGABLE)

- Progressive changes in status quo of Lake Erie water levels and other physical systems impacted by water levels.
- Change in power generating potential of hydro power stations downstream on Niagara River.
- Change in micro climate due to changes in ice regime of the River or Lake Erie.

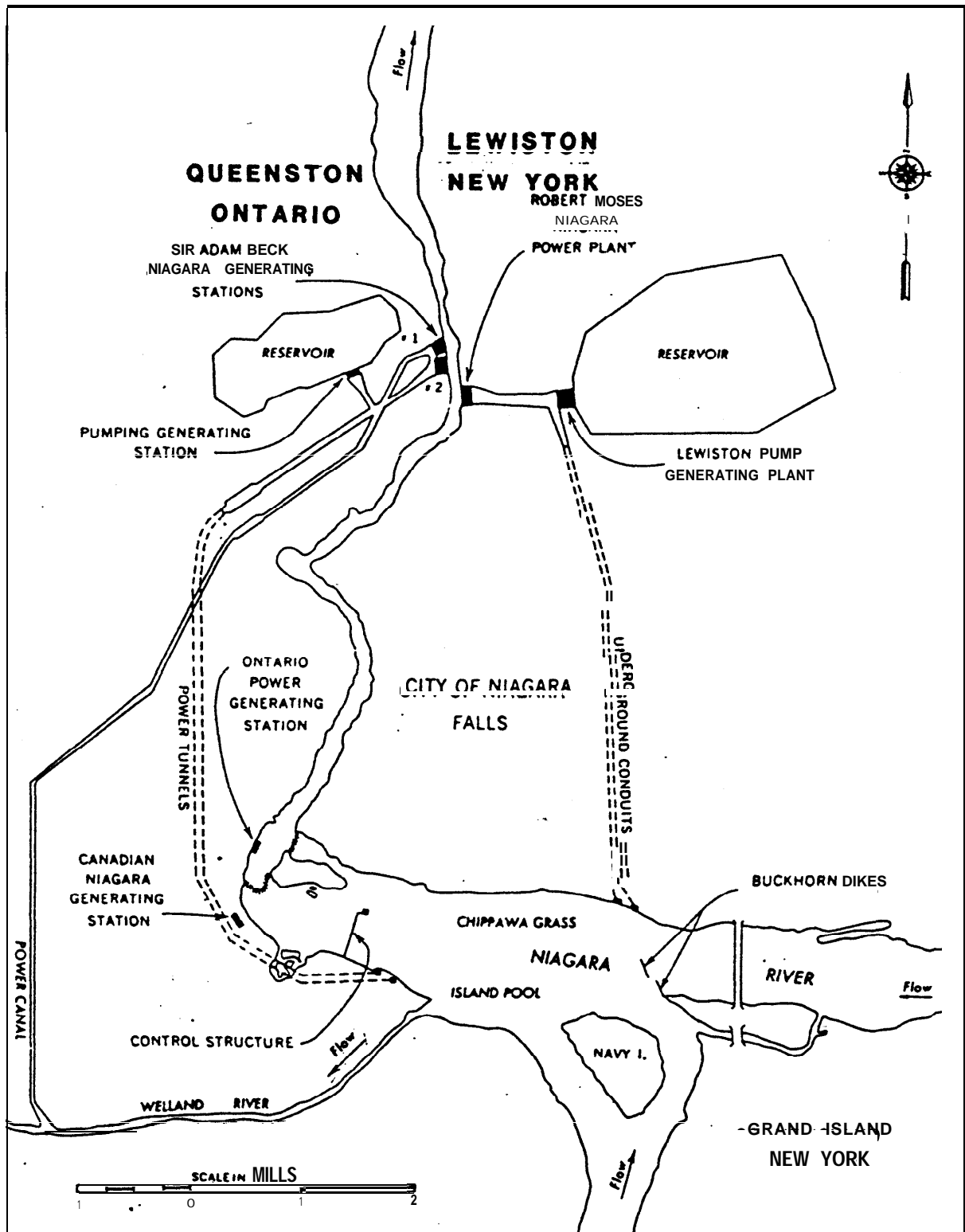
SCREENING DECISION

Status quo for river hydraulics should be maintained, i.e., no additional **infilling** should be allowed, hydraulic characteristics of structures located in the water should not be changed from that determined for baseline conditions.

- Based in hydraulic studies carried out on the river, and the need to be consistent. Infilling in some areas may not be critical to river hydraulics but approval of any **infilling** may lead to the perception that filling may be condoned at other more critical locations.
- Modified hydraulics should not affect normal ice regime.

MAJOR FILL STRUCTURES AND DYKES
IN THE UPPER **NIAGARA** RIVER
1930 TO DATE

Project	Location	Date Commenced	Date Completed
Rock Fill Weir	Chippawa-Grass Island Pool	1942	1944
Int. Control Structure	Chippawa-Grass Island Pool	1954	1957
Sir Adam Beck Diversion	Chippawa-Grass Island Pool	1954	1958
New York State Thruway	Upper Niagara River Buffalo Harbor to Sheridan Dr.	1958	1959
Robert Moses Parkway	Chippawa-Grass Island Pool	1958	3.960
Robert Moses Diversion	Chippawa-Grass Island Pool	1960	1962
Buckhorn Island Dyke	Chippawa-Grass Island Pool	1962	1962
Extension of Int. Control Structure	Chippawa-Grass Island Pool	1962	1963
Shoal Removal	Chippawa-Grass Island Pool	1963	1963
Treadway Inn Fill	Chippawa-Grass Island Pool	1964	1964
Squaw Island Fill	Black Rock Section	1969	1969



**NIAGARA RIVER DIVERSION STRUCTURES
and POWER PLANTS**

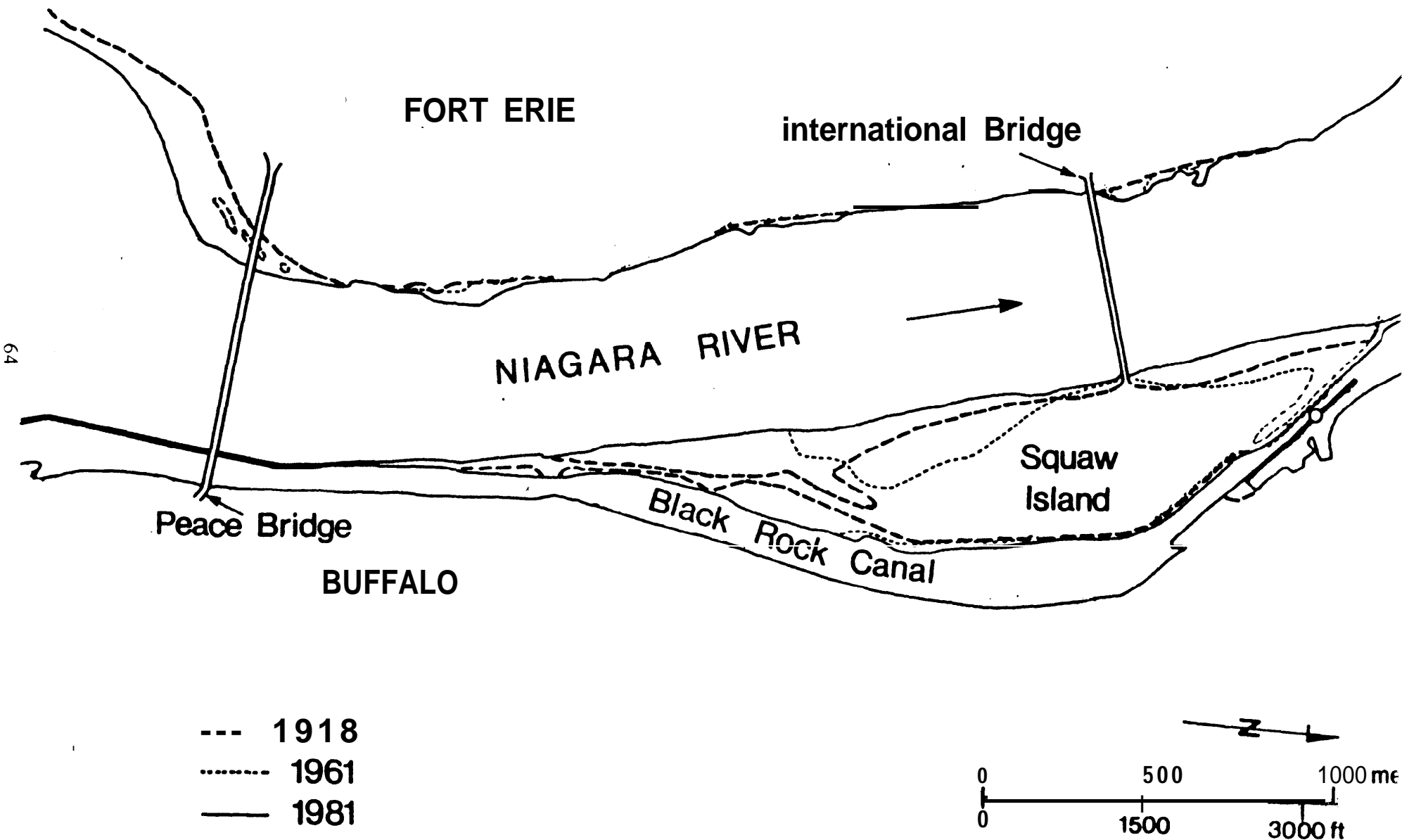


Fig.1 NIAGARA RIVER SHORELINE CHANGES , 1918 TO 1981
source : NOAA Chart 14833

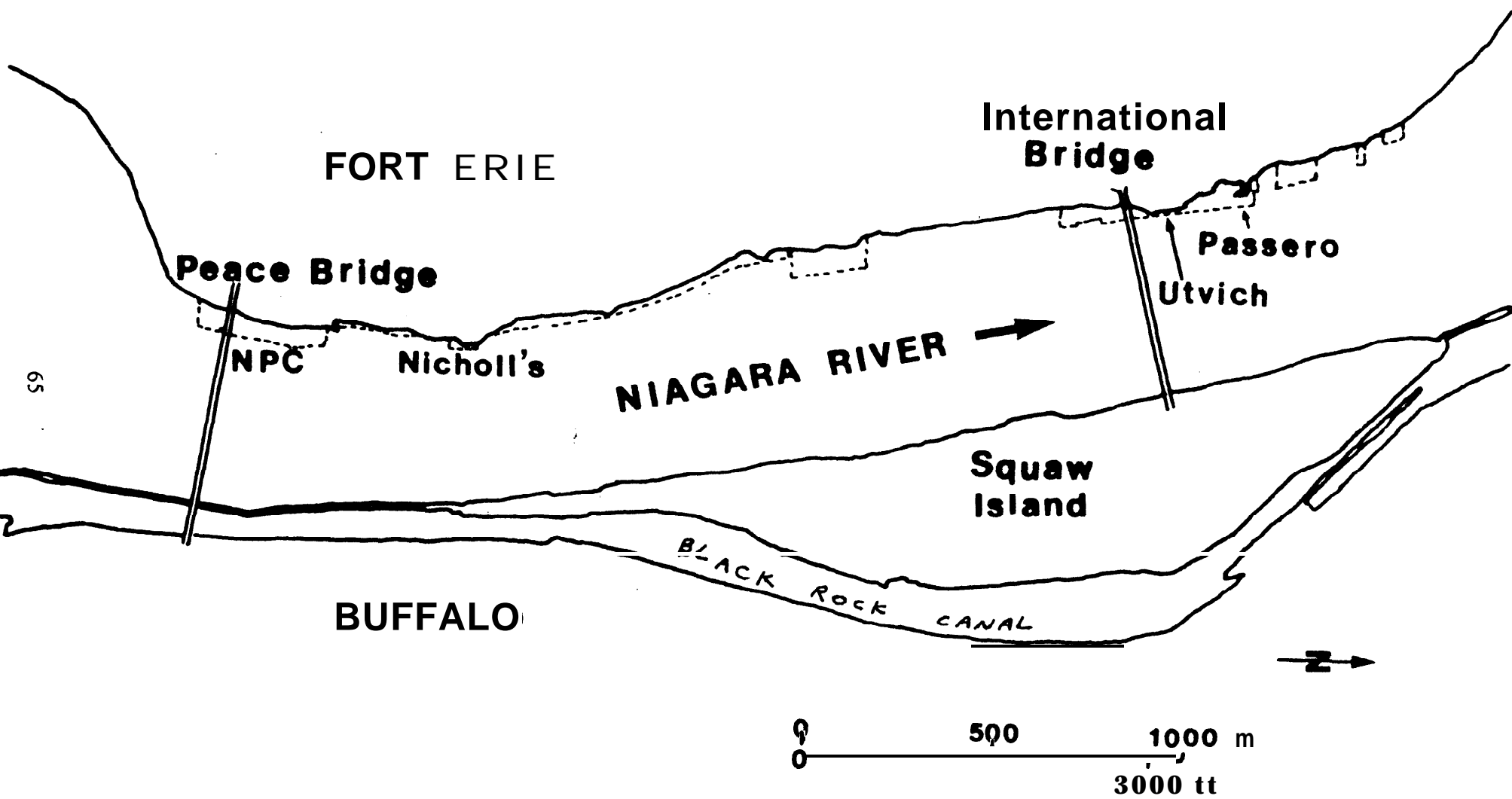


Fig. 2 CANADIAN WATER LOTS

TABLE 1

EFFECTS OF LANDFILLS ON LAKE LEVEL

<u>Scenario</u>	<u>Effect on Lake Level (foot) *</u>		
	<u>231,800</u>	<u>199,500</u>	<u>176,500</u>
1914 U.S. Shore	-0.05	-0.04	-0.04
1918 U.S. Shore	-0.01	-0.01	-0.01
1918 Canadian Shore	-0.09	-0.07	-0.06
1918 Both Sides, Peace Bridge Absent	-0.18	-0.14	-0.11
1961 U.S. Shore	-0.01	-0.01	-0.01
No Peace Bridge	-0.08	-0.06	-0.05
No International Bridge	-0.08	-0.06	-0.05
John Passero's Lot Filled	- -	- -	---
Sam Utvich's Lot Filled	+0.01	+0.01	+0.01
Nicholl's Marine Lot Filled	+0.06	+0.05	+0.04
N.P.C. Lot at Peace Bridge Filled	+0.17	M.11	+0.07
All Canadian Lots Filled	+0.22	+0.16	+0.10

* The effect is the difference between the level under the given scenario and the level under existing conditions.

All scenarios assume present condition8 and the presence of the Peace and International Bridge,, except for the conditions stated.

4. MATTAGAMI RIVER HYDRO ELECTRIC DEVELOPMENTS

The following is based on information taken from the report entitled: 'Environmental Assessments, Hydroelectric Generating Station Extensions, Mattagami River, October 1990, Ontario Hydro' - *"In December 1989, Ontario Hydro submitted the Demand/Supply Plan (DSP) Report to the Minister of Environment under the EA Act. The DSP proposed the orderly development of remaining hydraulic sites in the Province within the limits of economical, technical, environmental and social acceptability."* (From Executive Summary)

BACKGROUND INFORMATION ON PROJECT

The Mattagami River originates on the Precambrian shield carving its way through glaciofluvial silt, clay, sand and gravel, till, and sedimentary deposits (see Figure 1-2). The Groundhog and Kapuskasing Rivers join the Mattagami 20 to 30 kilometres upstream of the Little Long hydro electric generating station. The drainage area of the Mattagami River at the Kipling station is about 35,000 km². The Missinabi River joins the Mattagami River about 90 kilometres downstream, where the two rivers combine to become the Moose River. Upstream of this, the river drains a total area of approximately 60,000 km². The Moose River flows to the north where it outlets into James Bay, near Moosonee and Moose Factory.

Ontario Hydro proposes expansion and redevelopment work to several existing hydro electric generating stations (GS) located on the Mattagami River. There are (starting upstream):

- Little Long GS, constructed in 1963, 61 MW capacity (expansion);
- Smokey Falls GS, constructed in 1931, 14 MW capacity (redevelopment);
- **Harmon** GS, constructed in 1965, 68 MW capacity (redevelopment);
- Kipling GS, constructed in 1966, 68 MW capacity (expansion).

(The proposed facilities are shown in Figure 3-2 and the Mattagami River profile showing all of the existing generating stations and dams is shown in Figure 5-5).

All stations, except for Smokey Falls (base load operation), operate as peaking plants during average flow conditions. Current operation at peak output under 98% dependable flow conditions is for a minimum of five hours per day for seven days. Under current operation, the daily **headpond** levels fluctuate significantly for Smokey Falls GS (1.5 - 2.5 m), **Harmon** GS (1.5 - 3m) and Kipling GS (0.6 - 1.5**m**). Also, flows in excess of the peak plan capacity at Little Long are diverted via a manmade channel known as Adam Creek, back to the Mattagami River 17 kilometres downstream of Kipling GS. Therefore, during off-peak periods when all generators, except Smokey Falls GS, are shut down, the river downstream of these stations is reduced to a series of pools connected by shallow rapid flow through the control sections.

Downstream of Kipling GS, for low inflow conditions ($100 \text{ m}^3/\text{s}$) the water level is estimated to fluctuate by 2.7 m at the tailrace, and 1.8 m at the confluence with Adam Creek. Periods of zero discharge occur downstream of Kipling GS for up to 12 hours per day under these low flow conditions. A large volume of soil estimated at 23 to 31 million m^3 has eroded from the banks in Adam Creek over the last 30 years, producing a large delta at its mouth covering about 4.7 ha, 1 to 2 m above the Mattagami River bed.

The stations currently operate continuously during high flow periods such as spring and during flooding events when flows significantly exceed $541 \text{ m}^3/\text{s}$. After reservoirs are filled, excess flows above $541 \text{ m}^3/\text{s}$ are spilled via **the** Adam Creek division. The highest flow recorded for the Mattagami River at Little Long was $5070 \text{ m}^3/\text{s}$.

Water and Sediment Quality of the Mattagami River:

Sediments - Total mercury concentrations from 0.11 to 0.34 $\mu\text{g/g}$ versus 0.042 $\mu\text{g/g}$ in undeveloped rivers. Also, higher than normal iron levels, followed by potassium and manganese; chromium, nickel, zinc and vanadium.

Water - Somewhat degraded due to upstream pollution sources such as the Smokey Falls Pulp and Paper (SFPP) Mill (See Figure 5-12).
Some chemical parameters (COD, turbidity, total Kjeldahl nitrogen and TOC) exceed provincial guidelines.

Aggregates and Minerals in the Study Area:

Most aggregate production is used locally and not exported.
Sizable mineral deposits include kaolin, silica and iron ore. A previously active kaolin and silica mine is located close to Kipling GS (See Figure 5- 13).

Forestry in the Study Area:

Most of the study area is covered by boreal forest, except for small areas previously cleared during construction of the existing stations. Several provincially and locally significant plant species were found in the study area. Several areas in the watershed upstream of Little Long GS are allocated for commercial harvesting.
Cutting is not permitted within 122 m of the Mattagami River. The SFPP mill is located on the Kapuskasing River.

Fisheries in the Study Area:

Sports and limited subsistence fishing is carried out mainly by local anglers.
Harvest of lake sturgeon presently exceeds sustainable yield.
Prior to construction of dams, fish such as sturgeon and walleye were able to negotiate all downstream rapids as far upstream as Smokey Falls.

Fish - Thirty seven species reported; **Longnose** and white suckers most common, walleye, sturgeon and northern pike fairly common.

Wildlife in the Study Area:

Trapping of furbearing mammals: Muskrat, otter, mink, squirrel, weasel, fox, wolf and lynx (in decreasing order).

Hunting of moose mainly, but black bear and small game, including waterfowl and grouse are popular. Several tourist outfitter camps are in the area upstream of Little Long.

Mammals - Moose, caribou, black bear, red fox, weasel, otter, mink, muskrat, beaver, marten and a variety of small mammals. None of the species found were considered rare or endangered for Ontario.

Birds - Over 124 bird species historically recorded, 100 species of waterfowl, raptors and woodland birds observed. A Great Blue Heron rookery located on an island in study area. Bald Eagle identified in past - inactive nest site on Little Long headpond.

Amphibians and Reptiles - Eight species expected present, confirmed 5 amphibians and 1 reptile.

Heritage resources within study area:

Historical portage route and Hudson's Bay Company storehouse.

PROJECT OPTIONS

With redevelopment of Smokey Falls, in step operation of all of the following units is possible:

- Little Long GS, addition of 1 or 2 generating units, 61 **MW** capacity each.
- Smokey Falls GS, rehabilitation - addition of 3 x 60 **MW** units; retirement/redevelopment - replacement of existing units with 3 x 80 **MW** units.
- **Harmon** GS, addition of 1 or 2 generating units, 68 **MW** capacity each.
- Kipling GS, addition of 1 or 2 generating units, 69 **MW** capacity each.
- Construction of a wider and more durable access road, a construction camp and site storage are required for all options.

- Construction is estimated to require over 2000 person years of direct employment and cost over \$390 million.
- Proposed upgraded transmission from all downstream stations to Little Long GS with central control system installed at Little Long GS.
- Proposed operation of plants in-step (will reduce daily water level fluctuations in all headponds except Little Long, to less than 0.5 m).
- Proposed increased peaking operation during weekdays, and shutdown on weekends (would increase surges in the river and extend periods of zero flow).

MAJOR ISSUES/CONCERNS IDENTIFIED BY SCREENING

1. Erosion and sedimentation during construction and due to peaking operation.
2. Destruction, or degradation of fisheries and habitat by facility operations, and overfishing during construction.
3. Degradation of water quality due to construction activity.
4. Destruction of forestry and vegetation due to construction activity.
5. Disruption of Natives traditional activities during construction.
6. Socio-economic effects on adjacent communities during construction.
7. Preservation of heritage resources from construction activity.
8. Dislocation, disturbance of wildlife habitat, and excessive hunting during construction.
9. Further disruption to navigation (recreational canoeing - currently disrupted downstream of Kipling).

MITIGATION OPTIONS (FOR RECOMMENDED ALTERNATIVE)

The recommended alternative by Ontario Hydro is to redevelop the Smokey Falls site with a 3 x **80 MW** station; and extend other sites by one additional generating unit. All sites

would therefore be capable of utilizing a similar flow volume for power generation and be able to operate in-step.

Presented in same numerical sequence as above screening concerns:

1. In-step operation reduced **headpond** water level fluctuations for all reservoirs except Little Long. Spill flows (and erosion) in Adam Creek reduced due to increased plant capacities.
2. Fisheries habitat in reservoirs enhanced due to (1). Increased flow in Mattagami River downstream of Little Long GS. Increased water level fluctuations however.
3. Known mitigation techniques applied to reduce potential degradation impacts.
4. Careful selection of temporary work and camp sites to minimize impacts.
5. Education program on these issues for workers.
6. Provision of construction camp to accommodate most workers, prior skill upgrading for local workers, public information to minimize long term socio-economic impacts on nearby communities.
7. Careful siting of temporary work facilities, location of proposed site of new Smokey Falls GS is not affecting any heritage resource.
8. Careful siting of temporary work areas, worker education, restriction of boating on site and Ministry of Natural Resources issuing of hunting permits.
9. Existing conditions preclude use of this section of river by recreational canoeists.

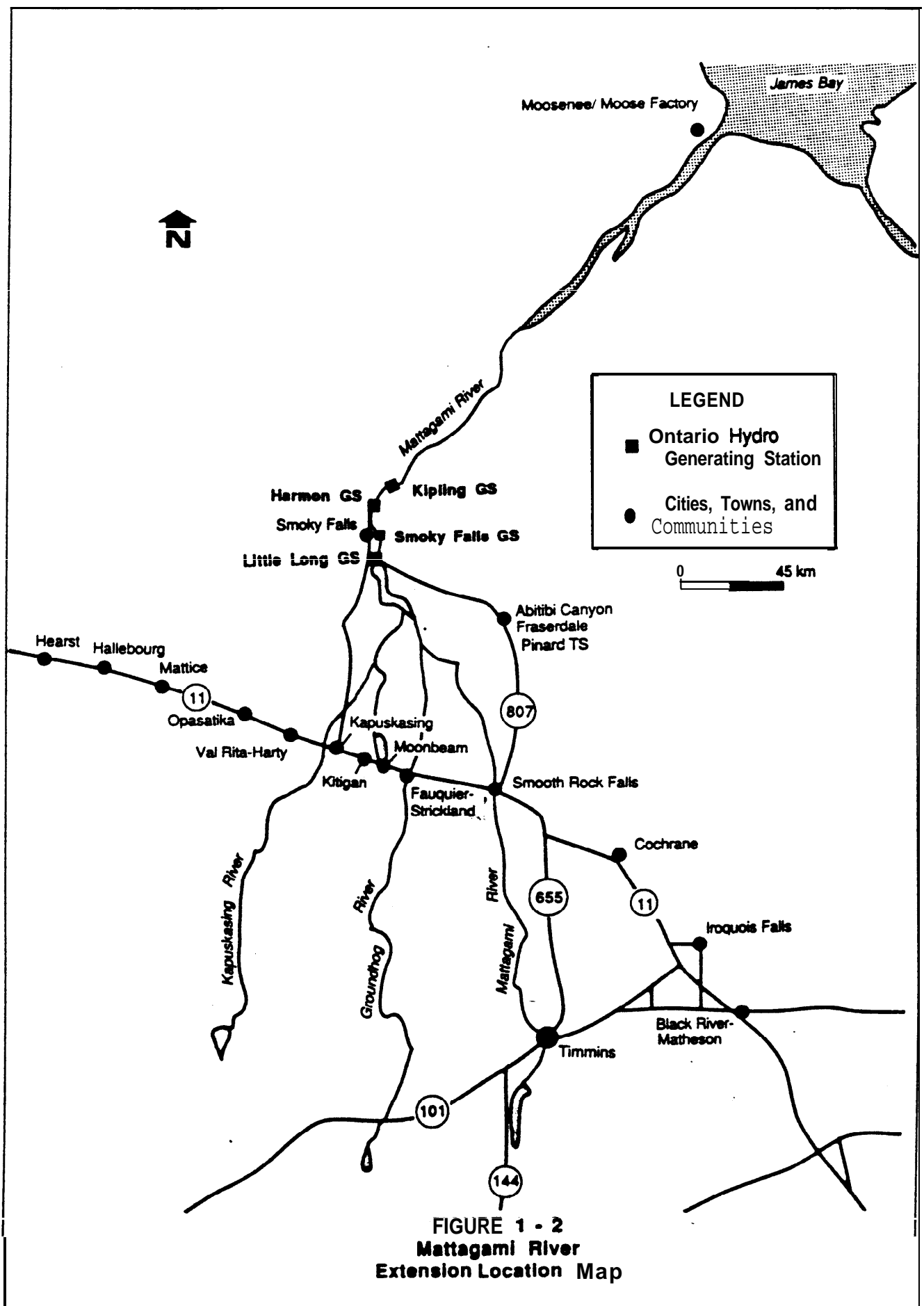
A monitoring programme will be undertaken to collect baseline data, and will be continued during the operational phase of the proposed facilities. If there are any unexpected changes from the baseline, additional mitigation measures will be employed, as necessary, to minimize any adverse impacts to the ecosystem.

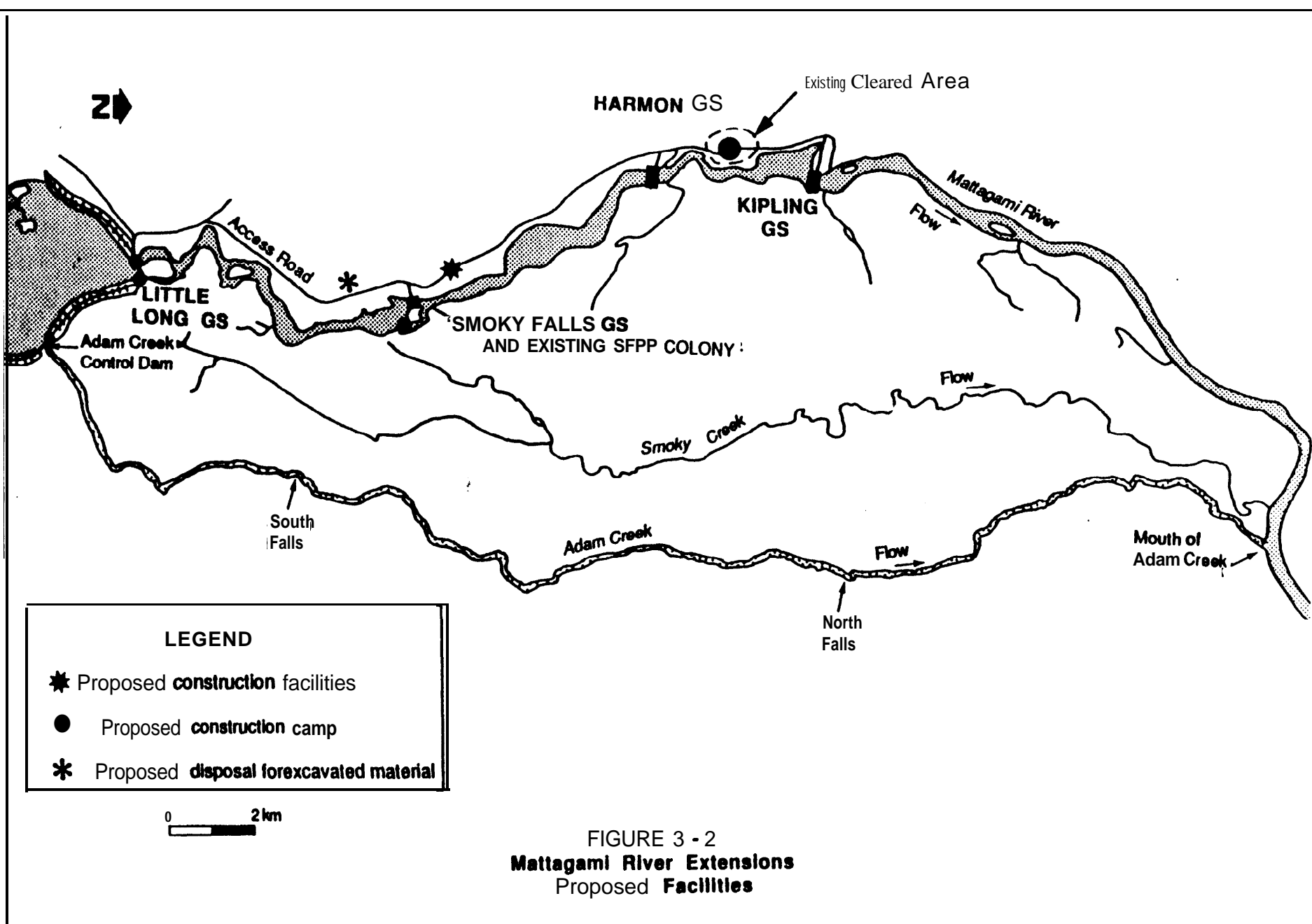
POTENTIAL CUMULATIVE IMPACTS (IF NOT FULLY MITIGABLE)

- Improved access with resultant stresses on ecosystem due to increase use and potential to stimulate further development in area.
- Further changes to Mattagami River geomorphology due to further changes in flow regime.

SCREENING DECISION

The recommended alternative was selected as the preferred option, however, the most economical operating procedure, which optimizes the peaking function of the generating stations, will result in the most significant environmental impacts on the River.





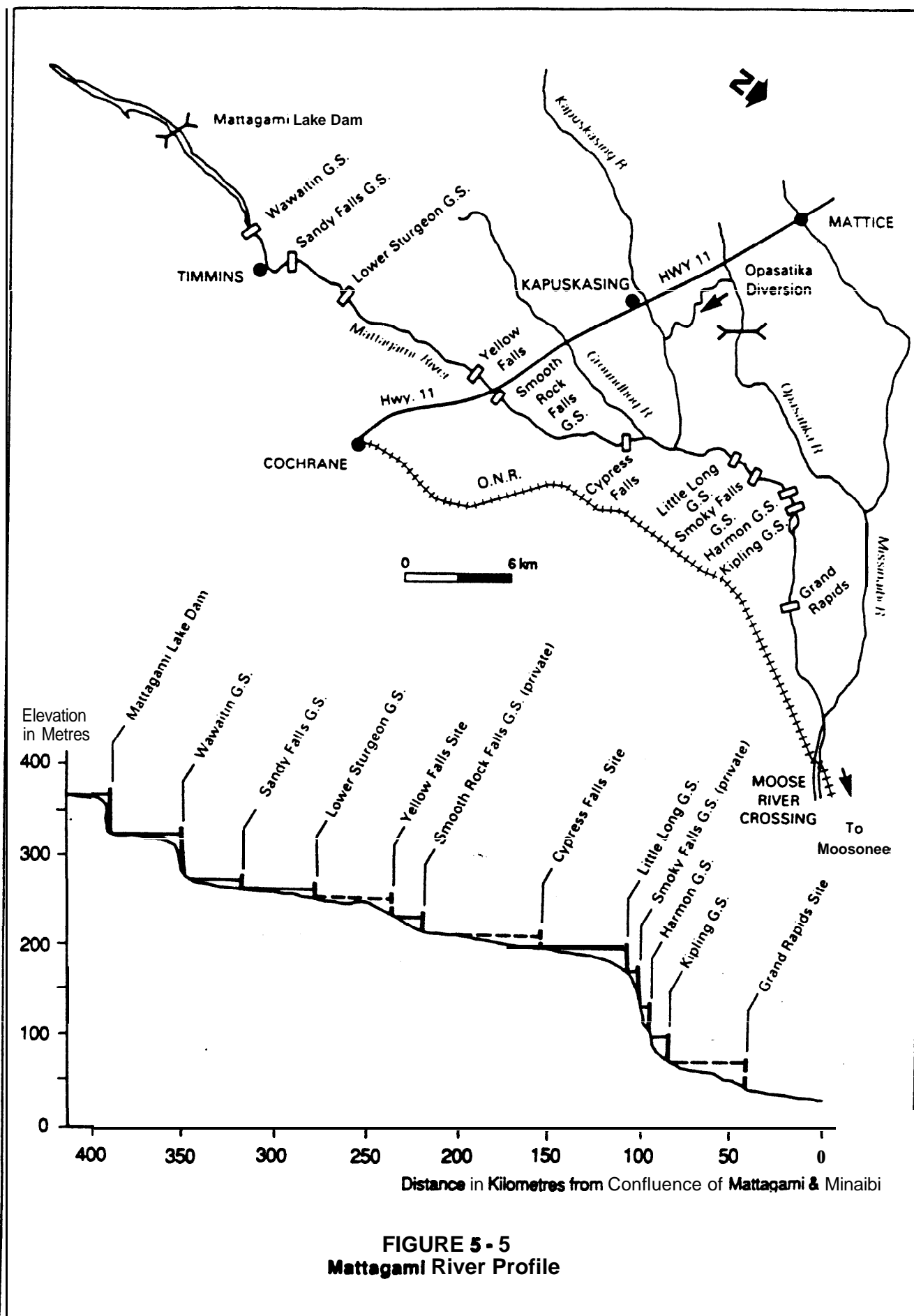


FIGURE 5 - 5
Mattagami River Profile

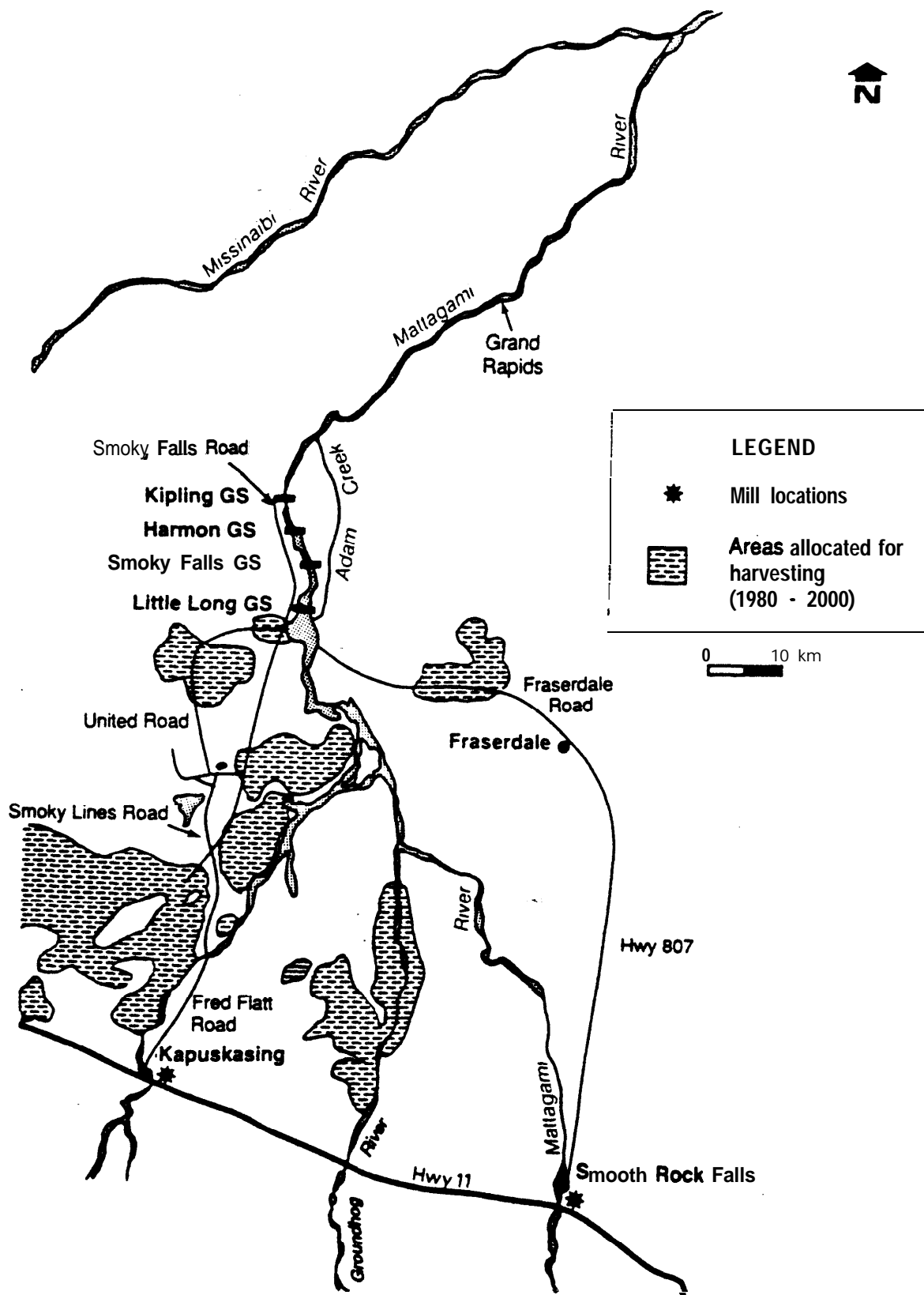


FIGURE 5 - 12
Forest Harvesting Map
Mill Locations, Crown Management Units
and 20 - Year Allocated Cutting Area
(Approximate)

