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Regional Approaches to Managing Cumulative Effects in Canada's North

March 1, 2000

AXYS
Environmental Consulting Ltd

REGIONAL APPROACHES TO MANAGING CUMULATIVE EFFECTS IN CANADA'S NORTH

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Environment Canada Environnement Canada

TO: INTERESTED PARTIES

FINAL REPORT: REGIONAL APPROACHES TO CUMULATIVE EFFECTS MANAGEMENT IN THE CANADIAN NORTH

Environment Canada commissioned the work contained in this report as part of its ongoing effort to support the development of regional approaches to managing cumulative effects in areas of the Canadian North experiencing development pressure. The content of the attached report does not necessarily reflect the views of Environment Canada.

The Department believes that the development of regional approaches to managing cumulative effects (i.e. frameworks) represents a proactive measure supporting timely management decisions regarding development while ensuring healthy ecosystems in the North. Knowing that development pressures will continue to mount and place stress on the relatively undisturbed and unpolluted northern ecosystems, provides a unique and unparalleled opportunity to apply what we have learned and to put that experience into practice. Regional approaches or frameworks are intended to:

- Further support the management of development within the carrying capacity of the environment and in harmony with the social values of local people.
- Build upon current experience in both cumulative effects assessment and regional (ecosystem level) study initiatives in Canada.
- Complement existing planning, assessment and regulatory processes in the Canadian North.
- Provide further assurances that northern ecosystems can be protected for the benefit of all while ensuring the North remains attractive to industry.

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Executive Summary

As one of its initiatives under the Northern Ecosystem Initiative, Environment Canada contracted AXYS Environmental Consulting to examine opportunities to manage cumulative effects in Canada's North (i.e., Yukon, Northwest Territories, Nunavut, Northern Quebec and Labrador). The approach recommended in this report is based on the identification of options within a cumulative effects management Framework. The report also identifies the nature of these effects, the urgency associated with these effects, and specific opportunities to manage these effects.

As development pressures increase in the North, a coordinated regional approach is necessary to assist decision makers in addressing cumulative effects on the environment, communities and human health. This approach would occur under a Framework, representing an evolution in managing effects beyond the historical sole reliance on single-project reviews. There remains the opportunity in most Northern regions to implement a Framework prior to any or extensive development; however, this opportunity may change. Therefore, initiatives to regionally manage cumulative effects in the North are timely and necessary.

Case Studies

To provide an understanding of what has been accomplished so far in addressing cumulative effects, a total of 22 case studies from across Canada were reviewed in detail. The case studies were organized into four groups: regional development and assessment, regional land use planing, local land use planning, and regional monitoring and data collection. The case studies were evaluated using a standard set of criteria as a basis for identifying "lessons learned" which were then summarized. These lessons were evaluated in terms of the degree to which they could contribute to a regional framework. This review determined that the majority of cases were principally data collection and monitoring exercises without the subsequent steps necessary for a framework. No case study provided a complete framework.

Building a Framework

With this understanding of cumulative effects issues and what has been attempted, the report describes five major elements or steps of a framework. These steps are then combined to build a generic approach that can be used to develop a Framework anywhere in the North. Key to the success of this Framework is the recognition of opportunities and constraints in managing cumulative effects. This generic approach of building a Framework may then be adopted within any northern jurisdiction, followed and modified as necessary to meet the needs of communities for many future generations.

The five steps mentioned above to be considered in building a Framework are:

1. ***Principles***: Accepting certain broad principles as to what a Framework is to accomplish and how it would generally be implemented. These principles, such as adaptive and cooperative processes, lay the foundation on which any Framework should be based.

2. ***Building Blocks***: Defining building blocks to provide fundamental direction to the Framework. These building blocks are the establishment of a Vision, the identification of a spatial scale, and the establishment of a temporal scale. The temporal scale includes consideration of pace of development and the implications this has on any management initiatives.

3. ***Focus***: Establishing a focus of the Framework to guide the management efforts. There are three types of focus: Land use, Resources and Project. One of these should be used to start the development of a Framework, possibly followed by use of another. A focus provides an overall direction for the Framework in which various specific tools (see next step) may be used.

4. ***Tools***: Selecting effects management tools that can directly assist in the regional management of cumulative effects within a Framework. The tools are organized into four groups: project applications and reviews, land use and environmental planning systems, resource management systems and scientific and knowledge based systems. A total of 23 tools are described within these groups, and direction provided regarding which tools are most useful for each focus described above.

5. ***Legal Provisions***: Understanding the legal provisions in northern jurisdictions that influence the development of a Framework. In many jurisdictions, there is a clear obligation to address cumulative effects through project-specific reviews, land use planning, or regional monitoring. Overall, the North is poised to address cumulative effects in a way unlike that which exists elsewhere in Canada.

Future Initiatives

The report concludes with recommendations to Environment Canada regarding possible future initiatives, including the identification of three candidate regions (Slave Geological Province, Southeast Yukon and Liard Valley, and northern Quebec and Labrador) in which a pilot Framework may possibly be implemented.

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Acknowledgements

This report represents the efforts of various individuals. George Hegmann was the Project Manager, Chief Editor and principal author of sections not identified below. The following identifies the remaining team members and their principal contributions (affiliations other than with AXYS are noted).

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Abbreviations

AE — Alberta Environment
AIP — Agreement in Principle
ASTIS — Arctic Science and Technology Information System
AXYS — AXYS Environmental Consulting Ltd.
BBV(TF) — Banff-Bow Valley (Task Force)
BEMP — Beaufort Environmental Monitoring Project
BNP — Banff National Park
BREAM — Beaufort Region Environmental Assessment and Monitoring Program
CARC — Canadian Arctic Resources Committee
CEA — Cumulative Effects Assessment
CEAA — Canadian Environmental Assessment Act
CEEM(P) — Cumulative Environmental Effects Management (Partnership)
CRE(ILG) — Central Rockies Ecosystem (Interagency Liaison Group)
DAP — Development Assessment Process
DIAND — Department of Indian and Northern Affairs Canada (same as INAC)
EARPGO — Environmental Assessment Review Process Guidelines Order
EC — Environment Canada
EIA — Environmental Impact Assessment
EIP — Environmental Information Partnership
EIRB — Environmental Impact Screening Committee
EISC — Environmental Impact Review Board
EMCO — Ecological Monitoring Coordinating Office
EMAN — Ecological Monitoring and Assessment Network
EMS — Environmental Management Systems
EPP — Environmental Protection Plans
EQC — Environmental Quality Commission
ESC — Ecological Science Cooperative
EUB — (Alberta) Energy and Utilities Board
GIS — Geographical Information System
GSA — Gwich'in Settlement Area
GLUPB — Gwich'in Land Use Planning Board
GNWT — Government of Northwest Territories
IEMA — Independent Environmental Monitoring Agency
IFA — Inuvialuit Final Agreement
INAC — Indian and Northern Affairs Canada (same as DIAND)
IRP — Integrated Resource Plan
ISR — Inuvialuit Settlement Region
IUCN — International Union for the Conservation of Natural Resources
JBNQA — James Bay and Northern Quebec Agreement
JRP — Joint Review Panel
LIA — Labrador Inuit Association
LIMS — Land Information Management System
LRMP — Land Resource Management Plan
LUCO — Land Use Coordinating Office
LUP — Land Use Plan
MEMP — Mackenzie Environmental Monitoring Project
MRB(IMS) — Moose River Basin (Information Management System)
MVEIRB — Mackenzie Valley Environmental Impact Review Board

MVRMA — Mackenzie Valley Resource Management Act
NED — Nunavut Environmental Database
NEI — Northern Ecosystem Initiative
NEQA — Northeastern Quebec Agreement
NES-IRM — North Eastern Slopes Integrated Resource Management Strategy
NGMP — Nunavut General Monitoring Program
NLCA — Nunavut Land Claims Agreement
NIRB — Nunavut Impact Review Board
NOGAP — Northern Oil and Gas Action Program
NPC — Nunavut Planning Commission
NRBS — Northern River Basins Study
NTI — Nunavut Tunngavik Incorporated
NWT — Northwest Territories
PLANNER — Public Land Use Application Notification Network and Environmental Reporter
RAAS — Rawson Academy of Aquatic Sciences
RIS — Regional Information System
RCEMF — Regional Cumulative Effects Management Framework
RLUP — Regional Land Use Planning
RSA — Regional Study Area
RSDS — Regional Sustainable Development Strategy
SDS — Sustainable Development Strategy
SGP — Slave Geological Province
TEK(MS) — Traditional Ecological Knowledge (Management Systems)
UFA — Umbrella Final Agreement
VEC — Valued Ecosystem Component
VSC — Valued Socio-economic Component
WKSS — West Kitikmeot/Slave Society
YDAB — Yukon Development Assistance Board
ZOI — Zone of Influence

1.0 Introduction

1.1 Report Background

Environment Canada (EC) has a role under the *Department of the Environment Act* to advocate best environmental practice and to facilitate improved resource management decisions. In response to this role, EC has been involved in the Northern Ecosystem Initiative (NEI), a partnership-based program to support collaborative efforts regarding environmental topics of mutual concern in Canada's North.

One major issue of concern identified under the NEI is the impacts of development, particularly in regions undergoing rapid change due to industrial resource uses. Four such regions have been identified under the NEI: northern Labrador, southeast Yukon, southwest NWT and the Slave Geological Province (NWT and Nunavut). One contribution to addressing this issue is the establishment and implementation of a framework to manage cumulative effects arising from these developments. To formalize such a framework, EC commissioned AXYS Environmental Consulting Ltd. (AXYS) to prepare this report.

This report also represents one of EC's contributions to the inception of the NWT Cumulative Effects Assessment and Management Framework and its Working Group, an initiative that arose from recent commitments by the Minister of Indian Affairs and Northern Development and Minister of the Environment.

The development of this report has included extensive consultation with EC representatives, particularly in Yellowknife; consultation with representatives of various northern institutions; and, consideration of the results of the INAC Cumulative Effects Assessment and Management Workshop held on December 6-9, 1999, in Yellowknife.

1.2 Purpose and Objectives of Report

The purpose of this report is to identify the state-of-the-art in terms of regional approaches to managing cumulative effects in Canada's North, to advance best practice in assessing and managing cumulative effects, and to identify options and challenges to implementing regional approaches to managing cumulative effects in the North. The formalization of this is referred to as a Regional Cumulative Effects Management Framework (RCEMF), henceforth referred to in this report as the "Framework".

To accomplish this purpose, the objectives of the report are to:

1. summarize the Canadian experience in managing cumulative effects through the review of various selected case studies;
2. identify key messages of "lessons learned" from these case studies;
3. identify other potential management responses based on key elements of assessment practice and process;
4. combine information obtained in (2) and (3) into a management "Toolkit";

5. describe a process that can be followed anywhere in the north to create a Framework customized to meet the needs of any particular region; and
6. recommend possible further measures to be taken by Environment Canada.

1.3 Definition of a Framework

A Regional Cumulative Effects Management Framework is a regional approach to managing cumulative effects. It can be broadly based, addressing ecological, social, cultural and economic factors. The application of a Framework will minimize or eliminate unacceptable effects on environmental and social components through the implementation of long-term and regional initiatives in response to a clear vision regarding desired future land use and levels of land use. A Framework assists decision makers in preparing a response to the simple but difficult to answer question: how much development is too much?

The complexity of managing cumulative effects typically means that one initiative alone is not sufficient. Therefore, a Framework represents a "package" of various concepts and initiatives, including mechanisms to involve various jurisdictions, proponents and the public in addressing regional effects. A Framework also represents an attempt to move beyond the conventional reliance on project-specific assessments alone in managing regional effects.

A Framework is used to *manage* effects; it is not intended to *assess* effects except through the possible incorporation of specific initiatives within the Framework. Therefore, a Framework is not a Cumulative Effects Assessment (CEA). However, a Framework can make use of information provided by a CEA. The use of the term *regional* implies a geographic scope that is large enough to include many human disturbances; and, the consideration of all those effects together as opposed to separately on a project-specific basis.

1.3.1 What this Report Provides

This report ultimately describes a process to *build* a Framework anywhere in the north. It therefore does not offer a specific Framework that can be immediately implemented. The advantage of this approach is the flexibility it offers by providing a process that is generic to any jurisdiction, and that can be adopted and modified as necessary to meet the unique needs of any particular region.

While building a Framework, various unknowns and uncertainties need to be recognized that are associated with managing effects (especially, thresholds). Also, the regulatory and administrative provisions must be recognized that influence the practical implementation of the framework. This report describes these matters so as to assist the reader in practically designing their own Framework.

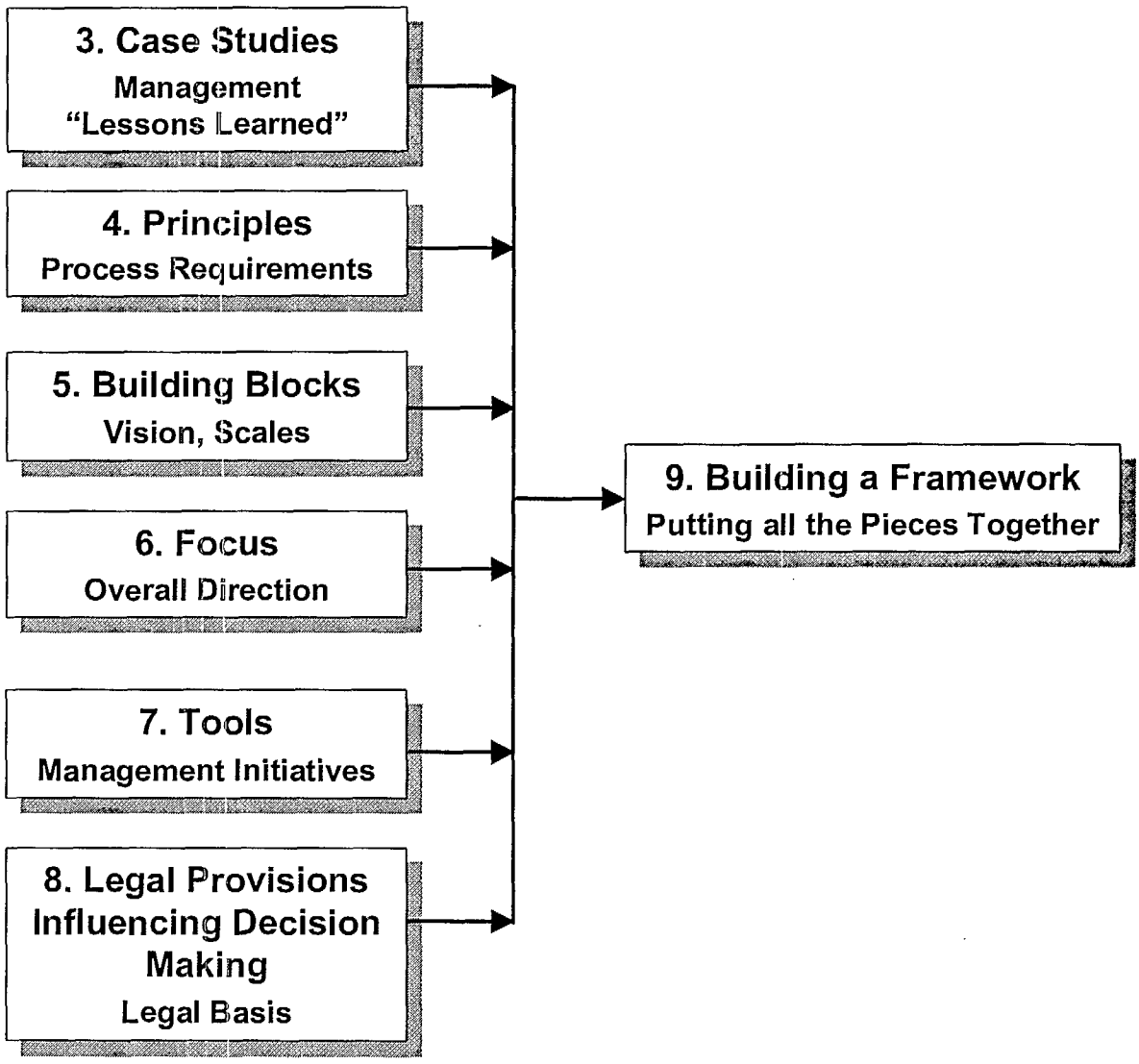
1.4 Structure of Report

This report consists of the following chapters:

1. ***Introduction***: Provides a background to the history and structure of the report, and defines the meaning of a Regional Cumulative Effects Management Framework.
2. ***Cumulative Effects in Canada's North***: Provides an overview of key issues contributing to cumulative effects.
3. ***Case Studies***: Introduces the case studies reviewed and summarizes key "lessons learned".
4. ***Principles***: Describes the process related principles, challenges and benefits of a Framework.
5. ***Building Blocks***: Describes the basic components to be considered prior to commencing the establishment of a Framework.
6. ***Focus***: Proposes three themes, from which one should be used to initiate a Framework.
7. ***Tools***: Describes various "tools" available for application within a Framework.
8. ***Legal Provisions Influencing Decision Making***: Reviews key provisions in legislation, guidelines, and policy throughout the various northern administrative jurisdictions regarding the degree by which cumulative effects and land use planning are addressed.
9. ***A Framework***: Describes a process to build a Framework, based on the principles, building blocks, focus and tools, "packaged" to approach management of effects from different perspectives. Legal provisions are not part of the Framework, but are recognized for the role they may have in the final decision making regarding land use and resource development.

Figure 1-1 provides an overview of the major Sections and their contribution to the final proposed Framework.

Figure 1-1 Overview of Report's Approach



Note: The numbers within the flowchart correspond to Section numbers in this report.

2.0 Cumulative Effects in Canada's North

As the sea is laying there, we look at it,
we feed from it and we are really part of it.[1]

A substantial amount of work has already been done in the area of cumulative impacts, both in the north and throughout Canada. We now have an excellent opportunity to apply and further develop what we have learned so that we can ensure the north remains one of Canada's natural treasures.[2]

This report on regional approaches to managing cumulative effects in Canada's North is being written at the turn of the century. The issue of cumulative effects has only been included in the list of high priority issues during the last two decades, although concerns about cumulative effects can be traced back to earlier events in Canada like the Berger Commission and the Baker Lake Court Injunction.

The concern for the potential impacts of cumulative effects in Canada's North has been growing in recent years and has been at the forefront of every recent conference on environment and development in the North. Canadian policy makers are aware of the less than desirable state of the environment in other parts of the circumpolar world including Russia and eastern Europe where there is little evidence that the consideration of potential cumulative effects has been factored into resource development decisions. Representatives of Northern Canadian communities that have seen the details of the experience in developed parts of the circumpolar world, and who have participated in meetings of the Arctic Council, certainly do not want to see this experience repeated in Canada.

There are many "resources" and habitats in the Canadian North that qualify as global resources that are valued not just by all Canadians but also by people from other countries. The international community will watch Canada's management of cumulative effects with interest and concern and this community has the opportunity to give its blessing or recommend sanctions through the World Conservation Union (IUCN – International Union for the Conservation of Natural Resources).

While attention needs to be paid to both national and international concerns about the Canadian North, the people most affected by decisions on the management of cumulative effects are the people that live close to the natural resources in each of the regions in Northern Canada. The history of the North is the history of the relationship between its peoples and the natural environment as evidenced by the evolution of unique cultures; an identity that has been forged through an ongoing series of adaptations where mistakes can have severe consequences.

The management of cumulative effects can be viewed by looking at the ways in which local peoples are affected with respect to their relationship to the land, now and in the

[1] Quote from Norah Reuben, Paulatuk In: *Northern Frontier, Northern Homeland* Thomas Berger, 1977. Vol. 1, page 94 In: Inuvialuit Renewable Resource Conservation and Management Plan.
[2] Quote from the Honourable David Anderson, Minister of the Environment, 1999.

future. How will these people be affected in terms of their utilitarian aspects of their relationship to the land? How will they be affected in terms of their social, spiritual and cultural relationships to the land?

The orientation of the assessment and management of cumulative effects towards local peoples not only makes sense from a practical point of view, it is also required as a result of the passage of constitutionally enshrined legislation establishing Final Land Claims Agreements. For example, the signing of the *Gwich'in Comprehensive Land Claims Agreement* in 1992 and the passage of the *Mackenzie Valley Resource Management Act* in 1998 provided the formal authority for the production of a Land Use Plan for the Gwich'in Settlement Area (GSA). The GSA qualifies as a "region" in the sense of this consideration of regional approaches to managing cumulative effects in Canada's North. The title of the draft Gwich'in Land Use Plan *Working for the Land* reflects one of the ways that the Gwich'in view their relationship to the natural world. As stated in the draft Plan (GLUPB 1999, p. 6):

> *According to the Mackenzie Valley Resource Management Act, Gwich'in, government and other regulatory authorities will be obligated to carry out their powers in accordance with the Gwich'in Land Use Plan after it receives formal approval. Proposed land use activities will be required to conform with the Gwich'in Land Use Plan.*

The cumulative impacts of human activities on northern environments can be viewed with reference to potential effects on local peoples and with reference to effects on land and water and the potential effects on ecosystem structure and function. Potential cumulative effects on ecosystems can be evaluated by considering effects on species, communities, guilds and ecosystem processes.

The cumulative effects issues of current concern in Northern Canada can be reviewed with respect to those that are:

1. as a result of the influence of factors that are largely external to Canada (International Factors);
2. as a result of factors that originate within Canada (National Factors); and
3. as a result of factors that originate from local or regional sources (Regional Factors).

The following provides examples for each of these factors.

International Factors

- global warming
- long-range transport of atmospheric pollutants
- long-range transport of oceanic pollutants
- cooperative management of shared populations of polar bears, narwhal, shrimp, turbot (halibut) and other groundfish as well as caribou from the Porcupine herd
- development of new oil and gas pipelines
- potential for increased traffic through the Northwest Passage
- impact of world commodity prices; e.g.; nickel

National Factors

- hydroelectric developments; e.g., potential effects of the Bennett Dam on the Slave River and the Great Whale and La Grande Dams on the Churchill and Lower Churchill Rivers
- effects of forest fires
- effects of pulp and paper mills on water quality in the Slave and the Mackenzie Rivers; e.g., Alpac and Diashowa
- the development of transportation corridors, e.g., extension of the Dempster Highway down the Mackenzie Valley as part of a natural gas transportation corridor

Regional Factors

- development of new transportation corridors
- potential development of new hydroelectric facilities
- maintenance and expansion of existing mines
- development of new mines
- reclamation of mines; e.g., Colomac, Giant and Con
- decommissioning of DEW Line sites
- the development of new institutional mechanisms to integrate and coordinate the management of natural resources
- fragmentation of habitats at both the local and landscape levels
- management of cumulative effects associated with increases in tourism
- management of the potential effects of induced development as new transportation corridors will make other developments economically viable
- growth of new communities
- creation of new settlements; e.g., Ekati
- management for ultimate end land uses
- completion of the determinations of sustainability for all valued components

The Canadian North is still in a relatively undeveloped state and so it is a good time to strengthen management systems and take advantage of the new concepts and techniques that are available for the effective management of cumulative effects. In addition to this, the pressure of future natural resources extraction across Canada's North in combination with a northern ecosystem which requires a significant time period for recovery makes effective cumulative effects assessment a crucial factor for both decision makers and for private sector proponents. There are a number of examples of recent advances in approaches to the management of cumulative effects, such as the application of fragmentation statistics to enhance the analysis of potential cumulative impacts on biodiversity at the landscape scale.

However, time may be running out in some regions to take best advantage of some management options which may require years before they become useful (e.g., monitoring, establishment of thresholds). According to INAC (1997), the recent mining and petroleum "boom" in the North has "led to mineral staking in vast areas which may lead, in turn, to new commercial ventures and proposals for large-scale mine developments" (p. 40).

The Canadian portion of the circumpolar world is in a relatively undeveloped state. People are sparsely distributed across the region and most communities are accessible only by air or from the ocean. Most of the communities of people on this vast landscape are small with populations of less than 2000 people. Aboriginal people form the majority of the population in most communities. These people continue to depend on the traditional economy in a significant way. Their participation in the traditional economy requires cash from other sources to purchase fuel for boats and snowmachines, fish nets and other supplies. While some people and some communities lead a healthy lifestyle, there are social problems in many northern communities that governments and the communities are attempting to alleviate.

The concerns about cumulative effects on the environment have, at times, eroded hope and added to the sense of despair that permeates the thinking of many young people in the communities. Perhaps the most recent high profile example is the finding that the concentrations of PCB's in the breast milk of nursing Inuit mothers on Baffin Island is many times the national average and comes from the bioaccumulation of PCB's through the marine ecosystem. The accident at Chernobyl and its potential effects on caribou raised the profile of the potential for contaminants from other parts of the globe to affect Northern Canadian ecosystems.

On a more local scale, these same concerns are clearly highlighted in INAC's proposed *Towards Sustainable Development Strategy* (1997), in which under "Environmental Threats" the "contamination from local mining, oil and gas, government and community activities" and "pollutants transported over long distances" are viewed as a threat throughout the Canadian Arctic.

Some of the social problems in Northern Canadian communities include:

- the potential long term effects of very high population growth rates;
- the lack of jobs in most communities;
- declining rates of participation in secondary school and virtually no participation in post-secondary school;
- high suicide rates and rates of substance abuse and spousal assault; and
- low potential for new economic opportunities.

It is against this backdrop of circumstances that people learn that there are substances in their supply of country foods that not only could impair their physiology but could also be carcinogenic.

Even though there is trace evidence of human activity that is detectable in the most remote regions of this planet (e.g. trace amounts of the pesticide chlordane in polar bear tissues in the High Arctic), we are still in the relatively early stages of growth of the human population of the Canadian North. The cumulative effects of human activities have not yet here resulted in widespread changes to the environment that are irreversible and that unduly limit the options of local peoples and other Canadians.

And so, in conclusion, one sees arising the opportunities afforded to the people of Canada's North. The combination of a relatively undisturbed landscape, new forms of governance, settlement of land claims, attractive lifestyles, and the hope of sustainability through community based management and time-honoured principles suggests that the management of cumulative effects will be successfully accomplished as part of the ongoing commitment of northerners to their north.

3.0 Case Studies

This section reviews and summarizes the "lessons learned" from various examples of management initiatives (or "case studies") in Canada. The purpose of this review is to identify any management approaches with potential for application in the North. In this way, the current "state-of-the-art" can be assessed, providing suggestions of best practice that may be incorporated into a Framework.

3.1 Selection

A total of 22 case studies were reviewed (see Table 3-1 for a list), each in some way offering some approach to the regional management of cumulative effects. Each were categorized into one of the following four types, based on their primary stated goals:

- Regional Development and Assessment (7 case studies)
- Regional Land Use Planing (4)
- Local Land Use Planning (3)
- Regional Monitoring and Data Collection (8)

The geographic regions covered by these case studies include Alberta, British Columbia, Saskatchewan, Ontario, Yukon, NWT, and Nunavut.

3.2 Review

Each case study was described using the following headings:

- Name of Initiative
- Geographic Region [in which the Initiative is Implemented]
- Jurisdictional Authority [the Initiative is Under]
- Purpose [of Initiative]
- Reason [for Initiative]
- Issues [Addressed]
- Methods [Used]
- Key Contributions [to Management of Cumulative Effects]

The complete detailed results of this review are provided in Appendix A.

3.3 Evaluation Criteria

Each initiative was "screened" regarding key attributes, based on the following series of questions.

Does the initiative:

- result from concerns about a single-project or multiple projects?
- contribute to a long-term understanding of environmental and/or social conditions in a specific geographic region?
- define a means of focussing on key concerns?
- offer specific effects management techniques?
- create or use a land use/environmental database?
- provide a means of communicating the results to a broad audience?
- involve the participation and support of more than one group?
- involve more than one administrative jurisdiction?
- include public participation?
- assist in defining land use goals?
- assist in defining land use, biological or physio-chemical thresholds?
- offer a complete framework or only a partial framework?
- appear to be adaptable or immediately implementable in the North?

The results of this screening are provided in Table 3-1, and discussed in more detail in the next section.

Table 3-1 Case Study Screening of Evaluation Criteria

	duration of initiative	single-project	potential future projects	focussing	management solutions	database	long-term knowledge	broad communication	broad participation	broad jurisdictions	land use goals	thresholds	complete framework	implementable in north
Regional Development and Assessment														
Alberta Regional Sustainable Development Strategy	1998 to present		√	√	√	√	√	√	√	√	√	√		√
Athabasca Oil Sands CEA Framework	1999 to present		√	√		√	√	√	√	√		√		√
Banff-Bow Valley Study	1994-96		√	√	√		√	√	√	√	√			
Beaufort Environmental Monitoring Project	1991		√	√		√	√	√	√	√				√
Hudson Bay Programme	1992-95		√	√			√	√	√	√				√
Uranium Mining in Northern Saskatchewan	1991		√					√		√				
West Kitikmeot-Slave Study	1995 to present		√	√		√	√	√	√	√				√
Regional Land Use Planning														
Alberta Integrated Resource Plans	1970's-present		√	√			√	√	√	√	√			
British Columbia Land Resource Management Plans	1997		√	√			√	√	√	√	√			
Central Rockies Ecosystem Interagency Liaison Group	1991 to present		√	√	√	√	√	√	√	√	√	√		
Gwichin Land Use Plan	1999 to present		√	√										√
Local Land Use Planning														
Inuvialuit Community Plans	1990-1994		√	√	√		√	√	√	√	√			√
Pedigree Caribou Program	1990		√	√	√		√	√	√	√	√			√
National Park Management Plans	1997		√	√	√	√	√	√	√	√	√	√		
Regional Monitoring and Data Collection														
BHP Monitoring Program	1998 to present	√		√	√		√	√	√			√		√
Grizzly Bear Conservation in the Alberta Yellowhead	1997 to present	√	√	√	√	√	√	√	√	√	√	√		
Coppermine River Basin Study	1999 to present		√				√							√
Mackenzie Valley Cumulative Impact Monitoring	1994 to present		√	√		√	√	√	√		√			√
Moose River Basin Study	1992-98		√	√		√	√	√	√	√				√
Northern Rivers Basin Study	1991 to 1995	√		√		√	√			√				√
Ecological Monitoring and Assessment Network	1994 to present		√	√			√		√	√				√
Nunavut Land Use Planning and Mapping	1999 to present		√	√		√	√	√	√		√			√

Note: √ indicates that the case study has partially or fully met the evaluation criteria

3.4 Lessons Learned

This section highlights the key "lessons learned" from the case studies, based on the identification of the elements contributing to best practice and the identification of the promising initiatives and key elements within them potentially applicable to the North.

As an overall summary, the following was determined, arranged in order from most to least common:

1. all case studies include some elements of a framework;
2. all case studies relied on some degree of collaboration amongst various stakeholders, in most cases such collaboration was essential to the success of the initiative;
3. all case studies involved some form of scoping (e.g., identification of issues and VECs\VSCs) and data collection;
4. all case studies contributed towards some form of a regional database;
5. some case studies used scoping tools, such as hypothesis and linkages;
6. few case studies took this information further to detailed analysis;
7. very few case studies suggested or used thresholds;
8. only one case study included some means to take the collected information and provide some process of incorporating this information into application reviews (e.g., permits and licenses) and land use decision making (therefore, most case studies only went as far as facilitating a data collection exercise); and
9. no case studies provided a complete framework.

Table 3-2 provides a summary of lessons learned from selected case studies (i.e., notable initiatives and specific management options) of most relevance to establishing a Framework in the North.

Table 3-2 Key Lessons Learned from Selected Case Studies

Case Study	Key Lessons Learned
Athabasca Oil Sands[1]	• issues of concern and prioritization of monitoring and data collection can be coordinated regionally • management effects in a region undergoing rapid industrial change (in this case, from both heavy oil mining and timber harvesting) can be approached in a regional and coordinated fashion • a decision making process can be based on management responses using thresholds (however, a final and enforceable land use decision process has not yet been defined or implemented for this process)
Banff-Bow Valley Study	• following an extensive public consultation process, a variety of tools can be used to forecast potential impacts in a region and provide the information necessary to form the basis of recommendations to government
Hudson Bay Programme:	• Traditional Knowledge can be incorporated into regional research
Uranium Mining in Northern Saskatchewan	• assessments can be made of many projects (in this case, mines) within the same geographic region with the consideration of joint development opportunities included in project approvals • cumulative effects of contaminants on human health can be assessed on a regional basis
West Kitikmeot-Slave Study	• the formulation and implementation of a research-based approach to support sustainable development in the North can be accomplished under the direction of various regional interests
Gwich'in Land Use Plan	• a complete land use plan can be accomplished in northern jurisdictions
Inuvialuit Community Plans	• community based planning can be used to manage both local and regional resources
Pedigree Caribou Program	• specific limits to certain land uses in a species habitat may be used to manage regional effects on that species
BHP Monitoring Program	• a monitoring program in the North can be implemented to monitor the project-specific effects of a major industrial project (a mine)
Mackenzie Valley Cumulative Impact Monitoring, Coppermine River Study, Northern Rivers Study	• the implementation of jointly coordinated regional and long-term watershed monitoring programs in the North can be used to effectively monitor regional issues of concern
Nunavut Land Use and Environmental Mapping	• implementation of an advanced mapping tool can be provided in an accessible form to provide information to government and the public to assist in project assessments and land use planning

[1] Of all the case studies examined, this one contributes the most in providing useful examples for a Northern Framework.

4.0 Principles

The development and implementation of a Regional Cumulative Effects Management Framework should be based on a number of guiding principles. These principles reflect a proactive approach of benefit to many interests in their efforts to support timely development and management decisions while ensuring human health and healthy ecosystems in the North. These principles include:

- ***Adaptive***: A framework should have participants making increasingly more informed decisions as more information becomes available, but not unnecessarily delaying project applications to wait for all information. An application of regional adaptive management should augment project-specific adaptive management practices by individual project proponents.

- ***Best Practice***: A framework involves identifying, developing and utilizing best available information and technology as well as best practices in overall management efforts.

- ***Certainty***: A framework should provide a consistent and understood review process and information requirements for project proponents.

- ***Complementary***: A framework should complement existing planning, assessment and regulatory processes among any northern jurisdiction and not duplicate what already exists under land claims settlements and regulatory regimes. It should enhance decision-making and planning capabilities to the benefit of all interests (e.g., provides a regional context within which to facilitate the evaluation of project-specific cumulative effects in existing environmental assessment processes).

- ***Comprehensive***: A framework should provide guidelines for solving technical aspects of cumulative effects (e.g., identification and use of thresholds, definition of significance).

- ***Consensus***: A framework should be consensus-based and non-confrontational.

- ***Cooperative and Inclusive***: A framework should include the co-operative involvement of governments, regulatory and planning bodies, project proponents, communities and the public, and facilitate collaborative work across many jurisdictions. A framework should therefore enhance opportunities for all interested groups to participate.

- ***Efficiency***: A framework should minimize the resources required to study and assess each project application. (e.g., prior to review of applications in a region, the identification of regional Valued Ecosystem Components (VECs) or Valued Socio-economic Components (VSCs), the implementation of field studies and technology development, and the identification and implementation of regional level mitigation measures). By combining resources (e.g., money, people, knowledge and expertise), a framework can move forward in a cost-efficient manner of benefit to all involved.

- ***Evolutionary***: A framework should build upon current experience and knowledge. As many elements of a framework already exist, gaps need to be identified and needs defined in terms of enhancing decision-making and planning capabilities.

- ***Information Intensive:*** A framework should generate information to support decision-making and project planning efforts by governments, regulators, industry and communities. This information should come from all sources, including traditional (i.e., Aboriginal).

- ***Proportional***: The level of effort by proponents and government should be proportional to the potential effects from projects.

- ***Realistic***: The framework should recognize uncertainties associated with data and predictions of effects.

- ***Responsive***: The framework should be able to be implemented quickly in areas of rapid development.

A clear and illustrative message is provided below from First Nations and Inuit on requirements for a Sustainable Development Strategy (INAC 1997, p. 24) that could be readily adopted to requirements for a Framework:

- Ensure that the linkages between the well-being of the individual, community, the ecosystem and the natural environment are made explicit.

- Include environmental assessments in all development decisions.

- Establish selective practices in logging, and in the harvesting of medicinal plants that offer alternative economic opportunity.

- Include traditional knowledge in resources management policies.

- Find ways to set priorities where there are conflicts, such as yielding some forest rights to protect a vital water resource.

- Remove barriers to protecting and preserving the environment.

- Build local capacity to conduct environmental impact assessments and formally establish a First Nation environmental assessment process.

4.1 Challenges

Challenges in implementing a Framework are encountered by all participants, including proponents, in the development and implementation of a Framework. The following identifies various types of challenges:

Technical	• establishing reasonable spatial boundaries
	• lack of resource thresholds
	• predicting effects of induced projects
	• establishing reasonable expectations in addressing future activities and activities that are infrequent and randomly dispersed (e.g., mineral exploration).
Regulatory	• extent and complexity of jurisdictional authority
	• clarifying responsibilities of government, proponents and communities
Logistical	• identifying key environmental and social components to be studied and considered
	• lack of adequate baseline information
Social	• obtaining involvement and support of all stakeholders
	• obtaining a clear and publicly approved vision of appropriate land use

4.2 Benefits

A Framework is of benefit to governments, regulatory and planning bodies, industry, communities and the public; and ultimately, to sustainability of environmental and social conditions. Benefits include cost-efficiencies, building trust, and generating information to support decision-making and planning efforts.

5.0 Building Blocks

The basic building blocks that are required for the effective management of cumulative effects include the identification of:

1. Vision and Related Strategies;
2. Spatial Scale; and
3. Temporal Scale.

The following sections discuss these building blocks in detail.

5.1 Vision and Related Strategies

A Vision is an expression of values. Vision statements are typically very brief and include social, economic and environmental statements of value. Most provisions of the legislative Acts of Canadian governments are reflective of the visions of society as a whole.

Other strategies can be used to support and enhance Vision Statements for a Framework, such as energy policy, mineral strategy, transportation strategy, renewable resource development strategy, biodiversity strategy, community wellness, and housing programs.

5.2 Spatial Scale

The establishment of appropriate spatial scale is a critical first step in the development of any Framework. A management Framework can be relevant locally, regionally, continentally or globally. A local Framework can apply to an area as small as a municipal park or a single watershed while a regional plan could include the area that is the range of a wildlife species (e.g., as used by the polar bear population of North East Baffin Island in portions of Nunavut, Greenland, Northern Quebec and Labrador).

Spatial scales can be established with reference to ecologically relevant boundaries, the boundaries of political jurisdictions, the extent of concentrated areas of development, or all of these. Mineral deposits, oil and gas plays and forestry development all tend to concentrate in prospective areas which are limited from a geographic perspective due to the geological (e.g. mineral potential, hydrocarbon potential) setting and ecological setting (e.g. boreal forest). The use of ecologically relevant boundaries will result in a spatial scale that is more relevant and more defensible than the use of political boundaries alone. In many cases however, the primary initial point of reference does relate to jurisdictional boundaries for social, cultural and economic reasons. The elegant solution in cases like this is to define a set of ecologically relevant boundaries that lie entirely within the political boundaries. For example, the Regional Study Area (RSA) for the cumulative effects assessment of the proposed Diavik Diamond Mine is a square area corresponding to the boundaries of a single remotely sensed image. The drainage boundaries for the headwaters of the Coppermine River are prescribed by an irregular shaped area that lies entirely within the RSA.

5.3 Temporal Scale

Many of the remote regions in Canada are now experiencing rapidly increasing development pressures; they are becoming "busy". Examples of such areas include Alberta's Athabasca Oil Sands, the Liard Valley in the southwest NWT and southeast Yukon, the Slave Geological Province, northeast British Columbia and the offshore east coast. The driving force behind the increase in activity in these areas is the ongoing exploration and development of petroleum, mineral and timber resources.

A crucial component in developing a framework for the assessment of regional cumulative effects is government agencies working in partnership to develop a management strategy in areas where future development will likely occur. At the present time there is sufficient technical knowledge (e.g. geological) to predict broad areas for future development

An observer of recently updated maps of these regions will see a pattern familiar with rapidly growing resource frontiers: upgraded existing roads, extensions of existing roads and trails, appearing and disappearing exploration camps, and permanent surface facilities in support of operations. Such maps would show many new lines indicating an expanding road network, and new dots indicating camps and processing sites. Over time, the lines and dots become uncomfortably close, and the question is asked: *how much is too much*?

In areas experiencing a relatively rapid pace of change, existing administrative responses often prove inadequate to address cumulative effects in the face of pressure to review an increasing number of individual permit and license applications, or for progression through the regulatory review process (i.e., environmental impact assessments). In such situations, the application of ideal goal of implementing the "precautionary principle" may be difficult (i.e., where there are threats of serious or irreversible damage, the lack of full scientific certainty shall *not* be used as a reason for postponing cost-effective measures to prevent environmental degradation).

Some desired management options may require an unacceptably long period of time before implementation due to the unavailability of required information. In such cases, interim measures must be applied, especially in a concurrent timeframe. Management responses may occur within three different stages based on the proximity in time of future developments:

1. ***Anticipatory***: no known future developments; however, a Framework is prepared in anticipation of possible future developments.
2. ***Preparatory***: there are imminent known future developments.
3. ***Concurrent***: developments are already approved or already exist.

The pace of development also has an implication to the degree by which certain information may be available and useful. Effects monitoring, a common component of many regional management initiatives, cannot always provide results and their subsequent interpretation into thresholds before commencement of project review in that region. Referring to the aforementioned management timeframes, monitoring and other studies may then be planned as follows:

1. ***Anticipatory***: long-term studies can be accommodated.
2. ***Preparatory***: short-term studies are required.
3. ***Concurrent***: reference to existing studies provide only source of information to assist in the preparation of an immediate management response.

The establishment of temporal scales is a second critical step in the construction of a Framework. Temporal scales can be established with primary reference to timeframes that are relevant to the VEC/VSC and secondary reference to timeframes that are relevant to the peoples that value the ecosystem component.

Some guidance is provided from temporal scales used in the development of scenarios for cumulative effects assessments, such as those based on project phases such as: pre-development, baseline, full development and reclamation. Alternatively, depending on the reference point desired for comparison of effects, timeframes can be established based on historical benchmarks, such as: pre-historic (geological time), pre-European contact, post-European contact; present; and future (short-, medium- and long-term).

The timeframes selected for a Framework need to be relevant to the VECs and any thresholds for those VECs (see Table 5-1). While the broad categories of timeframes will vary for each of the VECs, the relative importance of each segment of time will vary in relation to the ecology of the individual VEC.

Table 5-1 Timeframes and Valued Ecosystem Components

Timeframe	Valued Ecosystem Component			
	Water	Caribou	Geese	Polar bear
Distant Past	✔	✔ ✔	✔	✔
Present	✔	✔	✔ ✔ ✔	✔ ✔
Future	✔ ✔ ✔	✔ ✔ ✔	✔	✔

Note: The checkmarks provide a general indication of the timeframe that is most relevant to a Framework and where attention should be focussed: ✔ = low, ✔ ✔ = medium, ✔ ✔ ✔ = high

6.0 Focus

A Framework requires a focus that serves as a starting point and establishes direction. In this way, the Framework can be focussed on a specific theme that knits together the building blocks and tools in a consistent and efficient manner. Three such themes are proposed:, each discussed in more detail in the following sections.

- ***Land Use Focussed:*** A Regional Land Use Plan (RLUP) is implemented before any development is allowed in a region, and enforced while developments occur in a region.

- ***Resource Focussed:*** The effects on one or more species are directly managed.

- ***Project Focussed:*** Individual projects are assessed, but in a coordinated fashion that changes project requirements for each subsequent application.

One or more of these may be used; however, it is most suitable to begin with one and incorporate another as needed. As each of these are intrinsically or potentially broad enough to encompass a region, it is inevitable that addressing cumulative effects for any one will eventually lead to examining cumulative effects for all concerns. It is also possible that a Framework can eventually change its focus as conditions warrant and experience is gained by those involved in implementing the Framework.

The order in which these themes appear above is suggested as the *ideal* implementation priority; i.e., first try to implement a land use plan, otherwise, follow a resource focus, otherwise follow a project focus. Current practice typically occurs in the reverse order, reflecting the reliance still placed on single project reviews until land use plans and other broad resource focussed initiatives are pursued.

6.1 Land Use Focus

A land use focus for a Framework is accomplished through the development and implementation of a Regional Land Use Plan. The use of such plans are a fundamental prerequisite to the ideal management of cumulative effects, and are the most promising and useful alternative to the over-reliance and inefficient use of project specific reviews alone to manage such effects (Hegmann *et al.* 1999, Kennett 2000). Regional land use plans ideally are used before projects commence in a region; however, they can be equally effective once development has commenced. At minimum, RLUPs provide a means of evaluating the acceptability of individual projects because now a pre-defined environmental condition is available against which to compare the project's effects.

The principle attributes of RLUPs contributing to the management of cumulative effects includes (NRCan 1999, p. 3):

- land use zoning, each with various levels of restrictions to developments, against which the appropriateness of proposed projects may be judged and a decision made (i.e., rejection, delay, conditional approval, approval);

- availability of some form of threshold against which the incremental effects of proposed projects may be compared (e.g., minimum viable long-term population size of the Bluenose

caribou herd, a maximum sustainable annual harvest of the herd, and a minimum calve/cow ratio);

- availability of environmental baseline and land use information (ideally, in a digitally mapped form using a Geographic Information System) that identifies environmentally sensitive areas, other developments, culturally important sites and other regional-wide information;
- a means of addressing "screening-level" effects for numerous but relatively small projects that are normally not assessed in detail;
- an agreement of what valued ecosystem and cultural components are to be assessed, and the appropriate geographic boundaries in which such effects must be assessed;
- an understanding of regional issues of concern;
- a means of monitoring environmental conditions either before projects are permitted (i.e., to establish an environmental baseline) or after projects are approved (i.e., as follow-up);
- a broadening of jurisdictional responsibility throughout the region to ensure that the limitations of narrow administrative authority do not prevent or hinder the implementation of region-wide mitigation measures and cooperation between proponents and government; and
- a broadening of the approaches used by government in managing natural resources; an integrated approach between government agencies is crucial to develop a good understanding of projects being proposed as well as to deal with issues in an effective manner with decreasing government budgets.

The development of a RLUP is in itself a challenging and complex process (see CREE 1996 for guidance). Such plans have been developed in British Columbia, Alberta and the Gwich'in Settlement Area (see Appendix A for descriptions of these examples). In this Section, the assumption is that such a plan exists; the matter then being as to how to most effectively use this plan to manage cumulative effects. To this end, the following steps could be used in following a land use focus for the management of regional cumulative effects:

1. use the RLUP to assist strategic land use planning regarding the acceptability of certain projects and activities in certain zones, particularly to minimize the potential for induced projects to occur by imposing land use restrictions in the plan;
2. support government sponsored long-term ecological monitoring to support project assessments and provide independent verification of baseline conditions, particularly important when private sector proponents are designing environmental baseline programs;
3. ensure that project proponents are aware of all implications of the RLUP to their project regarding acceptability within any given zone and the potential for affecting VECs/VSCs in that and other zones, particularly zones with a high status of protection (e.g., the "Protected Areas" in the Gwich'in Land Use Plan (GLUPB 1999));
4. apply all conditions of the plan to project applications as part of the permitting and licensing process;
5. for projects for which environmental assessments are required, compare the results of project effects to thresholds provided in the plan, and determine acceptability of the projects contribution to cumulative effects; and

6. for projects for which environmental assessments are not required (e.g., most screening level reviews), establish decision criteria for project approval based on the information provided in the plan, principally the location of the project in zones, proximity to other projects, and known concerns and issues in the immediate project area (see DIAND 1997b for an example of a screening level review process in the Yukon).

6.2 Resource Focus

A regional Framework to manage cumulative effects could be designed and implemented using a single VEC as the primary point of initial reference for the Framework. A Framework for the Slave Geological Province (SGP), for example, would have to include barren-ground caribou from the Bathurst herd. This is because caribou are one of the primary VECs that most of the people who live in the communities of the SGP depend on to some degree for their nutritional, economic, social and cultural needs. A review of the management issues associated with this herd will immediately raise questions about the management of cumulative effects in the SGP in general.

The following steps use the management of the Bathurst herd of the SGP as an example for establishing a management Framework through the use of a resource focus:

1. review and summarize the general goals for the management of this herd from the Bathurst Caribou Draft Management Plan (GNWT 1988);
2. produce a synthesis of all of the available information on caribou, caribou habitat, wolves and grizzly bears using the West Kitikmeot/Slave Society as a mechanism and post the synthesis on a new GIS based website for the Bathurst caribou herd;[3]
3. convene a second workshop of stakeholders and scientists to review available information, identify ecological and land use thresholds, determine if thresholds could be exceeded under certain conditions and identify an appropriate set of recommendations for effective management based on the tools described in this report;
4. use the results of this second workshop to develop a second draft of the management plan and post it on the net for public comment, which could include a means to evaluate the relative merits of establishing a Bathurst Caribou Management Board;
5. monitor all human activities on the range and review specific project applications, with all land use information and monitoring information compiled with central databases shared between Nunavut and the NWT and posted on the website; and
6. review land use and herd status on a regular basis to identify any problems and alert management authorities.

6.2.1 Management Plans for Wildlife

An ideal resource focus approach for wildlife would include management plans for all of the VECs that are consistent with the Biodiversity Conservation Strategy (Government of Canada 195). One of the sets of VECs that will emerge in any VEC list in the Canadian North is a group of high priority wildlife species. The effective management of cumulative effects within the context of the Vision needs to take advantage of the "fine-grained" (i.e., detailed) considerations that go into the public consultation on individual species management plans. A

[3] For example, refer to URL: http://www.taiga.net as an example of a website sponsored by Environment Canada for the Porcupine caribou herd.

complete species management plan will provide a set of all of the thresholds that need to be applied to ensure both the survival of the species, its productivity and its current distribution.

The following illustrates this approach using three selected species as examples: polar bear, geese and caribou.

6.2.1.1 Polar bear

The two factors that affect the long term sustainability of populations of polar bears are their population dynamics and habitat. Unlike caribou however, population dynamics of polar bears are of greater concern over the medium and long term than are concerns with habitat.

The circumpolar habitats of polar bears have not been modified as a result of project-specific human activities to this point in time. There are potential concerns with respect to the effects of global warming on the ice-dominated habitats of the polar bears world as well as the potential effects of the long range transport of atmospheric pollutants and their subsequent bioaccumulation through the food chain to the polar bear as summit predator. Such effects may currently be at an early stage, possibly yet to become a serious concern in the future.

Population dynamics are probably of greater concern over the medium term as there are concerns that the total mortality for many of the Canadian polar bear populations may not be sustainable. Polar bears are a long lived species who breed slowly and who invest significant energies in the raising of their offspring. Age of first reproduction is about five years of age, the breeding interval is about three years and mean litter size is about 2.2 cubs per female. While there may be some compensatory mechanisms operating within polar bear populations, they probably cannot sustain a mortality rate from hunting of more than 3%.

6.2.1.2 Geese

The two factors that affect the long term sustainability of populations of geese are their population dynamics and the availability of sufficient habitat of sufficient quality for each season. Unlike polar bears however, the greatest concern over the medium and long term for geese relates to habitat.

The alteration of habitats through intensive agriculture has resulted in the enhancement of habitats in many of the wintering areas. This has resulted in explosions in the numbers of some geese. These inflated populations of geese have subsequently damaged the habitats on the breeding grounds. Some of this damage may be irreparable.

6.2.1.3 Barren-ground caribou

The two factors that affect the long term sustainability of populations of barren-ground caribou are their population dynamics and the availability of sufficient habitat of sufficient quality for each season.

The population dynamics are obviously important since total mortality must be less than recruitment over the long term or the population will eventually decline below a critical threshold. In Canada at least, all of the populations of barren-ground caribou are at population levels that are significantly above any critical thresholds with respect to abundance.

The focus of a Framework for areas where caribou are one of the VECs should be directed towards the issue of habitat and, specifically, the issue of thresholds with respect to seasonal

migration routes. To this point in time at least, the calving grounds of all of the herds have not been compromised such that there are major concerns; the same is true for the wintering areas.

Caribou migrate to and from the calving grounds and wintering areas in spring and fall and, in many cases, most of the consumptive benefits to hunters occur along these movement corridors and on the winter ranges. To this point in history, the habitats along these corridors have not been degraded or fragmented to the point that there has been any apparent disruption of movements. The timeframes that are relevant to barren-ground caribou are in the future and are annual and multi-year.

6.3 Project Focus

A project focus is based on the management of cumulative effects through the incremental management of effects for each project or activity. The expectation is that the rate of contribution of projects effects on regional VECs/VSCs will be reduced, or possibly even stopped. This approach does not have the advantage of the land use and resource based themes as the effects management is not necessarily done within the context of a more broad (regional) initiative.

This approach also raises a fundamental challenge in addressing cumulative effects, namely the degree of responsibility between proponents and government. These responsibilities include the degree by which the proponent is responsible for collecting regional data and for managing effects on a regional basis, a responsibility that may not be in proportion to the contribution of the project to cumulative effects. Proponents should not be expected to conduct (unless made a condition of applications, a situation not yet encountered) their assessments in such a way that they are assessing the appropriateness of land use on a regional basis, an initiative that should instead be the responsibility of governments or part of an inter-governmental and industry joint initiative.

The following steps could be used in following a project focus for the management of regional cumulative effects:

1. ensure that all project applications are subject to the full extent of applicable regulations, guidelines, thresholds and other statutory requirements;
2. provide the proponent with any information obtained from monitoring and land use and environmental mapping;
3. consolidate as many project components as possible amongst various project proponents, or for the same proponent for different projects, in the same region;
4. encourage or commit proponents to develop joint management strategies in conjunction with government and the public;
5. update all information and databases with information from the project to ensure that the next project review has the advantage of this information; and
6. initiate a process of integration and synthesis of existing government information and databases that should be available publicly and that will assist both government project managers and private sector proponents with the assessment and approval of development projects.

7.0 Tools

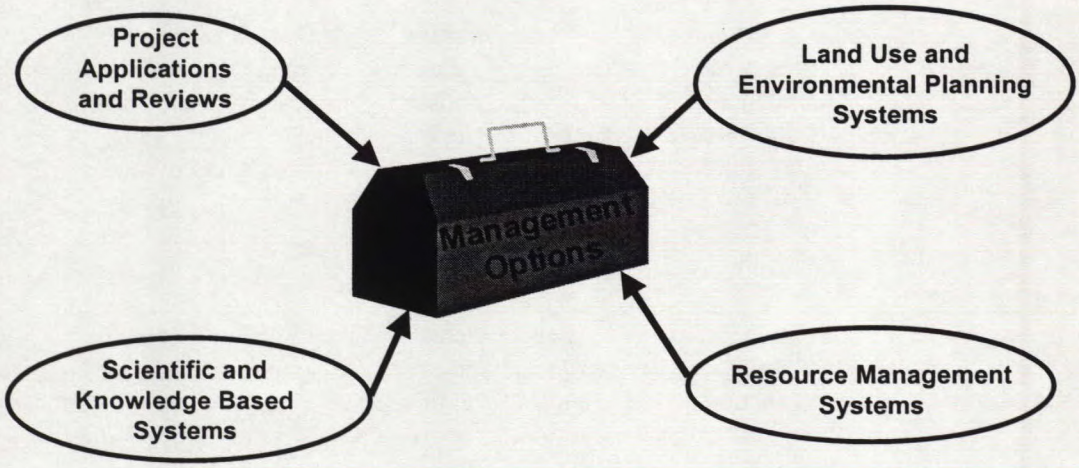
Tools are the actual pieces of a Framework used to manage cumulative effects: they get the work done! Collectively, they contribute to a "toolkit" of cumulative effects management options. Anyone using the Framework can then select the most suitable tools to meet their unique requirements.

The tools are organized into four groups (see Figure 7-1):

1. project applications and review;
2. land use and environmental planning systems;
3. resource management systems; and
4. scientific and knowledge based systems.

The following sections describe the tools available for each of these groups.

Figure 7-1 Management Tools



7.1 Project Applications and Reviews

These tools are based on one of the most important and readily implementable concepts in managing cumulative effects: minimizing or eliminating direct effects caused by individual projects. Management can be planned into a project during the project design stage, as recommendations within an assessment, or as approval conditions imposed on a project (e.g., for permit or license approvals; or, as requirements in an application decision from a Panel or Board).

- ***Information from project environmental assessments***: Individual project assessments provide an opportunity to collect new or additional baseline information, identify issues and VECs/VSCs, and identify the degree by which the proposed project may actually contribute to cumulative effects (as it is not always the case that the project alone contributes to cumulative effects, and even less the case that it alone contributes significantly). In this way, decision makers may benefit from this information to make a

more informed decision. Further to this is the concept of "tiering" by land use administrators, in which each new project approval adds to the baseline information that is known for an area. In this way, the individual project review process is used as a means to slowly provide decision makers with a better understanding of environmental issues, with the subsequent setting of precedent possibly "bumping up" future application information requirements and possibly resulting in more stringent approval requirements for those future applications. A centralized repository of this information would be required that is publicly accessible.

- ***Project mitigation and monitoring***: The most powerful and readily implementable option to manage cumulative effects is to mitigate any project effects to the maximum extent possible, typically defined as those measures that are both technically available and possible; and, are economically feasible by the proponent. These measures are often described in Environmental Protection Plans (EPPs) or Environmental Management Systems (EMSs), typically in direct response to environmental and design requirements arising from applicable Regulations (e.g., from the CEAA Law List for permits and licenses). Application of best available mitigation as conditions of project approval is ideally accompanied by monitoring as another condition of project approval. Effects monitoring and compliance monitoring may be used in an adaptive fashion whereby the results are periodically reviewed and a determination made if the project's mitigation is effective and the effects meet all regulated compliance requirements.

- ***Joint development plans and combining of infrastructure***: In regions where projects for different proponents are rapidly occurring and within close proximity ("close' depending on the nature of the activity and landscape), there may be a benefit for proponents to submit one joint assessment and to possibly share infrastructure (e.g., access roads, processing facilities, pipelines), thereby reducing cumulative effects by at least minimizing the direct and local effects. This approach, for example, has been adopted by the Alberta Energy and Utilities Board (EUB 1993) in the environmentally sensitive region of the southern eastern slopes of the Rocky Mountains, a region undergoing continuing oil and gas activity.

- ***Risk Assessment***: Ultimately, a decision to allow a development project to proceed is a judgement based on environmental risk. If a proponent does not demonstrate clearly the environmental effects and/or the mitigative measures associated with a development project, government by default either requires additional information/interpretation/analysis to improve understanding and ultimately reduce the risk; or rejects the project due to unacceptable environmental risk and/or significant public concerns. A risk assessment approach can be used to better understand the environmental implications of development projects both from an individual perspective as well as from a CEA perspective (e.g., the Northern Environmental Risk Assessment Strategy (NERAS) used by INAC for management decisions about contaminated sites in northern Canada).

  There are 5 basic steps or phases involved in risk assessment: (1) Problem Formulation (e.g., identification of sources and exposure pathways of chemicals and the development of scenarios for assessment); (2) Exposure Assessment (e.g., an assessment of receptors such as migrating waterfowl that are exposed to chemicals of concern); (3) Hazard Assessment (e.g., a determination of the exposure limits for chemicals of concern); (4) Risk Characterization (e.g., an evaluation of the impact on the receptors such as through bioaccumulation); and (5) Risk Management (i.e., management decisions to deal with the risk and to develop site specific risk management criteria).

7.2 Land Use and Environmental Planning Systems

These tools are based on the regional allocation of resources and the planning of what projects and activities may occur in those regions. These tools are usually not specific to any one project. Instead, they describe land use requirements that individual projects must meet, requirements that are defined typically before project review commences. Some of these tools accomplish these objectives through the management of access, one of the principal contributors to cumulative effects.

- ***Regional land use plans***: Regional Land Use Plans (RLUPs) define what human activity is allowed within specific areas (or zones) and what conditions apply to permitted activities. These plans reflect a vision for the future use of the land (and waters). The development and use of RLUPs by decision makers is the most powerful *regional-based tool* that decision makers can use to take control of their land and mange their resources on a continuing basis (imposing conditions on individual project applications addressing that project's direct effects is the other most important tool, which typically however is more *locally*-based). The Gwich'in Land Use Plan (see Appendix A) is the most advanced such plan in the North; others will follow for other jurisdictions.

- ***Regional access management***: New road access into previously inaccessible or difficult to access areas (on the ground) is often the single most important contributor to cumulative effects. This facilitates the creation of more access and encourages the construction of other infrastructure (the most common example of "induced" cumulative effects). Regional access management is one of the simplest to define and most implementable regional tool, which can include such options as permanent or seasonal road closures, controlled access to certain roads, use of barriers and other measures to control off-road vehicle access.

- ***Linear corridor controls:*** Linear corridor controls are based on establishing and enforcing limits to linear corridors (e.g., highways, access roads, trails, paths, pipelines, seismic, transmission lines) in a specific region. Examples of such controls include the maximum length of a specific corridor within a specific area in any given year, or the maximum density of any one or all corridors (see the Pedigree Caribou Program case study in Appendix A). These controls do not affect how access is used by vehicles (as described under Regional access management), but instead control the degree of access potentially available to vehicles. This addresses the direct effects on the landscape such as habitat loss and sediment runoff, as opposed to the indirect effects of human disturbance (e.g., noise) along these corridors.

- ***Regional transportation strategies:*** The development of major transportation corridors in the North will be driven by resource development pressures and balanced by societal and environmental concerns. The implications of these decisions to cumulative effects are significant; such decisions must consider the induced effects potential of these corridors. If decisions to proceed with new or extended corridors are strategically planned to avoid creating an ever expanding inter-connected road network, the cumulative effects of such corridors may be lessened. Examples of such corridors include possible all-weather roads from Inuvik to Tuktoyaktuk and from Bathurst Inlet to Contwoyto Lake.

- ***Community conservation plans***: These plans provide a means for individual communities to define land use goals and mechanisms to implement those goals. Although not necessarily large in geographic area affected, they nonetheless provide an effective means of addressing environmental effects, and hence cumulative effects, close to human settlements (producing similar results as from project assessments). Examples of

community conservation plans can be found in the Inuvialuit Settlement region (see Appendix A).

- ***Regional co-operative programs:*** Regional co-operative programs include inter-government/industry programs and land use co-management under government and First Nations Boards. The principle contribution of these initiatives to cumulative effects management are the improved opportunities to address cumulative effects on a regional basis in which effects on the VECs/VSCs are of concern throughout multiple jurisdictions. This provides a formal structure in which governments, industry, and the public may communicate and develop joint initiatives. Examples of such programs includes the recently convened Cumulative Effects Management Framework Working Group in the NWT; and as described in the Case Studies (see Appendix A), the Alberta Regional Sustainable Development Strategy, Central Rockies Interagency Liaison Group, and the Grizzly Bear Conservation in the Alberta Yellowhead Ecosystem (arising from the federal Decision Report for the proposed Cheviot Coal Mine).

- ***Protected spaces planning***: Protected spaces planning provides a means of identifying specific areas in which no or limited development may occur. Such areas may be considered as environmentally sensitive areas for various reasons; for example, providing watershed protection or key habitat for wildlife. Once accomplished, any future development would be in recognition of these land use restrictions. Therefore, the management of cumulative effects would be accomplished by managing the siting of development and by preserving areas that would otherwise possibly have been affected by such activities. Both the Yukon (DRR 1998) and the NWT (NWTPASAC 1998) have protected area plans under consideration.

- ***Development scenario forecasting***: Scenarios are predicted future conditions, based on what developments are known and assumed to possibly happen in the future. Forecasting is the assessment of what effects may occur through the use of an analytical modeling technique (e.g., a computer-based program using GIS based data and analysis). Therefore, development scenario forecasting may be used to "peer" into the future and see what happens for different types and timing of developments. The principle advantage of forecasting is that one can quickly identify what may be the combined effects of various projects, providing results that may ideally be used in regional land use planning before projects commence; or, to determine the implications of specific projects as part of an assessment (for either one or a few large projects such as diamond mines, or many "small" activities such as mineral exploration). The principle disadvantage of forecasting is the considerable uncertainty of predicting future developments; and the scientific uncertainty of translating project effects into regional and long-term effects on VECs and VSCs (for these reasons, this report recommends alternatives to forecasting until a greater degree of certainty occurs).

  An attempt to define the means of such forecasting was done for the Slave Geological Province (DIAND 1995), which serves as an example of any forecasting initiative. Firstly, three levels of intensity of development were defined within 10 to 15 years from the date of the study. Secondly, generic footprints were created for various typical projects (e.g., roads, mines). Thirdly, an analytical framework was defined, in this case based on impact hypotheses (i.e., defining and assessing many linkages between developments and their effects). Although the study did not actually "run" through the models (nor since), it did establish a methodology for forecasting.

- ***Sustainable Development Strategy***: A Sustainable Development Strategy (SDS) can be used by decision makers, especially within government, to provide a strategic direction regarding policy, program and operations commitment to initiatives of benefit to the management of cumulative effects. For example, Indian and Northern Affairs has identified the need to adopt a "community-based 'livelihoods' approach to implementing sustainable development" (INAC 1997), reflecting the approach advocated in the Inuvialuit Community Conservation Plans and recognizing the importance of adducing social concerns.

7.3 Resource Management Systems

These tools are based on the management of specific environmental resources, such as water and wildlife. Management of the targeted resource then becomes a means of addressing cumulative effects due to the typically large geographic areas involved, and hence the involvement of many jurisdictions at territorial, national and international levels.

The need to conserve wild species of plants and animals figures prominently into all *Visions* for balanced development in most countries in the world. Whether these visions are published or not, people certainly expect that decision makers will include consideration for the environment in general and wildlife in particular as they evaluate new opportunities for the ongoing advance of human civilization.

The management of wild species occurs within the broader context of the conservation of biodiversity. In recent years, Policy Makers have shifted their focus from the management of individual species to landscape level approaches to capture a longer term and higher level approach to the management of the earth's natural resources. This section describes the tools required for the effective management of wild species of plants and animals within the context of the conservation of biodiversity.

- ***Species management plans***: Species management plans define recovery and conservation plans for wildlife species, especially species at risk (e.g., North American Waterfowl Management Plan, Bathurst Caribou Management Plan). Such plans may also be used to manage a specific species, at risk or not, as an indicator of ecosystem conditions (e.g., "umbrella" species such as grizzly bear).

- ***Habitat conservation***: The need to protect and conserve habitats must be a paramount consideration in the management of all species. If the life history requirements of a species for food, water and shelter cannot be adequately met the species will decline or disappear. The influence of people on wildlife and wildlife habitat is now pervasive and increasing. The current challenge is to identify a new balance between absolute protection measures, partial protection measures and general conservation measures so that the needs of single or many species can continue to be met while development proceeds (in the face of increasing pressures for development). Using caribou as an example, the annual habitats of concern can be divided into three broad categories: calving and post-calving areas, migratory routes and wintering areas. The parallel for migratory geese like the white fronted goose would be the nesting habitats of the Arctic, the spring and fall staging areas on the Canadian prairies and the wintering areas in the United States.

- ***Watershed management***: Watershed, lake and river management can be accomplished through the cooperation of jurisdictions within those areas. The establishment of water quality and aquatics monitoring, followed by the setting of water quality standards, can be used to address environmental effects and human health. Examples of such initiatives (see

Appendix A) include the Northern River Basins Study, the Moose River Basin Study and the Coppermine River Basin Study.

- ***Wildlife management Boards/Committees***: Species management may be accomplished through the ongoing representation of scientists, governments and public on wildlife management boards and committees at the regional, national and international level (e.g., Flyway Council, International Porcupine Caribou Management Board, Polar Bear Technical Committee).

- ***Resource extraction controls***: The extraction of specific resources can be limited or restricted in specific geographic areas and/or during certain times (e.g., volume of timber harvested, harvest of hunted sport and subsistence game species, catch of sport and subsistence fish species). In some cases, a deferment of any further activity may be required until more information is known on which to base decisions.

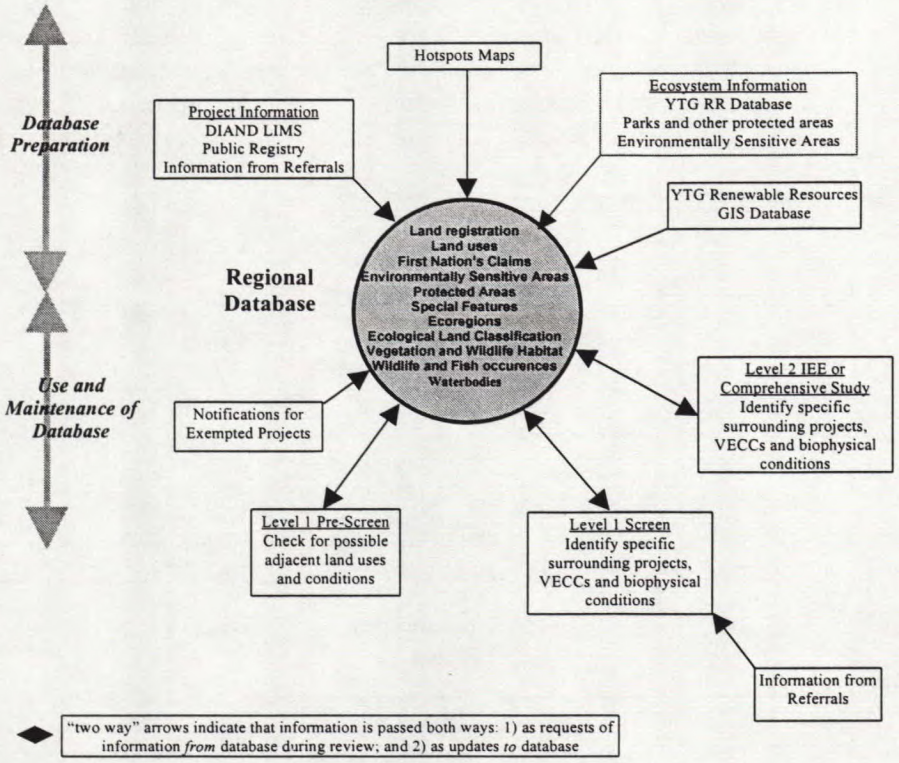
- ***National and international agreements, conventions and pan-Arctic initiatives***: International and national initiatives for air, water and wildlife may be used to provide strategic direction and issue prioritization regarding which resources should be addressed for cumulative effects in the North. Examples include the North American Waterfowl Management Plan, the Arctic Goose Joint Venture, the Arctic Council, and the Arctic Environmental Protection Strategy.

7.4 Scientific and Knowledge Based Systems

These tools are based on the need to ensure that timely, accurate and relevant information is available to decision makers. All of the tools for this option are only used in support of other tools, as they do not in themselves provide a *management* of effects. As has been explained in Section 3, the majority of past and existing management initiatives in Canada largely remain as scientific and knowledge based systems. Therefore, they are incomplete until other tools are used.

- ***Regional land use and environmental mapping/database:*** The most important tool that must be implemented for any Framework is the establishment of a common source of information on land use (including traditional use) and environmental conditions. This information can assist decision makers in understanding the extent of development and spatial proximity to communities and environmentally sensitive areas. This information can also be used to assist in the development of land use thresholds. This must include maps and associated attributes, a requirement that is most effectively accomplished through the use of a GIS database. Examples of such initiatives include the Yukon Land Information Management System (LIMS), the Nunavut PLANNER (see Appendix A), the Northern Land-use Information Series (NLUIS), and the B.C. Terrestrial Ecosystem Mapping (TEM) system (describing ecological conditions that must be assessed prior to development). Land uses include cadastral information, infrastructure and most importantly, an updated mapping of all past, active and proposed projects and activities. Environmental conditions includes many thematic maps, especially topographic, waterways, wildlife habitat, traditional use and an ecological land classification. Figure 7-2 illustrates a database approach proposed for the Yukon to be used within its current Level 1 and Level 2 review process.

Figure 7-2 Proposed Environmental Information Database for Yukon



Source: DIAND 1997a

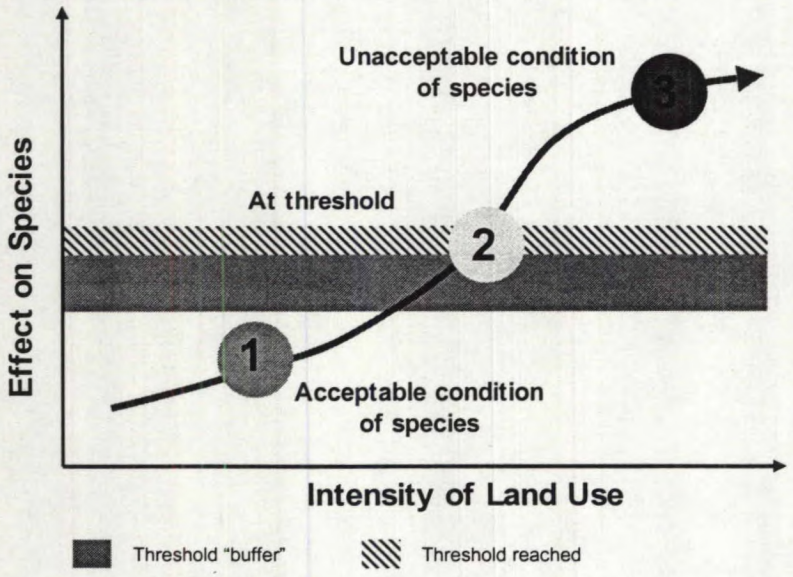
- ***Incorporation of Traditional Knowledge***: Traditional Knowledge has been defined as "a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes 1993). The inclusion of such knowledge in regional land use and environmental databases is required information for decision makers.

- ***Regional ecological monitoring***: Regional ecological monitoring is typically conducted in watersheds or large contiguous landscapes supporting key VECs/VSCs of concern. After a focusing exercise, the objectives and targets of the monitoring are identified and a usually multi-year program commenced with the support of many jurisdictions; and possibly, project proponents. This monitoring assists in identifying baseline conditions, and possibly the degree by which conditions have changed in the past due to both human and natural influences. Most importantly, monitoring serves as an "early warning system" to identify if a management response is warranted for a VEC/VSC. Therefore, a principle objective of such programs are to compare conditions to existing thresholds, or in the absence of thresholds, to provide information to assist in the creation of thresholds. Examples of such initiatives (see Appendix A) includes the Mackenzie Valley Cumulative Impact Monitoring Program and the Coppermine River Basin Study.

- ***Identification of thresholds***: A threshold is a point at which a resource undergoes an unacceptable change or reaches an unacceptable level (see Figure 7-3), either from an ecological or social perspective (DIAND 2000). Thresholds are usually (and most usefully) expressed numerically, although thresholds can be expressed as a subjective desired state. Thresholds are a fundamental requirement of both CEAs and a Framework; without

thresholds, one cannot know if a VEC or VSC is now or yet may be significantly affected. Thresholds are therefore also a necessity if significance is to be defined; and, are equivalent to the concept of "carrying capacity". Thresholds are readily available for some constituents of air and water and for some contaminant exposures to humans. However, thresholds for wildlife (see DIAND 2000) remain elusive, and represent a major challenge to the management of cumulative effects. Due to their importance, thresholds are discussed in more detail below.

Figure 7-3 Threshold Conditions



Source: AXYS 1999.

7.4.1 Thresholds

The most common and important elements missing from a Framework are thresholds, particularly for terrestrial environmental components (i.e., soil, vegetation and wildlife), and to a lesser extent for air, water and human health (as some thresholds do exist for these components). Therefore, given the lack of an ideal management response using thresholds (i.e., providing a comparison of effects to a pre-determined desired environmental or social condition), a "back door" approach to managing cumulative effects is required until such thresholds are developed and widely accepted. These alternatives include many of the aforementioned tools that allow effects management to be effectively and often immediately applied without the need for the establishment of a final quantified objective.

The draft Bathurst Caribou Management Plan (GNWT 1988), for example, starts the process of establishing thresholds for total numbers of caribou in this herd. The draft plan proposes that the herd should be maintained at a level sufficient to sustain a harvest of at least 16,000 caribou. A population of 300,000 to 600,000 caribou in the Bathurst herd has been identified as the range that will meet this objective.

Thresholds for herd size and seasonal distribution for the Bathurst herd will ultimately be required. The thresholds for herd size can be transposed into a threshold for total annual mortality from all sources with hunting "quotas" established as a subset of total annual mortality. Thresholds for development will ultimately be required so that the general pattern of movements of caribou in relation to the distribution of the communities is not compromised.

The Government of the Northwest Territories sponsored a workshop of stakeholders concerned with the management of the Bathurst caribou herd in the fall of 1996. There was general agreement that the workshop provided a useful forum to develop consensus and there was also agreement that a follow-up workshop would be valuable. This set of stakeholders has been busy with other priorities since that time including the assessment of the proposed Diavik Diamond Mine which is situated near the BHP Ekati Diamond Mine on one of the primary migratory routes of this herd.

A follow-up meeting would be a useful next step in the development of a final species management plan for the Bathurst caribou herd. While there have been some significant changes to management systems in this area since 1996, these changes do not reduce the need for a process to develop consensus on the best approach to the future management of this herd. The changes include the passage of the *Mackenzie Valley Resource Management Act* and the formal establishment of Nunavut; both of these changes introduce new administrative structures that will influence the management of caribou and caribou habitat in the future.

The development of a final plan for the Bathurst herd will represent an essential prerequisite for a management Framework for the SGP. The final plan will probably include thresholds that can serve as guidelines to regulators; specifically, thresholds for appropriate levels of human activity on the migratory routes of caribou. The Bathurst herd is the single most valuable renewable resource in the region and, if managed properly, will ensure the continuity of the human cultures in the area in perpetuity. The completion of the process of establishing an adaptive plan for this herd will represent an important contribution to the application of best management practices to this region in the future.

8.0 Legal Provisions Influencing Decision Making

8.1 Introduction

In the period since the James Bay and Northern Quebec Agreement was ratified by the Inuit and Cree of northern Quebec and approved by governments in 1975, the regulatory framework for the management of the environment and the assessment of the impacts of northern development has been substantially revised. These changes reflect both the evolution of environmental law in Canada over the last 25 years and, in no small measure, the special requirements that have emerged from land claim agreements.

Land claims have been settled in the Yukon, Northwest Territories, Nunavut, northern Quebec, including Nunavik, and an agreement in principle has been achieved in Labrador. All of these agreements address environmental management and include provisions for environmental impact assessment and, in some cases, land use planning.

Any consideration of a Framework must occur within the context of these pre-existing legal provisions. As an overarching regional environmental management concept, the Framework goals may be achieved in a variety of ways. The review below is intended to provide an overview of how existing environmental impact assessment (EIA) and regional land use planning systems (RLUP) in the territories, northern Quebec and Labrador will inevitably shape and contribute to Framework efforts.

Current EIA requirements, based either on land claim or legislation, almost invariably require the consideration of cumulative effects of new project proposals. Thus, project based EIA systems will contribute to both the information required for a Framework and to the management of the environmental effects of projects as a contribution to Framework efforts. Regional Land Use Planning also has the potential to contribute to Framework through the control of land use activities, based on local and regional environmental goals and objectives.

Since the more recent changes to the legislative and regulatory frameworks for EIA and Regional Land Use Planning in northern Canada are generally based on commitments made in land claims, these new frameworks seem unlikely to change. As a consequence, any broadly based Framework will have to be flexibly designed in order to integrate efficiently into this pre-existing legal landscape.

The review below proceeds from west to east, briefly highlighting environmental legislative provisions in the various jurisdictions that are relevant to the consideration of a Framework. The cumulative effects provisions of the federal EIA system, based on the *Canadian Environmental Assessment Act* (CEAA) (S.C. 1992) are reviewed first since this legislation is broadly applicable across the northern territories and provinces.[4] Next,

[4] It is beyond the scope of this report to comment on the actual application of CEAA under each of the land claim regimes. The issue of CEAA application is not without controversy, for example in Nunavut, NTI has adopted the position that Article 12 of their land claim entirely displaces the legislation.

the EIA and RLUP systems resulting from land claims or based in the provincial legislation of each of the territories, northern Quebec and Labrador are reviewed.

8.2 Cumulative Effects and Land Use Planning under Federal Law

8.2.1 The Canadian Environmental Assessment Act and Cumulative Effects Assessment

There were no explicit requirements to consider cumulative effects in the Environmental Assessment and Review Process Guidelines Order (EARPGO) and cumulative effects did not figure prominently in any decisions under the Guidelines Order.

When the Canadian Environmental Assessment Act (CEAA) came into force in 1995, however, it lead the way in establishing a legal requirement for the assessment of cumulative effects. Unfortunately, the science and technique of cumulative effects assessment (CEA) is only developing. CEA has thus become a significant issue and has figured in recent litigation, including such cases as *Sunshine Village Corp. v. Canada (Minister of Heritage)* (Federal Court Trial Division, 1995); *Sunshine Village Corp. v. Canada (Minister of Heritage)* (Federal Court of Appeal, 1996); *Alberta Wilderness Association v. Express Pipelines Ltd.* (Federal Court of Appeal, 1996); and most recently in *Alberta Wilderness Association v. Cardinal River Coal Ltd.* (Federal Court Trial Division, 1999) (the "Cheviot" decision). It appears from a brief review of these cases that the obligation to conduct CEA included in the legislation has proven difficult to consistently satisfy.

The CEAA provision most relevant to our discussion is Subsection 16(1) which requires that every screening or comprehensive study of a project and every mediation or assessment by a review panel include a consideration of the list of factors contained in paragraphs (a) to (e). The most relevant paragraph is (a):

> the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with 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* (emphasis added).

In the Cheviot case, there were gaps in the evidence before the Joint Review Panel (JRP). The JRP did not use its subpoena power to require that the necessary evidence be produced. In its judicial review, the court held that the information that might have been secured was relevant to several of the factors in Section 16 of the CEAA, including cumulative effects that were in issue in the hearing before the JRP.

The court held that the panel had an obligation to secure information about forestry and other mining development activities in the Cheviot area in order to relate the effects of these activities to the Cheviot mining proposal. Since the information was available and panel failed to obtain it, the court concluded that the JRP breached its duty to obtain all available relevant information as a basis for its decision and specifically to consider that information with respect to cumulative environmental effects.

As a result of this and other errors and a breach of the rules of fairness, the court quashed the fisheries authorizations issued by the Minister of Fisheries and Oceans under Section 35 of the *Fisheries Act*.

Federal agencies had already begun the work necessary to develop a systematic approach to cumulative effects assessment at the project level at the time the Cheviot decision was rendered.[5] Nevertheless, this case highlights the importance of good cumulative effects assessment practice at all levels of EIA under the CEAA.

It is clear that project based CEA is a requirement in any EIA conducted under the CEAA in the territories and the northern provinces.

8.2.2 Federal Land Use Planning

Since land and natural resources belong to the provinces and legislation with respect to these matters is the constitutional prerogative of the provincial legislatures, there is no federal land use planning legislation applicable in these areas. Until the *Mackenzie Valley Resource Management Act* (SC 1998) was passed, there was no legislatively based land use planning process in the territories either.[6] Several of the land claim agreements do, however, call for RLUP. These requirements are reviewed below.

8.3 Territorial and Provincial Requirements

8.3.1 Yukon

The Council for Yukon Indians and Canada settled an Umbrella Final Agreement (UFA) in 1993 (UFA 1993). The UFA provides the framework for future land and resource management including land use planning and environmental impact assessment in Yukon. There are 14 Yukon First Nations parties to the UFA. Each of these First Nations must also negotiate a First Nation final agreement and a self-government agreement. Only seven of the First Nations have done so to date. In order to bring the rights negotiated in the UFA into force, a First Nation final agreement must be settled and ratified.

8.3.1.1 Land Claim Cumulative Effects Assessment Requirements

Chapter 12 of the UFA deals with development assessment and includes a requirement for development assessment process (DAP) legislation. The UFA provides for the new legislation to be developed by the parties to the agreement, that is the two governments and Yukon First Nations. The UFA requires the establishment of a Yukon Development Assessment Board (YDAB) with Yukon wide responsibility for the DAP and of Designated Offices which are community, regionally or First Nation based and are responsible, among other duties, for screening.

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[5] As one example, see the *Cumulative Effects Assessment Practitioners Guide,* by Hegmann et al. Canadian Environmental Assessment Agency, November, 1998.

[6] From 1984 until the early 1990's, there was a northern land use planning program in place in both Yukon and the NWT but no plans were ever finalized and the program was eliminated due to budget cuts. Some of the planning exercises underway under land claim regimes, for instance, the Gwich'in land use planning process have benefitted from the earlier program.

Section 12.4.2 of the UFA outlines the matters which shall be considered by YDAB and each Designated Office when they are carrying out their environmental assessment functions. Cumulative effects are not listed specifically under this section. However, Section 12.4.2.10 does provide for the consideration of "any other matter provided for in the development assessment legislation." Section 12.8.1.8 which deals with the powers and responsibilities of YDAB includes a monitoring role and also indicates that the Board can, "upon request by government, or with the consent of government, upon request by a Yukon First Nation, undertake studies of environmental or socio-economic effects that are cumulative regionally or over time." Thus, YDAB's UFA based responsibility clearly includes responding to CEA issues.

Land use plans are integrated into the DAP by Section 12.7.0 of the UFA. It is a mandatory requirement that YDAB or a Designated Office secure a determination form a Regional Land Use Planning Commission as to whether a project subject to environmental review is in conformity with an approved plan.

8.3.1.2 The Legislative Basis for Cumulative Effects Assessment in Yukon

A draft Yukon Development Assessment Act has been prepared and circulated for public comment[7]. At the present time DAP legislation is being re-written partly in response to significant public concerns expressed with previous draft legislation. Part 2 of the Act outlines the provisions of the assessment process. Section 39 lists the matters to be taken into consideration by a Designated Office, the Executive Committee of or a panel of the YDAB in conducting a screening or review. Paragraph 39 (1)(b) requires of that the "adverse environmental and socio-economic effects of the project and the significance of those effects, including the effects of malfunctions or accidents that may occur in connection with the project and any cumulative effects that are likely to result from the project in combination with other projects that have been, or will be carried out."

During the screening or a review of a project, Section 65 of the draft Act requires that an approved land use plan be reviewed by a planning commission in order to determine the conformity of the project. If the project does not conform, the planning commission is invited to make representations and the screener or reviewer is required, "to the extent practicable, to recommend terms and conditions that would bring the project into conformity with the regional land use plan."

Thus, consideration of cumulative effects is a requirement for both levels of the assessment process under the DAP legislation and land use plans must be factored into DAP decision-making.

8.3.1.3 The Role of Land Use Planning

Land use planning in Yukon applies to both settlement and non-settlement lands and is intended to be linked to other land and water planning and management processes. The UFA provides for both a Yukon Land Use Planning Council and for Regional Land Use Planning Commissions which will develop land use plans. Once plans are approved, government shall exercise any discretion that it has in granting interests in land, water or

[7] We reviewed the draft dated 15 October, 1998 for this report.

other resources in a manner consistent with a plan. Yukon First Nations are also generally constrained by approved land use plans in terms of their use of settlement lands.

As was mentioned above, once a regional land use plan is in effect, the Planning Commission shall, upon the request of YDAB or a Designated Office, determine whether a project is in conformity with the approved plan. Such a determination must be factored in to a DAP decision about a project.

8.3.1.4 Relationship to the Canadian Environmental Assessment Act Process

Until the DAP legislation is approved by the parties to the UFA and enacted by Parliament, the *Canadian Environmental Assessment Act* is the environmental impact assessment process for Yukon. The CEA provisions in that act consequently outline the cumulative effects requirements for Yukon at this time.

Section 6 of the DAP legislation provides that an environmental impact assessment cannot be conducted under the CEAA for a project that is submitted under the DAP legislation. Thus, once the new legislation for Yukon is in place, cumulative effects assessment in Yukon will be based on the statutory provisions enacted in response to the UFA.

8.3.2 The Northwest Territories

8.3.2.1 The Inuvialuit Settlement Region

The Inuvialuit Final Agreement[8] (IFA) (IFA 1984) was settled between Canada and the Committee for Original Peoples Entitlement in 1984. It was the first land claim settled in the Northwest Territories. The provisions for environmental impact assessment in the IFA are found in Sections 11 and 12.

Land Claim Cumulative Effects Assessment Requirements

Section 11 of the IFA identifies the developments subject to environmental screening. Section 11(1)(c) provides that developments in the Inuvialuit settlement region (ISR) for which the Inuvialuit request screening are subject to the process described in Section 11. On April 10th, 1987 the Inuvialuit Game Council gave formal notice that all developments in the offshore and onshore on Crown lands within the ISR were to be submitted for screening under Section 11. As a result, all activities in the Inuvialuit settlement region except those on private land that meet the definition of a "development" in the land claim are subject to screening and possibly environmental impact review under the Inuvialuit Final Agreement.

The IFA establishes two bodies that are responsible for environmental impact assessment in the Inuvialuit settlement region. The first, the Environmental Impact Screening Committee ("the screening committee") is responsible for preliminary screening and review of developments. If a development appears likely to have significant negative impacts the screening committee shall refer the project for environmental impact assessment. Environmental impact assessment is conducted by the second of the two

[8] The Western Arctic Claim: The Inuvialuit Final Agreement, 1984.

bodies established by Section 11 of the IFA. The Environmental Impact Review Board ("the review board") is responsible for formal public reviews of developments requiring environmental impact assessment.

There is no mention in the IFA of a specific requirement for cumulative impact assessment. Section 11(11) however, allows the screening committee to establish and adopt bylaws and rules for its internal management and procedures. The screening committee has adopted such guidelines and operating procedures (EISC 1998). Section 4.4 of the guidelines outlines the project description format for developers submitting material to the screening committee. Subsection 4.4(6) of the guidelines document indicates that "Proponents are expected to identify and assess the cumulative effects of all the proposed development and other activities in the area to the best of their ability." Appendix D of the guidelines also identifies a series of criteria for the determination of significant negative environmental impacts. These criteria are expressed as a series of questions and Section 10 of the appendix poses the following question, "What are the cumulative effects of the proposed project?"

CEA is thus a component of all screening activities conducted for developments in the Inuvialuit settlement region.

The Environmental Impact Review Board has also adopted procedures to guide its environmental assessment processes (EIRB 1997) The review board procedures identify information required from proponents involved in environmental assessment hearings. Section 10 of the procedures document deals with "Information Requirements" and Section 10.2 outlines the required contents for an environmental impact statement. Subsection 10.2.1(c) requires that the proponent's impact statement outline "the nature, significance and uncertainties concerning the potential environmental effects of the alternatives (including cumulative effects)." Impact assessment documents submitted to the review board therefore must include an outline of cumulative effects and an evaluation of their significance.

Thus, CEA is an ongoing requirement for both screening and environmental impact assessment processes in the Inuvialuit settlement region.

The Legislative Basis for Cumulative Effects Assessment in the Inuvialuit Settlement Region

There were no requirements for follow-up legislation included in the IFA. It is not anticipated that there will be separate environmental impact assessment legislation for the Inuvialuit settlement region. The primary basis for CEA in the region is the IFA.

The Role of Land Use Planning

The IFA does make provision for land use planning in Sections 7(82) to 7(84) but the land claim does not establish any obligation for government to initiate such a program. The Inuvialuit did participate in the 1984 Northern land use planning process and a start was made on a Beaufort Delta land use plan. The plan had not been completed when the program was cancelled in the early 1990s.

The sections of the IFA that make reference to land use planning make no mention of CEA, monitoring, or any other mechanism for the integration of land use planning and environmental impact assessment.

Relationship to the Canadian Environmental Assessment Act

The CEAA is potentially still applicable in the Inuvialuit settlement region. Once the screening committee has completed its review of a development and decided that significant negative impacts are possible, the committee refers the development for environmental impact assessment. Section 11(15) of the IFA gives the screening committee the discretion to choose which environmental assessment process should be applied to the development. As long as the review process "in the opinion of the screening committee...adequately encompasses or will encompass the assessment and review function, the screening committee shall refer the proposal to the body carrying out that review function." In the 15 years since the settlement of the IFA, all of the screening committee's referrals have gone to the Environmental Impact Review Board.

Therefore, even though the CEAA is applicable in the Inuvialuit settlement region, the discretion available to the screening committee will most likely be exercised in favour of a referral to the environmental assessment body established by the IFA.

8.3.2.2 The Gwich'in and Sahtu Settlement Areas

For purposes of this review the Gwich'in and Sahtu settlement areas will be treated together. The provisions of the Gwich'in Comprehensive Land Claim Agreement and the Sahtu Dene and Metis Comprehensive Land Claim Agreement with regard to environmental impact assessment and land use planning are essentially identical. Furthermore, the implementation legislation for these claims, the *Mackenzie Valley Resource Management Act* (MVRMA) applies to both these settlement areas.

Land Claim Cumulative Effects Assessment Requirements

The provisions in these land claims that require environmental impact assessment assert that the process established pursuant to the claims will be the main instrument for impact assessment in the Mackenzie Valley. The land claim specifically requires implementation legislation in order to outline the details of environmental impact assessment, land use planning and other resource management functions in the settlement areas. The land claims provisions dealing with environmental impact assessment require that the process consider cumulative effects. The land claims also require an ongoing process of environmental monitoring and auditing in the Mackenzie Valley.

The Legislative Basis for Cumulative Effects Assessment in the Mackenzie Valley

Part V of the MVRMA establishes the Mackenzie Valley Environmental Impact Review Board (MVEIRB) and the process for environmental impact assessment for the Mackenzie Valley. The MVRMA defines the "Mackenzie Valley" for purposes of the Act to be all of the Western NWT except the Inuvialuit Settlement Region. Thus, even areas in the NWT where there are no settled land claims are covered by the impact assessment process in Part V. Section 116 of the MVRMA limits the applicability of the

CEAA in the Mackenzie Valley to proposals which are determined to be in the national interest or to projects that are trans-regional where the MVEIRB and the Minister of Environment agree to invoking the CEAA.

Part V of the MVRMA establishes a three step environmental impact assessment process. The first level is called preliminary screening. Responsibility for preliminary screening rests with regulatory authorities or other entities undertaking a project. Where a screening body determines that a development might, in its opinion, have a significant adverse impact on the environment or be the cause of public concern, it shall refer the development to the MVEIRB in order that the development can be assessed. This is the second level in the process. If, as a result of the assessment, it appears that the development is likely to have a significant adverse impact on the environment or to be a cause of significant public concern, then the MVEIRB can order an environmental impact review of the development. Environmental impact review is the third level in the impact assessment process. This would usually involve a public panel review.

Section 117 of the MVRMA specifies the factors to be considered by the Board during the environmental assessment and environmental impact review of a development. Subsection 117(2)(a) specifies consideration of "the impact of the development on the environment, including the impact on malfunctions or accidents that may occur in connection with the development and any cumulative impact that is likely to result from the development in combination with other developments." Thus, CEA is a requirement of both assessment and environmental impact review under the MVRMA environmental impact process.

Part VI of the MVRMA provides for environmental monitoring and audit and Section 146 of the MVRMA requires the responsible authority to analyse data collected by it, and other pertinent information for purposes of monitoring the cumulative impact on the environment of concurrent and sequential uses of land and water and deposits of waste in the Mackenzie Valley. The "responsible authority" will be designated by regulation, but such a designation has not yet taken place.

The Role of Land Use Planning

The MVRMA requires that land use plans be developed for the Gwich'in settlement area and the Sahtu settlement area. Land use planning is integrated into the overall resource management process in the Mackenzie Valley. The Gwich'in Tribal Council has reviewed and approved a draft land use plan prepared by the Gwich'in Land Use Planning Board (GLUPB 1999). Government is now reviewing the plan. A land use plan is also in preparation in the Sahtu area. Section 46 of the MVRMA requires that the Gwich'in and Sahtu First Nations, departments and agencies of the federal and territorial governments and other bodies with legal authorities, carry out their powers in accordance with the land use plan applicable in a settlement area. Section 61 of the Act prevents a land and water management board from issuing a license permit or authorization except in accordance with an applicable land use plan.

Thus, the MVRMA makes approved land use plans central to land and water management in the Mackenzie Valley. Land use planning processes have only begun and there are as yet no approved plans. Until the framework and content of an approved land use plan can be studied, it will not be possible to determine in any detail the actual

interrelationship between CEA, land use planning and environmental impact assessment in the Mackenzie Valley.

Relationship to the Canadian Environmental Assessement Act Process

Except in the limited circumstances outlined in Section 116 of the MVRMA, the CEAA no longer plays any role in environmental impact assessment in the Mackenzie Valley. The CEAA has effectively ceased to be important in the CEA process in the Mackenzie Valley.

8.3.2.3 Areas in the Northwest Territories Without Settled Land Claims

There are a number of areas in the western territory which have not yet settled land claims or where treaties and not comprehensive land claims are applicable. These include the North Slave area, the South Slave area, the Deh Cho area and the Dogrib area. Portions of these areas are covered by Treaties 8 and 11. Portions of these areas are subject to Metis claims.

Land Claims Cumulative Effects Assessment Requirements

Since these areas are not covered by land claims there can be no claims based CEA requirements.

The Legislative Basis for Cumulative Effects Assessment

As was explained above, the MVRMA defines the "Mackenzie Valley" as all of the rest of the western territory except the Inuvialuit settlement area. Part V of the MVRMA which outlines the environmental impact assessment provisions of the Act applies to the Mackenzie Valley. This process then applies to areas without settled land claims.

Consequently, the explanation provided above of the CEA provisions in the MVRMA is applicable for areas without settled land claims as well.

Relationship to Land Use Planning

The land use planning requirement for the western territory is currently based in the MVRMA. However, Part II of the Act, which deals with land use planning, applies only in Sahtu and Gwich'in settlement areas. Thus, there is no land use planning process required by law for the areas of the NWT without settled land claims.

Relationship to the Canadian Environmental Assessment Act Process

The discussion above with regard to the applicability of the CEAA is equally applicable to areas in NWT without settled land claims.

8.3.3 Nunavut

The new Nunavut territory established on April 1st, 1999 is subject to only a single land claim agreement (Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada, May 1993). The Nunavut Land Claims Agreement (NLCA) was signed in 1993 and ratified by Parliament in the same year. CEA requirements in the Nunavut settlement area are reviewed below.

8.3.3.1 Land Claim CEA Requirements

Article 12 of the NLCA includes provisions dealing with development impact. Article 12 establishes the Nunavut Impact Review Board (NIRB) which is responsible for overseeing the impact assessment process in Nunavut. Only passing reference to CEA is made in Article 12. Specifically, Part 3 of Article 12, which deals with the relationship between the NIRB and the Nunavut Planning Commission (NPC) during the impact assessment process, requires that the NPC review a project proposal in order to determine whether the proposal is in conformity with a land use plan before screening of the development proposal by the NIRB takes place. Section 12.3.3 permits a referral by NPC to the NIRB of certain projects that would otherwise be exempt from environmental screening when the NPC is concerned about the potential cumulative effects of those projects.

Section 12.7.6 of the NLCA establishes a requirement for general monitoring to collect and analyse information on the long-term state and health of the ecosystem and socio-economic environment in the Nunavut settlement area. This work is undertaken in co-operation between government and the NPC. This section of the NLCA has been interpreted as a basis for a monitoring system that should identify cumulative effects of development in Nunavut and assist responsible agencies in taking corrective action.

Other than these provisions, there are no express requirements for the assessment or monitoring of cumulative effects in Nunavut in the NLCA. In April of 1996, the NIRB transition team held a strategy session that looked at CEA and resulted in the initiation of a CEA geographic information system. In April 1997, the NPC and government convened a general monitoring program workshop that also gave consideration to CEA in Nunavut.

8.3.3.2 The Legislative Basis for Cumulative Effects Assessment in Nunavut

Article 10 that the NLCA requires that all of the substantive powers, functions, objectives and duties of NIRB shall be set out in statute. The required legislation has, however, not yet been drafted. Current legislative efforts are directed to the passage of the Nunavut Waters and Surface Rights Board Act that is currently before Parliament. It would seem unlikely that environmental assessment legislation for Nunavut will be prepared in the near future. Thus, CEA in Nunavut is likely to continue to depend on the provisions of Article 12 of the NLCA for the foreseeable future.

8.3.3.3 The Role of Land Use Planning

The land use planning process in Nunavut, which is the responsibility of the NPC, is intended to be intimately related to the process of environmental impact assessment. Part 3 of Article 12 mentioned above establishes the formal relationship between land use plans and the environmental assessment process which is the responsibility of the NIRB. Section of 11.5.10 requires that the NPC shall review all applications for project proposals and determine whether or not they are in conformity with a land use plan. A project proposal which is not in conformity must either be exempted from the plan or be granted a variance by the NPC. Otherwise, no project proposal can be forwarded to NIRB for environmental assessment.

In the absence of an approved land use plan, project proposals are forwarded directly to the NIRB for screening. The formalities associated with project proposal review by the NPC will not begin until a land use plan is approved.

Even though the impact assessment relationship between the NIRB and the NPC is in abeyance until the first plan is approved, it is clear that the NLCA framework intends a formal and ongoing relationship between land use planning and environmental assessment that would have to include cooperation in long-term monitoring of the cumulative effects of development.

8.3.3.4 Relationship to the Canadian Environmental Assessment Act

The question of the relationship between the *Canadian Environmental Assessment Act* (CEAA) and the process outlined in Article 12 of the NLCA is one characterized by significant controversy. Inuit institutions, including Nunavut Tunngavik Incorporated (NTI), have expressed their view that the CEAA does not apply in Nunavut. The NIRB has also adopted this position. Federal agencies are aware of the Inuit position, but have not yet formally responded to the issue. It is inevitable that once drafting efforts begin for the legislation required to implement Article 12 of the NLCA that this issue will have to be resolved. In the meanwhile, the question on the application of the CEAA and its cumulative effects assessment requirements is a contentious one and the answer may depend on the agency to which the question is posed.

8.3.4 Northern Quebec and Nunavik

The James Bay and Northern Quebec Agreement (JBNQA) and the Northeastern Quebec Agreement (NEQA) were Canada's first modern land claim agreements, signed in 1975 and 1978 respectively. The JBNQA involved a settlement between the governments of Canada and Quebec and the Cree and Inuit of Northern Quebec. The Naskapi negotiated the NEQA and it was signed in 1978, amending the JBNQA. The provisions of these agreements will be reviewed separately below.

8.3.4.1 The James Bay and Northern Quebec Agreement[9]

Section 22 of the JBNQA establishes a regime covering the "Environment and Future Development Below the 55th Parallel" for the Cree portions of the area to which the Agreement applies. Likewise, Section 23 of the Agreement provides for the "Environment and Future Development North of the 55th Parallel" (Nunavik).

Subsection 22.5 of the Agreement specifies that all developments listed in Schedule 1 are subject to the EIA process outlined in Section 22. Schedule 2 lists the exempted developments. Projects not on the schedules are assessed based on the recommendation of the Administrator. A screening-like step then ensues, which is the responsibility of the Administrator and a jointly appointed Evaluation Committee. If significant impacts appear likely, an assessment and review is conducted and an impact statement is required. The decision rests with the Administrator, subject to the Agreement. The next step is the establishment of an Environmental and Social Impact Review Committee for provincial projects, or a Review Panel for federal projects, to conduct the review. These bodies can be combined if warranted; a development project shall not be subjected to more than one assessment and review.

Under Subsection 22.6.8 the content of the Statement of Environmental and Social Impact may vary depending on the instructions of the Administrator under Subsection 22.5.15 and shall include any requirements based on applicable laws or regulations and such other information as is referred to in Schedule 3 of Section 22. The contents of Schedule 3, Section 3 require the proponent to consider "whenever appropriate, direct, indirect and cumulative impacts; short term and long term impacts; reversible or irreversible impacts." Thus, consideration of CEA in the JBNQA is mandatory under Section 22.

Under Section 23 of the Agreement, an Environmental Quality Commission (EQC) is appointed to be responsible for the environmental and social impact assessment process in the region north of the 55th parallel. The Section 23 system also requires the consideration of all developments on Schedule 1 and provides for the exclusion of projects on Schedule 2. Screening is done by the EQC. As in Section 22, separate provincial or federal assessment of projects is possible and each government appoints an Administrator to whom the provincial or federal screenings are forwarded for decision. If significant impacts from a project appear likely, an Environmental and Social Impact Review Panel is appointed. Section 23 provides for flexibility in the contents of an environmental impact statement and Schedule 3 to this Section includes identical wording to Schedule 3 to Section 22 with respect to the requirement for the consideration of cumulative effects. Project based CEA is thus mandatory in Nunavik as well..

The Legislative Basis for Cumulative Effects Assessment in Northern Quebec and Nunavik

The JBNQA provisions are legally binding on both Quebec and Canada. The Agreement is a modern treaty within the scope of Section 35 of the *Constitution Act, 1982* and, as such, prevails over inconsistent federal or provincial legislation. The JBNQA stands on

[9] Please note this portion of the review is preliminary only. The JBNQA system is very complex. In the time available, secondary sources have not been consulted. This part of the report will be revised before being finalized.

its own, however, and did not require any subsequent environmental assessment legislation in order to bring the provisions of Sections 22 and 23 into force.

Role of Land Use Planning

While there is no explicit requirement for land use planning in the JBNQA, there are requirements in the agreement for actions with similar effect. In the Nunavik Region, the Kativik Regional Government has drawn up a master plan for land use. This plan came into effect in October 1998, following approval by the Minister of Municipal Affairs and will be adopted by implementing appropriate regulations.

8.3.4.2 The Northeastern Quebec Agreement

Land Claim Based CEA Requirements

The environmental provisions of this Agreement, found in Section 14 apply to the area south of the 55th parallel and east of the 69th meridian (the "territory"). Depending on the nature of a development, assessment under a provincial or federal process is possible but only one review shall be conducted per project. The review of development includes both environmental and social impact assessment. Schedule 2 to Section 14 lists the project types to which the section applies. Schedule 3 lists the required contents of an environmental and social impact statement. Part 4 of Schedule 3 entitled "Predicting and Evaluating Probable Impacts" indicates that this section of an impact statement should consider, "whenever appropriate, direct, indirect, and cumulative impacts, short term and long term impacts and reversible or irreversible impacts."

Thus, it appears that any EIA conducted in the territory would have to include consideration of cumulative effects.

The Legislative Basis for Cumulative Effects Assessment in the "Territory"

The NEQA stands alone and did not require follow up legislation.

Role of Land Use Planning

There are no provisions for land use planning in the NEQA.

8.3.5 The Labrador Inuit

On May 10, 1999, the Labrador Inuit and the governments of Newfoundland and Canada initialed an Agreement in Principle (AIP) which could lead to a land claim agreement in the near future. The AIP includes self-government powers and Inuit will be able to make laws with respect to the lands granted them under the agreement.

8.3.5.1 Agreement in Principle Cumulative Effects Assessment Requirements

Chapter 11 of the AIP deals with Environmental Assessment and Section 11.2.10 outlines the matters to be considered in the environmental assessment of a project. Paragraph 11.2.10(e) refers to any environmental effects and "any cumulative Environmental

Effects that are likely to occur in combination with other undertakings, projects, works or activities that have been or are likely to be carried out." This language is quite similar to that found in Section 16(1) of CEAA and this provision applies to all assessment in the settlement area regardless of whether it is carried out under Inuit, provincial or federal law.

8.3.5.2 The Legislative Basis for Cumulative Effects Assessment in the Settlement Area

Because of the self-government powers in the AIP, the legislative base for CEA in the settlement area will vary depending on the nature of the project and the lands affected. The AIP provides for harmonization as required. Irrespective of the legislative base upon which an EIA proceeds, because of the provisions reviewed above, CEA will be a component of the exercise.

8.3.5.3 Relationship to Land Use Planning

The AIP establishes a land use planning system which does not apply to federal lands[10] and which is based on the province's *Urban and Rural Planning Act* (RSN 1990). A land use plan must be developed for "the control of land, water and resource use in the Labrador Inuit Settlement Area" within three years of the effective date of the land claim. Implementation of the plan is anticipated by way of regulations. Subsequent to public consultation, a draft plan must be approved by both the Inuit Central Government and the province. Once in force, new land uses will have to conform to the plan.[11]

The AIP makes no explicit link between the land use planning process and the EIA process but it appears that the planning process itself must take Inuit rights and the management of the environment, wildlife, fish, habitat and marine and estuarine areas into consideration. Thus it would seem likely that a convergence will occur between the values protected by an approved land use plan and the matters which will be considered by the AIP's EIA process on a project by project basis. Projects reviewed under the Chapter 11 process will have to be in conformity with a land use plan that is based in regulation.

8.4 Conclusion

Project based cumulative effects assessment is required across the provincial and territorial North, either by virtue of federal legislation or by provision of land claims or land claims settlement legislation. Although project based CEA is only one component of a Framework, it is an essential one. Furthermore, project based CEA is mandatory and the results of these assessment efforts will contribute to the regional database essential to a Framework.

Regional Land Use Planning is another common component of the regulatory regimes emerging from land claims, with the exception of the Inuvialuit Settlement Region and the territories subject to the NEQA. Participation in RLUP exercises is another way that government and industry can contribute to the information base upon which regional

[10] Since lands in Labrador are primarily provincial this exclusion does not appear to be significant.
[11] The federal government is exempt.

development decisions can be made. The databases necessary for RLUPs represent a resource, largely developed with public funds, that can also contribute to a Framework. Where land use planning initiatives are just beginning, government and planning boards should consider developing RLUP databases cooperatively and in a scale and format that will encourage multiple use of the information.

The linkage drawn between RLUP and EIA in the legislation or land claims in most of the northern jurisdictions is a feature of vital importance to a Framework. Decision makers in these jurisdictions will have to consider project based CEA results in the context of regional planning objectives and restrictions. Several of the regimes, for example the *Mackenzie Valley Resource Management Act*, prevent the authorization of a project inconsistent with a land use plan. To achieve regional cumulative effects management, the results of project based assessment must be integrated into a regional context. This can be done relatively easily where there is a regional land use plan. Thus, some linkage between EIA and RLUP is an essential component of a Framework. This connection is already present in many of the jurisdictions surveyed and represents an opportunity for proponents of Framework.

Another necessary component for a Framework is some form of environmental monitoring or data collection and reporting. Such efforts can be initiated in various ways. Partnerships between industry and government, either project focussed or resource focussed, can complement the data collection that will be undertaken in the context of a RLUP. Some of the land claims regimes in the Mackenzie Valley and Nunavut also provide for regional monitoring of environmental change. In such instances the major components of a Framework are already present and enshrined in the legal framework for the jurisdiction. These areas offer unique opportunities for the implementation of a Framework; serious consideration should be given to the development of pilot projects or studies to this end.

The actual approach to a Framework should be refined in a consultative fashion with the boards and agencies established by land claims, and with government and industry. A single formula for a Framework does not yet exist, and certainly given the central role and jurisdiction granted to the new northern impact assessment and land use planning institutions, no formula can be imposed from the outside. The authority granted to land claims based institutions was won at the negotiation table. The only appropriate approach to a Framework is one which respects the roles and importance of these institutions.

This report has proposed a flexible approach to a Framework. Flexibility will be the key to implementation. While the land claims and legislation in the jurisdictions reviewed may determine the structural components of a Framework, room should still be available for collaboration with these institutions in the development of a Framework.

9.0 Building a Framework

9.1 Summary of Key Elements of a Framework

Most of the key elements of a Framework (i.e., principles, building blocks, focus and tools) already exist in the North, either as an existing or planned initiative. However, there may not be a clear means of ensuring that all the elements are being used, identifying which elements are missing, and determining which if any are being used in the most productive way. Also, what remains missing is how decision-makers are to make informed decisions based on available information, in recognition of the uncertainties involved and lack of thresholds and definition of significance of effects.

Hence, a Framework is required to tie these elements together to ensure the most efficient and acceptable management of cumulative effects.

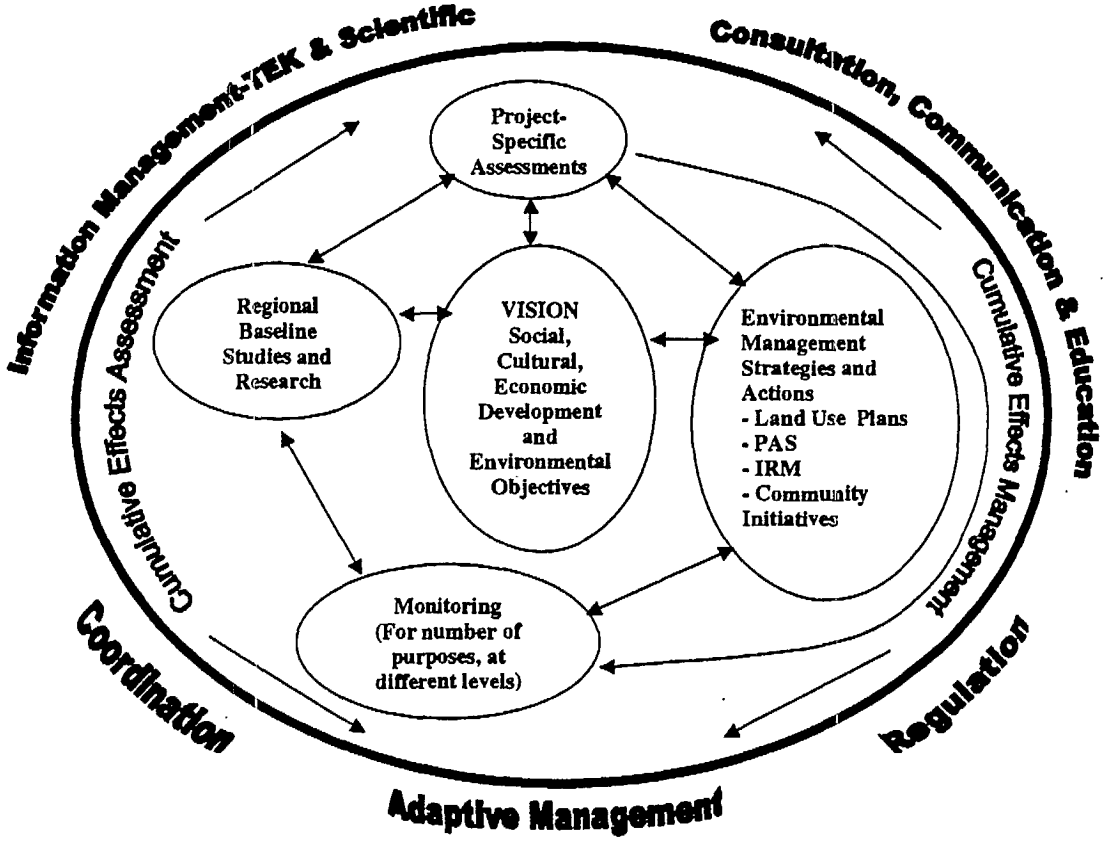
The results of the recent INAC Cumulative Effects Management Workshop (INAC 1999), focussing on the management of cumulative effects in the NWT, clearly indicate the views of the residents of NWT on this subject. Figure 9-1 illustrates the final conceptual Framework model developed during the INAC workshop (p. 23). The conclusions arising from the workshop are generic to the North and reflect the same views expressed in this report, including the need for:

1. collaboration amongst various interested and effected parties;
2. facilitation of public input;
3. identification of vision, issues and description of desired goals;
4. identification of VECs/VSCs;
5. use of regional adaptive management;
6. use of ecological monitoring;
7. desire to develop land use and ecological thresholds; and
8. collection of land use and environmental information, followed by preparation of a digital database.

The following elements should be added to the above:

- identification of timeframes in which to implement an effects management response;
- use of thresholds if available, but recognition of effectiveness of implementing other tools in the absence of clearly defined and accepted thresholds;
- selection of a focus (or "key theme") for effects management; and
- a decision-making process that identifies and assigns the authority to review the information provided and implement a management response.

Figure 9-1 Conceptual Framework from INAC Workshop



Source: INAC 1999.

9.2 Approach to Building a Framework

Figure 9-2 illustrates the proposed approach to build a Framework, based on five steps:

1. Agree on the Framework's Principles.
2. Establish the Building Blocks.
3. Select a Focus to start the management initiatives.
4. Implement appropriate tools from the toolbox.
5. Make land use decisions by implementing the Framework with a clear decision-making process that uses the results obtained, using an adaptive monitoring approach, and in recognition of the existing and pending legal provisions and opportunities they provide in the jurisdictions involved.

Figure 9-2 is purposefully linear (i.e., "step-by-step") as opposed to circular, as is typically the result of preliminary views for Frameworks (e.g., see Figure 9-1 from the INAC workshop). Circular frameworks identify well all the various elements required and their interwoven relationships and dependencies. However, they are not of practical use for implementation as they do not provide a starting-point, a subsequent process to follow, and an end point. The latter is more useful for implementing a Framework.

Figure 9-3 illustrates the relationship between each Focus and the first set of tools to be used for each Focus. Other tools can be used afterwards if useful. The Scientific and Knowledge Based tools should as much as possible be part of any Focus, and therefore contribute to further information that can be used under any Framework.

Figure 9-2 Proposed Approach to Build a Framework

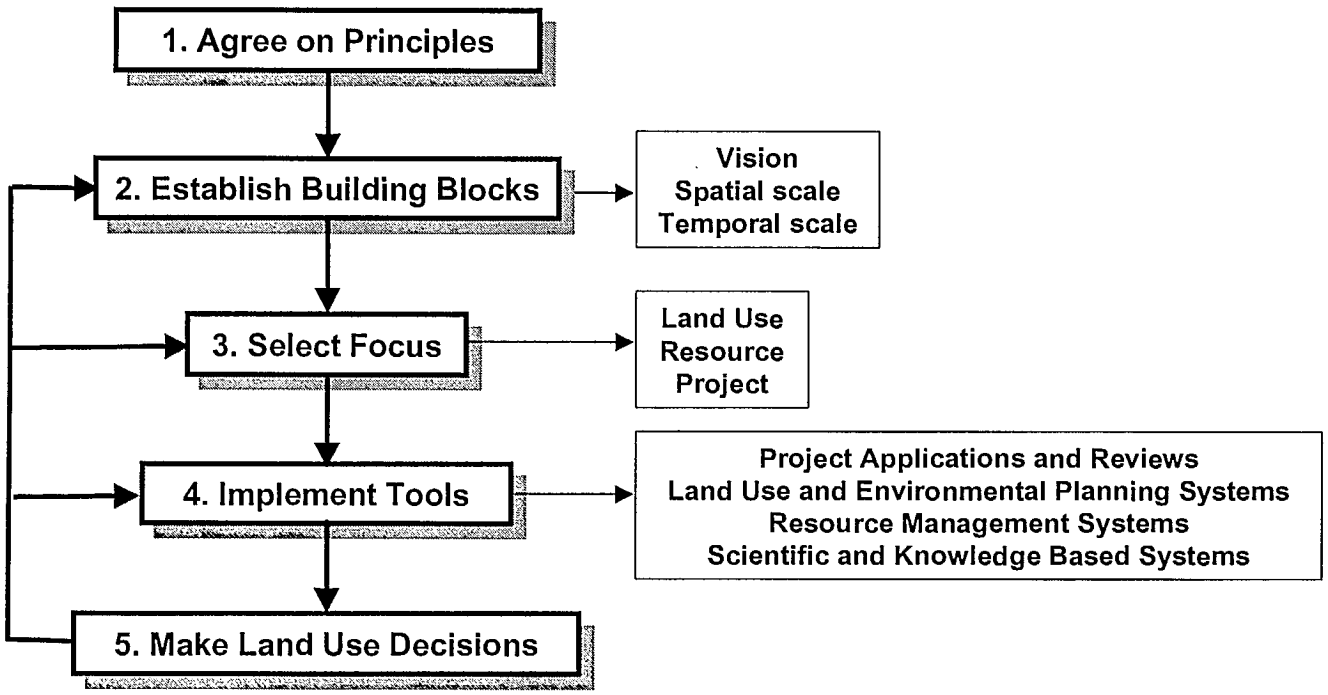
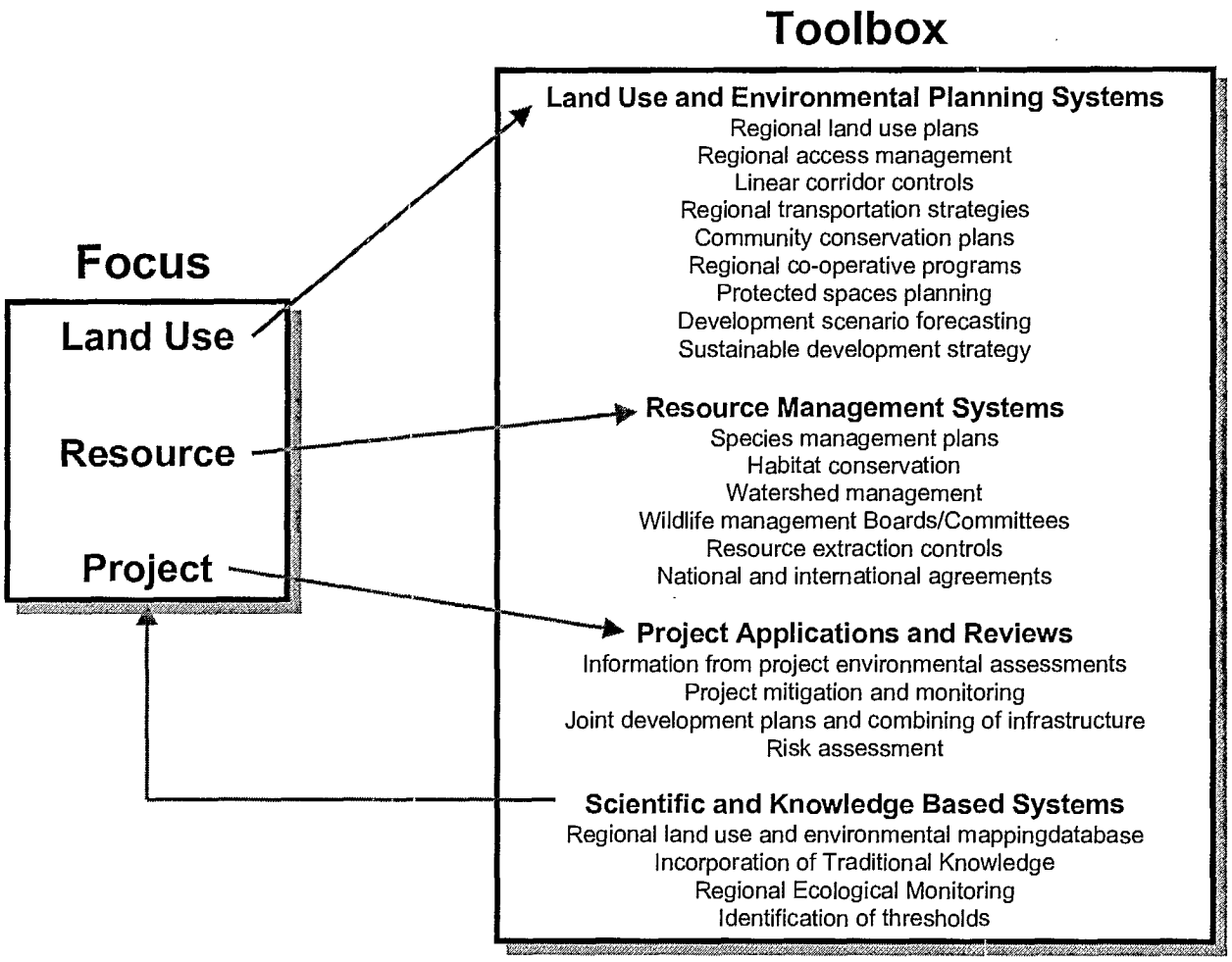


Figure 9-3 Relationship Between Focus and Tools



9.3 Candidate Geographic Regions for Pilot Programs

There has recently been considerable progress in the process of building consensus towards a new approach to designing regional approaches to managing cumulative effects in Canada's North. Once there is general agreement on a preferred approach to the application of a Framework, the Framework can be tested for its suitability and refined as necessary. One approach is to select regions of the North where there are contemporary management challenges and then consider the possible application of a new Framework in each.

Such regions can be selected where there is an urgent need to achieve balance between:

- opportunities for development of non-renewable resources;
- opportunities to ensure that the use of renewable resources can continue on a sustainable basis; and
- opportunities to implement regional land use plans in a way that will ensure that northern landscapes are not altered to the point that they can no longer meet the needs of the people (especially for areas that currently are largely untouched by the effects of human activity).

Three candidate regions for establishing pilot programs to test the application of a Framework are the Slave Geological Province in the NWT and Nunavut, the Southeast Yukon and Liard Valley in Yukon and the NWT, and, northern Quebec and Labrador. Each of these regions has been the focus of recent attention by developers and governments and, in each of these regions, local people have expressed concerns about the potential effects of development on the environment and their health.

9.3.1 Slave Geological Province

The Slave Geological Province (SGP) is a vast region that stretches from the north shore of Great Slave Lake to the southern and eastern shores of Great Bear Lake in the west to the shores of the Coronation Gulf and Bathurst Inlet of the Arctic Ocean in the North. The eastern boundary of the SGP is defined by the Thelon River.

The range of the Bathurst herd of barren-ground caribou corresponds to the boundaries of the SGP; caribou from this herd of 350,000 animals have their calves near Bathurst Inlet each year and migrate across the SGP to their winter range. While the general movement patterns of the herd fall within the SGP, there can be a considerable amount of annual variation in these movements. The herd may calve on either side of Bathurst Inlet. The caribou may follow a variety of pathways to reach their winter range, which may be concentrated in the area south of Great Bear Lake in some years or as far away as the east arm of Great Slave Lake near Lutsel'Ke' (formerly known as Snowdrift). While caribou from this herd spend most winters north of Great Slave Lake, they have migrated south of the Lake during several of the winters between 1940 and 1999 and may have traveled as far south as Fort Chipewyan, Alberta.

The non-renewable resource potential of the SGP is considerable although the cost of development is high as a result of the remoteness of deposits relative to existing transportation corridors, the distance to population centres and the extreme winter conditions that occur in most years. The non-renewable resources with high potential for development in the SGP include base metals like zinc and nickel, beryllium, gold and diamonds.

The human population in the SGP is not large by southern Canadian standards. Most communities are separated by hundreds of miles and most are only accessible by air. Like the other two regions discussed below, the origins of the peoples that live in or near the SGP can be subdivided into three broad categories: original peoples, people whose family tree can be traced to relatives who lived in the area prior to 1953, and people who have

made the North their home in more recent years. The first category of people include Inuit, Inuvialuit and Dene' whose family tree can be traced back to relatives who lived in the region prior to contact with European peoples. The second category of people includes Metis and Dene' people with a long history of occupancy in the region as well as other Inuit, Dene', Inuvialuit and other Canadians who moved into the area prior to 1953; a date prescribed by the *NWT Wildlife Act* to determine eligibility for the relatively unrestricted General Hunting License. The third category includes a mixture of people of ethnic backgrounds as richly varied as those in any set of communities in Canada.

The institutional mechanisms that govern the use of natural resources in the SGP are in a state of transition, so it is timely to consider the application of a mechanism like a Framework for the management of cumulative effects for this area. About half of the Slave Province is now included within the jurisdiction of the Government of Nunavut that was established on April 1, 1999. While there is a management board for the Beverly and Qamanirjuaq caribou herds and also a management board for the Porcupine herd, there is no equivalent mechanism to coordinate the management of the Bathurst caribou herd.

The portion of the SGP that lies within Nunavut falls within the comprehensive land claim that was signed with the Government of Canada in 1993. This claim establishes mechanisms for land use planning within Nunavut and makes provisions for cooperative arrangements to ensure effective resource management with institutions that will govern the SGP in the future. The southern portion of the SGP falls within the area that is currently the subject of land claim and self-government negotiations between Treaty 11, Treaty 8 and the Metis.

Recent environmental impact assessments and cumulative effects assessments have been produced in the region by the proponents of the approved BHP Ekati Diamond Mine and the proposed Diavik Diamond Mine. These assessments were conducted pursuant to the terms of the *Canadian Environmental Assessment Act.* There are also several opportunities for additional diamond mines in the so called "Corridor of Hope." If these potential projects (some outside of the Nunavut Settlement Area) proceed to the assessment phase, they will be reviewed under the terms of the 1998 *Mackenzie Valley Resource Management Act.* Similarly, the development of transportation corridors is at an early stage with no permanent roads crossing the region and only a small portion of the region accessible by ice road.

A substantial amount of baseline information for the SGP has been organized and collected under the authority of the West Kitikmeot/Slave Society (WKSS). The WKSS program is continuing and additional baseline studies are continuing to help fill high priority information gaps. However, there is no published Vision for the SGP, and no Regional Sustainable Development Strategy or Regional Land use Plan that establishes thresholds for VECs. Decision makers have had to evaluate the relative merits of the BHP and Diavik opportunities without the benefit of regional land use plans.

9.3.2 Southeast Yukon and Liard Valley

While most of the Slave Geological Province is flat and either taiga or tundra, most of the Liard region is mountainous or part of a forested system of watersheds that drain into the Liard and Mackenzie Valleys. The most important renewable resources in the region

include natural gas and oil as well as base metals including tungsten for the NWT portion of the valley.

There are relatively few communities of people in the Liard area compared to the SGP. Communities include Watson Lake, Yukon and Fort Simpson, Nahanni Butte, Trout Lake and Fort Liard, in the NWT.

A portion of the Southeast Yukon and the Liard Valley region falls within the Yukon and a portion falls within the NWT. The area within Yukon is the subject of comprehensive land claim negotiations between the Kaska Dene' and the Government of Canada. The area within the NWT is the subject of self-government negotiations between the people of the De Cho and the Government of Canada. There is no formal Vision, Land Use Plan or Regional Sustainable Development Strategy for either the Yukon or the NWT portions of this region.

9.3.3 Northern Labrador

Northern Quebec and Labrador cover a territory that ranges from James Bay in the west to the Labrador Sea in the east. Geographically, it is known as the Ungava Peninsula. Politically, the Ungava's watershed defines the boundaries between Quebec and the province of Newfoundland and Labrador. Much of this region is covered by arctic and subarctic vegetation. In Quebec, the landscape is dominated by the drainage basins of Hudson's Bay to the west and Ungava Bay to the north; land does not rise more than 450 m above sea level. The interior plateau of the Peninsula, the "heights of land," rises to 1800 m above sea level.

Population density in the region is approximately 0.1 person/km^2. Caribou outnumber humans eight to one. The George River caribou herd is reputed to be the largest in the world. Population estimates range from 300,000 to 600,000. The herd's migratory range extends from the eastern shore of Hudson's Bay to the coast of Labrador. The high plateaus of the Labrador coastline are the caribou's birthing grounds.

Northern Quebec (Nunavik) and Labrador are home to approximately 12,500 Inuit (Statistics Canada website 2000). In Quebec, Inuit territories are defined and administered by the *James Bay and Northern Quebec Agreement*, which was signed in 1975. Municipal government powers remain under the administration of the Quebec Ministry of Public Affairs (First Peoples website 2000). In 1999, the Labrador Inuit Association (LIA) initialed an Agreement in Principle with the Canadian and Newfoundland governments; it is currently undergoing ratification (LIA website 1999).

The Innu of Labrador and the Naskapi of Quebec share a common culture and ancestry. The Innu Nation represents approximately 1,600 Innu in the communities of Sheshashiu and Davis Inlet (INAC website 2000). The Innu are at the Framework Agreement stage of the land claims process. The Naskapi of Quebec signed a comprehensive land claim with the Quebec government, the *Northeastern Quebec Agreement*, in 1978. The 1984 *Cree Naskapi Act* transferred many local government powers to the Naskapi (Naskapi Nation website 2000).

Historically, military activities, hydroelectric development and mining (iron ore, uranium) have driven development in the region. Quebec's land claim settlements with

the Inuit, Cree and Naskapi living within its boundaries were fueled by its desire to open up the North to hydroelectric development. More recently, a rich nickel find at Voisey's Bay, located 35 km southeast of Nain, Labrador has reawakened local peoples' concerns about the potential effect and impact of such activities in this region (Nain is the largest Inuit community in Labrador and home of the Labrador Inuit Association).

The political boundaries and cultural differences of the region present numerous challenges to regional approaches to management. The Canadian, Quebec and Newfoundland governments have thus far "managed" land use in the area through negotiated land claims settlements. No Vision, regional land use plan or Regional Sustainable Development Strategy yet exists for the region.

9.4 Possible Future Initiatives by Environment Canada

Environment Canada has already taken the initiative to contribute to the effective management of cumulative effects in Canada's North through the Northern Ecosystem Initiative, other programs, and through representation on various organizations. This report contributes to this ongoing initiative by providing further information and guidance that can be used by northern organizations as they develop their own approaches to managing the potential impacts in the social, environmental, and human health sectors. Such an initiative is timely and appropriate. The North has an opportunity, in many cases not anymore available "south of 60", to implement truly effective measures to address cumulative effects, thereby meeting the needs of communities for many future generations.

The work of this report does not end here; therefore, the following recommendations are made to Environment Canada regarding possible future initiatives to build on what has been started.

1. Various administrative jurisdictions and organizations should be made aware of Environment Canada's ongoing initiatives in the Northern Ecosystem Initiative and of the implications it may have to the interests of communities. This report should be made available to those parties as part of that initiative.

2. The proposed approach to build a Framework as described in this report should be communicated to northerners as one possible means to start systematically addressing the management of cumulative effects in a regional and coordinated fashion.

3. An education program should be developed to inform northerners of current and future regional cumulative effects issues, and what may be done to address such concerns in consideration of a Framework, the needs of the communities, and the expression of their needs as reflected in legislation and land claim settlements. Environment Canada should also take the opportunity to facilitate the process of profiling community concerns and provide the opportunity for community representatives to participate in collaborative initiatives to address cumulative effects (e.g., as has been started with the NWT CEA Working Group). There remains misunderstanding of cumulative effects analysis, the limitations involved due to issues such as the lack of regional land use plans and thresholds, and the significant challenges faced by both private sector developers and government decision makers.

4. As a member of the recently formed NWT CEA Working Group, Environment Canada should through this participation continue to identify issues, opportunities

and constraints to management of cumulative effects in that region, and subsequently continue to evolve this report and related work in an adaptive fashion to reflect that new information. This information should then be modified as necessary for application in other regions.

5. The implications of existing and pending legal instruments that could be applied to the implementation of a Framework (e.g., the Government of NWT's proposed *Species at Risk* Legislation) should be examined more closely, especially regarding constraints and opportunities.

6. The implications of the constraints posed by lack of adequate thresholds should be examined more closely, in part addressed through a specific effort by Environment Canada to identify existing thresholds and to develop initiatives to identify missing thresholds. In parallel with this is the continued support of monitoring programs that provide the required information in support of the development of thresholds.

7. A pilot program should be immediately considered within one or more of the three geographic regions identified in this report. Such a program would implement and test a Framework, incorporated into or alongside existing regulatory and administrative process. Such a pilot program must be preceded by consultation with all affected parties. This consultation could be handled in an efficient and low key manner. The results of such a program should periodically be communicated to all interested parties in the North. A workplan needs to be developed for each pilot project.

8. Develop a scenario model for development using an approach similar to that developed for mineral potential assessment. For example, with an understanding of ore deposits, expert panels of geoscientists, in combination with the statistical treatment of information, can assess which areas have high mineral potential and therefore may be subject to future development.

9. Support should be provided for the creation and operation of a centralized spatially-referenced database of land use and environmental information. The database would also facilitate the collection of monitored information and provide reporting that is understandable and usable by individual communities.

10. Initiate *a Gap Analysis* of the current state of scientific, technical (e.g. engineering) and traditional knowledge which is available for assessing effects. There is a clear leadership role for government in providing state of the art regional scientific information for both private sector development and senior public sector decision makers.

11. Initiate an assessment of Regional Land Use plans in terms of environmental assessment and "usefulness" for decision makers. This type of pilot project could be quite important for new land use planning initiatives that are currently being developed as a result of northern land claims settlements. Examples of land use plans that could be reviewed includes the Kluane Land Use Plan, the Dempster Highway Plan and the Gwich'in Land Use Plan.

12. An approach to addressing cumulative effects in screening level project reviews should be developed; one that is clear, concise and practically implementable.

13. Contributions should continue to the funding of the various Caribou Management Boards (e.g., Porcupine, Beverly, Qamanirjuaq). The relative merits of establishing other caribou management boards should be systematically evaluated where existing

institutional mechanisms do not provide adequate provision for effective conservation of large migratory herds (e.g., Bathurst, Bluenose).

14. The allocation of funding to organizations under the terms of the MVRMA should continue to be evaluated, and consideration given to providing such funding on a full-time basis. Contribution to the funding of the work of the Arctic Council should be continued.

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Appendix A Case Study Summaries

A.1: Regional Development and Assessment

A.1.1: Alberta Regional Sustainable Development Strategy

Geographic Region

Athabasca Oil Sands Area of North Eastern Alberta, located within the Regional Municipality of Wood Buffalo (Figure A-1)

Jurisdictional Authority

The Regional Board of Directors for Alberta Environment's Northeast Boreal Region. Additional key players involved in this cooperative approach include other Alberta government departments, Alberta Energy and Utilities Board (EUB), Environment Canada and Saskatchewan Environment.

Purpose of Initiative

To "ensure implementation of adaptive management approaches that address regional cumulative environmental effects, environmental thresholds, appropriate monitoring techniques, resource management approaches, knowledge gaps and research to fill gaps." (Alberta Environment 1999a, p. 39). The Regional Sustainable Development Strategy (RSDS) will provide the structure needed for combining environmental and resources management.

Industry is taking the lead in several management technique initiatives as part of the RSDS, including (Baker *et al.* 1999, p. 9):

- Coordination of environmental assessment, monitoring and planning.
- Promotion of oil sands research and technology development.
- Dissemination of oil sands technology and experience through commercial arrangements.
- Sharing of utilities and infrastructure.
- Coordination of project management.
- Sharing of mine plans and joint mine planning for mining and reclamation.
- Harmonization to ensure resource recover and reclamation.
- Consultation and cooperation in communicating with members of the public.

Reason for Initiative

The unprecedented pace of development in the area presents new challenges to both the government who must regulate development and the industry players themselves. The RSDS is intended to provide a structure which will support the initiatives needed to manage these new challenges.

Issues Addressed

Issues are organized as themes within three categories, as outlined below:

- ***Category A***: (First three-year period) Sustainable ecosystems; cumulative impacts on wildlife; soil and plant species diversity; effects of air emissions on human health, wildlife and vegetation; bioaccumulation of heavy metals.

- ***Category B***: (Second to Fourth year) Access management; cumulative impacts on fish habitat and population; effects of tailings pond emissions; effects of acid deposition on sensitive receptors; and impacts on surface water qualities.

- ***Category C***: (Third to Fifth year) End pit lake water quality; impacts on surface water qualities; and impacts on groundwater quality and quantity.

Methods Used

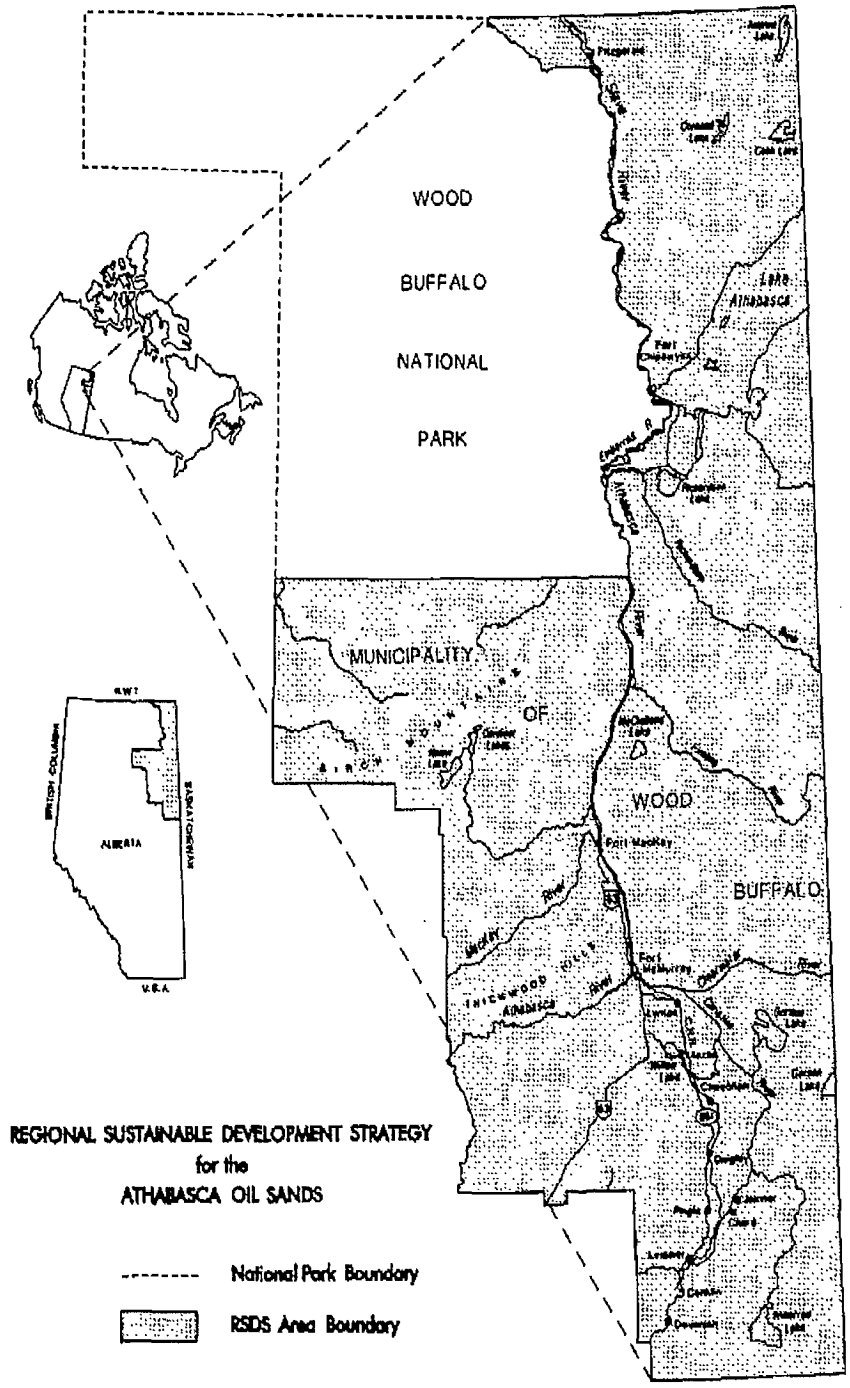
The Northeast Boreal Region of Alberta Environment (AE) partnered with the federal government's Department of the Environment, regional stakeholders and regulators to form the RSDS. The first actions completed were an inventory of environmental and resource management systems, the identification and analysis of issues, and the drafting of the RSDS. Issues were grouped according to their similarities in information gaps. A list of themes was created, followed by blueprints for action which were developed to resolve the issues within the theme groups.

The RSDS will create a framework by (Alberta Environment 1999a, p. 3):

- providing support for resource development at a rate consistent with environmental protection and resource sustainability by ensuring there is an effective framework for managing natural resources and the environment; and

- creating an environmental management framework that can adapt to the changing needs of the area, including a strong foundation of environmental information and science as well as methods to identify priority regional environmental issues.

Figure A-1 Regional Sustainable Development Strategy Area



Source: Alberta Environment 1999a.

The industry initiative contains (Baker *et al.* 1999, p. 10):

- A defined long-term development scenario.
- An approach in setting regional boundaries.
- The standardization of methods and models for assessment.
- An agreement to share environmental information to create a regional database of baseline environmental conditions.
- A framework for continuous improvement of the cumulative effects assessment.

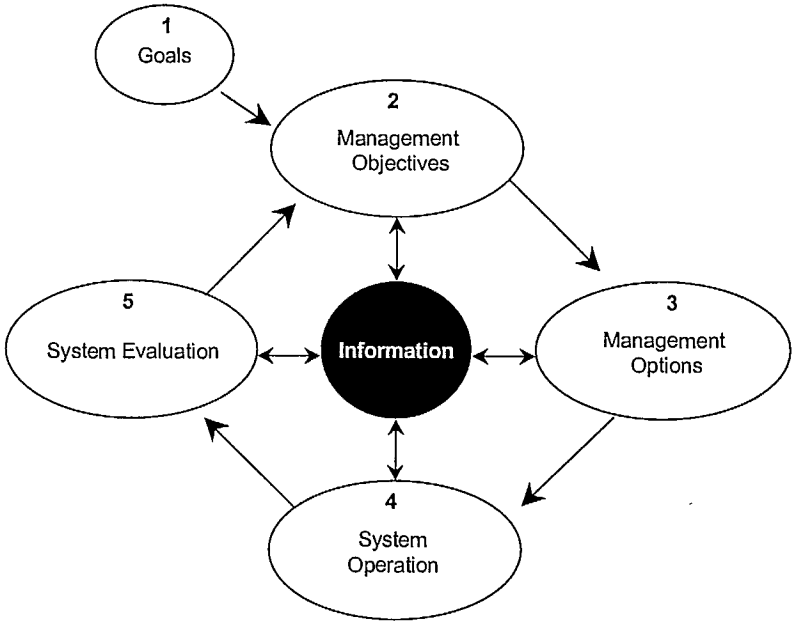
While carrying out the above, the RSDS will communicate information to the public; involve regional stakeholders in shared environmental stewardships, coordinate a joint stewardship approach; and use the "continuous improvement management model" (Alberta Environment 1999a, p. 2), which includes the following elements (see Figure A-2):

- Setting Regional Goals – develop specific regional goals where they are lacking.
- Management Objectives – set new management objectives for the region in addition to those already in place, as needed.
- Management Options – use a tiered management approach, which involves the use of critical, cautionary and target levels of stress.
- System Evaluation - using progress reports and workshops to track progress.
- System Operation using Blueprints for Action.
- Information – compile up-to-date data.

The tiered management approach (see Figure A-3) will allow RSDS management to deal with many activity levels, based on critical, target and cautionary levels which employ the use of thresholds. The critical level is the continuous maximum amount of stress that an ecosystem can support. The target level is the management objective for the amount of stress in an ecosystem. The cautionary level shows that additional or more intensive monitoring is required to ensure the amount of stress in an ecosystem does not exceed the target level (Alberta Environment 1999a).

The Cumulative Environmental Effects Management Partnership (CEEMP) addresses the management objective for RSDS. It is a multi-stakeholder committee that will identify and prioritize cumulative effects and their solutions. Also, several regional committees were established to protect the environmental quality of the oil sands area. The goals of these committees range from planning to assessment to research. Table A-1 describes each regional group and their area of focus.

Figure A-2 The Regional Sustainable Development Strategy Management Model



Source: Alberta Environment 1999, p. 15.

The Wood Buffalo Environmental Association's vision is to "encompass all environmental monitoring and policy and guideline development for the region, including the Regional Aquatic Monitoring Program" (Baker *et al.* 1999, p. 11). In addition, it will include such processes as the oil Sand Mining End Land Use Committee, the Reclamation Soils Working Group and the Vegetation Committee.

The Athabasca Oil Sands Development Facilitation Committee is a forum for industry to gain quick attention and identify combined infrastructure needs. The Regional Health Integration Committee will conduct a regional health study.

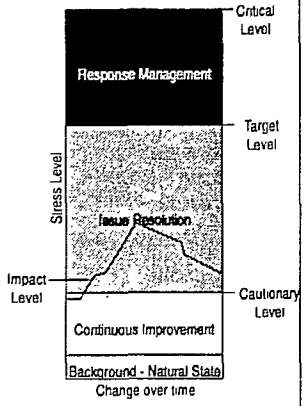
A Regional Environmental Management Board is being developed to satisfy the needs for a regional regulatory framework. This represents the much needed next stage for a cumulative effects management Framework. The main purpose of the Board is "to develop a clear framework for cumulative effects assessment, environmental management and project review in the oil sands region" (Baker *et al.* 1999, p.12).

Figure A-3 Tiered Management Approach

Tiered Management Approach

As the amount of stress reaches each tier, the suggested management options are initiated within the appropnate timelines.

Example: Impact of Management System at Different Activity Levels



Management Tier **Critical Load**

Response Management

- Stakeholder-derived response strategy.
- Mandated implementation of response strategy by regulators through the approvals process.
- Best available technology in new, expanding and retrofitted facilities.
- Economic instruments; activity restrictions.

Management Tier **Target Level**

Issue Resolution Management

- Expanded environmental monitoring and applied research initiated to support issue resolution.
- Stakeholder consultation—issue resolution strategy.
- Voluntary implementation of issue resolution strategy by regulators and affected stakeholders.
- Best available demonstrated technology, abatement equipment in new, expanding and retrofitted facilities.

Management Tier Cautionary Level

Continuous Improvement

- Best management practices.
- Adherence to provincial and national guidelines for leak detection and repair.
- Routine environmental and activity monitoring.

Source: Alberta Environment, 1999, p.19

Table A-1 Regional Committees Under the Regional Sustainable Development Strategy

Committee	Focus
Wood Buffalo Environmental Association Terrestrial Environmental Effects Monitoring	Air quality Terrestrial ecosystems
Regional Aquatics Monitoring Program	Water quality and fish studies
Regional End Land Use Committee	Reclamation goals
Canadian Oil Sands Network for Research and Development	Water quality Terrestrial ecosystems
Northern Rivers Ecosystem Initiative	Federal Government response to the Northern Rivers Basin Study
Athabasca Oil Sands Regional Development Facilitation Committee Regional Infrastructure Working Group	Infrastructure needs Social and economic Issues
Athabasca Tribal Council	Human health
Athabasca Chipewyan First Nations	Aboriginal issues
Athabasca Oil Sands Cumulative Effects Initiative	Coordination of regional issues facing all stakeholders in the Municipality of Wood Buffalo
Vegetation Working Group	Terrestrial vegetation
Wetlands Working Group	Wetlands vegetation

Source : Baker *et al.* 1999, p. 10.

The Board will contain a Secretariat and an organization of collaborative working groups responsible for developing prioritized guidelines/environmental limits for specific environmental parameters. Each working group will recommend regional guidelines and environmental limits. The management system and framework would involve:

- Setting goals and objectives for each environmental parameter in the oil sands region.
- Establishing guidelines/environmental limits to meet the goals and objectives of each environmental parameter.
- Selecting management tools to implement the guidelines/environmental limits.
- A mechanism to evaluate the guidelines/environmental limits to determine whether they need revision.

The working groups will also determine which environmental parameters were without proper guidelines/environmental limits. These gaps would be filled as information is gathered and evaluated over time. The working groups would meet periodically to make recommendations to the Board in an adaptive management approach. The Board would then recommend these regionally developed guidelines/environmental limits to regulators.

Key Contributions to Management of Cumulative Effects

- Keeps pace with new information, science and technology.
- Ensures comprehensive information is available in order to guide decision-makers, through the development of the Regional Information System (RIS). This system will provide baseline information as well as data storage and manipulation, and will assist in current and future management of the area. The RIS will be shared among resource developers, provincial and federal agencies and any other stakeholders.
- Provides clear direction for sustainable resource, environment and related health management.
- Provides a blueprint for action for issues within the themes, which will continue to be tracked and implemented for many years.
- Provides a living document designed to keep pace with changes in the region.
- Addresses needs of industry, First Nations and Aboriginal Communities, Environmental organizations and concerned citizens as well as government agencies and regulators.
- Reduces conflict.
- Increases clarity.
- Provides an example of stewardship and how it works in a business sense.
- Produces environmental thresholds.
- Provides solutions to jurisdictional issues.
- Provides a regional regulatory framework.

A.1.2: Athabasca Oil Sands CEA Framework

Geographic Region

Athabasca Oil Sands Region Northeast Alberta, located within the Rural Municipality of Woodbuffalo.

Jurisdictional Authority

The Regional Board of Directors for Alberta Environment's Northeast Boreal Region.

Purpose of Initiative

The purpose is to provide a framework, in the form of a single document, for single project cumulative effects assessments for oil sands projects in the Athabasca oil sands.

The document provides guidelines to proponents for information requirements for project assessments in the region.

Reason for Initiative

The reason for the initiative is attributable "to increased activity related to expansions of existing oil sands operations and new oil sands developments in the region as well as regional development from other industries such as forestry" (Golder 1999, p.1); and, "in recognition of the need to establish a consistent and logical CEA approach to multiple developments" (Golder 1999, p. 5).

Issues Addressed

The framework addressed local issues, baseline, CEA methodologies, effects classification, monitoring and information needs for the following areas: socioeconomic, air, water, terrestrial, human and ecological risk, and land use.

Methods Used

Consultation on CEA issues was conducted by individual project proponents, as well as a Working Group, consisting of six proponents. Input to the framework was provided during a series of workshops attended by members of the public and the government community (Golder 1999). Participants in the initiative included Aboriginal groups, members of the public, other existing and potential oil sands operators, other industries and the various federal, provincial and municipal governments.

The framework document included the following elements (Golder 1999):

- Regional development scenario – all existing or planned developments and/or activities that overlap geographically in space and time.
- Identification of environmental and socioeconomic issues, including linkages.
- Establishing spatial and temporal boundaries for the assessment.
- Identifying required baseline information and sources of information.
- Use of existing documentation of TEK.
- Scientific methods for analysis and modeling of cumulative effects.
- Mitigation of effects.
- Evaluating the importance of cumulative effects using ecological thresholds and effects classification analysis.
- Monitoring for effects.

The Cumulative Environmental Effects Management (CEEM) Initiative (made up of the working groups, management board and NO_X/SO_2 subcommittee) is responsible for

ensuring that the document will be updated as new baseline information, new assessment approaches and new monitoring information becomes available.

Key Contributions to Management of Cumulative Effects

The initiative includes industry involvement, is regional in scale and includes other industrial activities present in the region. It contains suggestions for specific effects management, and provides general thresholds.

A.1.3: Banff-Bow Valley Study

Geographic Region

Bow River Watershed within Banff National Park (BNP).

Jurisdictional Authority

Ministry of Canadian Heritage, with work conducted by the Banff-Bow Valley Task Force (BBVTF).

Purpose of Initiative

- To develop a vision and goals for the Banff-Bow Valley (BBV) that will integrate ecological, social and economic values.
- To complete a comprehensive analysis of existing information and to provide direction for future collection and analysis of data to achieve ongoing goals.
- To provide direction on the management of human use and development in a manner that will maintain ecological values and provide sustainable tourism.

Reason for Initiative

The initiative arose due to concerns that the "area's ecological integrity, already at risk, could suffer permanent damage" (BBVTF 1996, p. 1).

Issues Addressed

- Ecological and human use in Banff-Bow Valley.
- Future vision for valley based on trends based on legislation, human use, public opinion and ecological integrity.
- Role of communities.
- Role of commercial operations.
- Effects of visitor experience.

Methods Used

Phase 1 (from BBVTF 1996, p. 4):

- Set up study process.
- Begin public involvement.
- Start to collect information.

Phase 2

- Round table and sector working groups .
- Develop Common Vision, Principles and Values.
- Develop assessment framework.
- Continue to collect and disseminate information.

Phase 3

- Identify and assess key issues.
- Develop strategies, specific objectives and action plans.

Phase 4

- Prepare final report.
- Submit report to Minister of Canadian Heritage.

Methods employed by the Task Force also included various reviews, and projects such as the Visitor Behaviour Research Project, Tourism Outlook Project, and Ecological Outlook.

Key Contributions to Management of Cumulative Effects

- Public process that included industry, science and government.
- Extensive social science and ecological research.
- Broad and extensive public participation.
- Ecosystem based approach.

A.1.4: Beaufort Region Environmental Assessment and Monitoring Program

Geographic Region

Beaufort Sea, on and offshore.

Jurisdictional Authority

Department of Indian Affairs and Northern Development.

Purpose of Initiative

The Beaufort Region Environmental Assessment and Monitoring Program (BREAM) was initiated in 1991 to assist in the planning component of the Northern Oil and Gas Action Program (NOGAP)(GeoNorth/AXYS 1996). It was intended to provide a technical basis for the design, operation and evaluation of a comprehensive and defensible environmental research and monitoring program to accompany hydrocarbon development in the Beaufort Sea relative to the environmental and regulatory responsibilities of these departments (ESL 1990/91).

Reason for Initiative

The initiative arose from the need to combine and coordinate efforts of the Beaufort Environmental Monitoring Project (BEMP) and the Mackenzie Environmental Monitoring Project (MEMP). These programs had not been updated to reflect the Inuvialuit Final Agreement (IFA); the need for environmental assessment and monitoring of deficiencies identified by the Inuvialuit Environmental Impact Review Board; the establishment of the Beaufort Sea Steering Committee; a catastrophic oil spill which provided important data on oil spills; the future natural gas production in the Mackenzie Delta; and the completion of a number of projects providing relevant information (ESL 1990/91).

Issues Addressed

- The current hydrocarbon development scenario (ESL 1990/91).
- Concerns at a local versus regional level.
- New information available since the last reviews of relevant research.
- Potential for major oil spills.
- Community-based environmental concerns.

Other issues included global climate change, additional actions and linkages for cumulative impact assessment, noise; effects of barges; above-ground gas gathering systems, potential release of natural gas, high quantities of drilling muds and wastes, habitat for birds and terrestrial mammals and mitigation measures and their success.

Methods Used

- Creation of Steering Group (ESL 1990/91)
- Creation of Technical Working Groups
  - Review of Existing Impact Hypotheses
  - Catastrophic Oil Spill Background Information
  - Community-Based Environmental Concerns
- Determination of Assessment Methodology
- Liaison to develop support
- Program announcement and updates
- Workshops
- The Beaufort Sea Information Database, which included the following plans:
  - Marine Countermeasures
  - Shoreline Cleanup
  - Wildlife Protection
  - Wildlife Habitat Restoration
  - Environmental Assessment

Key Contributions to Management of Cumulative Effects

Key contributions of this initiative to the management of cumulative effects are the creation of a database of information and the formation of monitoring and recovery plans for a region. Other important contributions are the inclusion of community-based concerns and the development of a liaison between the Steering Group and government organizations to develop program support (ESL 1990/91).

A.1.5: Hudson Bay Programme

Geographic Region

Nunavut, Manitoba, Ontario and Quebec bordering the Hudson Bay, which includes James Bay, Hudson Straight and all interconnecting channels.

Jurisdictional Authority

The Canadian Arctic Resources Committee (CARC), The Environmental Committee of Sanikiluaq and The Rawson Academy of Aquatic Science (RAAS).

Purpose of Initiative

CARC, RAAS and the Environmental Committee of Sanikiluaq initiated the Hudson Bay Programme with the purpose of finding answers and a new approach (Sallenave 1994) to cumulative effects in the region. By performing a literature review and forming a partnership with various organizations and experts, the program identified factors likely to be affected by the cumulative effects associated with hydroelectric and other developments within and outside the region. Not only would this identify VECs but it also was to identify any gaps in the research. The effort would also include an attempt to promote a partnership with other organizations to improve the knowledge of the region.

Other objectives of the initiative were to come to a common understanding of what effects economic activities have already made in the bioregion, identify long term trends which have already been set in motion (cumulative effects), define the significance and magnitude of these trends, establish a common vision of the future of the Hudson bay region, and develop a framework which will encourage cooperation in achieving this vision

Reason for Initiative

It was felt upon initiating this program that there was a lack of information and direction regarding the future of the Hudson Bay Region and that there needed to be a long-term vision (Sallenave 1994). Added to this was the realization that while the Hudson Bay is very large, there existed the potential for the effects of future developments to have a negative cumulative effect upon the people and the environment. Therefore, the program was initiated to take a proactive approach.

Issues Addressed

Issues included the cumulative influence of hydroelectric and other developments within and outside the region, lack of framework, identification of VECs, identification of data gaps, long term trends, common vision; TEK, sustainable development, processes and state of the knowledge.

Methods Used

The Hudson Bay Program followed a three-year schedule involving two phases (Sallenave 1994, p. 1-3):

- ***Phase 1***: Identify key impacts of human activities, particularly hydroelectric developments, on the marine and fresh water ecosystems of the Hudson Bay and James Bay bioregion, using both scientific data and TEK, and to consider their significance as a cumulative influence on sustainable development in the region.

- ***Phase 2***: Examine processes for decision-making among governments, developers, aboriginal peoples and other stakeholders, and to propose acceptable and workable means that will foster sustainable development in the bioregion.

More specific methods included (Sallenave 1994, p. 2-3):

- Compilation of an annotated bibliography focusing on the biophysical environment of the region.

- A science overview paper describing the state of the knowledge of the biophysical characteristics of the region. This paper provided a background for a cumulative effects workshop, where there were discussions on the state of knowledge and means proposed to evaluate cumulative impacts in the region. The next step involved selecting the most critical topics on ecosystem components for which scientific papers were needed to enrich the knowledge base.

- A Traditional Ecological Knowledge and Management Systems (TEKMS) study was also running concurrently with the science study. The goal of this study was to help the Inuit and Cree bring forward their knowledge in a form that could be integrated into a Cumulative Effects Assessment (CEA). This involved three steps:

    - A description of important biological, physical and human ecological processes influencing the behaviour of communities on Hudson and James Bays.

    - The identification of natural and human-induced changes occurring in these processes.

    - A discussion of the effects of human activities on the natural environment and the people living in the region.

The phase 1 report was based on workshops that combined information from the science study and TEKMS.

Key Contributions to Management of Cumulative Effects

- The use of Traditional Ecological Knowledge.

- Focus on potential future projects.

- Contribution to long-term knowledge.

A.1.6: Uranium Mining in Northern Saskatchewan

Geographic Region

The region covered for this initiative included all of Saskatchewan north of Prince Albert National Park and areas with the potential to be affected by the five potential mines, the Dominique-Janine Extension of Amok Ltd., the South McMahon Lake Project of Midwest Joint Venture/Denison Mines Ltd., the McClean Lake Project of Minatco Ltd., the McArthur River Project of the McArthur River Joint Venture/Cameco Corporation and the Cigar Lake Project of Cigar Lake Mining Corporation.

Jurisdictional Authority

Joint Federal/Provincial panel under the Federal Environmental Assessment and Review Process.

Purpose of Initiative

The purpose of the initiative was to "review environmental, health, safety and socioeconomic impacts of five proposed uranium mine developments and an assessment of the cumulative impacts of existing operations and the proposed developments" (Ecologistic 1992, p. i). In addition, it would identify potential future impacts associated with the proposed projects that may not be evident from Environmental Impact Statements prepared for each project.

Reason for Initiative

At the time of the review, there was an "absence of an agreed upon methodology for conducting CEA" (Ecologistic 1992, p. i).

Issues Addressed

Issues addressed by the study included: mining activities and potential sources of environmental impacts; current state of knowledge about the impacted area and communities; identification of biophysical human health and socioeconomic impacts; potential significant cumulative effects of the proposed mines; proposed mitigation/compensation of cumulative effects; and environmental monitoring.

Methods Used

Methods followed by the review included: adapting general concepts for CEA, scoping, confirmation of study methods, definition of boundaries, and the identification of:

- pathways of environmental effects;
- relevant past and existing projects and activities, their impacts and pathways for impacts;
- future projects and activities and potential linkage; and

- VECs that exist within the zone of influence of the proposed projects.

Further tasks included the use of pathways to assess possible interactions among environmental effects of the proposed projects and the environmental effects of past, present and future project activities; determining the likelihood and significance of cumulative effects on VECs; and identifying appropriate monitoring (Ecologistic 1992, p. 1-21).

Key Contributions to Management of Cumulative Effects

There were several key contributions to the management of cumulative effects (Hegmann *et al.* 1999, p. B6). It attempted to define an organizational and jurisdictional framework; identified various problems typically encountered in CEA such as limited knowledge of various relationships and made specific recommendations for improving the practical aspects of CEA. These recommendations including mitigation and monitoring for cumulative natural environmental effects and for cumulative socio-economic and public health effects.

In contribution to the management of cumulative effects, the Joint Panel that commissioned this review issued three separate reports on the subjects of health, environmental and socio-economic issues. Among their recommendations was the requirement to investigate the option of combining the processing operations for several mines at a single mill. This recommendation was made as part of specific guidelines for the preparation of an EIS to two of the proposed mines (M. Liskowich, pers. comm.).

Another contribution was the establishment of a Cumulative Effects Monitoring program in 1994 by the Saskatchewan government. The focus of this program was to detect and evaluate cumulative effects of contaminants from multiple mine sources and identify VECs to assist in the monitoring program. This program is ongoing.

A.1.7: West Kitikmeot/Slave Study

Geographic Region

The study covers the West Kitikmeot and Slave Geological Province regions of the Northwest Territories and Nunavut. These regions stretch north from Yellowknife to the Arctic Ocean.

Jurisdictional Authority

The West Kitikmeot Slave Study (WKSS) is a partnership of aboriginal, industry and environmental organizations and the federal and territorial governments. The partners are: Dogrib Treaty 11 Council, Lutsel k'e Dene Council, Metis Nation of the NWT, Inuit organizations, Nunavut co-management organizations, the NWT Chamber of Mines, environmental organizations, the Government of the Northwest Territories and the federal government.

Purpose of Initiative

The long-term purpose of the study is to achieve sustainable development in the West Kitikmeot/Slave Study area that respects aboriginal cultural values so that the land is protected, culture is preserved and community self-sufficiency is enhanced. This is to be accomplished through collecting and providing information on the WKSS area to decision-makers to assist in informed decision making.

The short-term purpose of the study is the completion of regional level studies on the effects of development in the West Kitikmeot/Slave study area.

The WKSS has 7 stated objectives (West Kitikmeot /Slave Study website 2000):

- Provide an information base necessary for study partners to make sound resource management decisions.
- Provide a basis for the identification and assessment of cumulative effects for planning and development purposes.
- Provide a forum in which to share information on issues, while respecting the diversity of interests.
- Provide the information necessary to enhance the understanding of potential impacts of exploration and development on ecological processes and communities.
- Provide a central role for both traditional knowledge and scientific knowledge, and facilitate the linkage of research carried out in these systems.
- Ensure the accessibility of Study research results and information to all partners and the public, while respecting the confidentiality of certain information.
- Maximize community research training opportunities and the use of community resources in all Study research.

Reason for Initiative

The project partners joined together in late 1995 in response to increased exploration activity and development potential, particularly for mining, in the project study area. It was felt that there was insufficient information and data on the area in terms of development potential, environmental quality, wildlife populations and critical habitats. Consequently, it was not possible to predict possible cumulative effects of development in the area. The study was initiated to provide an information base to support sound resource management decisions and to examine the short-term and long-term effects of development.

Issues Addressed

The general areas of the research are traditional knowledge, physical environment, wildlife, wildlife habitat and socio-economic environment. There are two types work being completed under the study: the collection of primarily scientific knowledge and the

collection primarily of traditional knowledge. For projects that are scientific in nature, the study preferred to have parallel traditional knowledge research projects linked to them.

Methods Used

The Study operates under the guidance of a Management Board and a small study office. The Management Board is responsible for managing Study resources, making decisions on the design and conduct of research, ensuring that the interests and policies of the Partners are respected, generating public involvement, and directing the operations of the Study Office. The Study Office is managed by a Study Director and coordinates, conducts and facilitates Study work, carries out management and administrative duties and implements a communications strategy.

Twice a year the Study will receive proposals to conduct research according to the research priorities of the Study. The proposals are evaluated for their adherence to the Study objectives and will either be accepted, rejected or returned to the submitter for additional information.

The specific methods used in the approved projects to collect the baseline information will vary with each project so there is no established method beyond adherence to the Study research goals and objectives.

Key Contributions to Management of Cumulative Effects

The Study's key contribution to the management of cumulative effects is the collection of baseline environmental information, both traditional and scientific, to provide a basis for the identification and assessment of cumulative effects for planning and development purposes.

A.2: Regional Land Use Planning and Management

A.2.1: Alberta Integrated Resource Plans

Geographic Region

Eastern Slopes of Alberta, as established under the Alberta Government's Eastern Slopes Policy.

Jurisdictional Authority

Alberta Environment (AE).

Purpose of Initiative

The purpose is to implement integrated resource management through the development of Integrated Resource Plans (IRPs). The IRP's "guide the management, allocation and use of public land and natural resources within the planning area" (Dias and Chinery 1994, p. 304). The intent is to optimize the use of provincial management resources in order to achieve maximum net benefits for Albertans, now and in the future (RPB 1991).

There is also a new strategy currently being developed by the Alberta Government entitled the North Eastern Slopes Integrated Resource Management Strategy (NES-IRM). This strategy will build upon various sub-regional and local initiatives within the North Eastern Slopes area of Alberta, including the Athabasca and Smoky River major basin watersheds. The purpose of the strategy will be to provide (Alberta Environment 1999b, p. 1):

- An ecosystem-based system for land management with a clear framework.
- Clearer strategic direction for managing resources.
- Quicker, efficient, effective and consistent land management decisions, approvals and referrals.
- Commitment and ownership on the strategy's actions by all stakeholders.
- Protected areas as benchmarks on the landscape.
- Regional priorities and direction for future sub-regional planning needs.
- Improved opportunities for managing landscape cumulative effects.
- Increased certainty for industry in conducting its business in the region.

Reason for Initiative

The initiative arose due to "rising public concern for the protection of environmental quality and growing pressures for land and resources in the area" (Dias and Chinery 1994, p. 304).

Issues Addressed

Issues addressed by IRPs include: resource management, concerns and issues for the following resources: water and watersheds; minerals; timber; wildlife; fisheries; recreation; forage; and agriculture. Other topics covered in the IRPs include planning implications, monitoring and amendments as well as the general implications of the IRP (to the area covered).

Methods Used

Integrated Resource Plans are "developed by resource managers from several agencies and a plan coordinator. Planning teams include representation from non-provincial government bodies such as municipal councils and planning commissions. Public involvement includes Aboriginal groups throughout the whole process" (Dias and Chinery 1994, p. 306).

Steps in the process include plan initiation and setting of terms of reference; data gathering and analysis; policy formulation; development of design components; plan finalization; and plan implementation.

The new NES-IRM will use the following steps to develop its framework (Alberta Environment 1999b):

- Develop Terms of Reference; identify agency commitment; appoint a planning team; contact stakeholders; identify preliminary issues in planning area, plan initiation.
- Information assessment and identification of values and ecosystem goals.
- Develop criteria and indicators for measuring goals.
- Develop management scenarios.
- Identify areas of management consensus and develop options for areas with non-consensus.
- Report on implementation and monitoring of strategies and status of outstanding items.
- Develop a Regional IRM Strategy document that will include a work plan for further sub-regional planning as necessary.

Key Contributions to Management of Cumulative Effects

According to Dias and Chinery (1994), IRPs are rather unique in that they can provide both a regional and landscape context to cumulative effects assessment, even if they were not specifically designed to do so. In addition, while not directly addressing cumulative effects, the IRPs provide for the development of resource management objectives and guidelines as well as use the method of consultation before action.

A.2.2: British Columbia Land Resource Management Plans

Geographic Region

Province of British Columbia.

Jurisdictional Authority

Land Resource Management Plans (LRMP) under the authority of the Land Use Coordinating Office (LUCO), Environment and Land Use Branch of the Ministry of Energy and Mines in the province of British Columbia.

Purpose of Initiative

The purpose of this initiative is to provide "direction for land use and specifies broad resource management objectives and strategies. They provide a comprehensive, broadly accepted and approved management framework to guide resource development and more detailed planning" (Government of British Columbia website 2000). LRMPs considers all resource values and requires public participation, interagency co-ordination and consensus based land and resource management decisions.

Reason for Initiative

The LRMPs arose due to "past disputes over which areas should be available for resource development and which should be protected as parks and wilderness preserves. These disputes are being resolved with our land use plans" (Government of British Columbia website 2000).

Issues Addressed

Participation by the public, Aboriginals and government; planning area and scale; information; and planning process are some of the first issues addressed by the process. Next, there is a recommended management direction for agriculture, range, forestry, etc. Resource management zones are established or described, as well as proposed protected areas. Socio-economic issues are addressed through socioeconomic assessment. Finally, once these issues are dealt with, the LRMPs discuss implementation; monitoring and amendment [of the plan], interpretation and appeal.

Methods Used

At the beginning of the planning process, sector interest groups are identified and a Terms of Reference is drafted. The following are then identified:

- resource units and values;
- Resource Management Zone objectives and strategies; and
- protected areas.

Once this is accomplished, an agreement-in-principle is drawn up followed by several reviews by the public and the interagency management committee. Once these reviews are complete, the LRMP is submitted to government for approval.

Key Contributions to Management of Cumulative Effects

The LRMP is a comprehensive regional process that identifies objectives and strategies for land management.

A.2.3: Central Rockies Ecosystem Interagency Liaison Group

Geographic Region

The Central Rockies Ecosystem (CRE) encompasses areas east and west of the continental divide in both Alberta and British Columbia. The western border is the Columbia River Trench and the eastern border is the foothills of Alberta. The northern border is the northern tip of the White Goat Wilderness and the southern border a major highway.

Jurisdictional Authority

The Central Rockies Ecosystem Interagency Liaison Group (CREILG), which includes Alberta Environment, Parks Canada, British Columbia Ministry of Forests and the British Columbia Ministry of the Environment.

Purpose of Initiative

To cooperate to ensure biodiversity is maximized in the Central Rockies Ecosystem and the area is managed as a sustainable regional landscape (CREILG website 2000). Guiding Principles include:

- To recognize and understand the ecological continuums that cross jurisdictional boundaries.
- To liaise with land and resource management agencies and private groups that have an effect on the CRE.
- To encourage links between databases for the collection, recording, and sharing of ecological information (for example, the creation of the *Atlas of the Central Rockies Ecosystem*).
- To use existing planning systems, management efforts, and organizations rather than developing new ones.
- To encourage governments at the federal, provincial, and local levels to take an integrated ecological approach to land management.

Reason for Initiative

The purpose of the initiative is to provide effective and sustainable management of resources such as large carnivores whose home range includes lands controlled by a number of different agencies (CREILG website 2000).

Issues Addressed

There are many issues addressed by the CREILG and its *Atlas of the Central Rockies Ecosystem* (Komex 1995). These include, but are not limited to: baseline information such as topography, hydrology, ecoregions and vegetation, wildlife, fish, humans; landscape management and sustainable ecosystem management; jurisdictional issues; regional cumulative effects management; and biological diversity.

Methods Used

- Represent all native ecosystem types and seral stages across their natural range of variation.
- Preserve spatial connectivity to allow genetic flow and to minimize the possibility of island extinctions.

- Maintain viable populations of all native species in natural patterns of abundance and distribution.
- Maintain ecological and evolutionary processes such as natural disturbance regimes, fluvial processes, nutrient cycles, and biotic interactions including predation.
- Design and manage the system to be responsive to short-term and long-term environmental change and to maintain its evolutionary potential.
- Maintain sustainable recreational, tourism, industrial and natural resource uses within the framework of ecosystem management practices.

One of the first tasks accomplished by CREILG was completion of the *Atlas of the Central Rockies Ecosystem*. This atlas contains baseline information for the entire CRE, including topography, hydrology, vegetation, fish and wildlife and human use in a GIS map-based atlas. There are many themes, including wildlife species distribution, historical fire occurrence, ecoregions, biogeoclimatic zones and human impact (CREILG website 2000).

Key Contributions to Management of Cumulative Effects

The main contribution of CREILG to the management of Cumulative Effects is its intent to establish a regional approach to cumulative effects management. The strong interagency liaison is mandatory to achieve effective management of cumulative effects. Other contributions include the compilation of baseline data and the ecosystem management strategy outlined in the Atlas.

A.2.4: Gwich'in Land Use Plan

Geographic Region

An area of approximately 57,000 km^2 in the Northwest Territories, conforming with the provision of the Gwich'in Comprehensive Land Claim Agreement.

Jurisdictional Authority

The Gwich'in Land Use Planning Board, under the Gwich'in Comprehensive Land Claim Agreement and the Mackenzie Valley Resource Management Act (GLUPB 1999).

Purpose of Initiative

To set up a system for land management for the Gwich'in Settlement Area (GLUPB 1999).

Reason for Initiative

The Land Use Plan comes from the commitment of the people to taking care of the land and their children's future (GLUPB) and having the legal authority to do so under the Mackenzie Valley Resource Management Act (MVRMA).

Issues Addressed

The Gwich'in Land Use Plan (LUP) addresses the effects on land and water by considering the vision for the Gwich'in Settlement Area, the use of Land Zones and the direction for the Planning Board. Specific issues and actions examined within the plan include: Community Involvement, Non-Renewable Resources, Resource Development, Transportation and Utilities, Gwich'in Heritage Resources, Pollution and Waste Management, Water and Air, Tourism and Recreation, Renewable Resources, Transboundary Areas and Legislative Protected Areas.

Methods Used

The Implementation Plan Outline for the LUP has the following goals (GLUPB 1999):

- Continued information gathering.
- Focus on economic development.
- Focus on more detailed planning.
- Focus on monitoring.
- Required and recommended actions.

Key Contributions to Management of Cumulative Effects

- The use of TEK and community involvement.
- The legislative basis for the examination of cumulative effects under the Agreement.
- The land use basis for the initiative.
- Clear procedures which should help Gwich'in Land Use Planning Board.
- Monitoring for effects of development on the environment.

A.3: Local Land Use Planning

A.3.1: Inuvialuit Community Conservation Plans

Geographic Region

The plans include areas covered under the Inuvialuit Final Agreement (IFA), including Aklavik; Inuvik; Olokhaktokmiut (650 km northeast of Inuvik on the west side of Victoria Island); Paulatuk (lands, waters and offshore, including Cape Perry and the town of Paulatuk, located along the southern portion of the Amundsen Gulf in the Beaufort Sea); Sachs Harbour (the vicinity of Banks Island) and Tuktoyaktuk (the land and waters around Tuktoyaktuk, located just east of the Mackenzie River Delta on the Arctic Coast).

Jurisdictional Authority

The Inuvialuit Renewable Resource Conservation and Management Plan (1988), under the Inuvialuit Final Agreement (WMAC 1993).

Purpose of Initiative

A series of Community Conservation Plans were developed including Aklavik, Inuvik, Olokhaktokmiut, Paulatuk, Sachs Harbour and Tuktoyaktuk. Their goals for the initiative were as follows (WMAC 1993, p. vii):

- To identify important wildlife habitat, seasonal harvesting areas and cultural sites and make recommendations for their management.
- To describe a community process for land use decisions and managing cumulative impacts that will help protect community values and the resources on which priority lifestyles depend.
- To identify educational initiatives for the Inuvialuit and others interested in the area that will promote conservation, understanding and appreciation.
- To describe a general system of wildlife management and conservation and identify population goals and conservation measures appropriate for each species of concern in the planning area using the knowledge of the community and others with expertise.
- To enhance the local economy by adapting a cooperative and consistent approach to community decision making and resource management.

Reason for Initiative

The community plans were the first objective of the Inuvialuit Renewable Resource Conservation and Management plan, in partial fulfillment of obligations under the Inuvialuit Final Agreement (WMAC 1993).

Issues Addressed

Issues included community values, goals, special areas and recommended land use practices for the planning area, education, training and information exchange, and wildlife management and research.

Methods Used

Guidelines were established for land use practices, based on priority land uses and activities and areas of special ecological and cultural importance (WMAC 1993, p. 4-1). A community process for land use decisions was used. Cumulative Impacts Management is addressed as well as an environmental screening and review. In addition, several methods are used to educate the community (WMAC 1993).

Key Contributions to Management of Cumulative Effects

- Community involvement.
- Use of Traditional Knowledge.

A.3.2: Pedigree Caribou Program

Geographic Region

The Pedigree gas play located in Northwestern Alberta near the British Columbia Alberta border (Pedigree Caribou Standing Committee 1991).

Jurisdictional Authority

Joint government/industry planning group with government participation by Alberta Forest Service, Alberta Fish and Wildlife, Alberta Public Lands and the Alberta Energy and Utilities Board.

Purpose of Initiative

The purpose of the initiative was to protect caribou in the Pedigree Range (Pedigree Caribou Standing Committee 1991, p. 1). To achieve this, the Committee had the following objectives:

- To maintain inherent capability of range for caribou.
- To ensure the continued use of traditional range by caribou, while facilitating oil and gas activities.
- To prevent direct or indirect caribou mortalities from oil and gas activities.
- To minimize disturbance to caribou from oil and gas activities.
- To ensure that oil and gas activities are conducted in a safe, economical and environmentally responsible manner.
- To ensure that government commitments in resource agreements are honoured.

Reason for Initiative

Increasing concern over declining numbers of woodland caribou in the province [of Alberta] (Pedigree Caribou Standing Committee 1991, p.1).

Issues Addressed

Access development, habitat alteration, predation pressures and sensory disturbance.

Methods Used

Several tools were used by the Committee, including legislation and approvals; access control; general Caribou Protection Measures; timing and/or scheduling constraints; locational constraints; guidelines for seismic operations; guidelines for wellsite development; and guidelines for gas production and transmission.

The plan made use of a variety of land use thresholds as follows:

Maximum Simultaneous Activity Levels per Township

- A maximum of 30 km of linear corridors will be active in any township (i.e., 100 km^2) within the Pedigree area at any given point in time from December 1 to April 30. This active corridor density (i.e. 1 km/3.3 km^2 or 0.33 km/km^2) was adopted based on an assumed ZOI of 1 km on either side of the corridors, resulting in a maximum of 60% of any township being within a potential ZOI at any given time. An active corridor is defined as any seismic line, utility line or access road supporting equipment of vehicle travel during exploration, construction or operational phases of development.

Maximum Activity Levels per Township per Winter

- A maximum 300 km new linear corridors will be approved in any township during a single winter. Such approvals will be granted on a first-come-first-served basis until the limit is reached. Emergency maintenance requirements will not be affected by this restriction.

Absolute Maximum Development per Township

- Cumulative areas of disturbance (i.e., clearing) from all components of oil and gas activities will be monitored after each season of operation to determine the total level of habitat alteration within the Pedigree area. Once 5% of the area of any township has been altered from clearing, all future activities will be restricted to existing cleared corridors.

Key Contributions to Management of Cumulative Effects

- Inclusion of Legislation.

- Specific management suggestions.

It should be noted that there is an initiative to combine all Northern Alberta caribou plans (of which there are five) into one under a Boreal Caribou Committee that will encompass the area in Alberta north of the Peace River. This program is largely funded and driven by industry and includes involvement by representatives of oil and gas, timber, and peat companies, Alberta Environment, the Alberta Conservation Association and the World Wildlife Fund (B. Wynes, pers. comm.).

In the past, only individual projects were assessed without looking at the overall planning or disturbance model. Now, there is increasing regional-based industrial commitment in caribou range, including oil and gas, peat, timber and diamond mining interests.

The overall purpose of the program is to integrate industrial activity and caribou on the landscape. The objective of the program is to understand the real impacts of industry, what mitigation works, and how to better deal with the total human footprint on caribou habitat. A number of research projects have been initiated; one project is using cumulative effects modeling in an attempt to model landscape with industrial activity, followed by the use of caribou energetics modeling. Key contributions of the program to cumulative effects management lie in the work of three research projects, which examine habitat selection; caribou avoidance of linear features; and wolf/caribou interactions and linear corridor development.

A.3.3: National Park Management Plans

Geographic Region

Canada's National Parks.

Jurisdictional Authority

Department of Canadian Heritage.

Purpose of Initiative

To specify "what [Parks Canada] will do in the next five years and lays the groundwork for more action afterwards" (Parks Canada website 2000, p. 2).

Reason for Initiative

Park Management Plans are required by law, and every five years a comprehensive review of the management plan is undertaken (Environment Canada 1988a, 1988b).

Issues Addressed

The key issue is "the tension between resource protection and visitor use"(Environment Canada 1988b, p.3). To address this issue, the effects of use on vegetation, aquatics, wildlife, environmentally sensitive areas (ESA) and historical/cultural areas of significance are studied. There are many other issues which are associated with resource protection and visitor use, including: heritage tourism, frontcountry management, human use management, ski areas, Sulphur Mountain, Banff Springs Golf Course, communities (Banff and Lake Louise), environmental stewardship, transportation, park zoning and environmental assessment.

Methods Used

- Cooperation with land managers in neighbouring jurisdictions (Parks Canada website 2000).
- Management Plans for Vegetation, Bow Corridor Fire Protection Plans, wildlife habitat protection.
- Area closures and modification of regulations.
- Engage in partnerships with other government agencies and working groups.
- Planning initiatives that include the preparation of backcountry management plans human use strategies and guidelines for continuing operations.

Key Contributions to Management of Cumulative Effects

- Long-term scope of plan.
- Management of all sources of cumulative effects.
- Regional co-operation/participation.

A.4: Regional Monitoring and Research

A.4.1: BHP Monitoring Program

Geographic Region

The BHP Ekati Diamond mine is north of Lac de Gras, 300 km northeast of Yellowknife.

Jurisdictional Authority

The BHP Monitoring Program operates under an agreement INAC, the territorial government and BHP. This legally binding Environmental Agreement was signed on January 6, 1997. By-laws were drawn up by a working group established by the Environmental Agreement's Implementation Protocol (O'Reilly 1998, p. 6).

Purpose of Initiative

The Independent Environmental Monitoring Agency (IEMA) is a public watchdog and non-profit society for environmental management at the Ekati Diamond Mine, created as a condition of the Environmental Agreement signed by BHP, Canada and GNWT in 1997. The Agreement obligates BHP to report annually on its environmental programs and, every three years, to prepare an environmental impact report on its findings. It also requires BHP to give all available traditional knowledge full consideration as the environmental programs at the mine are developed and revised (IEMA 1999).

The review of the design of the monitoring programs and of the results given by government and BHP is one of the main responsibilities of the IEMA. It also must examine the environmental management systems used by BHP to determine whether they have the appropriate ability to respond to problems (O'Reilly 1998, p. 6).

Reason for Initiative

The reason for the IEMA was the view that there needed to be an independent agency monitoring the environmental management at the Ekati mine (IEMA 1999). "There was a lack of confidence in both BHP and government to adequately carry out monitoring programs, publicly report the results and take any corrective action that might be necessary" (O'Reilly 1998, p. 4).

Issues Addressed

Topics addressed by the IEMA include:

- water monitoring;
- aquatic monitoring baseline study;
- aquatic effects monitoring;
- fisheries studies and mitigation; stream habitat;
- construction phase wildlife monitoring; an operations phase wildlife monitoring program including caribou, grizzly bear, wolves, wolverine, upland breeding birds, loons, birds of prey;
- reclamation and research on plants;
- archaeological investigations; and
- Traditional Knowledge studies.

Methods Used

The mandate of the Agency is (O'Reilly 1998, p. 6):

- to provide an integrated approach to achieve the purposes [of the Agreement];
- to serve as a public watchdog of the regulatory process and the implementation of this Agreement;
- to compile and analyze relevant environmental quality data in order to review, report, or make recommendations concerning environmental effects monitoring, and cumulative impacts, and related management programs integration of traditional knowledge and experiences of Aboriginal Peoples into Environmental Plans and Programs;

- to participate as an intervenor in regulatory and other legal processes respecting environmental matters;
- to provide an accessible and public repository of environmental data, studies and reports relevant to the Monitoring Agency's responsibilities;
- to provide programs for the effective dissemination of information to the Aboriginal Peoples and the general public about the Project and the monitoring and regulation of the Project; and
- to participate as an intervenor, as appropriate, in the dispute resolution process under this Agreement.

Key Contributions to Management of Cumulative Effects

- Independence of monitoring from project proponent.
- Adaptive management.
- Scientific research and data collection, including TEK.

A.4.2: Grizzly Bear Conservation in the Alberta Yellowhead Ecosystem

Within the Yellowhead region in Alberta, an area encompassing Jasper National Park and provincial lands to the north and east, following Bear Management Unit boundaries.

Jurisdictional Authority

The jurisdiction for the framework lies with interagency agreements between the Government of Alberta, Fish and Wildlife and Jasper National Park. Industry partners also play an important role in the framework.

Purpose of Initiative

The purpose of this Strategic Framework is to apply some of the conditions of the Joint Decision Report for the Cheviot Coal Project (NESERC 2000). However, not all conditions are covered under this initiative and will be included in the Cheviot Carnivore Compensation Program (managed by the proponent of the mine expansion, Cardinal River Coals).

"The framework recognizes that the conservation of the Grizzly Bear requires a cooperative approach by all land and resource managers, disposition holders, and stakeholders. Such cooperative initiatives must operate at a variety of appropriate spatial and temporal scales over a large regional landscape" (NERSERC 2000, p. 3). To recognize this range in scale, the framework establishes the interagency cooperation, provides context for specific programs and provides mechanisms to ensure effective involvement of stakeholders (NERSERC 2000).

Reason for Initiative

The Strategic Framework arose from the recommendations by the Joint Panel on the Cheviot Coal Project. However, in addition to that project, every year brings more development proposals to the Alberta Yellowhead ecosystem. Pressures on the grizzly bear from human settlement and use of the landscape are also increasing in the region. As the Alberta Yellowhead ecosystem is thought to contain approximately 30% of the provincial grizzly bear population and is facing increasing development pressures, the North Eastern Slopes Environmental Committee was formed (NESERC 2000).

Issues Addressed

One of the most important issues addressed is that of linkages to other grizzly bear research initiatives, including the Carnivore Compensation Program within the Cheviot Cumulative Effects Area, the Rocky Mountain Grizzly Bear Planning Committee, the Greater Yellowhead Ecosystem Working Group and the Southern East Slopes Grizzly Bear Study (NESERC 2000, p. 6). Such linkages are important in order to share information, management goals and approaches. Other issues include suitable landscape conditions such as habitat effectiveness, security area, total human-caused mortality, road density and habitat connectivity. The Regional Carnivore Management Group will coordinate the management of the issues. The final issue is that of research, specifically, to identify research needs and deliver the research program.

Methods Used

- Assess current populations and habitat conditions (NESERC 2000, p. 8).
- Recommend appropriate landscape conditions and measures of success.
- Identify the implications to existing dispositions.
- Recommend a data management and sharing protocol.
- Develop tools including development or adaptation of models and a suite of management options.
- Evaluate and recommend the orderly implementation of the Framework.
- Recommend a monitoring program and criteria for measuring success.

In addition to the above methods, a Stakeholder Forum and a Research Forum will be used to provide input in the area of strategies and other issues.

Key Contributions to Management of Cumulative Effects

- A regional approach, not just project specific.
- Cooperation between Federal and Provincial governments and within Provincial government.

- Industry involvement.
- Linkage with other initiatives.
- Framework includes policy (government), research (including the Foothills Model Forest program), monitoring, mitigation and enhancement.

A.4.3: Coppermine River Basin Study

Geographic Region

The study encompasses the Coppermine River Basin in the Northwest Territories. The basin is centrally located in the NWT. Its common basin drainage divides the Great Bear Lake drainage to the west, Great Slave Lake catchments to the south, and the Back-Burnside river system to the east, with minor Arctic coast drainages to the north. It is 325 km north from Yellowknife to the basin midpoint at Point Lake and 600 km to the Hamlet of Kugluktuk on the river estuary on Coronation Gulf (Wedel *et al.* 1988).

Jurisdictional Authority

This study was completed by Environment Canada, Western and Northern Region, Conservation and Protection, Inland Waters Directorate, NWT Programs.

Purpose of Initiative

The study was intended to assist in any future water resource use decisions in the Coppermine River Basin.

Reason for Initiative

No reason was given for the initiation of the study beyond the stated purpose of assisting in any future water resource decisions.

Issues Addressed

The study presents a summary of available water resource information for the river basin, including water quantity and water quality data. The study report starts with a discussion of the physical nature of the basin and the regional climate and vegetation since these elements shape the characteristics of the water resource. The report also summarizes the traditional, existing and potential uses of the water resource.

Methods Used

The basin's physical nature and the regional climate and vegetation data are summarized based upon existing data. The water quality and quantity data is primarily based upon long term Water Survey of Canada hydrometric data stations, supplemented with additional data that was collected in 1985.

Key Contributions to Management of Cumulative Effects

The key contributions to the management of cumulative effects are:

- the summary of the existing water quantity and quality data;
- a recommendation that environmental conservation become a governing principle in design and operation of water-related developments in the basin;
- a recommendation that existing in-stream uses of the river be protected in the face of future developments which may be in conflict; including the valuation of instream resources beyond merely economic considerations; and
- recommendations for future additional water quality and quantity data stations that include an expanded set of parameters in order to provide a more complete picture of the baseline water resource environment.

The study does not, however, discuss methods that should be used in order to determine the presence and/or magnitude of environmental effects due to development within or without the river basin.

A.4.4: Mackenzie Valley Cumulative Impact Monitoring Program

Geographic Region

The Mackenzie Valley Area is defined under the Gwich'in Final agreement. This area "comprises the area within the Northwest Territories which is bounded on the south by the 60th parallel of latitude, excluding the area of Wood Buffalo National Park; on the west by the border between the Northwest Territories and the Yukon Territory; on the north by the boundary of the Western Arctic region; and on the east by the boundary of the Settlement Area of the Tungavik Federation of Nunavuk" (DIAND 1998).

Jurisdictional Authority

The Monitoring Program was a condition of the Mackenzie Valley Resource Management Act (MVRMA) and the Gwich'in Comprehensive Land Claim Agreement (DIAND 1998, p. 2).

Purpose of Initiative

The purpose of the initiative was to provide a framework and the information needed to facilitate the ultimate implementation of a cumulative effects monitoring and auditing program for the Mackenzie Valley (Bernard *et al.* 1994, p. 2).

Reason for Initiative

Under the Gwich'in Comprehensive Land Claim Agreement, clause 24.1.4 states there will be a monitoring program for impacts of land and water uses on the environment in the Mackenzie Valley (Bernard *et al.* 1994).

Issues Addressed

Several issues are addressed by the monitoring program, including:

- The spatial extent of the monitoring program. There were three scales identified, including the community scale, the ecoregion scale and the Mackenzie Valley scale.
- The presence of stressors, both from within the Valley and also from outside the valley (e.g., upstream sources of contamination). These stressors must be examined as part of cumulative effects monitoring.
- Impact mechanisms must be identified and verified.
- The existence of Traditional Ecological Knowledge (TEK) and how to incorporate it into the work done by the Monitoring Program and what must be taken into consideration to do this.
- Community-based monitoring and research as well as other monitoring programs operating at a larger scale. These programs include air, wildlife, fisheries, etc.

Methods Used

The Program uses a three-stage approach:

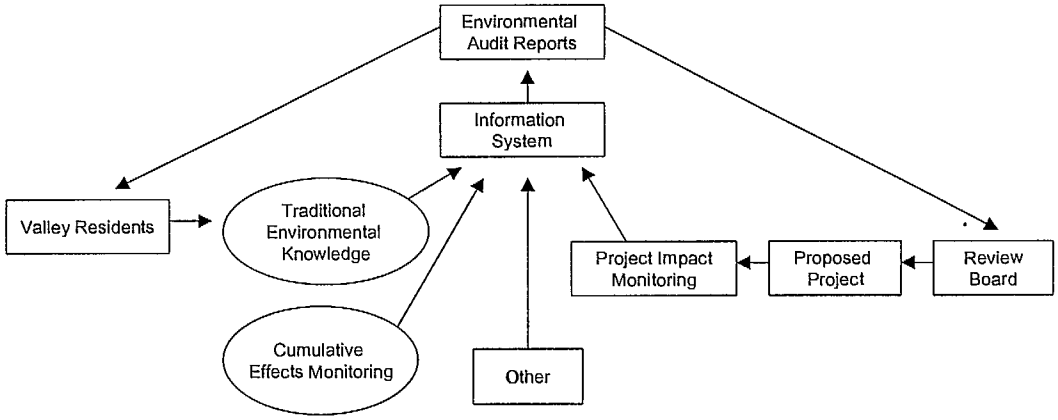
1. ***Framework:*** background information, recommendations.
2. ***Legislation:*** institutional arrangements, detailed program designs, information management system.
3. ***Data collection:*** synthesis and analysis, reporting, periodic program review and revision.

There was also an identification of mechanisms causing cumulative effects. Steps were identified to design a cumulative effects monitoring program that would include goals and objectives, assessment, endpoints, candidate indicators, and the establishment of an information system. Recommendations were made for monitoring and auditing as well as institutional options that would include data acquisition and information, administrative and decision systems.

A workshop was held in Inuvik (November 1998) to develop a dialogue with interested stakeholders in the Mackenzie Valley and to develop the purpose, nature and key principles that would guide the creation of a monitoring program (Figure A-4). Objectives included identification of (DIAND 1998, p. 2-3):

- key environmental components (VECs);
- potential indicators representative of the VECs for monitoring;
- essential issues/conditions and opportunities/benefits; and
- the next step of a consultation and action plan.

Figure A-4 The Mackenzie Valley Cumulative Effects Monitoring Program



Key Contributions to Management of Cumulative Effects

The key contribution of this initiative was the implicit understanding that there is the need for a framework where the subcomponents use comparable methods and procedures while sharing and integrating the resulting data (Bernard *et al.* 1994, p. 2).

A.4.5: The Environmental Information Partnership Moose River Basin Study

Geographic Region

Northeastern Ontario within the Moose River drainage into James Bay.

Jurisdictional Authority

Ontario Ministry of Natural Resources.

Purpose of Initiative

"Develop an information management system for the Moose River Basin (MRB) to assist in the identification and evaluation of cumulative effects for planning and development purposes; and understand the contribution of resource development (mining, forestry and hydro) to the cumulative effects on the aquatic environment of the MRB. The Environmental Information Partnership (EIP) is about people working together to sustain the environment of the MRB while allowing for economic growth and development" (Government of Ontario website 2000). This was not a land use or watershed planning initiative. The basic goal was to build an information management system to assist with future cumulative effects assessment (G. Duckwork, pers. comm.).

Reason for Initiative

"Concern [by government and the public] about environmental and social impacts of proposed hydro-electric development on the basin; and a lack of framework to address CEA" (Government of Ontario website 2000). A consultation process began to develop ways to resolve resource development issues.

Issues Addressed

Information management; the source of cumulative effects' Traditional Ecological Knowledge (TEK), and the Moose River Basin.

Methods Used

A series of consultations were implemented with members of First Nations, aboriginal organizations, stakeholder groups and government staff and officials to hear concerns. This lead to the recommendation for the development of a baseline data collection initiative.

In addition to the baseline data collection was the development of a science program with the following objectives:

- ***Comprehensive environmental information.*** Based on five subject disciplines, the following synthesis reports were produced: Biophysical Sciences, Geosciences, Socioeconomic Sciences, Development, and Traditional Ecological Knowledge (Government of Ontario website 2000).

- ***Impact assessment studies of principal resource development activities.*** Studies included:

  - Peaking Study, which examined how aquatic communities and habitats change downstream from a dam.

  - Contaminant Levels in Sportfish, which compared contaminant levels in sportfish from developed areas, undeveloped areas and historical levels.

  - Health of Lake Sturgeon Downstream of a Hydroelectric Dam, which examined fatty acid levels in upstream and downstream sturgeon on the Mattagami River and compared levels to sturgeon in the Missinaibi River (which is undeveloped).

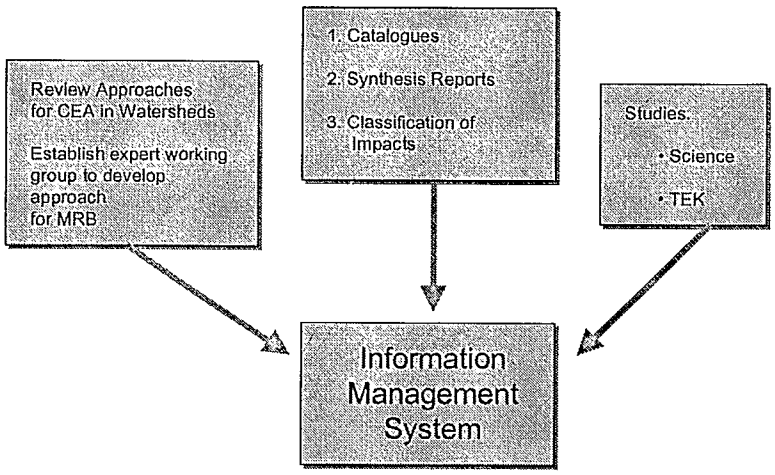
  - Literature reviews on the impact of hydroelectric dams on aquatic ecosystems and the impacts of mining exploration on aquatic ecosystems (Government of Ontario website 2000). Other Impact Assessment studies included the development of methods for CEA using fish populations, a reference site database for cumulative impact assessment, hydrologic impacts of forest operations on sub-watersheds and landscape level land cover change assessment.

- ***Development activity impact classification for aquatic impacts.*** A working group of experts reviewed the synthesis reports and arrived at a consensus on how to classify known impacts of development on the aquatic environment of the Moose River Basin (Government of Ontario website 2000). This information would then be included in the information management system. Additional tasks were to identify information gaps that need to be addressed.

- ***Identification and recommendation approaches and models to assess cumulative effects.*** To define an approach to CEA, a working group of scientists was created who examined other CEA frameworks before developing one for the MRB.

The final structure of the cumulative effects' decision will "be defined by the results of the process to develop and recommend approaches to assess cumulative effects. Figure A-5 illustrates this approach.

Figure A-5 Strategic Plan for the Moose River Basin Study



Source: Government of Ontario 2000.

A Traditional Ecological Knowledge (TEK) Advisory Committee was formed to identify oversight and establish guidance for the TEK Component of the Environmental Information Partnership. The specific responsibilities of the TEK Advisory Committee included the:

- identification of the specific TEK data needs and priorities of the First Nation partners to EIP;
- identification of EIP gaps in existing documentation of TEK of the First Nation partners;
- evaluation and recommendation of proposed studies to document TEK relevant to the Moose River Basin;
- evaluation and recommendation of methods for applying TEK to land-use planning and development decisions relevant to the Moose River Basin;
- review of studies documenting TEK relevant to the Moose River Basin;
- establishment of data quality standards for TEK documented under the auspices of the EIP;
- development of protocols for the documentation, summary, interpretation, and application of TEK;
- establishment of protocols for the use and protection of TEK that is documented under the auspices of EIP; and

- establishment of a work plan and schedule for the TEK Program of EIP.

Funding for EIP was cut short four years into the nine year program. What EIP did do was to define what was known about the Moose River Basin in a wide array of disciplines, including, biophysical, geoscience, socio-economic, development activities, and traditional ecological knowledge through the compilation of Metadata catalogues. This catalogue information then became the main input to a GIS based computer application referred to as the Moose River Basin Information Management System (MRBIMS).

Studies and literature reviews were done to address a number of data gaps. Priorities for these studies were suggested by either the EIP Study Office staff or the Steering Committee and then approved by the Steering Committee.

Key Contributions to Management of Cumulative Effects

The information management system consisted of an electronic catalogue of over 10,000 georeferenced records of information about the MRB and a spatial indexing system that allowed the use of the catalogue information in a GIS system (Government of Ontario website 2000).

The project was to "provide a forum in which to share and prioritize values; compile and evaluate existing information based on priorities and identifying data and information requirements in a cost-effective manner; and identifying actual benchmarks through continuous evaluation" (Government of Ontario website 2000).

As the study operated for only four of the intended nine years, not all goals were achieved, the primary objective being the creation of an information management system, conducting a literature review, designing an overall conceptual approach and funding some research on using fish populations as a means of assessing cumulative effects. The study did recommend specific management techniques, and no land use goals were defined.

A.4.6: Northern Rivers Basin Study

Geographic Region

The basins of the Peace, Athabasca and Slave Rivers, including much of northern Alberta and portions of British Columbia, Saskatchewan and the Northwest Territories. However, the study area was defined as only those portions of the basins that were within the borders of the Northwest Territories or Alberta.

Jurisdictional Authority

On September 27, 1991, the governments of Alberta, the Northwest Territories and Canada signed the Northern River Basins Study (NRBS) agreement. The Northern River Basins Study was completed under the authority of the Alberta, Northwest Territories and Canadian governments with cost sharing between the Alberta and Canadian governments (NRBS 1996).

Purpose of Initiative

The purpose of the initiative was to conduct research and gather basic information to better understand the cumulative impacts of developments in the river basins. The objectives were:

- To provide a scientifically sound information base for planning and management of the water and aquatic environment of the study area so as to ensure its long-term protection, improvement and wise use.
- To collect and interpret data and develop appropriate models related to hydrology/hydraulics, water quality, fish and fish habitat.
- To ensure that technical studies undertaken in the basins are conducted in an open and cooperative manner and that their purpose, progress and results are reported regularly to the public.

Reason for Initiative

In the late 1980s, public concerns were expressed regarding the proposed building of the Alberta Pacific Pulp Mill in Athabasca, Alberta. In response to these concerns, a joint Alberta-Canada Environmental Impact Assessment of the proposed mill was performed and a decision made. The review process brought together the Alberta, Northwest Territories and Canadian governments. In its 1990 report, the joint assessment review board identified the need for further investigation to fill knowledge gaps concerning the cumulative effects of contaminants on the Athabasca-Peace River system. The mill was approved after two more environmental reviews but the three governments acknowledged the need for further information regarding the impacts of development on the aquatic ecosystem. The NRBS arose out the findings and recommendations of these environmental reviews.

Issues Addressed

There were eight research components of the Study's science program: traditional knowledge, drinking water, nutrients, food chain, other uses, hydrology/hydraulics, contaminants and synthesis and modeling of information.

Although investigating health concerns arising from environmental conditions was not a part of the Study's mandate, the Study did respond to public concerns by creating the NRBS Human Health Committee. The health committee and the Board developed a process for dealing with scientific information that might have had health implications. Working with Alberta Health, the Committee also contributed to the design of the Northern River Basins Human Health Monitoring Program. This companion study was to gather baseline information on human health conditions within northern Alberta and examine possible links between human health and exposure to environmental contamination.

Methods Used

The NRBS was designed as Phase II of a three phase process. Phase I was completed in preparation for the study and consisted of identifying what information was known about the basins and what information was still required.

A 25 member Board was responsible for the over-all management of the Study. The Board included representatives from funding governments, municipal governments, First Nations, industry, education, agriculture, health, environmental groups and the affected public. Two additional seats were reserved for observers representing the governments of British Columbia and Alberta.

The Board developed a set of 16 questions that, if answered, would fulfill the Study's objectives and respond to public expectations and concerns. Fourteen of the questions were science based and the other two were societal in nature. The information required to answer the 16 questions was organized into the eight aforementioned issues.

Approximately 150 individual projects were completed over 4½ years in an attempt to gather the required knowledge. A series of synthesis reports summarized the project's findings. The final NRBS report used the synthesis reports as the basis to make recommendations for the future management of development activities in the basins.

Phase III of the process was supposed to enact management strategies based on the recommendations contained in the NRBS report. According to Environment Canada's news release, the various government representatives agreed with the recommendations of the study. They committed action in such areas as pollution prevention, science-based ecological management, resolving contaminant and nutrient issues, continuing environmental research, and open and full public participation in basin management decisions (Environment Canada website 1997). In addition, "they identify the future Mackenzie River Basin Board (MRBB) to provide the framework for this approach. Governments endorse the recommendation to establish an Integrated Ecosystem Monitoring Committee under the MRBB that uses scientific and traditional knowledge" (Environment Canada website 1997).

Key Contributions to Management of Cumulative Effects

- Compilation of an extensive collection of baseline data from the river basins that could be used for the detection of cumulative effects of development activities.

- Completion of the NRBS Synthesis Reports No. 10 and No. 11 entitled *Ecosystem Health and Integrated Monitoring in the Northern River Basins* and *Cumulative Impacts Within the Northern River Basins*, respectively. Report No. 10 provided nine recommendations on future ecosystem monitoring. Report No. 11 provided a series of 17 recommendations that are divided into four primary issue areas:

    - Environmental Contamination;

    - Aquatic Ecosystem Health;

    - Environmental Management and Monitoring; and

- Cumulative Effects.

A.4.7 Ecological Monitoring and Assessment Network (EMAN)

Geographic Region

Canada.

Jurisdictional Authority

Environment Canada.

Purpose of Initiative

In April. 1994, Environment Canada established the Ecological Monitoring Coordinating Office (EMCO) to organize partnerships with other federal departments, Provinces and Territories, universities, NGOs and industry to form a cohesive Ecological Monitoring and Assessment Network (EMAN) across Canada consisting of existing ecological monitoring and research sites, and promoting the development of new sites where feasible (Environment Canada website 1999).

The first task was to implement a national network of ecologically representative sites for monitoring ecological functions over long periods of time. The second task was to bring together academic governmental and private sector scientists to address the cumulative effects of major environmental stresses. Third, the sponsors of and participants in the EMAN will contribute to (Environment Canada website 1999):

- defining the ecosystem effects of environmental stresses affecting Canadian ecosystems;
- establishing strong scientific rationales for measures to control and, wherever possible, to prevent pollution, including the development of adaptive management measures;
- defining and interpreting the response of ecosystems to existing programs designed to control or prevent stresses;
- providing an early warning of significant new stresses; and
- assessing and interpreting the findings, and with policy analysts, supporting the formulation of sound policy and decision-making for sustainable development throughout Canada.

Reason for Initiative

The EMAN provides a national perspective on how Canadian ecosystems are being affected, a scientifically defensible rationale for control and management activities, an evaluation of the effectiveness of control programs, and identifies new issues as they emerge (Environment Canada website 1999).

Issues Addressed

Ecological Science Cooperatives (ESCs) conduct studies in five different areas, including ecosystem composition, structure, function and process (including energy flux, material cycling, sources and sinks); ecosystem history (paleoecology) and current state; causes and ecological consequences of environmental change; species inventory, population dynamics and biodiversity change; and rates and magnitudes of changes and whether such changes are parts of cycles or trends (Environment Canada website 1999).

Methods Used

- Mobilizing the scientific community to address major policy and assessment needs.
- Providing a base for undertaking additional monitoring and research activities.
- Assisting, clarifying and validating the basis for the selection of ecological indicators.
- Encouraging participation of scientists, educators and their students, and the general public within each ecozone.
- Giving notice of unexpected changes in rates and trends, therefore providing an early warning system.
- Communicating findings in forms useful for local, regional, national or international audiences.

Key Contributions to Managemnent of Cumulative Effects

- National coordination.
- Scientific basis for management considerations.
- Broad involvement.
- Monitoring and dissemination of information.

A.4.8 Nunavut Land Use Planning and Mapping

Geographic Region

Nunavut, including the following planning regions: West Kitikmeot, Central, Keewatin, North Baffin, Sanikiluaq, and South Baffin.

Jurisdictional Authority

The Government of Nunavut under the Nunavut Land Claims Agreement, administered by the Nunavut Planning Commission (NPC).

Purpose of Initiative

Develop land use plans, policies and objectives that guide resource use and development throughout Nunavut, with an emphasis on protecting and promoting the existing and future well-being of the residents and communities of the Nunavut Settlement Area (Nunavut Planning Commission website 2000).

Reason for Initiative

The Nunavut Land Claims Agreement, Article 11, established the requirement of land use plans for land and marine areas within the Nunavut Settlement Area and the Outer Land Fast Ice Zone (Nunavut Planning Commission website 2000).

Issues Addressed

- Land use, including water, hunting and offshore areas.
- Resource use and development.
- Protection and future well-being of residents and communities.
- GIS mapping.
- Traditional knowledge.
- Areas of archaeological significance.

Methods Used

Mapping wildlife populations, human use and areas of archaeological significance and the examining land use issues will be done through the PLANNER system (see below). The Nunavut Environmental Database (NED), a subset of the Arctic Institute of North America's Arctic Science and Technology Information System (ASTIS) database will be used to store data. The Nunavut General Monitoring Program (NGMP) will identify changes in the long-term state and health of the Nunavut Settlement Area, and act as an "early-warning system" for changes in the environment. The program will initiate and coordinate the collection of information, which will be openly available to communities and decision-makers (Nunavut Planning Commission website 2000).

The Nunavut Planning Commission's Public Land Use Application Notification Network and Environmental Reporter (PLANNER) will bring together proponents and institutions and link them together over the Internet. It will include project application forms and GIS capabilities so that those interested can generate site specific maps and reports. After proponents place the proposed project on the map, the software will then access information relevant to that area and will generate a report. For example, if there is a caribou calving ground, the report identifies issues, relevant scientific experts to contact and provide other related information. One layer contains all ongoing projects in Nunavut, including abandoned projects (P. Wilson, pers. comm.). At present, PLANNER is not ready for public use.

Key Contributions to Management of Cumulative Effects

- Focus on future projects.
- Focus on issues.
- Creation of a dynamic and openly accessible database.
- Contribution to long-term knowledge.

Appendix B Terms of Reference

REQUEST FOR PROPOSALS
(Reference: KA511-9-0659)

REGIONAL APPROACHES TO MANAGING CUMULATIVE EFFECTS

- DETERMINING THE STATE-OF-THE-ART -
- ADVANCING THE PRACTICE -

BACKGROUND

CUMULATIVE EFFECTS MANAGEMENT FRAMEWORK PROJECT

Under the Northern Ecosystem Initiative, Environment Canada is advocating the development of cumulative effects management frameworks for areas of the Canadian North experiencing development pressure or characterized by high growth potential due to the presence of valued natural resources (base and precious metal deposits, diamonds, forests, etc.). Knowing development pressures will continue to mount and place stress on the relatively undisturbed and unpolluted northern ecosystems, provides an unique and unparalleled opportunity to apply what we have learned from our past successes and mistakes. We now recognize the advantages of prevention over remediation. We understand the importance of managing development within the carrying capacity of the environment and in harmony with the social values of local people.

The frameworks are viewed as proactive measures of benefit to many interests in efforts to support timely development and management decisions while ensuring healthy ecosystems in the North. They are intended to:

- Build upon current experience in both cumulative effects assessment and regional (ecosystem level) study initiatives in Canada.
- Complement existing planning, assessment and regulatory processes in the Canadian North.
- Provide further assurances that northern ecosystems can be protected for the benefit of all while ensuring the Canadian North remains attractive to industry.

With this in mind, the Department plans to:

1. Determine the state-of-the-art in terms of regional approaches to managing cumulative effects.
2. Identify options and challenges to implementing regional approaches to managing cumulative effects in areas of the North which may benefit from such an approach.

CONTEXT:

Environment Canada's Northern Ecosystem Initiative (NEI) is the most recent addition to the family of ecosystem initiatives across Canada. The overall goal of the NEI is to provide the "*grease and glue*" in the formation of partnerships necessary to address long term ecosystem priorities for the North. Ecosystem initiatives represent a major component of Environment Canada's contribution toward a more sustainable future for Canada. The Department works with a broad spectrum of governments, Aboriginal organizations, industry, environmental groups, communities and others in pursuit of shared objectives. Ecosystem initiatives facilitate the achievement of results which can be superior to those achievable through the Department acting alone. Moreover, they help to build the capacity of the Department, the partners and communities involved.

The NEI is a partnership based initiative intended to facilitate coordinated action on priority issues of common concern that relate to the health and sustainability of northern communities and ecosystems. The sharing of objectives, responsibilities and resources amongst the partners are the fundamental underpinnings of the initiative. Environment Canada has identified four priority areas under the NEI:

1. Biodiversity;
2. Contaminants/Toxics;
3. Climate Change; and
4. Impacts of Major Developments.

Under the last category, Impacts of Major Developments, the Department identified cumulative environmental effects as an area of growing concern and having widespread interest among many northern organizations and communities. Specifically, Environment Canada recognizes the emerging need to develop regional approaches to managing cumulative effects in areas of the Canadian North experiencing development pressure or characterized by high growth potential. This is the basis of the contract.

Approaching the management of cumulative effects on a regional scale is viewed as being of benefit to a number of northern interests:

- **Management and Regulatory Bodies** - Decision-making would be improved through the provision of information on regional environmental thresholds, carrying-capacities and conditions.
- **Industry** - It would provide a framework within which to facilitate the evaluation of project-specific cumulative effects assessment work by proponents of new developments.
- **Public Expectations** - Government and co-management boards would be better able to meet growing public expectations and concerns in regards to the management of cumulative effects in the Canadian North.

- **Community Participatory Decision-Making** - Community organizations and residents would have enhanced opportunities to contribute to decision-making.

The practice and science of cumulative effects assessment is recognized and valued as a tool to support sound environmental management decisions and broad policy commitments to ensure sustainable development. In the Canadian North, cumulative effects assessment is becoming increasingly important as a requirement under new statutes (e.g. *Mackenzie Valley Resource Management Act*), resource management practices and policies and comprehensive land claim agreements (Natural Resources Canada Draft Discussion Paper 1999).

Project-level cumulative effects assessments are relatively well-established. There is a substantial body of literature on the subject. Applied experience is growing and well documented in publications such as the *Cumulative Effects Assessment Practitioner's Guide* (Canadian Environmental Assessment Agency,1999). The need for regional approaches to managing cumulative effects, through the development of frameworks, arises in part from limitations in current planning and environmental assessment processes. Regional approaches or frameworks would build upon existing northern planning and regulatory processes and enhance our ability to effectively manage cumulative effects.

Studies such as the Moose River Basin Study, Northern Rivers Basin Study Study, Beaufort Regional Environmental Assessment and Monitoring Program and have contributed greatly to our experience in addressing environmental concerns at a regional level. These and other regional approaches to environmental management issues in both northern and southern Canada provide an opportunity to build and improve upon current knowledge and experience. They indicate there are basic components which could be included in a cumulative effects management framework for northern regions. Possible components include but are not necessarily limited to:

- Adequate, accessible and readily usable baseline data.
- Identification of valued ecosystem components (ecological, social, cultural, economic).
- Identifying and understanding environmental linkages (cause-effect) and thresholds.
- Adequate and integrated traditional ecological knowledge and science programs.
- Improved knowledge and understanding among participants.
- Community involvement and participatory decision-making.
- Utilization of geographic information system technologies.
- Cumulative effects monitoring programs measuring indicators of environmental health and change.
- Evaluation of significance and determination of acceptable levels of change.

- Collaborative work among members of industry active in the North.
- Application of adaptive management measures at a regional level (versus project level).

Conceptually, the development of a cumulative effects management framework(s) may be relatively straightforward. Implementation will, however, necessitate adaptations to regionally-specific conditions across the Canadian North. This will involve flexibility and innovation. At its broadest level, a cumulative effects management framework could integrate ecological, social, cultural and economic factors important to environmental management and ecosystem health. In addition, there will be a challenge in ensuring the scope of the work remains manageable as effects on the ecosystem originate at the local, regional and global scale.

A number of northern organizations have knowledge or are undertaking initiatives that could play a key role in the development and implementation of regional approaches to managing cumulative effects in the North. The bodies include federal, provincial and territorial government authorities, Aboriginal governments and organizations, co-management boards established under comprehensive land claim agreements and stakeholder groups. Communities, industry and stakeholder groups would have a critical role to play under a framework. As well, academic institutions are likely not only to have an interest in this initiative but may also have important contributions to make to advancing the practice. Under the NEI, Environment Canada is to act as a catalyst in the implementation of cumulative effects management frameworks with a view to facilitating improved resource management decisions in efforts to ensure sustainable development in the Canadian North.

Preliminary scoping within Environment Canada identified four regional projects which may be suitable for promoting the development of cumulative effects management frameworks with the assistance of the Northern Ecosystem Initiative:

1. Southeast Yukon (forestry, base and precious metal mining, road development).
2. Northern Labrador (base metal mining, road and hydroelectric development).
3. NWT/Nunavut Slave Geological Province (base metal, precious metal and diamond mining, road development).
4. Southwest NWT - the "Liard Valley" (oil, gas and forestry activities).

The report, produced as a result of this contract, is intended to support efforts aimed at implementing regional approaches to managing cumulative effects. For example, as a result of recommendations and a commitment made in the June 1999 Diavik Diamonds Project Comprehensive Study Report, the Department of Indian Affairs and Northern Development is organizing a workshop to begin the development of a cumulative effects assessment and management framework

for the Northwest Territories. The workshop is scheduled to occur December 7th, 8th and 9th in Yellowknife. A similar workshop may occur in Whitehorse.

In this regard, the Department is soliciting interest in a contract which will:

- Determine the state-of-the-art in regards to regional approaches to managing cumulative effects.
- Identify options and challenges to implementing regional approaches to managing cumulative effects in the Canadian North.

The results of the contract will be presented in a report (written and electronic copies).

REFERENCES

Canadian Environmental Assessment Agency (February 1999). Cumulative Effects Assessment Practitioner's Guide.

Natural Resources Canada (April 1999). Preliminary Draft Discussion Paper: Review of Policy Issues for the Practice of Cumulative Effects Assessments in Canada's North.

GUIDELINES TO THE CONTRACTOR

1.0 PRODUCT:

The contractor will supply two reports:

- **An Interim Draft (Progress) Report** containing section headings and bullet points which will outline information obtained and analysis completed to date. The interim draft report will serve two functions: 1) **Main Function** - as a basis of discussion between the successful contractor and Departmental Representative/Scientific Authority on progress to date, challenges that may have been encountered in the contract work and what is required to finalize the report; and 2) **Minor Function** - as a potential resource tool to support the Departmental Representative/Scientific Authority's participation in the December 7th to 9th Yellowknife Workshop on developing a Cumulative Effects Management Framework for application in the Northwest Territories.
- **A Final Report** containing the results of the expert consultation, networking, research and analysis in regards to determining the state-of-the-art in regional approaches to managing cumulative effects and recommendations on options for implementation in the Canadian North.

2.0 DELIVERABLES:

The contractor will provide:

- Four serlox bound copies and one electronic copy (MS Word 95 or more recent version) of the Interim Draft Progress Report. This Interim Draft Progress Report will be delivered to the Departmental Representative/Scientific Authority by Friday, December 3rd 1999.
- Ten serlox bound copies, stiff plastic coated covers (front and back) and one electronic copy (MS Word 95 or more recent version) of the Final Report. The Final Report will be delivered to the Departmental Representative/Scientific Authority by Friday, January 28th 2000.

3.0 SCOPE OF THE WORK

The intent is to build upon current experience: what has worked well, what has not worked well, what may be the best options for moving forward in northern regions experiencing or characterized by high development. Although success stories are important, the identification and description of pitfalls is also important as it is important to not repeat mistakes.

Within the context of information provided in the Background Section, the successful contractor will report on case studies in both northern and southern Canada that best illustrate innovative approaches to addressing or managing

cumulative effects on a regional scale. Important elements include approaches to determining:

1. Environmental thresholds;
2. Environmental carrying capacities;
3. Acceptable levels of change;
4. Use of adaptive management measures on a regional scale (versus project specific scale);
5. How best to facilitate coordinated and collaborative work among diverse stakeholders, disciplines and issues in the Canadian North.

The following case studies will be considered in the contract work:

- Athabasca Oils Sands Regional Sustainable Development Strategy Initiative (ongoing).
- Moose River Basin Study.
- Uranium Mining in Northern Saskatchewan.
- Northern Rivers Basin Study.

Based on in-house knowledge of the topic and their ability to network, the successful consultant will identify other key initiatives in Canada, both ongoing and completed, that would ensure the Final Report accurately presents the state-of-the-art on the topic. The case studies need not be limited to experience in Canada although some discretion will be required to ensure the scope of the work remains reasonable and the work is completed on time. The contractor may want to simply flag noteworthy initiatives underway in other countries for future reference.

The work will involve consultation with experts, networking, research and the review and analysis of key publications and reports. No travel is required. The work will require current knowledge of cumulative effects assessment practices and regional approaches to complex resource management issues in Canada. The successful contractor will have demonstrated excellence in consultation, research and the ability to analyze and summarize complex initiatives into key points or lessons learned.

An extensive literature search is not required as many current publications are described through the:

- Moose River Basin Study - *1998/99 Cumulative Effects Assessment in the moose River Basin - A Literature Review. 1998/99 Conceptual Framework and Considerations for Cumulative Effects Assessment in the Moose River Basin: Final Workshop Report.*

  Website: http://www.mnr.gov.on.ca/mnr/eip/html/publications_on-line.html

- *Cumulative Effects Assessment Practitioner's Guide* (Canadian Environmental Assessment Agency,1999).

  Pages 57 to 60 of the *Cumulative Effects Assessment Practitioner's Guide* (February 1999) provides further context to the basis of the contract work. However, the current work must expand on that brief description and recognize the difference between a regional study versus a regional approach to managing cumulative effects as outlined in part by the earlier five important elements.

- Cumulative Effects Assessment: Current Practices and Future Options. September 1998. Prepared for Alberta Environmental Protection by Macleod Institute.

  http://www.macleodinstitute.com/htm1/cumulative_effects_assessment.htm1

The main components of the report will include:

1. Summary of noteworthy initiatives aimed at managing cumulative environmental effects on a regional scale.
2. Analysis of key case studies from Canada.
3. Results of expert consultation.
4. Summary of key lessons learned.
5. Recommendations on the best options for applying, and description of challenges to implementing, regional approaches to managing cumulative effects in the Canadian North.

Proposals may recommend modifications to this general structure. If accepted, such modifications would be appended to the contract.

4.0 CONTRACT MANAGEMENT

The Departmental Representative/Scientific Authority:

Mr. Carey Ogilvie
Northern Division
Prairie and Northern Region
Environmental Protection Branch
Environment Canada
Suite 301, 5204 - 50 Avenue
Yellowknife, NT X1A 1E2
Telephone: 867-669-4737
Fax: 867-873-8185

The Contract Authority:

Mr. Don Camire
Contracting Officer
Prairie and Northern Region
Environment Canada
Room 200, Twin Atria #2
4999 - 98 Avenue
Edmonton, Alberta T6B 2X3

Telephone: 780-951-8618
Fax: 780-495-5097

5.0 TIMEFRAME

Proposals must be received in Edmonton by 2:00 PM local time on Friday, October 15th 1999 and are to be directed to the Contract Authority, Mr. D. Camire, at the address indicated in Section 4.0.

Proposals received by facsimile are acceptable, but hard copies must follow.

6.0 BUDGET

The budget for the proposed contract will not exceed $35,000 (excluding GST).

7.0 PROPOSALS

Interested consultants must submit 4 copies of their proposals. The proposals shall include a description of:

- The contract team including each personnel's qualifications and experience as well as time allocated to the project and their role.
- The experience of the principal firm and any associate firms or outside expertise to be utilized in completing the contract.
- The proposed approach, including workplans, schedule, reporting and quality control measures and any innovations in the approach.
- Fees for each project team member and anticipated expenses.
- Any northern content in the proposal. This may include a northern office or utilization of associate firms or personnel located in the Canadian North.

Proposals should highlight experience and knowledge of project personnel related to:

- Cumulative effects assessment, monitoring and, in particular, management initiatives at a regional scale.
- Regulatory and policy regimes, including land claims, in the Yukon, Northwest Territories, Nunavut, northern Quebec and northern Labrador.

Proposals should describe the project teams experience in similar projects which involved consultation, networking, research and the analysis and summary of complex initiatives into key points or lessons learned.

Proposals must provide names and contact numbers of two references for which similar work was completed.

8.0 EVALUATION

An evaluation committee will review and rate the proposals according to the attached evaluation table. Environment Canada will not necessarily accept the lowest or any proposal submitted.

EVALUATION TABLE

REQUEST FOR PROPOSALS
REGIONAL APPROACHES TO MANAGING CUMULATIVE EFFECTS
NORTHERN ECOSYSTEM INITIATIVE
October 1999

CRITERIA	WEIGHTING
CONTRACT TEAM These evaluation criteria address the question, what is the capability of the contractor to carry-out the work to a high level of performance?	
What are the qualifications and experience of personnel to be assigned or made available to complete the contract.? Consider the time each personnel is assigned and their role in the contract work.	40%
What is the experience of the principal and any associate firms? Consider whether the firm has undertaken similar work.	10%
PROPOSED APPROACH These evaluation criteria address the question of which proposed approach to the project is likely to produce the best (desired) results?	
Work Plan and Scheduling - consider the degree of delegation in responsibility, reporting and quality control measures and time allocated to complete various tasks.	20%
Innovation - Are there any innovative measures which are likely to enhance the quality of the final product and which demonstrate insights by the organization submitting the proposal?	10%
QUALITY OF PROPOSAL	
Is the proposal clear, well-organized and logical?	5%
FEES AND EXPENSES	
Is the proposal likely to provide best value for the overall cost.	10%
NORTHERN CONTENT	
Does the contractor maintain a northern office or utilize a northern firm or personnel?	5%

Appendix C Project Workshop Notes

Department of the Environment
Cumulative Effects Management Framework

Workshop #1
Calgary, AB
November 29, 1999

DRAFT

Prepared for:

Department of the Environment (DOE)

Prepared by:

AXYS Environmental Consulting
Calgary, AB

November 30, 1999

CP569 Workshop Calgary, AB November 29, 1999 AXYS Environmental Consulting

Present:

- Ross Eccles, George Hegmann, Kevin Lloyd, Jennifer Bidlake – AXYS Environmental Consulting
- Steven Morrison, John Donihee – Sub Contractors
- Carey Ogilvie, Benoit Godin, Stephen Zwicker, Peter Blackall – Env. Canada

Introduction

GH – focus on presentation
CO – no, not just on workshop
GH – initial ideas for workshop: mandate of DOE; CEMF; issues in those areas w/out claims

1st Slide – VECs for RCEMF – GH

- Determine the state-of-the-art in terms of regional approaches to managing cumulative effects.
- Identify options and challenges to implementing regional approaches to managing cumulative effects is areas of the North which may benefit from such an approach.

- Institutional mechanisms available in Gwitchin, Sbtu
- What about transboundary issues such as caribou
- What about areas with unsettled claims

Discussion

CO – Canadian North basis, not just NWT
PB – not sure if content for workshop is right. Make sure report examines intellectual underpinnings of what and why we are doing this; workshop presentation should be able to be lifted for use in other workshops
KL – panarctic and pan sub arctic approach
PB – workshop is about NWT, Nunavut can buy in if they choose
JD – adding provinces adds a major jurisdictional element and complexity. If trying to adapt case studies for north there must be a jurisdictional context.
CO – generic model, adapt for jurisdictions
PB - advocate best practices for EA, recognizing differences among provinces. Don't need to figure out how it would work in PEI

2nd Slide – Overview – GH

Summary of noteworthy initiatives aimed at managing cumulative environmental effects on a regional scale.
Analysis of key case studies from Canada.
Results of expert consultation.
Summary of key lessons learned.
Recommendations on the best options for applying, and description of challenges to implementing, regional approaches to managing cumulative effects in the Canadian North.

Purpose of report:

- Look at all of Canada

- What would be best for the north
- Interpreted for N of 60, also for Nfld and Labrador
- Culmination of MVRMA and other boards
- In regards to December workshop, it is the first opportunity to bring info into the public forum. Therefore it is a good test for how to package work done so far

3rd slide - Purpose: determine state of the art; identify options and challenges - GH

- A strategy to incorporate all means possible to *manage* cumulative effects on a regional basis (as opposed to the analysis and prediction conducted during actual project assessments).

- Minimizes or eliminates unacceptable effects on environmental and social components through the implementation of long-term and regional initiatives in response to a clear vision regarding desired future land use and levels of land use.

4th slide – Objectives – GH

- Summary noteworthy initiatives
- Analysis
- Results of expert consultation
- Summary of key lessons
- Recommendation on best options

5th slide – RCEMF – GH

- A strategy to incorporate all means possible to manage CE on a regional basis
- Minimizes or eliminates unacceptable effects on environmental and social components through the ___of long term and regulatory initiatives.....

Comments:
BG – assume analysis is well understood. Difficulties – We're (DOE) not there
GH – not necessarily well understood. There are some major issues, however, applications are piling up and need to be dealt with
BG – section on science, section on management

6th slide – Approach – GH

- A RCEMF consists of many elements, not all of which necessarily are required in any given situation
- Recognize different implementation timeframes (interim and long-term)
- Recognizes ideal goal of land use plans if available, and need for alternatives if not available
- Recognize biophysical and socio-economic effects
- Recognize influences of existing and pending regulatory regimes
- Take best of what case studies have to offer in combination with other management options

Emphasis – until there are land use plans, we need alternatives, even land use plans aren't the total solution.

Comments:
JD – if you accept the need for regulatory agencies, if DOE has a better mousetrap they need to convince Nunavut that it is a better mousetrap. That is, DOE needs to do a sales job
GH – DOE's role is a result of agreements, etc.
RE – Framework should incorporate precautionary principles
PB – even those you must be careful with. In Europe, it is constantly being redefined

7th Slide – Major Elements of a RCEMF – GH
Table of Contents with those exact headings and examples

8th slide – Temporal Stages of RCEMF – GH

9th slide – Examples of management techniques – GH

- project-specific mitigation and monitoring
- non-project specific monitoring
- resource and land use restrictions
- trans-boundary agreements
- use of thresholds (environmental and land use)
- joint development plans

BHP – example of project specific
MVRMA – non project specific

10th slide – Report Table of Contents – GH
1. Introduction
2. Overview of Regional Cumulative Effects Management
3. Examples of Regional Cumulative Effects Management
4. A Management Toolkit
5. Jurisdictional Opportunities in the North
6. A Management Framework
- a clear signal/message that DOE can send

11th slide – CEAM Workshop Dec 7-9 Whitehorse – GH
- Dec. 7-9, Yellowknife
- Half presentation, half workgroups
- Objectives:
- Understand CEA
- Review initiatives
- Agreement on development/implementation of a CEA&M Framework
- Session: Overview of Unique Considerations for CEAM in NWT (15 min presentation, Morning of Day 2)

Comments:
CO- Peter is up for Day 1
PB – Roger Creasey is speaking on RSDS
GH – tying it up day 2 with overview

12th slide – Case Studies – GH

- Represents examples of various initiatives providing elements that may contribute to a RCEMF in the north.
- Each evaluated by specific criteria and summarized
- Organized into three groups:
- Regional Development and Assessment
- Regional Land Use Planning
- Regional Monitoring

Comments:

PB – would be useful to know what the end point is; what the ideal one is
GH – no such thing as an overarching framework usable for all the north; modular areas as it has to be flexible to reflect pursuit of interests, including technical matters, recognition of existing programs, and assisting in transboundary issues.
PB – env. Canada's mandate is important but focusing on wrong one. Important is the Environmental Act: environment Canada....to promote best practices.

- Key: We think there are shortcomings in EA. We need to make improvements as part of the evolution. It is far more economical for government to bring science to bear in an area of intensive or expected intensive development within a regional framework. It is more efficient and effective.
- If RSDS was viewed by law as a good project, the next project (as long as there were no violations) if it fits RSDS then it would be screened rather than going through all the studies, panel, etc.
- His colleagues are undersourced. To deal with this issue with areas such as oil sands, Liard, etc. Develop a regional model, framework, do a CEA, set bounds cumulatively. Also identify gaps – allows government to work in their science capacity rather than trying to study everything, which they cant.
- Summary of PB – more efficient and effective; more certainty to developers; better sense for local stakeholders, environmental groups, that government knows how it is going to manage development in their area. Use the framework and adaptive management.

GH – Suggests a recognition of best practices. The project becomes a suggestion to NIRB, MVRMA etc. If it is a suggestion then the framework would be coordinated by various government jurisdictions

JD – DOE was a prime player in Beanlands and Duinker

- don't find it enshrined in legislation ???
- conceptual framework to be adopted
- CEA through the act, land claims, etc.
- The north has picked up on land use planning; therefore, need flexible framework
- Our exercise is forward thinking
- Institution – must be flexible to deal with land claims

SM – short term challenges; don't forget industry
BG – lots of times, the DOE Act needs to be brought in to show jurisdiction

- Diand – caught by not having a tool but having responsibilities

SZ – reluctance by proponents to look at CE from a regional basis
PB – Proponents are worried it will slow development

- See ALPAC for adaptive management
- Do not get hung up on jurisdictional matters
- However, put forward a best practice while recognizing flexibility
- Generally, DOE takes high road in promoting
-

GH – there is no magic. There are many elements:
- do anything project specific to eliminate effects. This is rapidly improving
- everyone wants to see a regional database for land use and environment
- regional land use planning – in absence of, is a local CEA

SM – another component to include is the communities. Any strategy must be community friendly – ie. Open and inclusive.
GH – differences between north and south:
- weight attributed to local communities;
- northern legislation is progressive

13th slide – Summary of Case Study Evaluation - GH

14th slide – matrix – GH

Comments:
RE – what about localized land use planning
- BBVS is actually a wish list – should look at Parks Management Plans

SM – Regional traditional land use planning. For example:
- arctic institute, northern river basin study
- ???Dene Tha????

SZ – Labrador – Institute for Environmental Resources and Monitoring http://www.ucs.mun.ca/~iemr/english.htm

15th slide – Case Study Highlights – GH
- All involve some form of scoping and data collection
- Most work towards a regional database
- Some use scoping tools such as hypothesis and linkages
- Few take this information further to detailed analysis
- Very few suggest or use thresholds
- None provide a complete framework, but all provide elements of a framework

comments:
- land use plans can manage CE by recognizing VEC and managing for it, allowing a certain type of development in a certain area
- transboundary jurisdictional responsibility will be a big issue
- numerous monitoring initiatives under way – challenge is to take that information and make it accessible.

16th Slide – Athabasca Oil Sands Env Committee – (CEEMI) - GH

Comments:

PB – Shows how many groups are involved

SM – any project is going to be complicated
GH – most important contributions of RSDS:
- organizational: recognize the issues, mage agreement to support issue
- heightens expectations
- also, is a process framework

17th slide – RSDS Linkage chart – GH
18th slide – Potential Relationships – GH
19th slide – RSDS Adaptive management – GH

Comments:
PB – when mentioning best practice, don't scare people. Instead, like the RSDS, look at gaps and prioritize.
- modular approach is appropriate. Build in order of priority. Timeline is important

JD – Select things to look at; ways to make choices e.g. Build from community up, or risk management

PB – One workshop for scientists to rank, another for the public.
RE – Prioritizing data gaps; most important and easiest data is land use, yet this is lacking
PB – to build this now in the north would be simple
SM – GIS initiative in the Yukon – hasn't gone anywhere
RE – suggested to be done by private sector
SM – some good work done but never published
PB – none of this is rocket science but hasn't been rigorously used e.g. Adaptive management
BG – did we consider looking at the time and effort and money spent on our case studies? Not all companies/areas can afford such costly initiatives. A simpler, faster study would cost less.
GH – proportional effort vs outcome.
PB – don't slow down a $2-3 Billion project because you don't have a good framew3ork. Therefore, put the money into the framework ???
- if we still need a panel after the framework is in place then it's not worth it. It is worth it if we put a framework in and then screen everything = quicker, return on the investment
- polluter pays – fill knowledge gaps
- allow well managed development to fill data gaps

JD – to achieve efficiencies, the framework has to be sold proactively
- however structured, it needs to be like LEGO – add as you go

BG – What about with small, cumulative effects from family industries (Yukon)
SZ – all in the delivery. First one will be the toughest.
- Question: How do you distribute the onus?

PB – needs to be govt leadership
- Diavik – should have been a condition of approval to participate in a regional _____

SM – One of the significant pressures that the govt will face is from smaller industry players who don't have deep pockets
- most mining is junior companies operating at the land use permit stage, but they have some responsibility to the regional framework

JD – Juniors should know that govt is in there too to share responsibility; don't drive them out
SM – a lot of work doesn't address issues – formulate first. A framework would provide leadership for effects assessment
PB – early studies didn't ask questions before doing the fieldwork.
- make the framework for big development areas first and then where small development occurs and govt will have to pay for it

SKIP TOOLKIT UNTIL LATER

20th slide – Overview of Regional Context – JD AND SM
- see paper provided to Kevin and George
- CEA is one of the few occasions were legislation is ahead of technique and scientific assessment. The practice of CEA has been pulled along.
- Legislation is generally project specific e.g. MVRMA.
- CEA is a requirement under federal law and all land claims. Will also be in UFA in Yukon, Inuvialuit, Gwitchin, etc. in various ways.
- CEA is a building block
- No reference to land use planning in JPQIA ????
- When you look at the Yukon, Nunavut, MVRMA, the intention is Land use Planning, Impact Assessment and Land & Water Boards. These work together and you must satisfy all three
- There are jurisdictional responsibilities for transboundary effects. In all claims, there are provisions for interjurisdictional agreements except on air
- MVIRB and Nunavut are talking about these issues
- Therefore, there is the potential for cooperation. Any such initiative will be project driven
- You've got land use planning that counts in the north and you can't get around it
- LUP will be very important e.g. Labrador AIP is looking at everything

Comments:
RE – CEA Act – refers to project effects also past and future
- MVRMA – does not refer to future projects
JD – Why? The statute was negotiated. Perhaps they saw the problems associated with assessing future development. May be more restrictive without mentioning future
RE – CEAA – environmental effect must cause socio-economic impact
- North – immediately consider socio-economic effects
JD – JBNQA discusses both social and environmental
- MVRMA – directly addresses requirements for environmental monitoring of cumulative effects
- All major levers are there in the north
- What isn't there is a vision to link everything
- Too much look at the details – see frameworks for what they are – see the big picture

SM – tools are there; start up issues; framework can lead to land use planning; politics are involved with land use planning commission (leads to problems)
GH – Top down approach – broad geographic – nice but difficult
- bottom up approach – individual projects – is the way to go right now
SM – ELC forces bottom up
- no standards province to province that are the same

JD – Capacity issue
- DOE doesn't do regulation ??? Is the expert advisor
- These boards are underresourced therefore there is room for DOE (In a neutral way) to go to boards and offer to work together on a framework for them to use as they see fit.

LUNCH

Took Kit – KL
Box 1
a. time scale – short, medium, long term
b. Clock
c. Maps
d. Existing regulations
e. Charter for that area – vision for the use of resources
f. Protected spaces plan, species at risk
g. Fragmentation statistics

Box 2
Monitoring equipment

Comments:
SM – also mineral plans? Good plans include Kluane, Gwitchin, Yukon River Corridor Plan

KL? – Gwitchin is a good plan, enabling framework, could establish thresholds, etc.
- concern is for areas without claims settled
- diamond mines – established along a corridor parallel to migratory route. What about this??
- Slave mineral province – VEC's caribou, whitefish and migratory birds

SM – important is the integration of resource information and how it is used to make conclusions

GH – focus on a vec such as caribou
- use the vec as an indicator or entry point (like grizzly bear as an umbrella species)
- the data base gets built, liaison is built up, all to manage caribou

KL – quite likely that the dogrib will use AIP to address land use
- DOE can work with them to advance the beginning stages of a RCEMF for the slave province

GH – advance best practices for existing land use plans – LONG TERM
- mechanisms to span claim areas
- if no land use plan what do you do? Best Practice guideline until a plan is in effect

PB – govt want a framework for NWT at a coarse scale
- then plans for action in areas under development or that will be, such as Liard, SPG
- will have an agreement this spring/action plan on how to develop a framework
- next fall go to cabinet
- then to treasury

- mention in budget feb 2001
- is this timeline correct?

SM – land capability, degree of modification, sensitive habitat and geotechnical information = information that is needed to start the framework.
GH – individual permits and licenses must conform to land use plan
- conformance implies linkage to CE elements
- MVRMA monitoring program and data could be used by Gwitchin

PB – need framework to get you out of the lop that requires you to do a framework
GH – almost a class assessment approach
PB – everything come up with must be robust
- put framework in place before reviewing proposed developments

CO – Gwitchin Plan contains most pieces of a framework, adequate for the current situation. When there is a hotspot, it can bring in different points in a collaborative effort. Integrated land water and planning process should be adequate unless there is a hot spot.
GH – hotspot – things are happening quickly and need an 'emergency response'
- what do you do? Approvals are conditional, weighted on mitigation. Tie into regional effects e.g. Involved with regional access plan
- Pedigree – local area, hot and heavy. Put limits on density of access, length of seismic because there is too much uncertainty and no time to asses/monitor

SM – one of the products could be a CD-ROM with land use info, updated after each major project
RE – guidelines need to be more generic than those based on types of land use activities in the area
PB – need to address some regional issues for example way to handle land vs air vs water. Gwitchin is not specific enough.
- Alberta: instead of IRP they are looking at an IRM, based on RSDS. There is a workshop in early December.
- Question: Is there much difference? Maybe level of detail on issues such as thresholds
- Need detailed thresholds to make good decisions
- Use more judgement early on in areas with little data, but you can take some time as some thresholds are far from being reached in the north

GH – it is easy to get caught up in details
- 2 prongs with oil sands initiative: CE Framework which is top down and RSDS which is bottom up
- in the north those two prongs could be best practice and mitigation with any proponent linked up into information, support, etc. Therefore must buy into the process.

Kevin Notes on Board
Mandate: promote best practices
- flexible
- adaptive management approach
- open
- inclusive

collaborative – transparent, linked to vision
- enhanced version – available
- robust

Inuit – chamber of mines?
- dogrib/metis
- govt

CO – Framework – whoever is affected must be part of the solution. Implies regional scale
SM – integration of regional data bases
- Proponent wants to say there are no cum effects because of their project
- Must address regional story, admit there is an effect.
- Framework plays a role in this

KEVIN Notes on Board
Accelerate process to establish a land use plan in DSA
- geo referenced – data base
- without prejudice to claim
- inclusive
- web supported
- 24 months

Comments:
RE – don't penalize the proponent just because there is already a lot of development in the area
- maybe you should go to the proponents, tell them to work together to establish best practices

GH – MVRMA – reassessment after 5 years
PB – Project by project, govts are making decisions while lacking data. While lacking data, by using best knowledge, a decision-making framework could be proposed.
KL – scenario: 3 more diamond mines are coming, area is in three settled claims. Follow the steps above, how do you come to grips with spatial and temporal thresholds????

PB – what do you want in place, not how
- lay out you need something like IRM
- decision making by regulators
- proposals based on knowledge and framework
- proponents sit down to decide how to do it

KL – establish thresholds for population numbers.
- what about migratory patterns/terrain?
- What about seasonal distribution
- How? Establish thresholds for this

RE Answer – range broken into components
- rate for sensitivity
- land use threshold for core security, more vigorous for calving, less for migratory
- pop estimates as a monitoring tool

GH – EUB monitors air quality and multiple flares in certain areas. The view is regardless of public concern, there are no grounds based on scientific knowledge to turn down applications. So, they will impose various mitigation measures, such as timing.

Therefore, the regulator admits uncertainty so in the absence of knowledge, put conditions that will affect operating conditions.

KL Q: how do you establish a threshold for caribou movement in the zone with all the mines already there

RE A: sit down with stakeholders, what percentage of townships uncovered (density standard), address important areas

KL Q: when do we know enough that we will be stopping a project?

RE A: come up with best estimate. Perhaps when close to threshold, another proponent can come in if the others work together to reduce effects

SM – the overriding factor is that the communities don't believe a lot of the judgements coming out of assessments. People believe that the projects have always proceeded regardless. Most communities would chose the environment over jobs.

GH – what comes from this is a framework.

- VEDC specific
  - Public consultation and experts
  - Deal with anticipated development
  - Establish a standard by which all future developments are assessed, compared, including populations, science, thresholds to be assessed
  - Every assessment tested against
  - Difficult for the small player
  - Don't forget socio economic

PB – challenge VEC is specific to the region
GH – discussion gateway process

- pass through the gate for decision to be approved
- guideline info is VEC specific
- any jurisdiction can use it
- framework establishes the test
  - methodological
  - significance
  - these are things to be considered
- comes close to a prescriptive approach, therefore you must know what you must respond to, what you will be challenged on

SM – this is important for the smaller proponents
GH – for smaller proponents, a process threshold. I.e. at some point, jurisdictional authority will assist with info requirements
SM – provisions of standards are important for the consultants

BREAK

GH – game plan into the workshop

- the process is evolving
  - project team will take today's session into consideration

- goal is 1. Completion of presentation 2. Deliver rough draft report with background, some preamble
- critical question is whether or not there is intent to suggest a framework or an overview with suggestions/examples
- final draft before Christmas

GH – workshop themes – mutual benefit, cooperation
- workshop is the first in a number of events.
- Question: is this workable?
- CO Answer: yes PB A: yes

PB – we don't expect Axys to provide a framework, rather what a good one should be. This gives DOE a talking point to use. How and who depends on where.

GH – any recommendations not seem appropriate? If no, are we heading in the right direction?

CO – general is but don't hold him to it as he needs time to read it over. Concepts are consistent though.

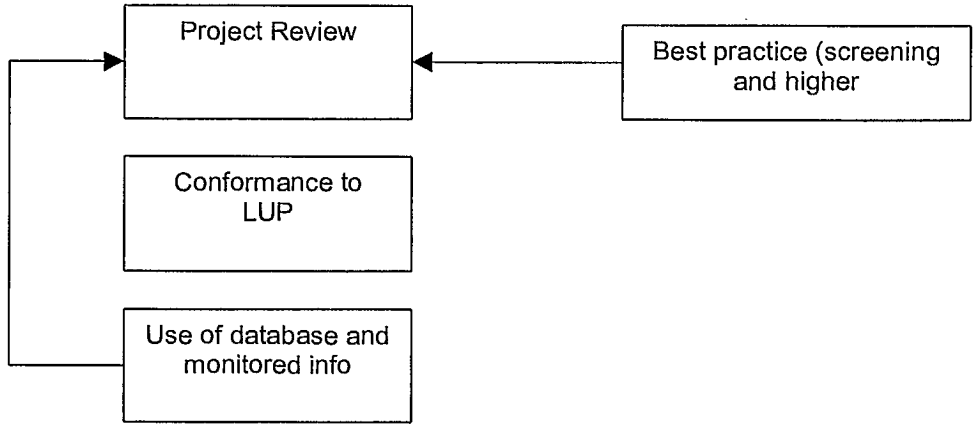
GH – In the RFP, considerable look at case studies was asked for. However, after looking at them, maybe not spend much more time after picking out some nuggets of wisdom, and then get on with "novel initiative" work. Other issues to include are transboundary effects
- any bases left?

KL – Passing reference to circumpolar initiatives such as Arctic Council, AMAP

BG – biodiversity convention
KL – Ramsar, CITES (Convention on International Trade in Endangered Species).

PB – CASA Clean Air Strategic Alliance model for setting thresholds

George's Diagram



Appendix D NEI and Project Overview

Presentation at Yellowknife CEAMF Workshop (7-9 December 1999) by Carey Ogilvie, Environment Canada

Cumulative Effects Management Framework Project
Northern Ecosystem Initiative

Carey Ogilvie
Environment Canada

Cumulative Effects Assessment and Management Workshop
Yellowknife
Wednesday, December 8, 1999

Northern Ecosystem Initiative

- Partnership based.
- Relates to health and sustainability of northern communities and ecosystems.
- Facilitate coordinated action on issues of common concern in the Canadian North.
- Sharing of objectives, responsibilities and resources amongst the partners.

Northern Ecosystem Initiative
Four Priority Areas

- Biodiversity
- Contaminants
- Climate Change
- Impacts of Developments
  - Cumulative Effects Management Framework Project

Status
Cumulative Effects Management Framework Project

Contract Work
AXYS and Associates

- Determining the State-of-the-Art -
- Advancing the Practice -

Work in Progress

Potential Pilot Programs

- Northern Labrador
- Southeast Yukon
- Southwest NWT
- Slave Geological Province (NWT-Nunavut)

Definition?

Regional approach to managing cumulative effects.

Involves:

- Working together on issues of common concern
- Applying adaptive management measures on a regional scale
- Combining resources

Possible Principles

- Generate information to support decision-making and project planning efforts
- Complement existing planning, assessment and regulatory processes, e.g. land claim bodies.
- Build upon current experience and knowledge
- Use "best practice"
- Inclusive

A Proactive Approach

Benefit to:

- Governments
- Regulatory Bodies
- Industry
- Communities and Public

Northern Ecosystem Initiative
Cumulative Effects Management Framework Project

Contribution to
NWT Cumulative Effects Assessment and
Management Framework

- State-of-the-Art Report.
- Potential Partnership-Based Funding Source.