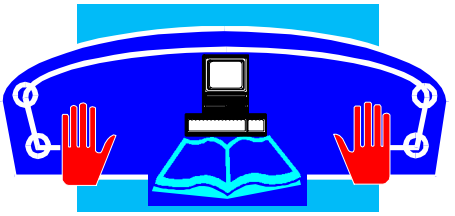

Planning And Managing Environmentally Significant Areas - Northwest Territories

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NORTHWEST TERRITORIES

Planning and Managing Environmentally Significant Areas

Planning and Managing Environmentally Significant Areas in the Northwest Territories

Planning and Managing Environmentally Significant Areas in the Northwest Territories: Issues and Alternatives

by
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Preface

As the current trustee of land and resources in northern Canada, the federal government recognizes that it must seek to balance promotion of economic development with protection of the environment and conservation of resources. In the last ten years, the federal government has provided generous financial incentives for development of non-renewable resources in the North but has not established a single new conservation area in the Northwest Territories or the Yukon Territory.

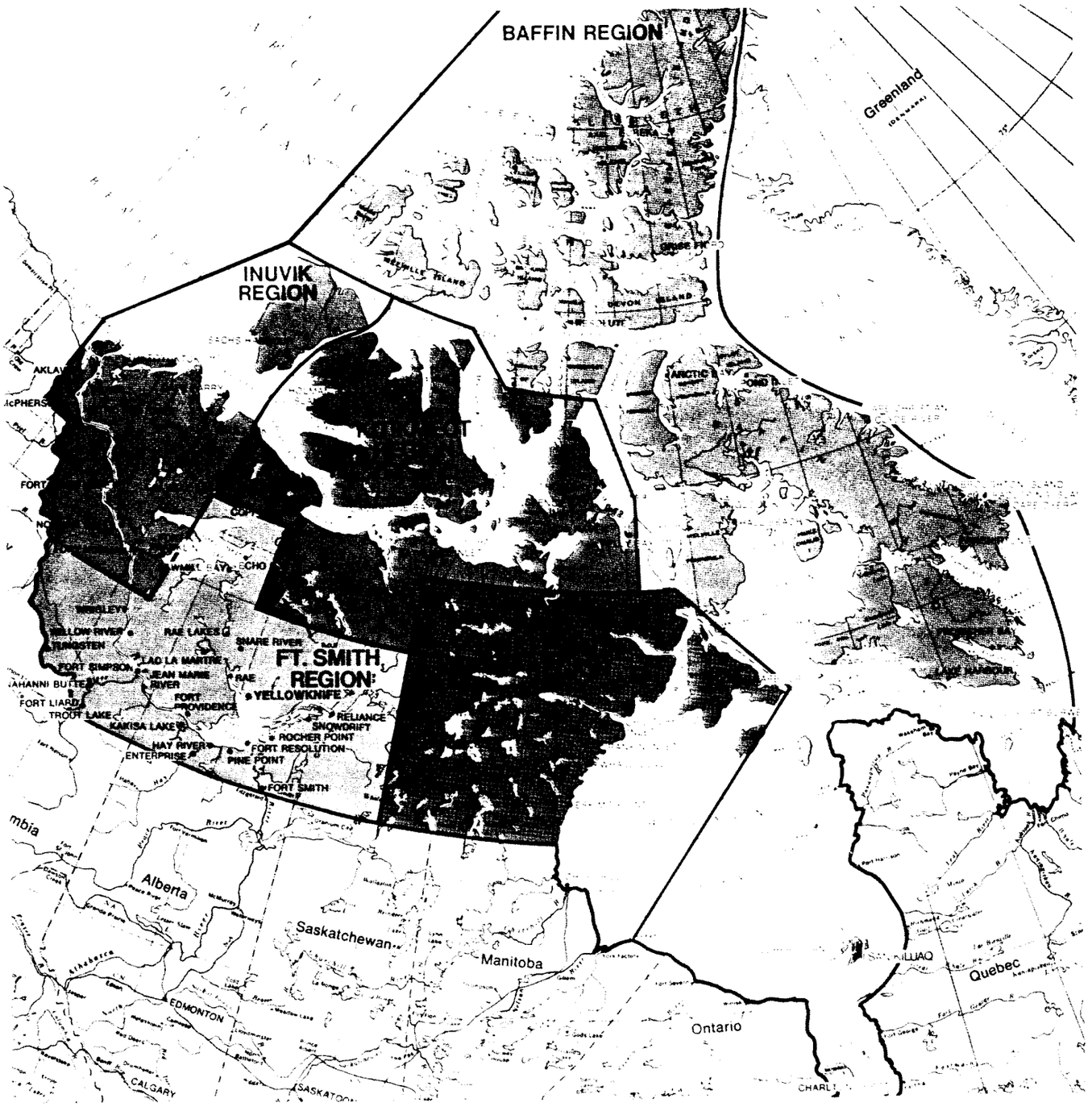
In northern Canada there are many areas important for wildlife, such as caribou calving grounds and wetlands where birds nest, rear young and stage migrations. Many other areas in the North are important for their flora, geological features, or other natural attributes. Nearly 150 of these environmentally significant areas (ESAS) were identified and mapped by scientists in the late 1960s and early 1970s through International Biological Programme (IBP). In 1982, the federal Department of the Environment identified 136 "special places" in the North worthy of conservation. Many of these sites should be established as national or territorial parks, national wildlife areas, or territorial wildlife preserves and sanctuaries.

The federal Department of Indian Affairs and Northern Development (DIAND) acknowledges that conservation of ESAS is part of its northern development strategy but has been unable to establish specific conservation areas in the North. In 1983, DIAND established a task force on northern conservation to advise the federal and territorial governments on how a northern conservation policy can be developed and implemented through land-use planning.

The research reported in this monograph was commissioned by the Canadian Arctic Resources Committee (CARC) to develop new ideas and methods for protecting ESAS in the North. These proposals are directed primarily to those who now are deciding how the balance between conservation and development in northern Canada will be achieved.

Dr. Terry Fenge
Director, Policy Studies
Canadian Arctic Resources Committee

The Northwest Territories Administrative Regions



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List of Abbreviations

CARC	Canadian Arctic Resources Committee
COGLA	Canada Oil and Gas Lands Administration
COPE	Committee for Original Peoples' Entitlement
Cws	Canadian Wildlife Service
DFO	Department of Fisheries and Oceans
DIAND	Department of Indian Affairs and Northern Development
DINA	Department of Indian and Northern Affairs (Name officially changed to DIAND in 1966)
DOE	Department of the Environment
EARP	Environmental Assessment and Review Process
ESA	Environmentally Significant Area
GNWT	Government of the Northwest Territories
IBP	International Biological Program
I NAC	Indian and Northern Affairs Canada (Applied, non-legal title for DIAND used in recent documents and publications)
I TC	Inuit Tapirisat of Canada
I UCN	International Union for the Conservation of Nature and Natural Resources
N.W. T.	Northwest Territories

Acknowledgements

It is impossible to thank individually all the people and groups who assisted with this study. The people who were interviewed and who served on the consultative committee were especially helpful and they are listed in Appendices A and B. The Canadian Arctic Resources Committee, which commissioned and supported this study under the direction of Terry Fenge, has been a very important stimulus and source of support throughout. Special thanks are also due to Don Gamble, who did so much to start this project. Other support was given by Dormer Canadian Foundation; the World Wildlife Fund; Parks Canada; Northern Environment Program of DIAND; Northern Studies Training Grants of DIAND; and the territorial government. Redmond Clarke, Everett Peterson, and Alan Vaughan especially were helpful with commentary and criticism. Linda Norton patiently and skilfully typed and prepared the manuscript. Bonnie Bender and Kevin O'Reilly helped with editing and Marko Dumancic provided computing technical assistance. The authors are grateful to all concerned for their support.

Executive Summary

1. This discussion paper focuses on the development of a method for planning and managing environmentally significant areas (ESAs) in the Northwest Territories (N.W.T.).

2. The principal concern in this discussion is how to match such areas with appropriate acts and agencies so that each ESA can be managed to protect its wildlife, its geology, its scenic beauty, or its unique character. The development of a co-ordinated system of national parks, national landmarks, water reserves, national wildlife areas, territorial parks, or other management types would include private as well as public lands to preserve the natural systems upon which we all depend.

3. A brief discussion of the current situation in the N.W.T. outlines the constraints on ESAS that include unsettled native land claims; evolving relations among federal and territorial governments and agencies; lack of comprehensive land-use planning and management; evolving territorial, regional, and local governments; and the uncertain economic, social, and political environment.

4. The competitiveness, complexity, and uncertainty that appears to characterize the planning and management of ESAS is likely to continue for years. Therefore it seems essential to develop a bridging institution or co-ordinating body that will be flexible enough to provide for ESAS now and also will be able to merge into different managerial and political systems at some time in the future.

5. From an assessment of the management character of existing agencies dealing with ESAS in the N.W.T. it seems that, although limited individually in various ways, most of them have the powers and means of developing ESAS if an effective bridging institution could bring together their strengths and capabilities.

6. After reviewing the proposed N.W.T. Fish and Wildlife Board, the existing N.W.T. Water Board, the proposed Nunavut Wildlife Management Board, the Illinois Nature Commission, and other co-ordinating bodies, three alternatives are proposed for consideration for application in the N.W.T.: (1) a Natural Heritage or ESA Board; (2) a Natural Heritage or ESA Advisory Commission; and (3) a Natural Heritage or ESA Advisory Council. Some essential characteristics of any bridging institution or co-ordinating body are also discussed.

7. The bridging institution could help to increase the range of techniques used in protecting and managing ESAS. From a discussion of the advantages and disadvantages of purchase and lease backs, conservation easements, and other techniques, it is noted that few of these have been used in the N.W.T., partly because of the ubiquity of federal land ownership. Ways of protecting ESAS while allowing for some appropriate land uses are considered briefly but, so far, few such means have been used in the territories.

8. A co-ordinating body also could assist by establishing the management objectives and management types for a system of ESAS in the Northwest Territories. Analyses of management objectives and management types, including national and territorial parks, are discussed.

9. The co-ordinating body also could play a role in matching the national parks, territorial parks, wildlife preserves, and other management types with proposed ESAS. A method of classifying candidate areas into groups appropriate for certain management types is being developed in a companion study by Theberge and Smith.

10. In order to balance use with protection, the bridging institution or co-ordinating body would also need a good method for the mapping and analysis of land use. A set of land-use maps showing roads, dams, or other structures, transport corridors or other functions, historic or cultural significance, and land-use conflict or natural constraints, as developed for studies of ESAS in the Yukon Territory, provides a useful example.

11. To match proposed ESAS with appropriate management, the bridging institution would require a means of analyzing the strengths and weaknesses of agencies, acts, and other policy tools. Suggestions for such analyses include the use of mandates, permitted and non-permitted uses, track records, and other criteria.

12. In conclusion, the importance of comprehensive land-use planning is emphasized in relation to the planning and management of ESAS. As a source of ideas for application in the N.W.T., the example of the Australian Great Barrier Reef Marine Park is cited as being worthy of careful consideration.

I Introduction

The problem of how to promote desirable changes in the land use, the economy, and the society of the North, while protecting both the traditional ways of life and the environment upon which they depend, has been with us for many decades. Indeed, in the last decade or so the federal government has been committed to a policy of balanced development in the North. However, many individuals and groups in government, industry, and northern and Canadian society generally are not satisfied with the progress made toward this elusive goal. On the international scene, concern is growing about the degree to which Canada is fulfilling its responsibilities for conservation of flora and fauna and other aspects of the northern environment.

Three general ways to provide for development while controlling its effects on existing land-use activities and environment are: first, general laws and regulations (for example, the northern land-use regulations); secondly, reserves or protected areas in which certain land and resource uses and their undesirable effects are prohibited or strictly controlled (for example, national parks or territorial wildlife sanctuaries); and thirdly, large-scale institutional changes (for example, the introduction of the Environmental Assessment and Review Process (EARP) in the 1970s) .

Ideally, the three methods should interact in a complementary, comprehensive, and effective manner to provide for both development and environmental protection as economic and technical growth and land-use change unfold over the years. Some Canadians feel that this has, indeed, been the case. Others feel that the effectiveness of the land- and water-use regulations have been unsatisfactory and that EARP and other new institutional arrangements require considerable improvement.

Of principal interest here is the second of the three methods outlined, namely that dealing with designated reserves and protected areas. Such designated areas are essential to the protection of wildlife, calving areas, wetlands, endangered flora and fauna, acquifers, archaeological sites, and other special places. Insufficient progress has been made in establishing such areas in the North in recent years. In this report, an analysis is undertaken of the obstacles and some means of overcoming them in the context of what are termed environmentally significant areas (ESAS).

The ultimate aim is to balance different land uses with the varying biophysical and cultural characteristics of special places through the design and application of a co-ordinated set of institutional arrangements. Strict management types, such as a national park, would be used where little human interference could be tolerated, for instance to preserve a representative example of a northern ecosystem. A national wildlife area could be established on contiguous lands where the major conservation goal might be the protection of certain wildlife species, and where, with appropriate safeguards in place, a wider array of land uses could be permitted. Territorial parks, or special provisions under the land-use regulations, could also be established on some adjoining ESAS in accordance with development objectives, land use, and environmental circumstances. Such an interwoven tapestry of different arrangements for land management thus would provide for appropriate use and protection of the ESAS upon which land use in large surrounding regions often depends.

This study was commissioned by the Canadian Arctic Resources Committee (CARC). Research began formally in May 1982, following an organizational workshop attended by members of CARC and interested members of the Faculty of Environmental Studies at the University of Waterloo. About four weeks were spent planning the research, after which a meeting was held in Yellowknife, N.W.T., with the study's Consultative Committee, whose membership is listed in Appendix A. In the following three months, interviews and office and library research were conducted, notably in Ottawa and Yellowknife. The people interviewed are listed in Appendix B.

A draft paper was prepared in the fall of 1982 and was submitted to CARC for circulation to members of the Consultative Committee for their comments early in 1983. It also was made available by CARC to some participants at a DIAND Conservation Workshop in Whitehorse in March 1983. A revised draft was made available to some participants at CARC's Third National Workshop on People, Resources, and the Environment North Of 60: in Yellowknife in June 1983. A

further revision was provided to CARC and was distributed to the Consultative Committee in July 1983. Only a few written comments have been received on the various drafts but the authors have benefited from numerous verbal comments and discussions.

II Purposes and Motivation

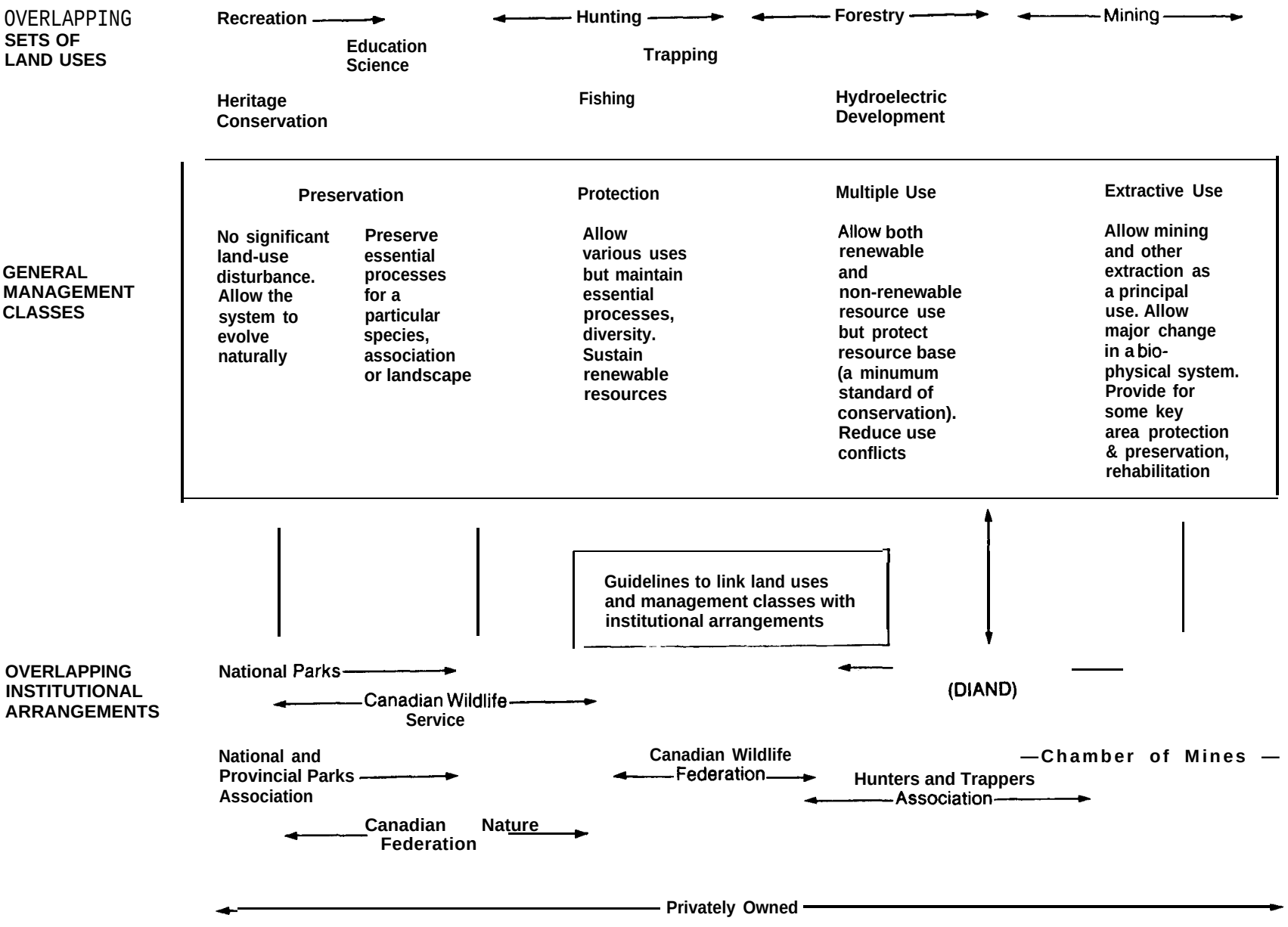
The authors were asked to analyse and to make recommendations upon institutional arrangements for planning and managing ESAS in the Northwest Territories. The emphasis was on the development of a method for planning and managing ESAS that could be applied by both government and private agencies. A companion study conducted by J.B. Theberge and Paul Smith has as its principal purposes: first, the identification of areas meriting ESA status; and secondly, the development of a classification or screening system that would group such areas into broad types, each of which could then be linked to different forms of management. Thus, wildlife areas, representative ecosystems, and hydrologic or geologic features definitive of ESAS could be managed appropriately through the development of a co-ordinated system of national parks, national landmarks, water reserves, national wildlife areas, territorial parks, game sanctuaries, or other institutional arrangements. These arrangements would involve appropriate management of private as well as public lands to preserve the natural systems upon which we all depend.

Basically this co-ordinated system would provide for management of the renewable and aesthetic resources of the Northwest Territories in accordance with the main goals of the World Conservation Strategy (Allen, 1980, pp. 12-15):

- the maintenance of essential ecological processes and life-support systems;
- the preservation of genetic diversity; and
- the use of species and ecosystems in such a way as to sustain them.

Such arrangements would provide for recreational, tourist, educational, scientific, and other uses as well as for environmental protection. The aim is balanced land use in the N.W.T. Figure 1 illustrates the relationships involved among specific land uses, broad land-use types, and

Figure 1
Balanced Land Use



various institutional arrangements. The broad land-use types are modified from Naysmith (1976) and include preservation, protection, and multiple and extractive use.

There are two broad schools of thought concerning ESAS in the Northwest Territories. On the one hand are those people who believe that such areas already are being managed reasonably well, or at least as well as current economic, social, and political circumstances permit. From this perspective, the gradual identification and establishment of national parks, territorial parks, wildlife areas, and other management types is all that can be expected, given the present competition for land use from mining, hydro-electricity, transport, defence, petroleum, and other uses in the N.W.T. People who hold this view emphasize that two national park reserves, Nahanni and Auyuittuq, were created in the Northwest Territories in 1972, and that Wood Buffalo National Park has existed since 1922 (Nelson et al., 1979). Also, a tentative agreement has been reached recently for a new national park on northern Ellesmere Island (Minister of the Environment and GNWT, 1982). Proposals for six other national parks and landmarks also are being considered (Parks Canada, 1982, p. 4).

Furthermore, the territorial government has created a number of small community and wayside parks. One hundred and twenty-two International Biological Program (IBP) sites (DIAND, 1982b, p. 101) have been identified and proposals for the land use of these areas are said to receive careful review under the land-use regulations (Revel, 1981). The first national wildlife area in the Northwest Territories is to be established at the Polar Bear Pass IBP site on Bathurst Island. Under the territorial land-use regulations administered by DIAND, caribou-calving and other special areas are being identified and given appropriate treatment as development proposals are screened (Cooper, 1981; Darby, 1978 and 1980). Floodplain and other zoning near communities also is being considered by local governments (Baker Lake, 1981).

On the other hand is a second group of people who believe that action on all types of ESAS is slow and that it is not in accordance with need. For example, the Polar Bear Pass National Wildlife Area is the first specific management proposal to result from a study of six IBP sites conducted by a joint federal-territorial committee since 1975 (Fenge, 1981). One hundred and sixteen other IBP sites have not yet received formal management review. Moreover, although large recreational and natural environment parks can be established, none have been created, despite territorial planning for them (see section III Table 1). This delay is

largely a result of the federal government's reluctance to designate land for such purposes, partly because of the desire to integrate such proposals into the new comprehensive land-use planning process currently underway (DIAND, 1982b), and partly because of the perceived need to settle native land claims before more land is set aside.

Another, as yet unsuccessful, example is the attempt to set aside national wilderness parks and other ESAS in land-claims-settlement agreements, notably the agreement in principle by the Committee for Original Peoples' Entitlement (COPE) for the northwest Arctic (COPE, 1978; Hunt et al., 1979; Keith and Wright, 1978). In this agreement the native people identified an area of 13 000 square km for a special type of conservation management, which would allow the control of mining, tourism, and other activities while attempting to retain wilderness qualities and to provide for native uses such as hunting and trapping. The area would be administered under a long-term joint agreement between government and native people.

It is the second group of people who feel that the northern land-management regime has been skewed too far toward the development of non-renewable resources side of the land-use spectrum (see Figure 1). They believe that this has had, and is likely to continue to have, an adverse effect on wildlife as well as on other renewable and aesthetic resources of the Northwest Territories, to the long-term detriment of hunting, fishing, recreation, tourism, education, research, conservation, and other uses. It is their beliefs that have led to this study.

HI Constraints on Improvement of Arrangements for Planning and Managing ESAS

Assuming that there is a need to improve upon existing arrangements for planning and managing ESAS in the Northwest Territories, the question becomes one of determining the means by which to accomplish this end. One of two approaches can be taken. The first involves some minor modifications to existing institutions, with the emphasis on building upon available personnel and resources. The second approach involves making major modifications to the existing system, and thus virtually creating a new set of institutional arrangements.

Existing arrangements for ESAS in the N.W.T. constitute a complex and poorly understood system of laws, policies, and regulations administered by various federal, territorial, regional, and local governments (Table 1). These arrangements also involve non-government agencies. Many of these arrangements were created relatively recently and have not been used extensively yet. Furthermore, there is potential to co-ordinate the various agencies and groups, thereby facilitating the planning and managing of ESAS (Gardner and Nelson, 1980 and 1981). For example, a federal-territorial park co-ordinating committee and a joint task force were created to determine the appropriate mechanism for managing the proposed northern Ellesmere Island national park (Minister of the Environment and GNWT, 1982) .

During interviews conducted with interested and informed individuals in Yellowknife and Ottawa, the consensus was that the institutional system for ESAS does not require major modifications to perform more efficiently and effectively. Some interviewees noted that although individual agencies and groups did not possess the full range of policies and procedures to achieve their goals, some did have complementary tools and powers. More therefore could be achieved, with greater economy, if a better system for co-ordination existed among them at the various levels of government. This matter is dealt with more fully in section IV.

Table 1

Existing Arrangements for ESAS in the Northwest Territories

Agency	Legislation	Regulations	Policies	Reserves/ Special Designations
Canada Department of the Environment				
Parks Canada	National Parks Act, 1930, amended 1974	National Park Game Regulations, 1965	Parks Canada Policy, 1979	National parks National historic parks
			National Parks Northern Strategy, 1982	Canadian landmarks National marine parks (proposed)
			Proposed National Marine Parks Policy, 1982	
			Agreements for Recreation and Conservation, 1972	Heritage canals Co-operative heritage areas Canadian heritage rivers
	Historic Sites and Monuments Act, 1953			Historic places
Canadian Wildlife Service	Canada Wildlife Act, 1973	Wildlife Area Regulations, 1977		National wildlife areas
	Migratory Birds Convention Act, 1917	Migratory Bird Sanctuary Regulations, 1974		Migratory bird sanctuaries

Table 1 cent'd.

Agency	Legislation	Regulations	Policies	Reserves/ Special Designations
Federal Environmental Assessment Review Office	Order in Council, 1973, 1977 (FEARO, 1979)		Environmental Assessment Review Process	
Inland Waters Directorate	Canada Water Act, 1970		Comprehensive Water Management Strategy	River basin study area (e.g., Mackenzie River)
Canada Department of Fisheries and Oceans	Fisheries Act, 1970, amended 1977	Northwest Territories Fishery Regulations, 1978	National Fish Habitat Management Policy, in preparation, 1982	Consideration being given to marine mammal sanctuaries and Beluga sanctuary
		Seal Protection Regulations, 1978		
		Walrus Protection Regulations, 1978		
		Narwhal Protection Regulations, 1978		
		Beluga Protection Regulations, 1978		

Table 1 cent'd.

Agency	Legislation	Regulations	Policies	Reserves/ Special Designations
Canada Department of Indian Affairs and Northern Development (DIAND)	Territorial Lands Act, 1950, amended 1975	Territorial Land Use Regulations, 1977	Northern Land Use Planning, 1982	Land withdrawal
			Conservation Policy and Strategy, 1982	Proposed ecological reserves
			Hydrocarbon Development Planning Strategy for Beaufort Sea, 1982	
			Policy of the Canadian Government for Northern Canada in the 1970s, 1972	
DIAND and Northwest Territories Water Board	Northern Inland Waters Act, 1970	Northern Inland Waters Regulations, 1972, amended 1975		Water management area
Northwest Territories Department of Economic Development and Tourism	Travel and Outdoor Recreation Ordinance, 1965	Guide Exemption Regulations, 1965 Travel and Development Area Regulations, 1965	Tourism Strategy for the N.W.T., 1982	Community-based tourism areas

Table 1 cent'd.

Agency	Legislation	Regulations	Policies	Reserves/ Special Designations
		Outfitters Regulations, 1968		
	Territorial Parks Ordinance, 1973	Territorial Parks Regulations, 1975	Territorial Parks and Outdoor Recreation Strategy for Development, in preparation, 1982 NWT Parks Promotion/Marketing Strategy, 1982	Community park Natural environment recreation park Outdoor recreation park Wayside park
Northwest Territories Department of Local Government	Commissioner's Lands Ordinance, 1974			
	Area Development Ordinance, 1956	Mackenzie Development Area Regulations, 1980		Development areas
	Planning Ordinance, 1974			Reserves for open space for parks, hazard areas, and other land uses
Northwest Territories Department of Renewable Resources	Wildlife Ordinance, 1978	Wildlife Reguiations, 1979		Wildlife management area Wildlife sanctuary Wildlife preserve Wildlife management area Critical wildlife area Special management area

Table 1 cent'd.

Agency	Legislation	Regulations	Policies	Reserves/ Special Designations
	Forest Protection Ordinance, 1956 Environmental Protection Ordinance, 1974			
Northwest Territories Energy and Resource Development Secretariat			Resource Development Policy, 1982	Development impact zones

Other interviewees identified a number of constraints that limit the effectiveness of the current system and that must be kept in mind when considering any changes (Dacks, 1981). These constraints include: 1. unsettled native land claims; 2. federal-territorial relations; 3. interagency relations; 4. lack of a comprehensive approach to land- and resource-use planning and management; 5. the evolving and uncertain nature of territorial government; 6. the evolving and uncertain nature of regional and municipal governments in the N.W.T.; and 7. an uncertain external economic, social, and political environment. Brief comments are made below on the individual and interactive effects of each of these constraints.

Unsettled nativeland claims

Although land-claims issues have been discussed for about ten years, their resolution remains uncertain. Even if native groups and the federal government reach formal agreements in the next few years, controversy over more-detailed aspects of the settlements will likely continue as has occurred, for example, with the James Bay agreement (Richardson, 1976). Various parties will continue to question and to object to the alienation of land for various purposes such as national parks and territorial parks. The federal government likely will continue to hesitate to designate land for large parks and reserves because of the prejudicial effect, not only on native land claims but also on mining and other industrial developments. On the other hand, mining and other projects will continue to be approved even though land claims are not settled.

Federal-territorial relations

The relative powers and roles of the federal and territorial governments in the Northwest Territories have been much-debated issues for more than 20 years, and have been the object of two separate inquiries, the first by Carrothers in 1966 and the second by Drury in 1980. Land

ownership and control in the territories illustrate the nature of the issues. The federal government owns more than 99 per cent of the land and is reluctant to surrender any land to the territorial government. Besides this monopoly over the disposition of land, the federal government also controls land use, with the territorial government having only a limited opportunity to influence decisions directly. As Drury (1979, p. 78) pointed out, the territorial government's efforts at planning are "severely constrained by the limited control it is able to exercise over the key variables of land availability and land use." On the other hand, the federal government's ability to plan and manage land comprehensively is limited by the lack of an agreed-upon system at the political and governmental level.

Interagency relations

At present, there is no comprehensive co-ordinated approach to the planning and management of parks, wildlife areas, or other management types either within, or between, the territorial or federal governments. At the federal level, there still appears to be relatively little management co-ordination between Parks Canada, which administers national parks, national landmarks, and other areas, and the Canadian Wildlife Service (CWS), which is responsible for national wildlife areas and migratory bird sanctuaries, even though both agencies are now in the Department of the Environment (DOE). Furthermore, the planning and management systems differ significantly among these and other agencies. Parks Canada has a formal, comprehensive planning procedure for the national parks programme, whereas CWS has a fragmented and informal one.

Lack of a comprehensive approach

It is only recently that land-use planning has been given a significant thrust by both the territorial and federal governments. At the territorial level, the Department of Renewable Resources and the Department of

Local Government have taken leading roles, mainly by assisting communities in the development of community plans (GNWT, 1982). Although the focus of the Department of Local Government is on lands within and surrounding communities, this includes a very broad area, beyond the settlement itself, designated as the "hinterland." An example is the Baker Lake Community Plan in which the hinterland is described thus:

> *Lands within this area are primarily intended to remain in their natural state, thereby encompassing such traditional activities as hunting, trapping, fishing and recreation. Uses that are necessary for the development of the community such as sewage lagoons, gravel extraction areas, garbage dumps and telecommunications facilities are permitted within this area but should be sited to minimize negative impacts by avoiding* streams, *ponds and significant wildlife habitat* (Baker Lake, 1981, p. 20).

Other GNWT agencies oriented to community planning include: a. the Department of Economic Development and Tourism through their community-based tourism programme (Department of Economic Development and Tourism, 1982, pp. 14-18); b. the Environmental Planning and Assessment Division in the Department of Renewable Resources; and c. the Energy and Resource Development Secretariat, which has as its main purpose the evaluation of the implications of resource development projects. The recently released Resource Development Policy indicates the intention to establish "Development Impact Zones" defined as

> . . .a *community, a group of communities or geographic area experiencing or expected to experience extraordinary impacts as a result of resource development* (Energy and Resource Development Secretariat, 1982, p. 2).

At the federal level, the principal instrument for land-use management has been the territorial land-use regulations, under which permits are issued for mineral exploration and similar activities (DIAND, 1981a and 1981b; Fenge et al., 1979, pp. 47-57). However, this process has tended to be reactive and project-oriented, with little consideration given to anticipatory or strategic planning (Usher, 1973; Beakhust and Usher, 1973; Beauchamp, 1976).

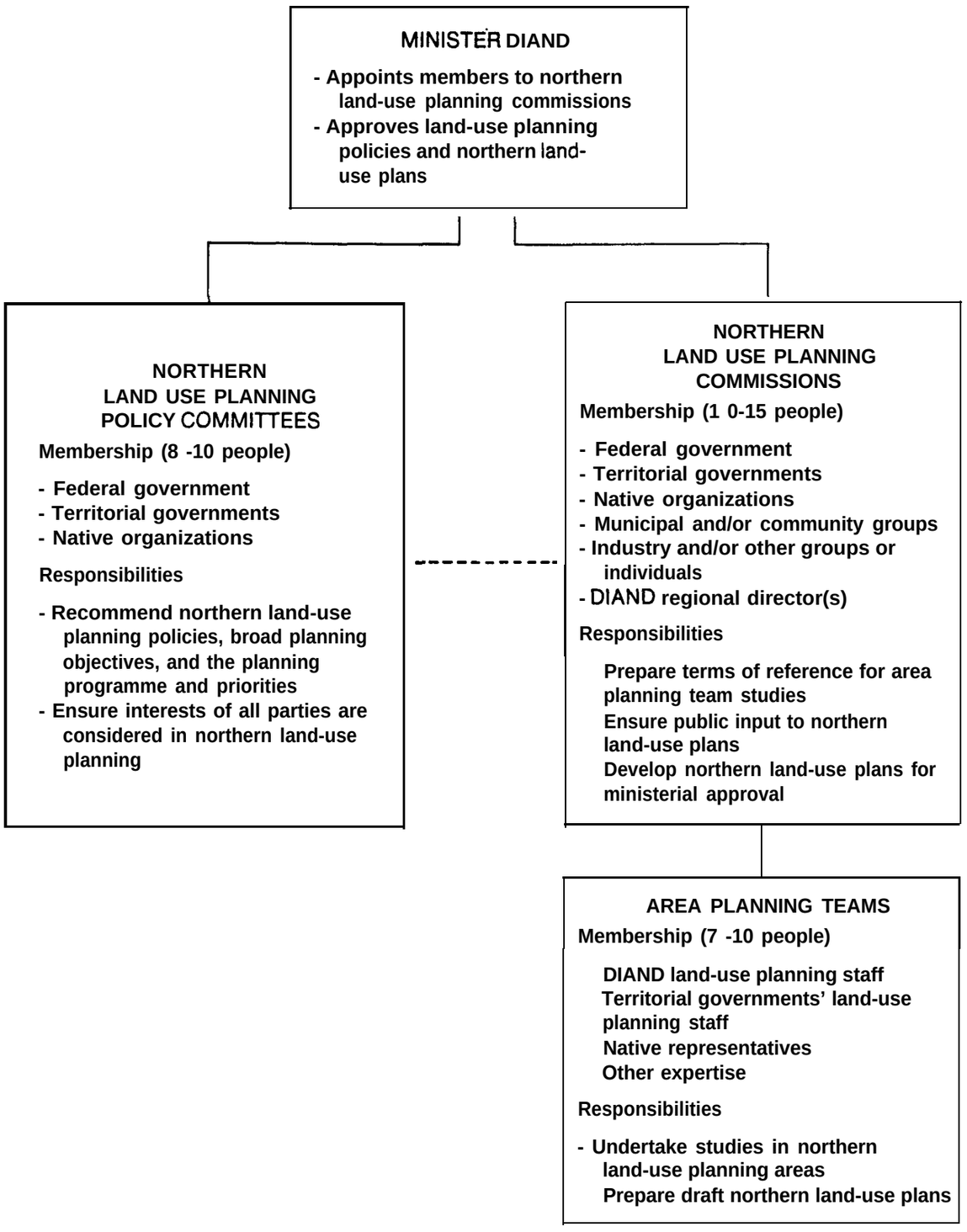
Recently, however, greater recognition of the need for a more anticipatory approach to strategic planning on a regional basis has emerged, notably through experiences such as the application for drilling approval in Lancaster Sound (Jacobs, 1981; DIAND, 1981c). These and other circumstances

have led DIAND to inaugurate broad initiatives in land-use planning and management (DIAND, 1981a; DIAND, 1982b; Richardson, 1982). The discussion paper approved by Cabinet in August 1981 and the draft implementation strategy released in October 1982 outlined three structures: 1. a Northern Land Use Policy Committee to be composed of senior bureaucrats from various federal and territorial departments; 2. Territorial Land Use Planning Commissions for each of the territories, to operate as "neutral planning bodies" (Fenge, 1982, p. 435); and 3. project Area Planning Review Panels or Teams (referred to as Area Planning Teams in the 1982 document) with members from federal and territorial agencies, native groups, industry, and other groups (Figure 2). The panels are to be responsible for preparing draft plans for the commissions.

The DIAND proposal for northern land-use planning has been evaluated in two reports by external consultants (Richardson, 1982; DPA Consulting, 1981) and has been reviewed by other groups and by the territorial government. The Government of the Northwest Territories has proposed a discussion on first principles before proceeding to detailed aspects, problems, and procedures. However, the available documentation provides limited information on the role that parks, wildlife reserves, and other ESAS will have in this proposed exercise in land-use planning, and thus presents a constraint in the context of this study.

As a further constraint, DIAND holds the position that, until this exercise is "complete," no land will be released for territorial parks and, presumably, for similar land types. It may, thus, be years before a planning process is accepted and many more years before it is complete, if this is indeed an attainable state. Planning is, after all, a dynamic exercise in which plans are adjusted regularly in the light of changing economic, technical, social, and other circumstances. If no progress is made on establishing ESAS until a planning strategy is in place, then many unwarranted changes in the renewable and aesthetic resources of the Northwest Territories could occur. This situation is of central concern and prompts the recommendation of a bridging mechanism in the form of a co-ordinating body such as a Natural Heritage Board, Commission, or Council (see section V).

Figure 2
Organization of Northern Land Use Planning Process



Source: After DIAND, 1982

Evolving territorial government

The role and influence of the Government of the Northwest Territories has evolved rather dramatically over the last 15 years. In 1951, the first territorial residents were elected to the Territorial Council, although it was not until 1975 that the council became fully elected (Dacks, 1981, p. 92). In 1979, a majority of native people were elected to the renamed Legislative Assembly, four of whom were given cabinet posts (Dacks, 1981, p. 100). Another important development in the past few years has been the acceptance by the commissioner of the Northwest Territories of decisions by the Assembly and Executive Committee on matters of government policy (Dacks, 1981, p. 93). For example, in 1982 a referendum resulted in a majority vote to divide the Northwest Territories into two areas: first, the portion south of the tree line including the Mackenzie Delta; and secondly, the remainder of the territories to the east, to be called Nunavut. The announcement by John Munro, Minister of Indian Affairs and Northern Development on 26 November 1982 indicated that the federal government will accept political division of the Northwest Territories, but only under conditions that appear to make "an early split of the vast Northern region impossible" (Sallot, 1982, p. 1). The conditions for division include: 1. the prior settlement of land claims; 2. northerners maintaining a broad consensus on the issue; and 3. reaching a consensus on the division of powers between territorial and regional or municipal administrations (Sallot, 1982, p. 1).

Besides these developments, there has been a recent commitment to local government; for example, in 1980 the Baffin Island Regional Council was created which has the power "to administer those government programs in the region delegated from time to time by the Executive Committee." It is uncertain which powers have already been delegated as they are not noted in the ordinance (Office of Tourism and Parks, 1980).

Also, more rigorous local programmed have been introduced by various of the GNWT departments. The Department of Local Government has co-operated with Baker Lake and other communities in the preparation of local plans

(Baker Lake, 1981), and the Parks and Tourism Branch of the Department of Economic Development and Tourism has produced plans and proposals for three territorial parks in consultation with local people.

These and other developments indicate the territorial government's desire for a greater role in land-use planning and management, as well as in related matters. Any proposals for the planning of territorial land use and ESAS should consider this stance and produce institutional arrangements adaptable to it.

Evolving regional and municipal governments

The evolution of a system of regional government in the Northwest Territories is a gradual process. The Keewatin and other areas are considering arrangements similar to those of the Baffin Island Regional Council. The COPE agreement in principle (COPE, 1978) included the concept of a Western Arctic Regional Municipality, which would link Aklavik, Tuktoyaktuk, and other nearby communities. The actual number of municipalities or regions that eventually will emerge, especially in the southern and western portions of the N.W.T., is not likely to be decided in the next few years. The eventual relationship of these regional councils with various other organizations and their "regions," for example, the Tourist Associations and the Hunters and Trappers Associations, presents a significant problem because the boundaries for these different regional entities do not coincide. DIAND's recent initiative in land-use planning seems to be adding yet another layer of boundaries. Its proposed land-use planning regions and units are said to be based on natural features (DIAND, 1982a, p. 53) and to be ". ..preferable to using any one of the administrative boundaries which have been developed for the North."

The proliferation of different administrative and management zones, by both the territorial and federal governments, led Drury to recommend that federal and territorial departments of government should try to rationalize their respective administrative and management zones (Drury, 1980, p. s6).

External economic, social, and political environment

The planning and managing of ESAS is characterized by competitiveness, complexity, and uncertainty. Various examples already have been mentioned. Economic uncertainty is reflected in the recent dramatic decline in expected oil prices, and the subsequent effects on various northern megaprojects, such as the Arctic Pilot Project. The consequent decline in federal revenues has negative implications for territorial funding and for environmental and other federal government programmed in the North.

IV Alternative Strategies and Mechanisms for Managing ESAS

Given the current constraints, it is unlikely that a coherent system of national parks, wildlife areas, territorial parks, wildlife sanctuaries, and other management types will be developed for some years. In the interim, various development projects either are proposed or are already underway; for example, the Norman Wells pipeline (Federal Environmental Assessment Panel, 1981) mining at Nanisivik, the hydro-electric project on the Slave River, and ports at Stokes Point and other locations on the Beaufort Sea. With no formal planning and management arrangements to mitigate and manage the effects, such projects will impinge on ESAS already identified in the territories.

It seems essential, therefore, that some bridging institutions be developed that will be flexible enough to provide for the immediate creation of ESAS and that also will be able to merge into a somewhat different managerial and political system as federal, territorial, regional, and corporate responsibilities take on a different character in the years ahead.

Before discussing changes that could be made, the nature of the existing institutional arrangements should be understood more fully. The available array of agencies and groups for planning and managing ESAS in the Northwest Territories varies considerably in character and capability. The management assessment model (Appendix C), already used in several other studies, represents a means of estimating the degree to which an agency possesses the mandate, planning, implementation, and other processes necessary for effective and comprehensive resource management (Nelson and Jessen, 1981).

Assessment of management character of agencies

The management character of three agencies with major responsibilities for ESAS in the Northwest Territories is listed below.

1. Parks Canada

a. Mandate
- National Parks Act, National Parks Policy (1979).

b. Planning

Strategic planning
- conservation and heritage protection goals and philosophy, providing for some recreation, tourism, education, and related uses;
- basic management concepts are preservation, protection, representativeness;
- achieve goals through systematic analysis, leading to identification of representative natural areas of Canadian significance, potential national parks, national park reserves and eventally national parks;
- prepare master plan for each national park, prepare site plans for more detailed developments;
- only one representative national park required in each natural area of Canadian significance.

Forecasting
- undertake recreation and other demand studies.

Inventory
- undertake detailed biophysical inventories; place less stress on social inventories.

Classification* use various biophysical classification

systems.

Especially significant areas	.responsible for various heritage or land types in accordance with objectives; national historic sites, historic parks, heritage canals, and waterways with proposals for national landmarks, wild and scenic rivers, and marine parks;
	• use special preservation, wilderness, natural-environment, recreation, and intensive-area zoning to reduce conflict and relate use to environmental constraints.
Evaluation	.economic and environmental impact assessments are used; agency is subject to EARP; less use of social and technology assessment; have supported reviews of policy and practice by universities and other agencies.
Design	• use landscape architects and planners to facilitate landscape designs;
	.use research, policy review, and other means to improve institutional design.

c. Implementation

Approval	.complex approval process involving public and other agency review of park purposes, alternate plan concepts, and management plan; new parks require parliamentary approval.
Construction and development	.some surveillance and inspection by conservation staff;
	.some monitoring of wildlife and related changes by conservation officers, or via contract with CWS or others;
	.enforcement by various legal, educational, and financial means; fines tend to be low;
	.plans and projects can be modified by park superintendent and others, management plans and zoning are not legally based.

d. General guides

Research	• undertake a wide range of in-house, consultant, and university research, much of which is used in management.
Co-ordination	• no known comprehensive system at federal government, federal-territorial, or co-ordinating level although various committees (e.g. the northern Ellesmere Island national park proposal); 1979 policy states a willingness to co-operate in national heritage areas; • informal with industry; • comprehensive public participation procedure for policies, new parks; • some inter-group co-ordination through park advisory committees, indirectly through Canadian Environmental Advisory Council of DOE; possibilities limited to some degree by Parks Canada requirement to own all land in parks, although this may be relaxed for national landmarks, wild and scenic rivers, and heritage waterways.
Economic incentives	• relatively large budget and professional staff; can provide funding for park-related proposals through Agreements for Recreation and Conservation and other avenues.
Information access	• provide a wide range of general and planning information as part of public participation; uneven practice in regard to policy; more stress on interpretation programmed desirable.
Management process monitoring and review	• five-year-interval reviews by corporate planning group in DOE.

In summary, Parks Canada has been the premier agency in identifying, planning for, and managing large national parks in the North. A major limitation in Parks Canada's role is its commitment to provide only enough national parks to represent each of the natural regions. On the other hand, Parks Canada's increasingly co-operative role with native groups and other agencies in creating national parks could

provide a major impetus to progress, especially if this co-operation were extended to national landmarks, wild and scenic rivers, marine parks, and other heritage areas, which might continue to be owned in whole, or in part, by private groups or by other governments.

2. Canadian Wildlife Service

a. Mandate

- 1917 Migratory Birds Convention Act.
- 1973 Canada Wildlife Act.

b. Planning

Strategic planning

- philosophy and goals are protection of wildlife for its own sake and as part of the human ecology and heritage;
- management concepts are conservation, protection of species, and habitat, interpretation and education; conservation is utilitarian, with uses permitted which do not endanger wildlife;
- no systematic planning or management framework, although guidelines are being developed with other agencies;
- generally no formal area-management plans, although this policy seems to be changing.

Forecasting

- no known user or other forecast for the North.

Inventory

- conducts wildlife counts and inventories for own use and for other agencies such as Parks Canada.

Classification*

- no known systematic habitat classification for the North.

Especially significant areas

- two reserve types: national wildlife areas and migratory bird sanctuaries; no known formal zoning systems in either case, more comprehensive species protection and habitat control in national wildlife areas than migratory bird sanctuaries; mining and other land uses controlled by regulation and permit.

Evaluation

- no known formal agency economic or

		social assessments; participates in environmental impact assessments and subject to EARP; few known policy or procedural reviews.
	Design	.designs wetland or other habitat modifications for migratory birds in South; not known to use public participation, policy papers, or other means to review institutional arrangements, although currently co-operating in interagency study of guidelines for wildlife policy in Canada.
c.	Implementation	
	Approval	• no known formal system for approving new reserve proposals, reserve boundaries, or comparable arrangements; use of regulation and of permits for development proposals in North.
	Construction and development	.limited surveillance and inspection by small number of professional personnel;
		.monitoring by various surveys (e.g., caribou populations), but limited by available personnel and budget;
		.enforcement by various legal, financial, and other guides, but fines limited; work in co-operation with territorial officials;
		.modification readily undertaken for a reserve through regulations and order in council; no parliamentary approval necessary for new reserves or boundary changes;
		.no known formal interagency advisory groups or other means for the North;
		.opportunities for co-ordination much widened by flexible ownership arrangements; land can be owned by CWS or controlled through other agreement with another government agency, private group, or individual.

d. General guides

Research	• a major role in own reserves and/or a service to other agencies; need exceeds staff and funding.
Co-ordination	.frequent co-operation by government with other agencies as funds permit; .no known formal mechanism with industry; .no known formal public participation procedures in North; .no known formal means for intergroup co-ordination.
Economic incentives	.limited by relatively small budget and staff; no known formal assistance programmed for the North.
Information access	.uneven generally, tend to be opportunistic in acquiring lands; now committed to new DOE public-participation policy.
Management process monitoring and review	.five-year-interval reviews by corporate planning in DOE.

In summary, the Canadian Wildlife Service has not been very successful in securing land for national wildlife areas in the Northwest Territories, although it is responsible for managing 16 migratory bird sanctuaries there. The major strengths of CWS are research, wildlife surveys, monitoring, and related activities. Other CWS attributes are long commitment to species protection and to work with international organizations such as Man and the Biosphere (Francis, 1982).

3. Tourism and Parks Division, GNWT

a. Mandate

“ 1973 Territorial Parks Ordinance;

.*1965* Travel and Outdoor Recreation Ordinance.

b. Planning

Strategic planning

“ goal is to promote parks and tourism development; philosophy is to plan and

		manage from a community base, a recreation and tourism rather than a conservation viewpoint;
		.management concept is sustained use of resources to ensure social and economic benefits for northern residents;
		.means of achieving goals include developing policy papers (e.g., a Territorial Parks and Outdoor Recreation Strategy for Development), and preparation of park management plans in co-operation with communities.
	Forecasting	.studies of tourist demand and park and facility requirements.
	Inventory	.undertake biophysical and social inventories as part of community planning orientation.
	Classification*	little formal attention as yet, since there are no large territorial parks.
	Especially significant areas	• community park, natural environment recreation park, outdoor recreation park, wayside park;
		• no specific provision for zoning in the park ordinance, although might be done through a provision allowing the making of regulations for controlling the use and development of resources in a territorial park.
	Evaluation	.undertake marketing and economic evaluations; no known environmental or social assessment.
	Design	.no data.
c.	Implementation	
	Approval	.through a Territorial Parks Committee which advises the N.W.T. Legislative Assembly and commissioner; consultation required with “representatives of persons residing in or near the location of a proposed park who may be affected by establishment of the parks.”
	Construction and	.little surveillance and inspection due to limited funding

development	and personnel; few parks created; •no reference to monitoring in ordinance, insufficient precedent to comment; •few parks established, low staff and budget, but provision for fines and penalties are in ordinance; •no data on modification.

d. General guides

Research	•some in-house and consulting research, some in association with community-based planning. •some government co-operation through Federal-Territorial Parks Committee, Northern Ellesmere Island National Park Committee, and other means; •no known formal means with industry; •required to consult the public in various ways under ordinance; have worked closely with committees on planning (e.g., Pangnirtung, Baffin Island, Territorial Parks Committee); •some inter-group co-operation for Northern Ellesmere; contemplating flexible land-tenure arrangements.
Economic incentives	•limited agency funding, can work with Parks Canada through Agreements for Recreation and Conservation, and with Parks Canada and other agencies through federal-provincial agreements.
Information access	•specifications for consultation and participation in ordinance; much information provided in context of community-based philosophy.
Management process monitoring	•no known means.

In summary, the Tourism and Parks Division of GNWT is a relatively new-agency whose role has been limited by the unwillingness of DIAND and the federal government to release land for larger territorial parks of the natural-environment

or recreational type. Its strengths include an orientation to parks as both a tourist and a land-management device, and a strong link to people through community-based planning and management.

Other agencies

Although a number of other agencies play important roles in planning and managing ESAS in the N.W.T., it has not been possible to analyse them in detail for this paper. A key agency is the territorial Department of Renewable Resources, which is responsible for wildlife sanctuaries, wildlife preserves, and critical habitats. DIAND's Northern Affairs Program can create water reserves under the Northern Inland Waters Act, although this power has been neglected to date. Areas can also be zoned as ESAS under the N.W.T. Area Development Ordinance. DIAND also can designate an area for special treatment under the land-use regulations of the Territorial Lands Act. Such an informal designation apparently has been applied to all IBP sites as well as to caribou calving and other critical areas in association with the new caribou management boards. However, maps and other details on such designations have not been made public. A positive sign of change is the publication of the 1983 Caribou Protection Measures and protection areas in a recent issue of the *Caribou News* (Beverly and Kaminuriak Caribou Management Board, 1983).

One major difficulty in drawing conclusions about all these institutional arrangements for planning and managing ESAS in the Northwest Territories is that few detailed assessments of their effectiveness have been undertaken by any group. Thus an understanding of their effectiveness is limited. The exception has been CARC, which has promoted assessments of the land-use regulations (Beakhust and Usher, 1973; Beauchamp, 1976) and the Northern Inland Waters Act (MacLeod, 1977). These assessments and general observations indicate that the arrangements work not only unevenly but also imperfectly. However, awareness of the importance of monitoring policies and procedures is growing. Yearly reports are now published by the Wildlife Service of the GNWT on the effectiveness of measures for protection of caribou calving areas under the land-use regulations (Darby, 1978 and 1980; Cooper, 1981; Clement, 1982). More monitoring and assessment of various arrangements for land planning and management would be valuable to managers, politicians, and citizens.

The shortcomings in available information limit the conclusions that can be drawn at this stage, although it is clear that no single agency has a fully developed capability to plan and to manage ESAS. However, together the agencies provide the basis for more comprehensive and effective

planning and management. The major task is to find the appropriate co-ordinating mechanisms.

Review of existing and proposed co-ordinating bodies

One mechanism that would link the agencies and promote interest-based planning in the sense advocated by Fenge (1982), is a co-ordinating body of some type. Such a body could have a membership representative of the major interest groups, together with a small support staff and budget. It would be in a position to draw upon the resources of agencies for information, research, and other assistance.

Also, such a co-ordinating body could be established to be adaptable to the uncertain institutional, social, and political environment in the Northwest Territories, and with the understanding that a major review of its operations would occur in five years. At that time, or earlier, it could be merged into a Land Use Commission or other agency, should circumstances make this desirable. Thus, the co-ordinating body would serve as a bridging institution until some of the social and political circumstances become clear, or it could function indefinitely.

Further study is required to define more precisely the role and powers of any co-ordinating body. It is not yet clear whether it should be primarily a planning, resource-sharing, and information-exchange agency, or whether it should be involved also in permit review, funding, and other aspects of management.

To assist in defining the attributes of a co-ordinating body, the characteristics of a number of agencies, both those already operating and those proposed for the Northwest Territories, Canada, or other areas, are listed in Table 2. In reviewing these bodies the focus was on the following questions:

1. From where does the agency derive its mandate? Is it based on legislation, a cabinet decision, an interagency agreement, a policy statement, or some other document?

2. What types of power does it exercise? Does it make independent decisions or write regulations, or are its decisions subject to the approval of another authority, for example, a minister? Does it serve in an advisory

Table 2

Comparison of Boards, Commissions, and Other Advisory Bodies

Agency	Mandate	Power	Responsibilities	Ultimate Authority	Funding	Support/Staff Secretariat	Members	Reference
Mississippi Wildlife Heritage Commiasion	Miss. Natural Heritage Act, 1978	Enter into agreement. Acquire property. Decide on management agency	Register of natural areas. Select areas for placement on register or for dedication. Designate management agency for specific areas. Acquire nature preserves. Provide for annual inspection of each natural araa preserve	Governor and state legislature	Wildlife Heritage money from legislature &donations for purpose of acquiring lands	May hira consultant when necessary. Assistance from Game & Fish Comm. members	9 part-time members incl. 3 senators, 3 representativea and 3 Game& Fish Comm. members	Hoose, 1961, 166-69 Mississippi Natural Heritage Act, 1978
Illinois Nature Reserves Commission	Illinois Nature Preserves System Act, 1963	Accept & administer gifts. Acquire land	Compile & maintain inventories & registers of nature preserves. Approve dedication of nature preserves. Prepare/guide preparation of master plans. Conduct investigations & disseminate information. Adopt policies for nature preserve system	Govarnor & state legislature	Not indicated in Act	Advisora from other state dept. when Commission deems necessary	Appointed by Governor on advice of Chief, Natural History Survey & Director, State Museum. Muat have demonstrated interest in preservation of natural areas, part-time members	Illinois Nature Preserves System Act, 1963
Nunavut Wildlife Board	Agreement between ITC & Cdn. government	Advise minister who can accept or reject (for 3 reasons only) but not alter	Establish wildlife reserves, establish wildlife protection program	Minister (presumably DIAND?). If disagreement between boards, minister, then federal Cabinet decides	Through federal and territorial government	Dependent on government department	9 part-time members (2 civil servants) 4 Inuit org. rep. and 2 residents)	Inuit Tapirisat of Canada, 1982

Table 2 cent'd.

Agency	Mandate	Power	Responsibilities	Ultimate Authority	Funding	Support/Staff Secretariat	Members	Reference
Former N.W.T. Game Adv. Council		Advisory to N.W.T. Commissioner	Make recommendations on wildlife management legislation, policies & programmed	N.W.T. Commissioner	No independent funding. Expanses covered by N.W.T. Wildlife Service	No separate staff services provided by N.W.T. Wildlife Service	About 9 part-time: 7 nominated by regional native associations appointed by & 2 appointad from outfitters and naturalists	Monaghan, 1980
Proposed Ecological Reserves Advisory Group	By decision of DIAND civil servants, Northern Affairs	Advisory to DIAND civil servants, Northern Affairs	Screen proposals for ecological reserves. Recommend appropriate action to DIAND	DIAND civil servants in Northern Affairs	Not likely to be independent funding	Not likely to have separate staff or a secretariat	Civil servants and some public representatives	DIAND, 1982b Draft discussion papar on Conservation Policy
N.W.T. Water Board	Northern Inland Waters Act	Relatively independent. Report directly to Minister of DIAND who can accept or reject but not alter board's decision	Provide for conservation, development & utilization of water resources. Issues lie with conditions. Hold public hearinga regarding any matter related to its objects. Maintain water use register	Minister of DIAND. Appeals to Supreme Court	Through DIAND. Controlled by bureaucracy	Minimal (2 office staff) dependent on gov't. dept's. and Technical Committee	9 part-time members represent wide ranga of interests, expertise and areas, appointed by N.W.T. and DIAND	Northern Inland Watera Act. Interviews MacLeod. 1977
Proposed N.W.T. Fish and Wildlife Board	New N.W.T. Ordinance Amendments to N.W.T. Wildlife Ordinance	Make regulations. Advise Minister of Renewable Resources who can accept or reject but not alter decisions	Make regulation for preservation and restoration of habitat. Hold public hearings twice yearly. Establish local and regional committees. Formulate all wildlife-related regulations	Minister of Renewable Resources N.W.T.	Directly from N.W.T. Legislative Assembly	To be determined by board. 4-paraorr secretariat proposed, including Executive and Assistant Director, secretary& Clark	7 part-time mambera appointed by Comm. of N.W.T. on advice of Minister of Renewable Resources, wide range of interests and experience	Kelsall and Kelsall, 1981a

Table 2 cent'd.

Agency	Mandate	Power	Responsibilities	Ultimate Authority	Funding	Support/Staff Secretariat	Members	Reference
Beverly and Kaminuriak Caribou Management Board	Intergovernmental between DOE, DFO, N. W.T., Manitoba & Sask.	Advisory to parties to the agreemant	Develop and evaluate herd management plan, collect data on state of herda & habitat, receive public input. Establish communication channels	Parties to the agreement	Max, of $75,000/ yr. split equally among parties to the agreement	Provided for in agreement, but siza not specified	13 part-time members, civil servanta and local residents	Agreement (Canada at al. 1982)
Australian Heritage Commission	Australian Heritage Commission Act, 1975	Advisory only to Minister. Can enter into agreement with private land owners. May accept gifts of money & property	Systematize information on national estate. Prepare register of places in national estate. Arrange for administration &control of places in national estate that are given to Commission. Advise on expenditures for conservation of national estata	Federal government minister	Appropriated by Parliament	Assistance from government dept. as required. May have consultants	12-19 members with a maximum of 6 from government dept., remainder not to be government employees	Australian Heritage Commission Act, 1975

capacity only? If so, does it report to Parliament, the Cabinet, a minister, or civil servants?

3. What specific responsibilities does it have? Possibilities include co-ordination of information for ESAS , formulation of wildlife management policies, acquisition of reserves, assigning management responsibility for ESAS, or holding public hearings.

4. Who is the ultimate authority for the agency?

5. Does the agency have special or independent funding? What are the sources of the funding? Who controls the purse strings?

6. Are there provisions for a separate secretariat or support staff? If so, how many people are involved and what types of operational, research, or other services do they provide? If not, how are these services provided?

7. Who are the members? How are thev chosen? Are thev full-time or part-time? What are-their backgrounds;

NorthwestTerritories WaterBoard

The Water Board derives its powers from the Northern Inland Waters Act (NIWA). The nine members of the board are appointed by, and report directly to, the minister of Indian Affairs and Northern Development. The federal departments of the Environment, Indian Affairs and Northern Development, and Health and Welfare each nominate members to the board. Three members are nominated by the territorial council and three are chosen directly by the minister. The Water Board meets at least once per month and has broad powers to hold public hearings on any topic "relating to its objectives" anywhere in Canada, if it is in the public interest to do so (NIWA S.15 (i)). Indeed, the potential of the board to become a major planning and management agency is said by some observers to be unfulfilled. Specifically, the board's current main role is the issuance of water licences for water use and for wastewater disposal, to which it may attach "any conditions that it considers appropriate" (s.10(2)). These licences must be approved by the minister, who may refuse to sign a licence but cannot change the conditions. Any appeals are made to the Supreme Court of Canada.

To assist with technical aspects, the Water Board has established the Technical Advisory Committee, which consists mainly of representatives of the federal and the territorial governments, although there are a few nongovernment people.

Reportedly, the Water Board is perceived by the people of the Northwest Territories as being fair and independent of the government, a perception that the board encourages. Great effort is expended in preparing for public meetings to ensure that all interested citizens have, and make use of, the opportunity to voice their concerns.

With its budget controlled by DIAND, the Water Board is heavily reliant on DIAND support staff, itself having only two support personnel, the executive secretary and an office secretary. The members of the board are part-time only and are said to receive low remuneration for their work, although members have remarked that the board easily could require a full-time commitment.

There is a significant discrepancy between the Water Board's regional perspective and the requirement that it must report to DIAND in Ottawa, which does not have the same perspective. Many have noted this problem, including Drury, who remarked that the present system ". . does not permit reconciliation of territorial differences through territorial institutions" (Drury, 1979, p. 79).

A final problem with the current operation is the need for more enforcement and monitoring by the Water Board of its decisions. Instead, these tasks are undertaken by DIAND staff (MacLeod, 1977). Certainly the board's lack of an independent secretariat hinders its ability to undertake these tasks.

Proposed Northwest Territories Fish and Wildlife Board

The Government of the Northwest Territories commissioned a study recently to review the Alaska Fish and Wildlife Boards and to recommend a Fish and Wildlife Board fOr the N.W.T. (Kelsall and Kelsall, 1981a and 1981b). The board proposed for the N.W.T. involves a three-tier structure based closely on the Alaskan system: first, a central board with seven members would be appointed by the commissioner of the Northwest Territories, on the advice of the minister of Renewable Resources, with the members representing a wide spectrum of user interests, experience, and geographic regions; secondly, six regional councils each

would consist of one chairperson and Up to four non-voting federal and territorial government representatives; and thirdly, local committees would be set up for each community with a population of an appropriate size.

The Fish and Wildlife Board would be responsible for making regulations which the minister of Renewable Resources could then either accept or reject, but not change. The board would be created through a territorial ordinance and would be funded by the Legislative Assembly. All board meetings would be public, and any board decision could be appealed. The board would have the power to make regulations, under the Wildlife Ordinance, relating to such matters as the preservation, maintenance, and restoration of habitat, restrict the hunting of wildlife during prescribed times or in prescribed areas, and control or prohibit the use of vehicles or other means of transport.

One of the board's duties would be to "hold public hearings to receive information and promulgate regulations for the conservation and development of wildlife resources. . . " (Kelsall and Kelsall, 1981a, p. 30).

It is interesting that the Alaska Fish and Game Boards possess some additional powers that were not recommended for the Northwest Territories, no doubt partly because of current federal dominance over such matters. The Alaska Boards, for example, may set aside game and fish reserves, refuges, and sanctuaries, both in the water and on the land, subject to the approval of the legislature. Moreover, they may engage in biological research, habitat improvement, and the management and improvement of game and fish. They also may enter into co-operative agreements with educational and government organizations.

A number of advantages and disadvantages of the Alaskan system were identified by Kelsall and Kelsall (1981b, pp. 11-15). Some of the major advantages included high public involvement and political independence of the boards. However, it is an expensive and unwieldly system and requires an increased bureaucracy to handle the heavy work load. It is also quite demanding of citizen time.

Former Northwest Territories Game Advisory Council

The proposed Fish and Wildlife Board is being considered as a replacement for the Game Advisory Council, which was created in 1977 and disbanded in 1980-1981. The success of the council has been a major impetus behind the study of the Alaskan system and the new proposal for the Northwest Territories.

The main responsibility of the council was to advise the commissioner and federal minister on all legislation, policies, and programmed respecting wildlife management. One of its first major tasks was to review and to rewrite the Wildlife Ordinance for the Northwest Territories. It also reviewed and approved the goals, objectives, and policies of the territorial Wildlife Service (Monaghan, 1980, p. 195).

Members of the Game Advisory Council were appointed by the commissioner of the Northwest Territories as follows: two members representing each of the interests of big-game outfitters, resident sportsmen, and nonconsumptive interests; and representatives from the native associations, of whom two were nominated from the Indian Brotherhood (now Dene Nation), two from the Métis Association, one from COPE, and three from the Inuit Tapirisat of Canada (ITC).

Although the Game Advisory Council was considered to be a success and to be very influential at both the territorial and federal levels, it suffered a serious weakness. Some members appointed on the recommendation of certain native associations were unable to maintain the support of those associations. To avoid a similar situation in future, Monaghan (1980, p. 195) suggested that nominations should be through regional coalitions of local Hunters and Trappers Associations because they are less highly politicized.

Beverly and Kaminuriak Caribou Management Board

Established in June 1982 by agreement between the Governments of Canada, Manitoba, Saskatchewan, and the Northwest Territories, the Beverly and Kaminuriak Caribou Management Board has 13 members, including one representative each from the federal departments of Indian Affairs and Northern Development and the Environment, the Ministry of Northern Saskatchewan, the Manitoba Ministry of Natural Resources, and the GNWT Department of Renewable Resources. Local residents are also to be appointed from the Keewatin Wildlife Federation, the Dene Nation and Métis Association in the N.W.T., and from Saskatchewan and Manitoba. The board plays essentially an advisory role to the parties to the agreement and is not empowered to promulgate regulations. Its duties relate mainly to developing a herd-management plan, collecting information on the state of herds and their habitat, and providing a contact point for the public on matters relating to caribou (Canada et al., 1982). It also provides feedback on the success of the management plan through annual assessments.

Although a secretariat is provided for in the agreement Canada et al., 1982), as well as an independent research review capability, the $75 000 maximum allocated on an annual basis to the board for administrative costs is not large.

Proposed Nunavut Wildlife Management Board

Although many of the details on the proposed Nunavut Wildlife Management Board remain confidential, a recent report of the Inuit Tapirisat of Canada *(1982,* pp. *8-9)* has highlighted some of its main features. Its responsibilities for all activities related to wildlife management in Nunavut would include the power to establish sanctuaries and conservation areas; to establish and to operate management zones; and to establish and to operate projects and programmed aimed at the protection of wildlife. The nine appointed members of the board would represent four Inuit organizations, the Canadian Wildlife Service, and the federal Department of Fisheries and Oceans. In addition two

Nunavut residents would be appointed, one by the minister of Indian Affairs and Northern Development and the other by the Nunavut government.

Although board decisions would need to be approved by the "appropriate minister," strict limitations will be placed on the minister's discretion. The minister will be able to disallow decisions, but will have to do so for one of three specific reasons outlined in the wildlife agreement in principle and will have to give written reasons within 30 days. Should the board and minister not agree, the decision would then go to the Cabinet. The wildlife agreement also contains provisions for a co-ordinated research programme, which, on board recommendations, would be carried out by the appropriate government agency.

Proposed Ecological ReservesAdvisory Group

The draft conservation policy paper, released recently by DIAND, recommends the establishment of an Ecological Reserves Advisory Group that would be responsible for ". . ..screening proposals for ecological reserves and for recommending appropriate action to the department. . ." (DIAND, 1982a, p. 74). This group appears to be envisioned as an interdepartmental one with some provision for public representatives, for example ". . . individuals active in ecological research and with extensive knowledge of the northern environment and ecological reserves program. .." (DIAND, 1982a, p. 75).

As this group is described only briefly in the discussion paper, little more can be said about it, except that it appears to consist primarily of government officials who would report to other government officials. The relationship of this advisory group to the proposed advisory groups on specific conservation programmed is also unclear. Six advisory groups are proposed for:

- biosphere reserves;
- wildlife areas, reserves, and sanctuaries;
- ecological reserves;
- migratory bird sanctuaries;
- Man and the Biosphere reserves; and
- national and territorial parks.

The rationale for creating the different categories and how distinctions would be made among the six is nebulous. According to DIAND (1982a, p. 47)

> *The advisory groups will wherever possible be based on existing structures or will formalize existing communications. Membership will be broadly based to* take advantage *of particular expertise inside and outside government and will ensure a high level of public participation* at *the working level.*

Mississippi Wildlife Heritage Committee

Under the 1978 Mississippi Natural Heritage Act, the Wildlife Heritage Committee has broad powers to identify, to register, and to provide for the management of the state's natural areas (Nature Conservancy, 1976). The main purpose of the act is

> *. ..to establish a dedication procedure by which owners of natural areas may voluntarily agree to convey* any *or* all *of their right, title and interest in the property to the State of Mississippi to be managed and protected by an appropriate agency designated by the Wildlife Heritage Committee for the people of Mississippi (49-5-145 (2)).*

Although the act is oriented mainly to the protection of natural areas under private ownership, the system has a number of attributes particularly applicable to the Northwest Territories. A very strong provision in the act is that "a natural area preserve is hereby declared to be at the highest, best and most important use for the public" (45-5-157). This statement protects the area against private and public development initiatives, as an area can be converted legally only through a difficult and public procedure involving the governor and the Legislature of Mississippi .

To provide for the acquisition of areas by the Wildlife Heritage Committee, a Wildlife Heritage Fund was established (49-5-77) that contains funding appropriated by the legislature, as well as donations from private individuals and groups.

The committee itself is a high-level and powerful agency consisting of three senators appointed by the lieutenant-governor of Mississippi from the Game and Fish Committee of the Senate; representatives appointed by the speaker of the House of Representatives from the Game and Fish Committee of the House of Representatives; and three members appointed by the governor of Mississippi from the Game and Fish Commission (49-5-61). Unfortunately no information is available on the efficiency and effectiveness of the committee.

Illinois Nature Preserves Commission

From the information available, it is not possible to determine who are **members** of the Illinois Nature Preserves Commission, other than that they are appointed by the governor of Illinois and that they must have demonstrated an interest in the preservation of natural areas (Nature Conservancy, 1976).

An important requirement of the Illinois Preserves Commission Act, which is not found in the Mississippi example, is that:

> *Any public agency or instrumentality holding a natural area with the intention of preserving natural conditions thereon or for a purpose the commission determines to be compatible with dedication of the area as a nature preserve* shall dedicate *it subject to approval of the Commission and Governor* (section 15, emphasis added).

This is a strong legal provision, which, if implemented, would prevent a public agency from converting the use of the lands it controls once they have been dedicated. Once again, no information is available on the efficiency and effectiveness of this commission.

Australian Heritage Commission

Created by the 1975 Australian Heritage Commission Act, the commission is an advisory group to the appropriate minister on matters relating to the national estate and, in particular, on actions that should be taken to conserve and to protect the national estate; on expenditures necessary to undertake such actions; and on financial and other assistance to state and local governments, as well as to private organizations for the conservation of the national estate (section 7 (a)).

An important function undertaken by the commission is the keeping of a register of places in the national estate. Before entering a place in the register, the commission is required to give public notice of its intention to do so and must accept objections for a three-month period following such notice (section 23). The same procedure must be followed also for places that are to be removed from the register (section 24). Moreover, the commission may request that the minister conduct an inquiry persuant to the Environment Protection Act on a matter relating to the natural estate. Concerning proposed activities "that might affect to a significant extent. . .a place that is in the Register. .." (section 30(3)), public authorities must inform the commission and give it a reasonable opportunity to consider the action.

Under section 32 of the act, the Australian Heritage Commission is to be provided with staff, although it is not clear how many. Also, the commission can draw on the staff of other departments for assistance. Although the commission is advisory only, an observer has suggested that its recommendations have considerable "moral weight."

V Alternative Co-ordinating Measures for the Northwest Territories

Three alternative co-or dinating bodies are described for the Northwest Territories. Basically the alternatives involve allocating types and levels of responsibilities to a co-ordinating group acting in the general interest. These alternatives are premised on a number of assumptions and principles, many of which have already been noted, but which nevertheless bear repeating.

1. The present informal and unto-ordinated approach to establishing and managing ESAS in the Northwest Territories is inadequate.

2. Any organization that might be created could not function effectively without a financial commitment by government, over which the co-ordinating body would have some control. Other private funding would assist also, as noted later.

3. Support staff, or a secretariat, would ensure some independence from government departments, as well as the capacity to perform day-to-day activities.

4. Whatever role is to be played by the agency, it should be given a clear mandate established in a formal manner (preferably through legislation, but perhaps through an agreement), which should also specify the duties of the governments, both federal and territorial, regarding any recommendations that the agency might make.

5. As much opportunity as possible should be given to allow local people, resource users, and other knowledgeable persons to be members together with government officials.

6. Careful consideration should be given to the reporting relationships of the co-ordinating body. The key is to develop reporting direction (or directions) that will enhance its ability to proceed in a politically

acceptable manner. The co-ordinating body could report at regular intervals to a minister, or to a council of ministers of both the territorial and federal governments. The body might also report to a committee, or to a council of deputy ministers, and all its reports should be made public. Other options may be available.

7. The co-ordinating body should be given the power to involve the public in its work. This might include such mechanisms as public hearings, open houses, advisory committees, and the publication of "green papers" and other documents.

NorthwestTerritories NaturalHeritageor ESABoard

The first alternative of the three proposed alternative organizations is the Northwest Territories Natural Heritage or ESA Board which would be the most powerful, autonomous, and financially independent of the three. In the face of existing political realities in the Northwest Territories, but with full consideration of the possibility of future changes, the board would be created under both territorial ordinance and a federal statute and would report through the N.W.T. Legislative Assembly to the commissioner of the Northwest Territories and to the federal ministers of Indian Affairs and Northern Development, and the Environment.

The most financially independent version of this board would be a public foundation. Although a large percentage of its funding would come from the governments of Canada and the Northwest Territories, it would also be empowered to raise money and to receive private donations of both money and property. The board would be under the direction of a chairman and a board of directors, whose members would be chosen for their knowledge, experience, and expertise.

To undertake its responsibilities in an effective and efficient manner, the board would be served by a secretariat large enough to allow for some independent research capability and to provide for the development and review of research programmed to be carried out by various government agencies and by private consultants. The staff could be drawn in part from various government departments.

The following are suggested as potential powers and responsibilities for the Northwest Territories Natural Heritage Board:

- to review the existing system of ESAS and to determine the need for additional management or reserve categories;
- to determine which existing agencies should be given management responsibilities for any new categories;
- to serve as the central repository for all data and information on ESAS and to establish a computer system for its storage and retrieval;
- to develop a registry of ESAS;
- to advise on the allocation of ESAS to various government, native, and other organizations for management;
- to undertake regular assessment of the programmed of the various organizations that deal with ESAs, and to make recommendations for more effective and efficient management of ESAS;
- to advise on lands and regulations for the management of ESAS ;
- to provide guidance and advice to existing and newly established organizations dealing with ESAs, for example, those to be established under agreements between Canada and the native organizations; and
- to hold public hearings and other forms of public participation in proposed new designations for ESAS.

NorthwestTerritories Natural Heritage or ESA Advisory Commission

The second alternative of the three proposed organizations is the Northwest Territories Natural Heritage Advisory Commission to advise the commissioner of the Northwest Territories, the Legislative Assembly, and the federal ministers of the Environment and Indian Affairs and Northern Development. It would, however, have the power to accept donations and bequests of money and property.

One of its main responsibilities would be to establish and to maintain a central information repository on ESAS. It also would give advice concerning the most appropriate plans for ESAs. The commission could work closely with management agencies in developing management plans and also could undertake annual reviews of the implementation of the plans.

Advisory Commission members would be civil servants, private individuals, and representatives from native organizations and public interest groups, who would serve part-time and meet at regular intervals. They would hold hearings on proposed designations, and, on the basis of representations made both by government agencies and by private individuals, would recommend to the commissioner of the Northwest Territories and to federal ministers the most appropriate management agency and the types of mechanisms that should be considered. The commissioner and the federal ministers should be required to make public written responses to these recommendations within a specified period of time. The commission should have a secretariat to assist with its technical and operational aspects.

NorthwestTerritories Natural Heritage or ESA Advisory Council

The third alternative is the Northwest Territories Natural Heritage Advisory Council that would be set up to advise either those federal or territorial departments with major responsibility for ESAS or the proposed Northwest Territories Land Use Commission. Possible departments include DOE and DIAND at the federal level, and Renewable Resources and Economic Development and Tourism at the territorial level. At the present time, perhaps some combination of these levels should be considered. This council would be based on the former territorial Game Advisory Council, except that it would have a different substantive area of responsibility.

VI Widening the Range of Management Techniques for ESAS

A co-or dinating body would play a role both in promoting the concept of ESAS and also in widening the range of techniques used to achieve their improved management. Many techniques are available to protect ESAS, although currently they have received little consideration in the Northwest Territories (Table 3). Of these techniques, only the transfer of crown lands and the designation of public lands have been used to any significant degree. Parks Canada is moving towards management agreements in the North, involving the territorial government and the native associations, for example, in northern Ellesmere Island. Through the avenue of a territorial heritage board, commission, or council, many of the other techniques available could be used to accommodate different types and levels of use and to manage different categories of ESAS in the N.W.T. Table 3 also indicates the possibility of promoting management of ESAS on private lands through the use of agreements and leases. Such techniques should be of particular interest to native groups who wish to retain ownership of heritage lands, but who also could benefit from an agreement for planning, personnel, and other assistance from either federal or territorial agencies. Such arrangements appear to have been useful in other jurisdictions, for example, Kakadu National Park in Australia (Gardner and Nelson, 1981). Trust arrangements could also provide an opportunity for the Nature Conservancy or other private funding to be made available to assist in the development of a coherent system of ESAS in the Northwest Territories.

Table 3
Summary of Techniques for the Protection of ESAS

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Simple purchase	Involves conveyance of all rights contained in fee simple for valuable consideration. The primary rights are the right to alienate the land and the right to everything in, on, and over the land. Can be done on a voluntary sale basis, or in the case of public. agencies, through expropriation.	All rights to land come under control of purchaser. Allows purchaser greater control over timing of acquisition. Free of major legal complications as it is most common mechanism and ia, therefore, well understood.	Cost can be prohibitive. Most expensive alternative. Initial acquisition cost added to by necesaify to manage land. Maybe legal limitations on purchaser's rights due to restrictive covenants. If expropriation is used, there is usually adverse public reaction. May be substantial legal fees and delays. If purchased by public agency, the land is removed from the tax roles, thereby reducing a municipality's tax revenue.	Parks Canada	
Bargain sale	Sale of private property to a public or private conservation agency at a price less than its fair market value. Funding in part sale and part charitable contribution.	Provides landowner with tax advantages by allowing the difference between the fair mar. ket value and the actual sale price be deducted from income tax. Much less expansive than purchase of fee simple.	May necessitate changing land acquisition priorities depending on when landowner wishes to sell.		
Purchase and sale-back	Land purchased by public or private agencies can be resold, with restrictions attached to ensure that the goal of protecting critical wildlife habitat is achieved.	Once the land has been purchased, the purchaser can place restrictions on the land to control future use of the area. By reselling the property some of the purchase costs can be defrayed.	Such land acquisitions especially by public agencies may generate unfavorable public reaction. Administrative process of buying and selling may be costly.		
Purchase and lease-back	The purchaser leases the land back to the vendor or other persons. The lease is made subject to ESA objectives.	Excellent interim management technique if development funds not available. The rental income can offset the purchase price. Maintenance work can be deferred. Retention of complete title rights and control of future land use is assured.	The opportunity for public access is limited or delayed. Administrative infrastructure and overhead work may be involved with maintaining provisions of the lease.		

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Right of first refusalor first option to purchase	This method involves a legal agreement or caution between a land owner and a person or agency, that if the land ownar decides to sell the property, the other party to the agreement will be notified and will have the first option to purchase.	The public or private conservation agency becomes an essential party to be consulted in all transactions respecting the property against which a caution has been registered. It maybe possible to have the land ownar agree to manage the property to protect the natural element of concern. Can be a very Inexpensive way to protact natural areas, until the owner decides to sail.	Not a permanent protective method and maybe on an uncertain legal footing unless a final agreement is made. Onca the land owner decides to sell, which could be at anytime, the conservation agency must be able to raise the necessary funds. Because there is little control over the timing, the agency may run into difficulties arranging funding.	Mississippi Natural Heritage Act, 1978	
Lease	A rental agreement for a specified period of time, whereby the land owner granta the tenant temporary but exclusive possession of the property, in exchange for a rental payment. Exclusive possession allows the tenant absolute control over use of the property during the term of tha lease.	Is much less expensiva than outright acquisition but provides for same exclusive possession and use. Flexibility, in that any form of convenant may be usad to fit the particular situation. May be used for short-term or long-term purposes. If there is no statutory limitation on the length of the lease, a long-term lease may be tantamount to a transfer of the fee simple. The covanant in the lease is enforceable as the lessor retains a reversionary Interest. This interest could be transferred to a conservation agency.	The lease is for a fixed period of time, and thus is temporary. Special conditions maybe attached to the lease. The lessee of tax exempt government land may be liable for proparty tax, depending on how land is used.	Missouri Prairie Foundation (Jenkins 1978, 419)	

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Conservation easement	An easement is a right enjoyed by one land owner over the land of another and is obtainad for a special purpose rather than for the general use and occupation of land. Once granted, easements legally bind present and future ownera. By acquiring an easement, a conservation organization is able to protect elements of natural diversity by controlling only the right that an owner could use to destroy or degrade them. That is, the rights to develop land are severed from the other rights contained in the fee simple. The severed rights are purchased from the land owner to become part of an easement agreement. The land remains in private ownership subject to the right of the easement holder to enforce restriction in the agreement.	Not as costly as fee simple acquisition. Allows protection of open space while making it available to public. May allow for property tax deduction. Relatively free from restriction and is flexible enough to be tailored to specific needs. The land is re- market for the duration of the easement and is thus protected.	They provide only partial rights concerning property. They are often confusing to land owners and other groups. They are difficult to appraise. Legal fees may approximate those for fee simple acquisition. May necessitate purchasing adjacent property because of need for dominant tenement. Difficult to enforce. Uncertain whether courts recognize conservation goals as legitimate subjects for an agreement.	Maina Coast Heritage Trust (Jenkins 1978, 419), U.S. Park Service, U.S. Forest Service	
Management agreement	These are contracts between land owners and conservationists (public or private) obliging the land owner to manage their property in a specific way for a stated period of time to achieve mutually understood purposes.	Low cost. Land owner may agree to manage property with only assistance or guidance from the organization involved, thereby posing less of a management burden on the agency.	Usually the agreements are for a specified period of time and, therefore, lack permanence., although it is possible for them to last anywhere from 1-99 years.		Is currently being considered a possibility for national parka in the N.W.T., i.e. COPE Agreement-in-Principle.
Donation	Simplest and most common method of giving land (conveyance in fee simple). It usually provides the greatest tax benefits to the donor and gives the receiving agency considerable freedom with respect to use of the land, since all rights to the property ara transferred by deed or will.	Saves considerably on public funds, although may be costly to manage.	The area might not be appropriate, or of priority, for conservafion purposea. Creates public pressure to develop and manage the properly. Funds may not be available for development or management.		

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Donation or sale with reserved life estate	This mechanism operates through either a sale or donation of property with the land owners retaining the right to live on the property for their remaining lifetime and possibly for the lifetime of other family members.	Although the vendor or dependents continue to live on the property, the purchaser is ensured retention of complete title rights in due time. Reduces social impact associated with owner relocation. Provides tax benefits to owner.	Can limit the total use of the land for an indefinite period of time. Specific conditions can be written into the deed to ensure the management and protection of the special features of the property. A conservation easement may also be useful in this regard.		
Donation of undivided interest in land	The donor gives a percentage of their legal interest in the land, rather than any specific physical portion. Therefore, the land is owned commonly as a unit by all those parties who have an interest in the property. Theoretically, all owners hava equal rights to possession of the property.	Very inexpensive for the recipient and provides the donor with a reduction in taxes. The donor may decide to make a donation of the entire property in a string of gifts of undivided interest.	It maybe necessary also to enter into some type of management agreement to ensure the protection of the significant resources.		
Donations by will	An individual can will land to an organization.	Provides tax relief to the donor if property willed for public, charitable, or religious purposes.	The terms of the will may restrict the use of the property. If possible, the recipient should review the section of the will that applies to the land, so that it can be worked out with the living donor.		
Designation of public lands	Lands already owned by government can be designated by various agencies to specific conservation purposes (e.g., migratory bird sanctuaries, national parks, game preserves, etc.).	Does not require purchase of property from private land owners.		National Parks, National Wildlife areas, Migratory Sird Sanctuaries	National Parks, Migratory Bird Sanctuaries, National Wildlife Areas, Territorial Parks

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Dedication	The placement of a natural area into a legally-established system of nature preserves, whose members are protected by strong statutory language against condemnation or conversion to a different use. Land ownera can dedicate specific interests in property as well as full fee title.	Flexible in that specific provisions of the arrangement can be tailored to suit individual circumstances. Strongest protective tool available, if there is a nature preserves act which contains provision for protection of dedicated purposes. Can be used on public or private land. Possibility for land owners to receive tax benefita for property dedicated.	Requires prior establishment of an ESA or nature preservea act to establish a system of such areas. The protection provisions and powers to create and establish such areas can vary widely.		
Trust dedication	Dedication as described above with one differerence. A trust is created by law and administered by a designated agency. Natural areas are dedicated into the trust, rather than into a nature preserves system. Three types: (1) Private (2) Public (3) Community Comments on advantages and disadvantages mainly related to public trust.	A donor can continue to control land uae whereaa, in an outright transfer, the donor loses this control. A relatively flexible le- can deal with almost anything. Courts will modify a charitable trust so that the charitable intent is always fulfilled. Therefore it is a secure medium for ensuring that land is protected. The trust offers the donor a wide choice in who should control and manage the property.	In order to pursue a coherent policy of ESA preservation, the trust agency should be involved in the design of the trust to ensure that the purposes contribute towards the satisfaction of ESA policies. A trust can be designed such that it is subject to modification or revocation by the seller. This injects a degree of uncertainty into the future of the subject property which may result in a reluctance of agencies to use the land for ESA objectives.	South Carolina Nature Conservancy	
Transfer of crown lands	Transfer or exchange of propertiea within and between governments. May involve the exclusive reservation of crown lands or the transfer of surplus lands from government agencies.	Usually involve no outright public expenditure.	May be economic ramifications through loss of assets or foregone resource development potential. May create burden on recipient due to lack of financial resources for development and management. Surplus lands may not always be in desirable locations or of desirable quality.		Polar Bear Pass, N.W.T. from DIAND to DOE

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Public land banking	Land banks are public bodies which acquire land and keep it free from development on a short- or long-term basis. Once purchased, then land can be disposed of for ESA purposes in a variety of ways. The land bank establishes initial control over the eventual uae of the land. The agency could be part of a government dept. at any of the various levels or it could be a separate public corporation.	Control over type, time and locations of development.	Expansive and requires large initial outlay of money. Local tax revenues are reduced.	Ontario	
Transferable development rights	A land-use control technique designed to distribute me cost of land zoning and regulation more equitably among affected land owners. Identify certain rights to develop land, sever them from other rights contained in fee simple ownership and create a market for them.	Owners of lands having significant natural features may be relieved from the full burden of preservation zoning. Permits land-market mechanisms to remain fluid and at same time effectively preserves ESA. Adjusts the burden of government land regulation more equitably among private land owners. Minimizes costs to taxpayers by internalizing the costs of land development by charging the development industry with Costa which formerly fell on the community in the form of environmental degradation. The system could shorten the time necessary for government approval of development projects. The main prerequisite for approval would be the acquisition of the necessary development rights.	Complexity of the market problem may prove overwhelming depending on the form of the scheme. Success of the system is heavily dependent on the soundness and sophistication of the planning and forecast techniques, and on integrity of government officials,		

Table 3 cent'd.

Technique	Description	Advantages	Disadvantages	Example	Use in N.W.T.
Notification	The act of informing a landowner that a natural element has bean identified on their proparty.	Thelandowner isnotrequired to do anything. Very little cost involved.	Requires a good inventory to Identity such areas. No legal or other powers to protect the element identified.		
	Involves giving special recognition to private land owners who allow their proparties to be entered on a registry or list of significant sites.	Can usa to encourage land ownera to volunteer to protect natural elements. Low cost recognition or incentives can be used, from a plaque or certificate, to a reduction in the assessed value of the property. Aa a condition of recognition, land owner may agree to manage holdings in specific way. Publicity for protection programme.	Limited strength as regulatory device. Non-binding agreement and, therefore, has limited strength as a regulatory device but is ideal as a foothold or fall-back position. Permanence questionable If land ownera change, without compensation a manager may not be able to meet required management standards.	Australia Ohio Indiana N. Carolina	

SOURCES
(1) Canadian Wildlife Service, n.d.
(2) Hoose, Phillip M. (1981).
(3) Greater Vancouver Regional District, Planning Department (1978).

Relating management objectives, management types, and ESAS

Besides widening the use of management techniques, a co-ordinating body should play a key role in evaluating and in making recommendations for a system of ESAS. From a systems perspective, consideration must be given to the range of management objectives that are to be achieved, and the linkage of those objectives with management types for individual ESAS. Miller (1978) suggests 13 objectives that relate wildland or the resources of ESAS to eco-development, i.e., to sustainable development. They cover the diverse benefits provided by such resources and they give general direction to the necessary management and development activities. The objectives are:

1. *Maintain large areas as representative samples of each major biological region of the nation in its natural unaltered state to ensure the continuity of evolutionary processes, including animal migration and gene flow.*

2. *Maintain examples of the different characteristics of each type of natural community, landscape and land form to protect the representative as well as the unique diversity of the nation, particularly to ensure the role of natural diversity in the regulation of the environment.*

3. *Maintain all genetic materials as elements of natural communities, and avoid the loss of plant and animal species.*

4. *Provide facilities and opportunities in natural areas for purposes of formal and informal education, research, and the study* and *monitoring of the environment.*

5. *Maintain and manage watersheds to ensure an adequate quality and flow of fresh water.*

6. *Control and avoid erosion and sedimentation, especially where they are directly related to downstream investments which depend upon*

water for transportation, irrigation, agriculture, fisheries, and recreation, and for the protection of natural areas.

7. *Maintain and manage fishery and wildlife resources for their vital role in environmental regulation, for the production of protein, and as the base for industrial, sport and recreational activities.*

8. *Provide opportunities for health and constructive outdoor recreation for local residents and foreign visitors, and to serve as roles for tourism development which are based upon the outstanding natural and cultural characteristics of the nation.*

9. *Manage and improve timber resources for their* role *in environmental regulation and to provide a sustainable production of wood products for the construction of housing and other uses of high national priority.*

10. *Protect and make available all* cultural, *historic and archaeological objects, structures and sites for public visitation* and *research purposes as elements of the cultural heritage of the nation.*

11. *Protect and manage scenic resources to ensure the quality of the environment near towns and cities, highways and rivers, and surrounding recreation and tourism areas.*

12. Maintain *and manage vast areas of land under flexible land-use methods which conserve natural processes to ensure open options for future changes in land use as well as the incorporation of new technologies, to meet new human requirements, and to initiate new conservation practices as research makes them available.*

13. *Finally, focus and organize all activities to support the integrated development of rural lands, giving particular attention to the conservation and utilization of marginal areas and to the provision of* stable *rural employment opportunities* (Miller, *1978,* pp. 9-10).

These objectives can be related to various types of reserve which, in total, purportedly comprise an ideal system. Miller has recommended 11 types of reserves at the national level, each identified and described in Table 4 according to their main attributes, permitted uses, tenure, and size. The principal management objectives for each type are also noted. The table indicates the extent to which the system of ESAS in the Northwest Territories compares with Miller's ideal.

Further ideas on ESAS and natural or conservation area systems are included in Appendices D and E. Appendix D sets forth the categories for conservation management established by the International Union for the Conservation of Nature and Natural Resources and its principal agency in the field of conservation areas, the Commission on National Parks and Protected Areas (1982). These categories derive mainly from Miller's work. Appendix E presents information on a model or comprehensive natural-areas system based on experience in the United States.

One of the most important requirements in the Northwest Territories is to create a framework of management types and to match these with the ESAS identified in the territories. Thus, a system of ESAS would be established first by seeking agreement on a range of national and territorial parks, wildlife areas, and other management types and then by matching these types with areas recognized as having commensurate wildlife, vegetation, hydrology, or other environmental attributes. A method of classifying areas in terms of grouping such attributes is being developed by Theberge and Smith in a companion to this study. Eventually, each ESA would be grouped in accordance with its biophysical characteristics or values, and would be linked with the park, or other management type, having the objectives and institutional characteristics required to use the ESA for various purposes as well as protecting its valued environmental attributes. The long-term objective is to implement a planning scheme for balanced land use (see Figure 1).

Table 4

Relationship of Reserve Type to Management Objectives

Reserve Type	Description	Management Objectives	Permitted Uses	Tenure	Area	Equivalent N.W.T. ESAs
National parka	Contain spectacular or unique natural features of national or international significance	Protect and preserve unique and representative natural and cultural areas	Education, recreation, research, environmental monitoring	Public in perpetuity	Thousands to millions of hectares, large enough to maintain integrity of ecological systems	National parks
National monuments	Contain central and outstanding natural features of national or international significance	Protect and preserve outstanding natural features, protect related genetic and scenic resources	Recreation, education, research, monitoring	Public in perpetuity	200-100,000 hectares sufficient to manage and protect central natural features	National landmarks
Scientific or biological reserves	Contain natural formations and species of flora and fauna of significance to science and natural environment	Protect and preserve natural areas of outstanding scientific value, provide opportunities for education, research and monitoring	Advanced education, research and monitoring	Public in perpetuity	Dependent on ecological features to be maintained, must contain most or all elements of ecosystems	IBP sites
Wildlife sanctuaries or refuges	Areas requiring special management to ensure continued existence of individual species or communities of resident or migratory species	Manage and maintain natural areas critical to migratory fauna, protect related genetic resources	Educational, research and monitoring, some alternative uses, may receive absolute protection during certain periods of the year	Public or in cooperation with local private owners	Dependent on habitat requirements of species	Territorial game reserves, territorial game sanctuaries, Canadian wildlife areas

Table 4 cent'd.

Reserve Type	Description	Management Objectives	Permitted Uses	Tenure	Area	Equivalent N.W.T. ESAs
Recreation areas, scenic rivers & highways	Relatively large areas with outstanding natural or semi-natural scenery. Physical potential to be developed for a variety of outdoor recreational uses of national or international significance. Proximity to significant population centres	Provide recreational opportunities in a semi-natural and aesthetic environment, also, maintenance of genetic resources, conservation of water resources, control of erosion, protection of ecological diversity	Recreational sources for large numbers of people, education	Public in perpetuity		Territorial parks
Scenic easements & rights-f-way	Areas requiring protection and management which do not qualify as one of other reserve types. Can be planned and co-ordinated to form integral elements of national parks and other reserves. Particularly appropriate for better zones	Protect scenic values and avoid conflicting land uses along important transportation routes, beaches, rivers and lakes, scenic overlooks, borders of parks, establishment and maintenance of access to otherwise isolated wildland areas	Variable, specified in legal agreement	Co-operative public and private through legal agreements	Variable	
Cultural monuments	Sites or areas containing historical, archaeological or other cultural features of national or international significance. Of particular interest are cultural features within wildlands to permit integral cultural and natural resource management	Protect and preserve cultural values, integral cultural and natural resource management	Variable, specified in legal agreement, education, research, monitoring	Co-operative public and private management, public ownership in perpetuity	Variable, dependent on extent of features to be preserved and necessary surrounding landa to ensure adequate protection	National historic parks and sites

Table 4 cent'd.

Reserve Type	Description	Management Objectives	Permitted Uses	Tenure	Area	Equivalent N.W.T. ESAS
Resource reserves	Extensive uninhabited area with unexploited natural resources. In absence of clear criteria not designated to specific use	Maintain resources in natural form, keep future options open		Holding category	Variable	
National forests	Extensive forested area with great areas of harvestable timber. Also generally contain watersheds, grasslands, wildlife habitat and scenic areas	Produce wood, water and forage under multiple-use and sustained-yield concepts, commitment to maintain productive capacity of natural system	Multiple use, recreational and touristic monitoring (environmental), educational, hunting, fishing, research	Co-operative management relations with local private or communal owners, public in perpetuity	Sufficient for adequate management of resources on sustained-yield basis	
Game farms	Contain populations of native wild speciea of fauna or habitat for production of fauna	Management of native wild species in native habitats, provide animal protein or animal products consistent with natural capacity	Recreational and touristic, hunting, viewing, wildlife management, educational and research	Combination of public and private cooperative management with local and private users	Determined by habitat requirements or migratory behaviour of species-of-interest and need to make production economically feasible	N.W.T. Reindeer Preserve
Protection areas	Require strict land-use control but doas not meet requirements of other categories i.e. shorelands, hazard areas, key transport routes, watersheds	Ensure natural land-use in zones critical to development and environmental conservation	Limited recreational	Public, private or communal if public controls effective	Small	Municipal hazard zones

Source: Based on Miller, 1978

Mapping and analysing land use

Mapping and analysis of land use are essential in planning and managing ESAS in the Northwest Territories. The principal problem is to understand the distribution and character of land uses and their effects on the geologic or abiotic and biotic aspects of proposed ESAS. Such understanding is essential for several reasons. Knowledge of land uses and their effects assists the planner in assessing the degree to which various uses are compatible with wildlife protection and other objectives. Some historic land uses and their artifacts or heritage resources may enhance the value of an ESA, whereas other uses may have adverse effects on water quality, scenery, or other objectives. Knowledge of land uses and their effects also enables planners and managers to assess the effects that the creation of a national park or similar type of reserve would have on the economy and cultural characteristics of people living in its vicinity.

A human-ecological approach to land-use mapping and analysis has been found useful in the Yukon (Theberge and Nelson, 1983), which is explained in detail in Appendix F. In this approach, people and their land use are considered as part of the ecosystem. Land uses are treated as processes with changing rates, magnitudes, and spatial and temporal distributions comparable to those of geological, biological, or other biophysical processes.

Thus, land uses are mapped separately on the basis of structures or artifacts. Man-made features such as roads and reservoirs are used to estimate the distribution and nature of land uses. These land–use or structural maps can then be overlaid and their distribution and interactions related to one another. Interactions among the uses or effects upon habitat or environment can be studied by using an environmental impact assessment (EIA) approach.

Land use also can be mapped on a functional basis by developing a conceptual mapping system that uses processes or groups of processes to divide the study area into spatial units that perform different cultural functions. These cultural maps are the counterparts to the abiotic and biotic maps that divide the area into land units that perform calving-area, migration-route, or other biophysical functions (Bastedo et al., in press; Hans Bastedo, 1983).

The system that has been used here to map cultural functions is modified from that developed by Lewis (1964) for land-use work in Wisconsin. Three broad types of functional areas are identified: nodes, corridors, and hinterlands.

The nodes are areas where several functions coalesce in space, for example, a settlement with its transport, industry, administration, and other processes. Another example is a provincial campsite with a marina, interpretation centre, historic site, and road interchanges.

Corridors, as the name implies, are alignments of trails, roads, telegraph lines, or some combination of transport and communication processes. Both nodes and corridors delimit areas where certain cultural processes are concentrated.

Hinterlands are regions where land uses and other processes tend to be dispersed over relatively large areas. Here spatial and functional interrelations are scattered rather than concentrated.

Once prepared, the information on the structural and functional maps can be used in the preparation of maps to show, first, cultural importance for national park and related purposes, and secondly, constraints on land use in the study area.

For the cultural importance map, certain criteria are required as a basis, for making judgments about significance. Knowledgeable persons must be consulted to identify historical themes (for example, aspects of Indian life or the fur trade) and perhaps rank them in terms of their perceived social importance. Archaeologists, historians, and other professionals can help with this identification and ranking, because of the academic nature of the subject. Local people should also be involved, for example, in judging the importance of artifacts of indigenous culture.

Other criteria are needed to identify and map land-use constraints and to assist in making judgments about which land uses are to be permitted and where. These criteria include the number of land uses, competition for environment and resources among land uses, differences in technology, introduction of new land uses, and weaknesses in planning or other institutional arrangements. Constraints can be mapped in terms of a spectrum in which areas having generally compatible land uses and cultural processes are at one end and areas having generally conflicting land uses and processes are at the other. Areas lying somewhere between the two are mapped as tension zones (Theberge and Nelson, 1983; Hans Bastedo, 1983).

Thus, structural, functional, cultural importance, and constraint maps clearly can be used in decisions about planning and land management. They can be particularly useful in attempting to control the effects of various land uses on abiotic, biotic, and cultural features through zoning, boundary delineation, and other techniques that combine or separate uses spatially.

To illustrate such use, Parks Canada has a number of different zones for managing land within parks including special ecological and cultural areas, wilderness, natural-environment, recreation, and intensive-use zones. However, the criteria for placing an area into one of these zones are not very precisely defined. Even so, the zoning system used within national parks is much more sophisticated than that used to separate the park from surrounding tenures and land uses. Currently, this system takes only one form; the straight-line boundary. One side of the boundary is under the strict control of Parks Canada and the other is under different owners and agencies.

Special treatment for ESAS might include designating, as part of a national park, several small areas outside its main boundary. As a result, the boundary would be staggered or would appear as islands. Another form of special treatment might involve the designation of areas outside the national park for other forms of appropriate management, for example, as territorial parks, wildlife sanctuaries, or national wildlife areas. Areas might also be designated for special treatment under general arrangements for land-use management, for example, under the territorial land-use regulations. Permits for mining exploration or other land uses judged likely to damage or destroy the values of key areas located outside the main park boundary could also be subject to special scrutiny, perhaps through the automatic requirement of an environmental impact assessment.

Institutional analysis: matching ESAswith managementtypes

Methods of institutional analysis that can lead to the identification of management types appropriate to the goals and characteristics of proposed ESAS have been developed in two recent studies (Theberge et al., 1981; Theberge and Nelson, 1983). In a study of ESAS in the Yukon, a set of criteria was developed for assessing the functions, powers, responsibilities, and record of legislation and agencies intended for the planning and management of areas with special geological, biophysical, and other features and

processes. The criteria were applied to the federal and territorial legislation and agencies pertinent to ESAS in the Yukon. The criteria revealed both strengths and weaknesses in the acts, ordinances, and agencies and also deficiencies in the overall management system for ESAs. The identification of gaps led to recommendations for change, such as legislation for ecological sites (Theberge et al. , 1981) .

The criteria for assessing legislation and agencies include mandate, permitted and non-permitted uses, and other factors. These criteria and some commentary can be found in Theberge et al. (1981, pp. 78-79 and 113-115). As the criteria are not comprehensive, it is not expected that they will be entirely satisfactory to potential users, who may choose to modify them as did Fenge (1982).

The actual linking or matching of an ESA to particular acts, ordinances, or agencies is a complicated process that can involve a lengthy review. In the Yukon case, a team of graduate students held workshops and made judgments about links but, for a number of areas, the matching was not finalized because of a lack of data or because of differences within the group.

Evaluation criteria can of course be treated as guidelines not only for the creation but also for the operation of national parks or other management types in ESAS . In an attempt to indicate how this could be done, possible guidelines for planning and management are listed below, although other criteria and more elaborate procedures could be used by planners and managers.

1. Agency

   a. Specify the government agencies responsible for planning and management.

   b. Specify the lead agency and support agencies.

   c. Specify the corporate or non-government groups with a major interest in planning and management.

   d. Specify mandate, powers, and responsibilities in legislation, regulation, and policy statements.

2. Planning

   a. Policy or strategic planning:

      - specify goals, objectives, means of achievement, and any other criteria for judging success;

- specify operational philosophy (for example, wilderness or heritage), and relate to goals and objectives;
- specify agency or group roles in the planning and management system (that is, relations to other agencies and groups and their goals, objectives, and philosophies);
- specify planning and management procedures (for example, the planning, implementation, and other elements defined in this set of guidelines).

b. Inventory:

- specify information requirements for planning and management and the social (economic) and biophysical inventory procedures to be used to collect data;
- specify who will collect the data, how often, and under what circumstances.

c. Classification:

- specify land or other classification procedures to be used in planning and management.

d. Especially significant areas:

- specify any areas to be designated as especially significant and why;
- specify any special planning and management procedures for such areas.

e. Evaluation:

- specify any environmental, social, economic, technical, or other evaluation procedures to be conducted, under what circumstances, by whom, and at whose cost;
- specify evaluation review procedures and responsibilities;
- specify linkages of evaluation with monitoring, implementation, and other planning and management procedures.

f. Design:

- specify any special landscape, architectural, institutional, or other design procedures with a rationale and directions as to how they are to be implemented;
- specify the nature of any links with biophysical guidelines (for example, any

special architectural or institutional requirements for active mass-wastage zones, permafrost areas, flood plains, or unique or representative landscape features or processes).

3* Implementation

a. Approval:

- specify means of approving policies, plans, or management statements (for example, scoping or pre-hearing discussions, hearing procedures, technical or financial assistance, feedback arrangements, appeal procedures, and responsibility for final decision).

b. Construction, development, operations:

- specify inspection and surveillance procedures and responsibilities for significant aspects of management (for example, wildlife or other natural resources);
- specify incentives or disincentives to be used (for example, special payments, subsidies, or fines) ;
- specify procedures and responsibilities for monitoring of significant social, economic, or biophysical processes or features (for example, visitor numbers and types, cost/benefit analysis, or fluctuations in wildlife, water levels, or other phenomena);
- specify procedures and responsibilities for making significant changes in policies, management plans, or natural resource or other system guidelines, and indicate who should participate and under what circumstances.

4. Planning and management guides and other characteristics

a. Research:

- develop a research policy and plan, linking it to management goals and objectives, including those of parks superintendents and users such as the scientific community;
- in the plan, specify what research should be carried out, when, and by whom; designate costs and financial responsibilities;
- specify community responsibilities (for example, through ethical guidelines like those supported by the Association of Canadian

Universities for Northern Studies for the North) .

b. Co-ordination:

- specify procedures for exchange of information and services, and other forms of co-ordination with agencies at all levels of government;
- pay particular attention to links among federal, territorial, and regional levels;
- specify procedures for cost-sharing, or other forms of co-operation with industrial or other corporate interests;
- specify public participation procedures in some detail, with rationale;
- specify procedures for promoting and implementing co-ordination among government, industrial, and corporate interest groups and the public.

c. Information access:

- specify any information that is considered confidential, with a rationale;
- indicate how information on planning and management can be secured, particularly by the public, consider a “single window” approach.

d. Economic aspects:

- develop a budget and specify any fees or other charges with a rationale;
- Adopt cost/benefit procedures and specify how they will be implemented;
- consider cost and other management-sharing arrangements with other agencies, corporations? and interested parties (for example, native people or nature conservancies);
- specify any special tax provisions, payments for loss of opportunities or benefits, employment arrangements, and the like.

e. Management process monitoring:

- specify some means of reviewing planning and management goals, objectives, means, criteria, and philosophy under changing social, economic, and environmental circumstances;
- specify financial, timing, and other arrangements for such review.

Since the completion of the report on ESAS in the Yukon in 1981, more recent work has been conducted largely with the

support of Parks Canada as part of that agency's interest in improved park planning in the North (Theberge and Nelson, 1983). The Parks Canada study focuses on the delineation of boundaries for new national parks and other related areas, which might be established during the next few decades.

A fundamental conclusion of the Parks Canada study is that the problem should not be considered simply as boundary delineation of a national park or other management type, but rather as a search for a set of co-ordinated land-tenure or management arrangements appropriate to the goals and characteristics of the proposed area. This set of arrangements could, and often should, include an integrated array of national parks, territorial parks, national wildlife areas, or other management types which could allow for recreation, tourism, hunting, and scientific or other uses conducted in an appropriately managed fashion, in accordance with the biophysical and cultural character of the various lands making up the ESA.

The ultimate goal is to balance different land uses with the varying biophysical and cultural characteristics of the ESA through the design and application of a co-ordinated set of institutional arrangements. Strict management types such as national parks would be used where little human influence is desired, for example, to manage representative ecosystems. Such a national park might be contiguous with an adjoining national wildlife area, where protection of a particular species is the major goal and a wider array of land uses could be permitted. Territorial parks, land-use regulations, or other forms of management also could be applied to adjoining lands, in accordance with conservation and development objectives and land-use circumstances. The result is a co-ordinated set of institutional arrangements designed to meet the biophysical and cultural characteristics and land-use objectives of proposed areas. This is the ESA method, or what has been called the conservation-unit approach by Luisigi (1981) in Africa.

One problem with using this method in the Northwest Territories is the lack of firm evidence on the track record of the various agencies responsible for land management. Few detailed evaluations have been completed on the efficiency and effectiveness of national parks, national wildlife areas, land-use regulations, or other land-management types. There is no sound understanding of the land uses and effects that have taken place on lands managed by agencies under various conservation acts or policies.

Some evaluations have been sponsored by CARC, and one is currently being conducted on land-use regulations in the Yukon by Kevin O'Reilly for a master's thesis in planning at the University of Waterloo. In his analysis, O'Reilly is

using evaluation criteria and methods developed for hazard management and environmental regulatory studies in Ontario and other areas (Nelson et al., 1981). Such evaluations of the available array of land-management regimes are needed in order to understand how these are working and how to improve them in planning and managing ESAS and other northern land use.

Finally, if it is to work well, the ESA method requires effective, co-ordinated planning and management. The search for, and study of, effective co-ordinated management arrangements is important because such management is essential to the implemention of the ESA method and to the monitoring and adaptation of management to changing constraints and circumstances.

VII Concluding Remarks

In considering the issues and alternatives involved in planning and management, the relationships between the ESAS and comprehensive land use should be stressed. Close ties should exist between the two. Eventually ESA activities should become part of the comprehensive land-use management, although there is now the need for a co-ordinating mechanism for ESAS alone. This need exists because of the vital role that ESAS play in activities based on renewable resources. Without more effective planning and management of ESAs, in the face of current land-use pressures, changes could occur that would place unwanted limits on future development as well as on conservation options not only for ESAS but also for large areas of surrounding land. Better planning and management of ESAS therefore is urgent because it forms a key element in the planning and management system for comprehensive land use, which will take longer to evolve because of the institutional, social, and political constraints.

Various initiatives in planning and management relating both to ESAS and to comprehensive land use are now underway in the Northwest Territories as well as in the Yukon. Recently, DIAND produced two discussion papers, one on conservation and the other on land-use planning in the North (DIAND, 1982a and 1982b). The conservation paper addresses many aspects of ESAS. Both papers describe quite centralized, federally oriented models involving a complex array of mechanisms for consultation with other territorial agencies or other parties. Neither paper sets out a much more substantial role for the territorial government in the near-to-medium term. The DIAND proposals for land use show key bodies such as the proposed Northwest Territories Land Use Commission reporting directly to the minister of Indian Affairs and Northern Development, and maintaining very close ties with the assistant deputy minister, Northern Affairs Program, DIAND.

Given the various economic, social, and political constraints, and given their conclusion that a multi-group and multi-government approach to the planning and managing of ESAS and comprehensive land use is desirable, the authors would like to see more consideration of a wider range of senior-civil-service and political involvement at the upper policy and decision-making level.

One example of the means whereby such involvement could occur is provided in Australia by the Great Barrier Reef Marine Park Authority (1982), which is actually a planning and management agency for the comprehensive use of thousands of hectares of land and sea in Northern Australia. The planning and management of the reef involves links with many user groups and agencies at the municipal, state (provincial), and federal (commonwealth) levels of government. The Great Barrier Reef Authority addresses this situation through a senior ministerial council established in 1979 to co-ordinate policy between the commonwealth and Queensland governments. The council comprises two ministers from each government. The convenor is the commonwealth minister for House Affairs and Environment. The other members are the commonwealth minister for Science and Technology, the Queensland minister for Primary Industries, and the Queensland minister for Tourism, Natural Parks, Sport and the Arts. A Day to Day Management Coordinating Committee consists of representatives of both federal and state agencies. A chairman (or director) of the authority has been appointed with a staff for planning, operations, and administration. Guidelines as well as planning, zoning, permit, and other management arrangements have been developed by this staff while working with the Day to Day Management Coordinating Committee and the Ministerial Council. A comparable system is worthy of very careful consideration for the Northwest Territories.

Appendix A

Members of the N.W.T. ESA Consultative Committee

John Donihee	Department of Renewable Resources, GNWT
Alan Vaughan	Department of Economic Development & Tourism, GNWT
Bob Bell	N.W.T. Science Advisory Board
Julian Inglis	Northern Environment Branch, DIAND
Bill Rees	Canadian Arctic Resources Committee
Everett Peterson	Canadian Arctic Resources Committee
Redmond Clarke	DFO
Bill Erasmus	Dene Nation
Judith Donaldson	Baffin Regional Inuit Association
Lynne Allen	Canadian Wildlife Service, DOE
Kevin McCormack	Canadian Wildlife Service, DOE
Bill Carpenter	Ecology North
Bob Gamble	Parks Canada, DOE
Terry Fenge, chairman	Canadian Arctic Resources Committee

Appendix B

List of People Interviewed

Floyd Adlam	Land Resources, DIAND
Peter Allen	Planning and Priorities Secretariat, GNWT
Randy Ames	Inuit Tapirisat of Canada
Robert Baker	Environmental Protection Services, DOE
John Bayly	Dene Nation
Hiram Beaubier	N.W.T. Region, DIAND
Bob Bell	N.W.T. Science Advisory Board
Arthur Boutiller	Town Planning and Lands Division, Department of Local Goverment, GNWT
François Bregha	Energy, Mines and Resources
David Brooks	Energy Probe
Karen Brown	Parks Canada, DOE

Ken Brynaert	Canadian Wildlife Federation
Clayton Burke	Dene Nation
John Carruthers	Parks Canada, DOE
Bill Cheffins	Parks Canada, DOE
Andrew Cullen	Water Resources, DIAND
George Davies	Canada Benefits, COGLA
James Dobbin	James Dobbin and Associates
Les Dominy	Freshwater Habitat Division, DFO
John Donihee	Environmental Planning and Assessment, Department of Renewable Resources, GNWT
Yvon Dube	Northern Environment, DIAND
Will Dunlop	Land Resources, DIAND
Harold Eidsvik	Parks Canada, DOE
Bill Erasmus	Dene Nation
Don Gamble	Northwest Territories Water Board
Paul Gray	Department of Renewable Resources, GNWT
Julian Inglis	Northern Environment Branch, DIAND
Gay Kennedy	Energy and Resource Development Secretariat, GNWT
Tom Kovacs	Parks Canada, DOE
Tim Lash	Canadian Wildlife Service, DOE
Mike Lawrence	Arctic Affairs Office, DFO
Gerry O. Lee	Lands Directorate, DOE
Sandy Lewis	Corporate Planning Group, DOE
John Loch	DFO
Ian MacNeil	Parks Canada, DOE
Jo MacQuarrie	Northwest Territories Water Board

Lorne Matthews	Energy and Resource Development Secretariat, GNWT
Jim Maxwell	Lands Directorate, DOE
A. A. Menard	Town Planning and Lands Division, Department of Local Government, GNWT
Heather Meyers	Environmental Protection Services, DOE
David Moll	Economic Planning and Analysis, DOE
Claude Mondor	Parks Canada, DOE
David Morris	Planning and Priorities Secretariat, GNWT
Paul Nind	Association of Municipalities, N.W.T.
Rod Patterson	Marine Habitat Division, DFO
Arthur Redshaw	Renewable Resources, DIAND
Igal Roth	Town Planning and Lands Division, Department of Local Government, GNWT
Maurice Ruel	Environmental Protection, COGLA
Norman Simmons	Department of Renewable Resources, GNWT
Ian Sneddon	Northern Environment, DIAND
Greg Thompson	Inuit Tapirisat of Canada
Robert Weir	Environmental Protection Services, DOE
Ed Wicken	Ecological Land Evaluation, DOE
Erik Val	Canada Benefits, COGLA
Alan Vaughan	Parks Division, Department of Economic Development and Tourism, GNWT
Graham Yapp	Lands Directorate, DOE

Appendix C
Management Assessment Model (revised)

Other	Industry	New Agency	Commission	Committee	International	Federal	Provincial	Local	Government or Management Level or Type	
									Lead Agency	AGENCY
									Participating Agency	
									Strategic Planning	PLANNING
									Forecasting	
									Inventory (Biophysical & Social)	
									Land Classification	
									Especially Significant Areas	
									Evaluation	
									Design	
									Negotiated Development	IMPLEMENTATION
									Pre-Hearing	
									Hearing	Approval
									Formal Case Record	
									Permit Order with Conditions	
									Appeals	
									Final Decision	
									Surveillance & Inspection	Construction and Operation
									Monitoring	
									Enforcement	
									Modification	
									Research	GENERAL GUIDES OR CHARACTERISTICS
									Government	Co-ordination
									Industry	
									Public	
									Inter-group	
									Economic Incentives	
									Information Access	
									Management Process Monitoring	
										COMMENTS

Appendix D

Extract from the United Nations List of National Parks and Protected Areas

Categories for Conservation Management

The maintenance and development of the human habitat requires that some areas be retained in their wild state. The flow of streams, the maintenance of genetic materials, the protection of scenic and aesthetic areas and the opportunity to enjoy and appreciate natural heritage, can all benefit from the conservation of natural areas. Indeed, some benefits can only be received through establishment and maintenance of natural reserves.

Other human needs from natural resources include wood and wood products, wild animal products and protein, grazing from natural grasslands, and water for agriculture, industry, domestic use, and for energy which can be produced on a sustained yield basis.

Logically, some benefits can be received from natural areas or wildlands in perpetuity if management is properly designed and implemented. However, there are types of benefits which compete [with] one another, that is, they are incompatible. It is, for example, physically and biologically difficult to remove wood products and study natural ecosystems in the same area; but the preservation of a sample ecosystem can be done together with research and monitoring, if appropriately designed and controlled.

Management categories, each of which addresses a compatible set of benefits, can be designed and implemented. In a particular category, the pursuit of any one benefit does not compete with or rule out the possibility of

receiving the other benefits of the group. Commonly known categories include the national park, wildlife sanctuary and forest reserve.

In many cases exceptions develop where, even among generally compatible activities, conflicts arise during particular seasons, such as during nesting or calving periods, or at specific sites such as in critical habitats. These types of conflicts can be treated normally through application of the management practice known as zoning.

Each benefit is related to specific objectives of management, such as the maintenance of sample areas of major biotic formations and physiographic features in a natural state, the protection of rare or endangered species or habitats, the conservation of outstanding landscapes or natural features of aesthetic value, and the conservation of areas where renewable resources can be harvested and utilized on a sustained yield basis. The objectives of each category are oriented towards scientific, educational, recreational and touristic activities. Ideally all objectives and activities are related to environmental protection and to economic and social development.

Areas which have been selected and are under management to meet specified compatible conservation objectives can be considered to be conservation or protected areas. They can be described and classified according to the objectives for which they are being managed. In contrast, however, the means required to meet the objectives of conservation will depend upon each particular situation and will vary with cultural, institutional, political and economic considerations.

Conservation categories which focus upon environmental protection and economic and social development provide the basis for clearly incorporating conservation into development ("eco-development"). Each relates to one or more of the major goals of a nation's development plan: nutrition, education, housing, water, science and technology, defence, and national identity. Viewed in this way, conservation categories become means for sustained development.

Conservation objectives have been grouped by IUCN ([in] 1978) into several categories which are commonly found in existence around the world. The delineation of these categories is not new, nor is it meant to be final; exceptions will occur and alternative concepts will no doubt arise. What is significant is that the IUCN scheme is designed by systematic analysis.

Taken together, these 10 categories can ideally be administered as a unified national system of conservation areas. In practice, the categories are generally divided among various divisions of central and provincial government. In exceptional cases, some of the categories are administered by private or corporate institutions. International categories - the Biosphere Reserve and the World Heritage site - will often require cooperative administration among several institutions. What is relevant, however, is that the institutions responsible for the individual categories are empowered to provide for the appropriate management of the resources and are representative of the significance which the nation wishes to give to the categories.

The 10 categories necessary to manage the natural resources of any nation can be divided into three groups:

A. Those categories for which the CNPPA [Commission on National Parks and Protected Areas] takes responsibility to monitor the status of each conservation area and to provide technical advice as requested. These include:

I Scientific Reserves/Strict Nature Reserves
II National Parks/Provincial Parks
III Natural Monuments/Natural Landmarks
IV Nature Conservation Reserves/Managed Nature Reserves/Wildlife Sanctuaries
V Protected Landscapes

B. Those categories which are of particular importance to IUCN as a whole and are generally found in most nations, but would not be considered exclusively within the scope of CNPPA. However, CNPPA may wish to monitor and provide expertise on those areas which are of particular importance to nature conservation. These include:

VI Resource Reserves
VII Anthropological Reserves/Natural Biotic Areas
VIII Multiple Use Management Areas/Managed Resource Areas

C. Those categories which form part of international programmed and which have specific relevance for nature conservation yet may, in many cases, already receive protection under a previous category. CNPPA may be called upon to monitor these categories and to provide special expertise in cooperation with other institutions with which IUCN has consultative status. These categories include:

IX Biosphere Reserves
X World Heritage Sites (Natural).

GROUP A - Areas of particular interest to CNPPA

Category I - Scientific Reserves/Strict Nature Reserves

These areas possess some outstanding ecosystems, features and/or species of flora and fauna of national scientific importance. The sites are generally closed to public access, recreation and tourism. They often contain fragile ecosystems or life forms, areas of important biological or geological diversity, or are of particular importance to the conservation of genetic resources. Size is determined by the area required to ensure the integrity of the area to accomplish the scientific management objective and provide for its protection.

Natural processes are allowed to take place in the absence of any direct human interference. These processes may include natural acts that alter the ecological system or physiographic feature at any given time, such as naturally occurring fires, natural succession, insect or disease outbreaks, storms, earthquakes and the like, but necessarily exclude man-made disturbances. The educational function of the site is to serve as a resource for studying and obtaining scientific knowledge.

Land-use control and ownership should in most cases be by central government. Exceptions may be made where adequate 'safeguards and controls relating to long-term protection is ensured and where the central government concurs.

Category II - National Parks/Provincial Parks

The criteria for the selection of national parks for the List are the same as the criteria used in 1975 with the exception of "effective protection". At its meeting in February 1978, in Portugal, the Commission decided to delete the financial and staff criteria for effective protection. . . .

Definition of National Park

The 10th General Assembly of IUCN, held in New Delhi in November 1969 approved a definition of the term "national park" in accordance with the following resolution:

Considering the importance given by the United Nations to the national park concept, as a sensible use of natural resources, and considering the increasing use which has been made during these last few years in some countries of the term "national park" to designate areas with increasingly different status and objectives [, t]he 10th General Assembly of IUCN meeting in New Delhi in November 1969 recommends that all governments agree to reserve the term "national park" to areas answering the following characteristics and to ensure that their local authorities and private organizations wishing to set aside nature reserves do the same:

A national park is a relatively large area where:

1. one or several ecosystems are not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educative and recreative interest or which contains a natural landscape of great beauty;

2. the highest competent authority of the country has taken steps to prevent or eliminate as soon as possible exploitation or occupation in the whole area and to enforce effectively the respect of ecological, geomorphological or aesthetic features which have led to its establishment; and

3. visitors are allowed to enter, under special conditions, for inspirational, educative, cultural and recreative purposes.

Governments are accordingly requested not to designate as "national park":

1. A scientific reserve which can be entered only by special permission (strict nature reserve).

2. A natural reserve managed by a private institution or a lower authority without some type of recognition and control by the highest competent authority of the country.

3. A "special reserve" as defined in the African Convention on the Conservation of Nature and Natural Resources of 1968 (fauna or flora reserve, game reserve, bird sanctuary, geological or forest reserve, etc.).

4. An inhabited and exploited area where landscape planning and measures taken for the

development of tourism have led to the setting up of "recreation areas" where industrialization and urbanization are controlled and where public outdoor recreation takes priority over the conservation of ecosystems (pare naturel régional, nature park, Naturpark, etc.). Areas of this description which may have been established as "national parks" should be redesignated in due course.

This resolution was subsequently adopted by the Second World Conference on National Parks ([at] Yellowstone and Grand Teton National Parks, 1972).

Exploitation

In general, exploitation of natural resources must be prohibited in an area which is to be included in the List. Exploitation, in this sense, is considered to include the removal of mineral resources, timber and other vegetation, and animal life, or the development of dams or other structures for irrigation or hydroelectric power. Prohibition should extend to agricultural and pastoral activities, hunting, fishing, lumbering, mining, public works construction (transportation, communications, power, etc.), and residential, commercial or industrial occupation.

Certain exceptions to this general rule may be permitted:

1. Some of the activities included in the general prohibition must be permitted in those national parks and related reserves in which zones have been established to protect a cultural heritage (e.g. managed agricultural or pastoral landscape zones; villages, towns or urbanized areas of historical or archaeological interest, etc.), since these activities form part of the heritage to be protected.

2. Sport fishing is regarded in the same category as sport hunting and should normally be excluded from national parks and equivalent reserves. It must be totally excluded from strict natural areas or nature reserves. In wilderness areas the continuance of sport fishing, where this has been a traditional practice, will not be a basis for exclusion from the List, providing adequate fauna exist in other areas. Sport fishing may be accepted in zones developed for intensive recreational or touristic use.

It is recognized that within the boundaries of certain national parks there are existing villages, towns, communication networks, and the on-going activities connected with them (apart from those referred to under exception 1. above). Provided that these areas do not occupy a significant part of the land are *de facto* zoned and so arranged that they do not disturb the effective protection of the remaining area, they will not be considered as a basis for exclusion from the List.

Similar considerations apply in regard to private rights which existed before the reserve was created, such as residential rights or rights to practise agricultural, pastoral or mining activities, always provided that these rights are confined to a small part of the area. They should not be permanent and their redemption or termination should be anticipated in the long term.

The general requirement against exploitation must be rigidly enforced.

Management activities

Not to be considered under the category of exploitation are those activities necessary for the administration and management of the protected area, or for the reasonable development of a national park or provincial park as a site for public outdoor recreation or tourism. Amongst these activities are the following:

1. Since public access is allowed in areas in the List of National Parks and Equivalent Reserves, the construction and maintenance of a road network, the setting aside of areas for public accommodation with consequent cultivation of gardens and the construction of recreation facilities, and related services must be permitted. However, accommodation, recreation facilities and the like should not be scattered throughout the protected area, and the area they occupy should be restricted to a minimum. They should be located in areas zoned for this purpose or preferably located outside the reserve.

2. The public works necessary for the actual administration and management of the protected area, including staff housing, offices, access roads, gardens, and so on are permitted but should also be restricted to a minimum.

3. Management activities for the purpose of maintaining the desired flora or fauna are an essential ingredient in the conservation of protected areas in the managed

natural zones and nature reserves and are permitted in them. These may include the removal of animals by shooting or capturing to maintain population levels, the removal of undesirable vegetation, and the use of controlled burning or grazing to maintain particular plant communities.

Zoning

At the 11th General Assembly of IUCN at Banff it was agreed by the Commission that areas to be designated as national parks should include areas here designated as "strict natural zones", "managed natural zones", and "wilderness zones".

In addition it was agreed that they could appropriately contain areas of the kind here designated as "protected anthropological zones" or "protected historical" or "archaeological zones". To be considered as national parks, [h]owever, they must be available for public visitation. This use, it was agreed, could be combined with the primary function of nature conservation through a system of zoning. In this, one zone would be established in which roads or other access ways may be constructed, buildings or other structures to accommodate tourism and park administrative functions may be located, and in which appropriate recreational facilities may be placed. This special tourism/administrative zone would not be one designated primarily for nature conservation, but would be so delimited and located as to create minimum interference with the nature conservation function of the park. National parks can also satisfy the public visitation function by establishment of wilderness areas over all or part of the national park, thus providing for limited tourism of a special kind.

To qualify as a national park, in the IUCN sense, an area may consist of various combinations of zones, as follows:

1. Wilderness zone only.
2. Wilderness zone combined with strict natural zone, managed natural zone or both.
3. Any or all of the above zones combined with a tourist/ administrative zone.
4. Any or all of the above zones combined with one or more zones classified as anthropological, archaeological or historical.

Category III -Natural Monuments/Natural Landmarks

This category normally contains one or several specific natural features of outstanding national significance such as a geological formation, a unique natural site, animal or plant species or habitat which, because of uniqueness or rarity, may be threatened and should be protected. The specific feature to be protected ideally has little or no evidence of man's activities. These features are not of the size nor is there a diversity of features or representative ecosystems which would justify the area's inclusion as a national park. These areas have particular potential for public education and appreciation. Size is not a significant factor; the area should only be large enough to protect the integrity of the site.

Although Category III areas may have recreational and touristic value, they should be managed in such a way that they remain relatively free from human disturbance. These areas may be owned and managed by either central or other government agencies or non-profit trusts or corporations, as long as there is assurance that they will be managed to protect their inherent features for the long term.

Category IV - Nature Conservation Reserves/Managed Nature Reserves/Wildlife Sanctuaries

A Category IV area is desirable when protection of specific sites or habitats is essential to the continued existence or well-being of individual biotic species, resident or migratory fauna of national or global significance.

Although a variety of (protected) areas fall within this category, each would have as its primary purpose the protection of nature, and not the production of harvestable, renewable resources, although this may play a role in the management of a particular area. The size of the area or, in certain instances, seasons in which special management is necessary, will be dependent upon the habitat requirement or specific characteristics of the species to be protected. These need not require vast areas but could be relatively small, consisting of nesting areas, marshes, or lakes, estuaries, forest, or grassland habitats.

The area may require habitat manipulation to provide optimum conditions for the species, vegetative community, or feature according to individual circumstances. For example, a Particular grassland or heath community may be protected and perpetuated through a limited amount of livestock grazing. A marsh for wintering waterfowl may require continual removal of excess reeds and supplementary planting of waterfowl food, whereas a reserve for an endangered

animal may need protection against predators. These areas may be developed in limited areas for public education and appreciation of the work of wildlife management.

Ownership may be by the central government or, with adequate safeguards and controls in which long-term protection is ensured, by lower levels of government, non-profit trusts *or* corporations, or private individuals or groups.

Category V -Protected Landscapes

The scope or character of areas that fall within this category are necessarily broad because of the wide variety of semi-natural and cultural landscapes that occur within various nations. This may be reflected in two types of areas: those whose landscapes possess special aesthetic qualities, which are a result of the interaction of man and land, and those that are primarily natural areas managed intensively by man for recreational and touristic uses.

In the first case, these landscapes may demonstrate certain cultural manifestations such as: customs, beliefs, social organization, or material traits as reflected in land-use patterns. These landscapes are characterized by either scenically attractive or aesthetically unique patterns of human settlement. Traditional land-use practices associated with agriculture, grazing, and fishing would be dominant. The size of the area would be large enough to ensure the integrity of the landscape pattern.

In the latter case, natural or scenic areas found along coastlines and lake shores, in hilly or mountainous terrain, along the shores of rivers, or inland, adjacent to important tourist highways or population centres, and offering scenic views and climatic variation, are often included. Many will have the physical qualities and potential to be developed for a variety of outdoor recreational uses with national significance.

In some cases the land would be privately held and the use of either central or delegated planning control would likely be necessary to assist in the perpetuation of both the land use and life style. Means of subsidization, or other government assistance, might be required for external renovations or construction to disguise improvements in the standard of living while recognizing the dynamics of evolution of the land and its use. Efforts would be made to maintain the quality of landscape through appropriate management practices. In other instances the areas are established and managed under public ownership in perpetuity.

GROUP B - Areas of interest to IUCN in general

Category VI -Resource Reserves (Interim Conservation Unit)

Category VI areas will normally comprise extensive and relatively isolated and uninhabited areas having difficult access, or regions that are lightly populated yet may be under considerable pressure for colonization and greater utilization. In many cases, there has been little study or evaluation of these areas, and the consequence of converting these lands to agriculture, mineral or timber extraction, or the construction of roads, etc. is unclear. Similarly, use of the resources may not be appropriate because of the lack of technology, human or financial resource restrictions or alternate national priorities. Consequently, natural, social, and economic values are not sufficiently identified to permit the area to be managed for specific objectives or to justify its conversion to other land uses. Restricted access is implied so areas will normally require control, depending upon the pressures to enter and utilize the area. Some lands may be government-owned while others may be owned or administered by public corporations.

Maintenance of existing conditions to allow for studies as to the potential use for the designated areas is a prerequisite. Protection, studies, and planning are envisaged as the major activities while under this short-term designation. No exploitation should occur, with the exception of use of resources by indigenous inhabitants. There is an acceptance of ongoing eco-sensitive activities.

Category VII -Anthropological Reserves/Natural Biotic Areas

Category VII areas are characterized by natural areas where the influence or technology of modern man has not significantly interfered with or been absorbed by the traditional ways of life of the inhabitants. These areas may be remote and isolated and their inaccessibility may be maintained for a considerable period of time. The societies are considered relatively unique and may be of particular significance to the maintenance of genetic diversity and/or for research as to the evolution of man. These are predominantly natural areas of which man is an integral component. There is a strong dependence of man upon the natural environment for food, shelter, and other basic material to sustain life. Extensive cultivation or other major modifications to the vegetation and animal life are not permitted.

Management is oriented toward the maintenance of habitat for traditional societies so as to provide for their continuance within their own cultural mores.

Category VIII -Multiple Use Management Areas/Managed Resource Areas

A large area, containing considerable territory suitable for production of wood products, water, pasture, wildlife, and outdoor recreation. Parts of the area may be settled and may have been altered by man. Generally, these forest or other wildland areas do not possess nationally unique or exceptional natural features.

Planning to ensure the area is managed on a sustained yield basis would be a prerequisite. Land ownership would be under government control. Through proper zoning, significant areas could be given specific additional protection. For instance, the establishment of wilderness-type areas is consistent with the purpose of these areas as would be setting aside nature reserves. Multiple use, in the context of Category VIII, is considered to be the management of all renewable surface resources, utilized in some combination to meet best the needs of the country. The major premise in the management of these lands is that they will be managed to maintain the overall productivity of land and its resources in perpetuity.

GROUP C - Internationally Recognized Affiliated Designations

Category IX -Biosphere Reserves

Each biosphere reserve will include one or more of the following:

(a) representative examples of natural biomes;
(b) unique communities or areas with unusual natural features of exceptional interest;
(c) examples of harmonious landscapes resulting from traditional patterns of land use; and
(d) examples of modified or degraded ecosystems capable of being restored to more natural conditions.

A biosphere reserve must have adequate long-term legal protection. Each biosphere reserve will be large enough to be an effective conservation unit, and to accommodate different uses without conflict. Each reserve must be approved by the Man and the Biosphere International Coordinating Council before it can receive designation as a biosphere reserve.

Each biosphere reserve will be zoned to provide direction as to its management. Four zones may be delineated as follows:

(a) Natural or Core Zone;
(b) Manipulative or Buffer Zone;
(c) Reclamation or Restoration Zone; and
(d) Stable Cultural Zone.

Category X -World Heritage Sites (Natural)

The World Heritage List is intended to include only areas of "outstanding universal value". In this respect each nation will not necessarily have a World Heritage site. Sites can only be nominated by a country which is a Party to the World Heritage Convention. The secretariat of the World Heritage Convention is provided by Unesco. Nominated sites are screened by IUCN in relation to the criteria established by the World Heritage Committee.

Criteria for the inclusion of natural properties in the World Heritage List as established by the World Heritage Committee:

Outstanding universal value will be recognized when a natural heritage property - as defined in Article 2 of the Convention - submitted for inclusion in the World Heritage List, is found to meet one or more of the following criteria. Therefore, properties nominated should meet the following (abridged) criteria:

(i) be outstanding examples of representing the major stages of the earth's evolutionary history;

(ii) be outstanding examples representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment;

(iii) contain unique, rare or superlative natural phenomena, formations or features or areas of exceptional natural beauty;

(iv) be habitats where populations of rare or endangered species of plants and animals still survive. Nominations based solely on this criterion must ensure that critical elements of a species habitat are considered throughout the range required for survival of the species.

It should be realized that individual sites may not possess the most spectacular or outstanding single example of the above, but when the sites are viewed in a broader perspective with a complex of many surrounding features of significance, the entire area may qualify to demonstrate an array of features of global significance.

All areas must also meet the criteria of "integrity".

Areas which are designated Biosphere Reserves and/or World Heritage Sites which are also national parks, reserves etc. are listed under both headings.

(Extract from Commission on National Parks and Protected Areas, 1982, pp. 11-29).

Appendix E

Extract from Preserving Our Natural Heritage

65.1 Introduction

Arguably the most significant single means for protecting natural areas by state government is the comprehensive natural area system. Less than half of the 50 states have such systems at present, and the systems differ considerably from state to state. The key point for the present study in determining whether a state has such a system is whether the natural areas of more than a single agency may be included. The system may be administered by one agency, but if it registers or dedicates natural areas on the lands of more than one agency or on the lands of one or more agencies and the private sector, then it is a comprehensive natural area system. Naturally, if all state and private land in the state is eligible for inclusion, either on a registry of natural areas or in some more formal system of legal dedication, a truly comprehensive system exists.

The significance of such a system lies in two facts: (1) that it recognizes the importance of protecting a broad spectrum of natural areas; and (2) that it is capable of protecting a broader spectrum than is a single agency. Any single agency program, as the concept is used here (although it may recognize the importance of protecting natural areas), is confined, with few exceptions, to protecting areas within a relatively narrow range - for example, forest types. It may be that all the resource agencies in a particular state have their own programs, so that in fact the full spectrum is represented; but this would be done by chance.

65.2 A model system

Legislation creating a comprehensive natural areas system typically begins with a declaration of findings or policy and a statement of goals. The findings are generally to the effect that because of the growth of the population and the development of the economy of the state, it is necessary and desirable that portions of the state's natural diversity be set aside as natural areas for the benefit of present and future generations before they have been destroyed. The thought is often added that such areas are irreplaceable as laboratories for scientific research, as beneficial reservoirs of natural materials not all of the uses of which are now known, as habitats for rare and vanishing species, and as living museums where people may observe natural biotic and environmental systems. The goals of the system may include setting aside natural areas:

(1) for research in such fields as agriculture, conservation, ecology, forestry, genetics, geology, history, paleontology, pharmacology, soil science, taxonomy and similar fields;

(2) for the teaching of biology, conservation, ecology, geology, natural history and other subjects;

(3) as habitats or places for maintaining plant and animal species and communities and other natural objects;

(4) as reservoirs of natural materials;

(5) as places of natural interest and beauty and as places for recreation;

(6) for visitation whereby persons may observe, value, and enjoy natural and cultural processes or events;

(7) as benchmarks against which to measure such processes or events and against which to measure environmental degradation;

(8) to promote understanding and appreciation of the aesthetic and scientific values of such areas by the people of the state.

Definitions of key terms are included. The definitions of administrative terms will vary depending on how the state is organized, but a typical list might be as follows:

(1) "Commission" means the Natural Resources Commission.

(2) “Department” means the Department of Natural Resources.

(3) “Board” means the Natural Areas Advisory Board.

(4) “Natural Area” means an area of land or water or combinations of land and water generally but not necessarily large in size, in public or private ownership, that contains relatively undisturbed ecosystems, land forms, threatened, endangered, or unique plant or animal habitats, or any other area of unusual or outstanding scientific, educational, or aesthetic interest.

(5) “Nature Preserve” means a natural area which is formally dedicated under the dedication provisions of this Act.

(6) “Dedicate” means to transfer to the commission, for and on behalf of the state, any estate, interest or right in an area in a manner permitted in the dedication section of this Act.

(7) “Articles of Dedication” means the writing by which any estate, interest, or right is formally dedicated or permitted under this Act.

(8) “Register” means to execute a written agreement between the commission and the owner of an area for the purposes and in the manner permitted in the registration section of this Act.

(9) “Recognition” means the official recognition by the board of an area as a priority area in connection with the policies, goals, and purposes for which the natural area program has been created.

(10) “Critical Areas List” means a list of those areas recommended by the board and approved by the board and approved by the commission that are of critical importance to the goals and purposes of this Act and are therefore eligible to be included in the Nature Preserves System.

The Act, as can be inferred from the definitions, generally vests primary authority in the commission which oversees a department of natural resources (or a large land-holding agency should there be no unified natural resources department). The commission’s executive director is appointed by the department, and other staff members are provided by the department. The commission is empowered, in addition, to oversee the general duties of a natural

resources department, to conduct and maintain inventories of the state for natural area program purposes; to select areas for dedication or acquisition; to select areas for recognition and registration; and to manage or provide for the management of nature preserves. This last power includes not only the issuance of appropriate rules and regulations but the power to assign to an agency, with its consent, the management duties for a particular reserve.

Advisory board members generally serve without compensation and contain a significant portion of scientists expert in ecology. The function of the board is to recommend from the inventories prime candidates for preserves and to advise on the creation of rules and regulations and other activities of the commission. Generally, the commission reviews board-recommended areas and areas so approved are entered on the registry of critical areas list. The department then contacts the owners of listed areas (who may be public agencies or private citizens) explaining the program and inviting them to enter into an agreement that results in the dedication of areas as nature preserves. Such agreement may result in, but is not limited to, the purchase of the area by the state.

A nature preserve is formally established when articles of dedication for the preserve have been filed in the office of the county recorder (or recorders) of the county (or counties) in which the preserve is located. Articles of dedication are executed by the owner of the land and accepted by the commission. Articles have the same effect as a conveyance of an interest in land. The articles are invalid unless they adequately restrict, openly or by reference to commission rules and regulations, the use of the preserve for natural area purposes. Articles may thus contain provisions for the management, custody, and transfer of a preserve, provisions defining the respective rights of the owner and the operating agencies in cases where they are different persons or entities, and such other provisions as may be necessary or advisable.

Registration of areas on the critical areas list is another process in which the board, the commission, and the landowner participate. The commission refers the critical areas list to the department for action. The department contacts the area's owner explaining the program and inviting an application for registration. The area becomes officially registered when an appropriate agreement has been signed by the owner and the commission. The owner is given a plaque and a certificate acknowledging the inclusion of the site in the system. The owner is committed to manage the site under the terms of the agreement and to maintain specified natural area values of the site. The agreement

may be terminated at any time usually upon 30 days notification by either party involved, an act which removes the site from the official registry.

A comprehensive natural areas system includes legal protections for the areas in the system. A typical protective provision begins by declaring that preserves are held in trust for present and future generations. Specifically:

> *Nature Preserves are hereby declared put to their highest, best, and most important use for the public benefit. Unless the articles of dedication otherwise provide, preserves shall not be alienated, or altered, or licensed, or taken by any agency or person; nor shall the articles of dedicate be changed, except for another public use and: (1) after a finding by the commission of an imperative and unavoidable public necessity and (2) after approval by the Governor. Before these two conditions may be met, however, the commission shall give notice of the proposed action in the major newspaper read in the county or counties in which the the preserve is located and shall hold thereafter a prompt and convenient public hearing or hearings in said county or counties at which all persons aggrieved or likely to be aggrieved shall have an opportunity to be heard.*

Judicial review is often provided for. Planning agencies are often mandated to take preserves into account in their decisions. Officials are often empowered to enforce preserve agreements and management regulations.

65.3 Existing systems: number and size

There are 25 states which, as of July 4, 1976, have natural area systems sufficiently close to this model system to be described as comprehensive natural area systems. The degree of conformity varies substantially, and there may be debate over whether one or two particular states should be included. Another qualifying factor is that some of the systems are of very recent origin and as yet contain no land; if one eliminates these, only 19 states would be included.

This is not a large number, but what is far more surprising is the small number of units in existing systems and the tiny total acreage protected by them. The number of units is about 436 and the total acreage is 181,580. (The United States contains over two billion acres.)

The following table lists those states which have systems that recognize or protect the natural areas in the control of (1) all owners of property within the state; (2) two or more agencies of state government; or (3) a single agency plus private or other landowners (units and acres per state are also given):

State	Units/Acreage
Arizona	0/0
Arkansas	1/40
Connecticut	7/2,270
Georgia	3/6,499
Hawaii	2/2,692
Illinois	60/15,465
Indiana	41/6,530
Iowa	27/2,326
Kansas	2/1,818
Kentucky	0/0
Maine	24/575
Michigan	12/45,000
Minnesota	5/1,594
Missouri	48/5,636
Montana	0/0
New Jersey	13/4,066
New York	1/1
North Carolina	(undetermined)
North Dakota	0/0
Ohio	28/6,167
Oregon	0/0
South Carolina	2/3,000
Tennessee	26/59,604
Washington	4/297
Wisconsin	130/18,000
TOTAL	436/181,580

(Florida is a special case. Because of the adverse impact of uncontrolled development, and for other reasons, it has established a regulatory scheme for certain areas which can be said to afford a measure of protection for some natural areas, including the Big Cypress Swamp, which contains over 85,000 acres. The nature of this regulatory scheme, however, is sufficiently different from the model comprehensive natural areas system described above that it is best not included in the tabulation here . . . .

65.4 Existing systems: degree of conformity to model

The varying degrees to which the systems listed above conform to the model system outlined in 60.2 must be appreciated if a fair picture of the use of comprehensive natural area systems is to be given. In general, probably none of the existing systems can meaningfully be said to match the model, point for point. Individual systems provide good examples of some of the particular elements, but variation from the model to some degree is present in all cases.

The chapters on each of the states in the table above must be consulted for the full picture of the variety which obtains existing systems. Here it is possible only to give some examples which will suggest the extent of this variety.

An example of a system which corresponds fairly closely to the model is the one in Illinois. Under the Illinois Nature Preserves Act, the Department of Conservation is authorized, subject to approval of the Nature Preserves Commission and the governor, to acquire, hold and manage real property within *or* outside the system of nature preserves. Acquisitions may be by gift, purchase, exchange, dedication or condemnation. The Department is further empowered to issue management regulations for nature preserves and to enforce them. The approval of the nine-member Commission (which serves without compensation) is needed before preserves can be acquired or disposed of. The Commission also has the duty of maintaining registries and records of nature preserves and other areas of educational or scientific values and of habitats for rare and endangered species of plants and animals.

The stated goals of the Illinois Nature Preserve System are to designate and set aside certain areas for preservation and protection and (1) for scientific research and for the teaching of natural history, conservation, and other subjects; (2) as habitats for rare and vanishing species; (3) as places of natural and historic interest and scenic beauty; and (4) as living illustrations of the state's original heritage.

An area approved by the governor and the Commission, whether in public or private ownership, becomes a nature preserve following its dedication by the administering agency or the private owner in a form approved by the Commission. The articles of dedication may contain restrictions (which may vary from one preserve to another) on the use of the area, define respective jurisdictions of the owner and the Department, and recognize reversionary rights. The law provides strong protection against the removal of or destruction of dedicated nature preserves:

areas, designated as nature preserves within the system are declared to be:

> *. . .put to their highest, best and most important use for public benefit and they shall be held in trust and shall not be subject to alienation except to another public use upon a finding by the Department of imperative public necessity and with the approval of the governor and the Illinois Nature Preserves Commission.*

The Illinois System contains 60 nature preserves containing a total of 15,465 acres.

At the opposite end of the spectrum from the system in Illinois stand the systems in states like Montana and Missouri. The systems in these states operate under substantial restrictions of one sort or another.

Missouri, for example, has a natural area system based solely (except as to management of areas) on administrative regulations issued to a department (the Department of Conservation) which includes only forestry and fish and wildlife divisions. The system is also limited in that it is at present confined to those lands owned or administered by the Department, although authority was given in July of 1976 to extend the system by permitting "designation" of land in other ownership. The Department can also lease land for inclusion in the system. At present, the natural area system consists of 48 areas totaling 5,636 acres. Thirty-one of these are on Department of Conservation lands; two are licensed from the U.S. Army Corps of Engineers; six are leased from the L-A-D Foundation; and ten are leased from The Nature Conservancy.

Montana has a system created by statute, **but the system** is confined almost exclusively to designating areas on state-owned land. Indeed, although purchases, gifts, and trades are permitted, the system was set up to work in the main through one state agency, the Board of State Land Commissioners, designating areas on land it already controls. (Legislative designations are required for other state-owned land to become part of the system.) Designated or acquired areas are protected from adverse use until the Legislature specifically authorizes condemnation or development. Unfortunately, a shadow has been cast on the system by the legal question of whether when school trust lands (given by the federal government upon statehood "for support of the common schools" and administered by the Board) are designated, compensation must be paid to the school trust fund. Partly as a result of this and partly because the Act is relatively new (1974), no areas have yet been designated and only one person works permanently (and only on a part-time basis) on the program.

It should be pointed out that it is possible for comprehensive natural area systems to prosper despite substantial restrictions. Wisconsin is often cited as an example. The Wisconsin Scientific Areas Preservation Council, established by statute in 1951, is restricted to an advisory role to the Department of Natural Resources. The Department, the state university system, the Department of Public Instruction, the Milwaukee Public Museum, and private colleges collectively are all represented on the n-member Council, which has a staff of two full-time persons. The original basic tasks of the Council were to: (1) determine the desirability of donated lands for preservation purposes; (2) recommend sites for federal designations; (3) recommend acquisition of scientific areas to the Department of Natural Resources and make determinations regarding the level of management and permitted uses on designated scientific areas; (4) maintain a published list of scientific areas available for research and educational purposes; and (5) cooperate with other agencies with similar or compatible interests. Little change has been made over the years in these basic tasks. Only recently have $50,000 and $100,000 been made available to the Council for acquisition, and this has resulted in only five sites containing 600 acres altogether; however, today the entire system consists of 130 scientific areas containing 18,000 acres. Sixty percent of the areas are on Department of Natural Resources land, and the remainder are on both public and private land.

The Wisconsin system works simply and effectively, but it relies more on moral force than legal obligation. Staff recommendations involving designation of Department of Natural Resources lands are channeled to the Scientific Areas Preservation Council from which they are forwarded to the Natural Resources Board (the policy arm of the Department of Natural Resources) for review and approval. Any new scientific area designation or the changing of an existing designation requires Natural Resources Board approval; however, designations on lands other than those of the Department need the approval of the Scientific Areas Preservation Council.

One other comprehensive natural area system should be mentioned here because it provides a good example of a system that works through one basic mechanism - a registry - to cover all the lands in the state.

The Maine Critical Areas Program of the State Planning Office was established by statute in 1974. The statute directs the State Planning Office to make a statewide inventory of the natural areas and to establish an official listing of these areas, to be called the Register of Critical Areas. “Critical areas” are defined as:

. ..areas containing or potentially containing plant and animal life or geological features worthy of preservation in their natural condition, or other natural features of significant, scenic, scientific, or historical value.

The statute also establishes an n-member Maine Critical Areas Advisory Board to advise and assist the Planning Office in creating the Register. Information on an area proposed for inclusion on the Register is presented to the Board of Planning Office. If the Board agrees the area should be registered, the landowner is notified and given 60 days to communicate his or her feelings about registration. At the end of that period, the Board reconsiders all information on the area and decides whether it should be registered. The area may be listed without the landowner's consent. Once an area is registered, the owner is asked to advise the Board of any proposed alterations to the area at least 60 days in advance of the start of alteration.

The program is not regulatory; it simply provides information on the significance an area. Of the 24 areas (totally 575 acres) which have been registered to date, approximately 70 percent are in private ownership. The Planning Office is working with these owners to develop formal management agreements or to encourage the donation of conservation easements. For the critical areas which are owned by the state, the information provided is expected to affect plans and decisions of state agencies acting under their own mandate. Administrative agreements are being developed with individual state agencies such as the Department of Transportation and the Bureau of Public Lands.

(Extract from Nature Conservancy, 1976, Vol. II, pp. 651-656.)

Appendix F

Summary and Guidelines: Human Ecological Considerations in Land Use Mapping

1. A description will be undertaken of land-use types and patterns present in the area. This description constitutes Level I of the cultural component of the ABC survey method.

2. Land-use description and mapping can be divided into two parts:

   a. Structural maps which are intended to show the form or morphology of a land-use type and are usually based on mapping of artifacts such as roads, trails, cabins, campsites, and dams, although leaseholds, zoning, and other less tangible arrangements can also be mapped and eventually described and interpreted.

   b. Functional maps which combine the spatial distributions of the land-use types into groupings of significance to planners and managers. The method used here is to delimit nodes and corridors where various land uses are concentrated, and hinterlands where more diffuse activities are the rule.

3. As a first step in preparing the structural and functional maps, a comprehensive list or record should be made of all known past and present land uses in the study area. This list can be compiled by review of the historic, current, and scientific literature on the general area and by interviews with knowledgeable persons. Tables or charts can be used to summarize the

land uses which could be mapped or described. Examples are the summary diagrams of Battin (1975) and Val (1981) .

4. A selection from the comprehensive land-use list can then be made of the key types to be described and delimited in detail on the structural and functional maps.

   a. The criteria for selecting the key land use types to be mapped at this first stage include:

      i. Historic persistence such that they are likely to be associated with artifacts considered worthy of protection;

      ii. Their current extent and intensity in the area, with intensity being judged through the number of people involved, level of technology, or similar factors;

      iii. Their actual or potential significance to local people for economic, lifestyle, or cultural reasons:

      iv. Their potential to generate land-use conflict;

      v. Their environmental effects;

      vi. The availability of data.

   b. The foregoing procedure can be repeated in a sequence of more detailed land-use descriptions which can be undertaken as funds, staff, and new information make such procedures advisable.

5. A consistent organization of the description of a land-use type is desirable in the text accompanying the maps. Any significant sub-types of the land use should be identified, for example, resident and non-resident hunting in the context of wildlife harvesting. Classification or grouping of land-use types is often rather difficult, for example, in the broad field of communications, but can be guided by many of the criteria and guidelines set forth below.

   a. The description of each selected land-use type should begin with an account of its historic development. Descriptions of changes in the nature or distribution of selected land uses should be succinct and based so far as possible on the data presented on the structural maps.

b. Other topics on which historic and current information should be presented for each selected land use include:

   i. Policies and institutional arrangements, for example, changes in land tenure systems, acts, regulations, and management agencies;

   ii. Perceptions, attitudes, and values, or ideologies, particularly those favouring or inhibiting land uses;

   iii. Technology;

   iv. Discussion of policies and institutional arrangements, perceptions, attitudes, values, and technology can be undertaken on an interest-group or actor basis. Describing the policies, ideologies, and technologies of hunters, miners, or other interest groups can reveal differences that are important to the understanding of conflicts and therefore to boundary delineation and to planning and management of national parks and related management units.

c. The socio-economic, biophysical, or overall environmental effects of each selected land use should be described as fully as resources and time permit. The identification and description of such effects is a difficult task which can involve lengthy study and field research. Such intensive work is not envisaged at this first-stage of mapping and description. Nor are funds likely to be available for it. Considerable first stage information on effects can be secured from:

   i. Historic descriptions or scientific work completed in the area or in similar environments in other areas;

   ii. Class environmental impact assessments or environmental-impact-assessment guidelines prepared by an agency or corporation for the land use in question;

   iii. Environmental impact statements undertaken for a land-use project of the type in question, preferably in the study area or a similar environment elsewhere;

iv. Various government or corporate planning reports, or the publications of conservation associations or other non-government groups;

v. Interviews with knowledgeable persons;

vi. Direct observation through field reconnaissance studies.

d. Proposed or official plans, or other plans or prognostications, should also be mapped and described as these indicate future potential conflicts, effects, and planning challenges. The guidelines considered in discussion of the organization of historic and current uses can be followed in the discussion of the future.

e. Chronological tables are useful means of summarizing data and reducing text length.

f. In all instances, the sources and weaknesses of the data should be noted and major research needs identified.

6. The next important step in the analysis is to group the land-use types delimited on the structural maps into process patterns which show where concentrations of activity are occurring that merit the special attention of planners and managers. Such concentrations influence the future character of very large surrounding areas. The scheme followed here to delimit such patterns is the mapping of nodes, corridors, and hinterlands.

a. Nodes are areas where land uses and infrastructure are concentrated.

b. Corridors are transportation and communications links which both facilitate and contain a number of other activities and effects.

c. Hinterlands are areas where concentrated patterns of overlapping activities are not typical. They are lower-level activity areas which are, nevertheless, related to the rest of the land-use system and often are quite important to the socio-economic and environmental character of a region.

d. A decision has to be taken as to the number of overlapping land-use types which define a node or corridor.

e. The number of land uses associated with each node or corridor can be mapped through varying degrees of

shading. Numerical values can also be used if the data and circumstances warrant such an approach.

f. The nature of land uses can be indicated by symbols adjacent to the node, corridor, or hinterland.

g. Extent can be estimated by averaging or interpolating the various land-use boundaries occurring at the edge of the node or corridor. The decision on extent may, in some cases, be rather arbitrary and should involve evaluation by a number of knowledgeable persons.

h. The width of a corridor can be indicative of the type of technology involved; for example, in a wildland area, the widest corridor might be utilized by a railway, the narrowest by bikers or walkers.

i. Annual- or seasonal-use variations of nodes and corridors can also be shown by using varying symbols.

j. Longer-term trends in the use of nodes and corridors can be shown on the maps. A node can be mapped as declining, developing, or consistent in terms of changes in such criteria as number of land uses, number of users, level of technology, and government policy. The direction of decline or development can be indicated as well.

7. The foregoing mapping and description of selected land-use types on structural and functional maps can set the stage for delineation of culturally significant areas as well as areas of conflict, tension, and compatibility as this is undertaken at Level II of the ABC resource-survey method. The first step here is to use the structural and functional maps to prepare: 1. a cultural significance map, and 2. a cultural constraints map.

a. Maps of cultural significance can be prepared through techniques similar to those used to delimit nodes and corridors.

At the level or scale of analysis characteristic of this study, available data are often sparse and of uneven quality so that firm boundary lines may be inappropriate. Tables can be prepared to summarize data and relevant characteristics.

b. Criteria are required to decide what historic, archaeological, or other themes, features, or artifacts are to be considered as culturally

significant. Preliminary studies of the human and environmental history of an area are necessary to identify likely events, themes, features, and artifacts. Care must be taken to ensure that the historic and cultural views of all major interest groups are considered in developing and applying the system. Criteria for determining cultural significance can be developed at a late stage in the process, although there is a risk that without general guidance at an early stage, events, themes, features, or artifacts may be neglected or ignored.

c. In the absence of a generally accepted and more detailed set of cultural-significance criteria, the following can be used:

   i. Historic: An area can be considered to be of historic importance if it is found, through literature research, field observations, or interviews with knowledgeable persons, to contain features or artifacts associated with an event, feature, or theme generally recognized as noteworthy for the period since the first entry of Caucasians into a study area. Where guidelines are lacking, these events, features, or artifacts cannot be ranked in terms of their importance for protection at this stage, and usually will simply be mapped and counted to delimit key areas;

   ii. Archaeological: Areas can be mapped as important on the following bases. They contain a number of known archaeological sites in close proximity, some of which have been judged by the Archaeological Survey of Canada, or a comparable body, to be of moderate-to-high significance. They are isolated sites judged by similar means to be significant. They are judged to have potential for containing significant sites;

   iii. Importance to Indigenous People: An area can be mapped for this reason if it has been considered, or is likely to be considered, as important by indigenous people for continuance of their cultural identity or traditional use of land. Delineation of such areas has been undertaken by indigenous groups as part of land claims or other activities. This data may not always be available, at least not on an official basis. While awaiting the availability of such data, guidance on the importance of areas to indigenous people can be

obtained from interviews and discussions, local writing, and documentation of concerns expressed at planning hearings. Air photos and field methods can also be used;

iv. Symbolic: This category refers to a natural or scenic feature considered to be of aesthetic or special value. The feature may be associated with music or the arts, or have some special geographic, geologic, or biophysical attribute such as size, uniqueness? orrarity.

e. Guidelines should be developed and decisions made on the educational, research, or recreational potential of each feature, artifact or area. Factors to be taken into account include:

i. Compatibility of new activities with traditional uses and values;

ii. Effects on abiotic and biotic resources;

iii. Ability of the feature, artifact, or site to withstand use;

iv. Access requirements and their impacts in the general area;

v. Costs, including opportunity costs;

vi. Educational and research potential based upon such criteria as uniqueness, rarity, or representativeness. International Biological Program (IBP) sites are of special interest because one of their purposes is to monitor the effects of various land uses. In this respect, they may be more appropriately included in a management type other than a national park; for example, a Canada Wildlife Area or an ecological site, if such is provided for in legislation or policy.

8. Areas of cultural constraint to various land-use activities can be mapped by employing a conflict-tension-compatability spectrum. Information for mapping conflict, tension, and compatibility can be obtained from the structural and functional maps. Conflict, tension, and compatibility areas can be defined in the following terms:

a. An area is included in the conflict category if it is characterized by the continuation of a historic and largely unmitigated conflict, by a new land use,

or by an increase in the intensity or extent of an existing use perceived to have adverse effects on other uses or the resources needed for them. Such effects may be direct (for example, control or destruction of wildlife habitat valued by trappers), or indirect (for example, increased access to a traditional fishing lake because of scenic road construction) . Possibilities for mitigating these effects through technology should be considered in judging degree of conflict. The track record of such institutional and technical arrangements should also be considered in deciding on prospects for mitigation. Where adverse direct and indirect effects are occurring, increasing, or likely, and mitigation procedures are judged inadequate, then a conflict area can be mapped. The degree of conflict and the effectiveness of mitigation measures may not be agreed upon by all parties. In such a case it is considered best to map a conflict if it is learned through literature, interviews, or similar means that at least one major group of users perceives a conflict.

b. The tension category can be applied to:

   i. Areas being evaluated for development which may have adverse effects on other uses or the resources or environment upon which these users are dependent;

   ii. Areas in which a decrease in the extent or intensity of a land use has created problems for other uses.

c. Compatability areas do not meet the criteria for either conflict or tension. Compatibility areas are characterized by relatively little change in land use and by lack of perception of conflict.

d. Delimitation of conflict, tension, and compatibility areas is difficult and rather arbitrary at the scale or level of analysis being pursued here. The participation of a team of knowledgeable persons in evaluation and interpretation is helpful in this respect. A major problem in delimiting the areas is lack of knowledge of the human ecology of the various land uses. Few detailed studies have been done and few relatively precise guidelines are available on such factors as the distance hunters and recreationists can be expected to travel off roads, and the effects they may have. Extent of conflict areas can be estimated by including areas of known disturbance, areas with related

infrastructure, and relevant claims, leases, or tenure arrangements. Actual conflict areas could vary considerably from those on the map. At this stage, however, the intent is to outline general areas of concern so that planners and managers can begin thinking about issues, further research and information requirements, and possible response measures, including boundary configurations and zoning arrangements.

9. At this point it is useful to summarize some of the major ways in which the foregoing methodology and resulting data can be used by planners and managers as well as interested citizens.

   a. The cultural data is important in its own right and can be related to the abiotic and biotic data acquired through the ABC resource survey (see Theberge and Nelson, 1983). In drawing relationships, important interactions can be revealed: for example, the location of a developing corridor near a biotically significant area or a planned hydroelectric facility near sites of archaeological value. Used in this way, the abiotic, biotic, and cultural maps can indicate areas of possible conflict and concern.

   b. When used as a bench mark or historic point of reference, the cultural data can be used to monitor the effectiveness of current policies and management systems. Control policies or practices applied to an emerging node or tension zone can be evaluated by mapping land-use changes and their effects during observation periods which could range in length from weeks to years. In this manner land tenure, zoning, enforcement, or other control systems can be assessed and adjusted by decision makers.

   c. By using observational methods like the foregoing, the effectiveness of management arrangements can be compared, perhaps for similar problems in separate regions, or perhaps across tenure boundaries. An example is to compare the effectiveness of arrangements for protection of caribou calving areas in national parks, Canada wildlife areas, or other management types located in the same general area.

   d. The foregoing commentary leads to the final planning and management use to be discussed here (for example, the applicability of the method to the delimitation of boundaries for national parks and related forms of land management). Indeed the method and the data can be used to delimit a co-

ordinated network of parks, wildlife areas, and institutional arrangements for management of a large environmentally significant area. The method can be used to provide for preservation of all aspects of environment in one part of this large area through creation of a national park, and for more selective protection of certain resources such as wildlife or water by creation of a Canada Wildlife Area or water reserve in another adjoining part of the large area. Obviously the method and the data can be used in similar fashion to delimit zones or special-use areas within a national park or related management unit.

10. A major objective of this study guide is to illustrate the application of the method to the delimitation of national parks in an environmentally significant area or ESA .

    a. To begin, a main boundary must be drawn around the core area of an ESA. Often the goals for this core involve strict protection of abiotic and biotic resources or preservation of a representative example of an ecosystem or natural region. The national park is the management approach frequently advocated under such circumstances.

        i. The first and fundamental guideline should be that the national park boundary will be drawn to accord as closely as possible with the ecological or biophysical principles and procedures outlined by Theberge elsewhere in this study (See Theberge and Nelson, 1983, Part I);

        ii. As it may not be possible to include all areas of ecological importance to the national park within the main boundary, discontinuous units, and interagency co-ordinating arrangements should be considered from the beginning;

        iii. In drawing the national park boundary, careful attention should be paid to the following land-use or cultural data:

            A. nodes,

            B. corridors,

            CO areas of cultural significance,

            D. tension and conflict zones;

iv. It is not possible to state categorically that all nodes and corridors should be excluded from the national park for several reasons. First, some access will be needed for recreation, tourist, scientific, and educational uses. Existing corridors and nodes may perform this function, to the possible benefit of current residents. Second, the corridors and nodes may contain calving or other significant areas best managed as part of the park. Third, the corridors and nodes may contain historic or other cultural features best managed as part of the park. Fourth, the growth of services in nodes and corridors may be better managed from a conservation standpoint by including them in the park. All of these factors, and the relationships among them, should be taken into account in the decision;

v. Special attention should be paid to nodes and corridors in which land use is increasing as well as to those specified for growth in municipal, regional, agency, or government plans. Special consideration is especially important where plans include a large number of uses, significantly more temporary or permanent residents or visitors, or technology likely to have a marked short- to long-term effect on abiotic, biotic, or culturally significant areas;

vi. At least one sample of all significant cultural themes should be included in the park. Special care should be taken to include as many important ecological sites as possible because of their value to all interest groups;

vii. Special attention should be given to including sites useful for understanding man's changing impacts on environment. Areas where it is possible to show the adverse effects of certain technologies and policies have high educational value;

viii. Very careful consideration should be given to leaving zones of increasing tension or conflict outside the national park boundary. Involving, as they often do, a number of competing land uses or large-scale, rapid, and controversial land-use changes, such areas are probably better managed under institutional arrangements that have fewer or more-specific conservation objectives than national parks. On the other

hand, where analysis reveals high abiotic, biotic, and cultural values near or within tension or conflict zones, it many be desirable to include the area within a national park;

ix. Land-use or cultural activities of indigenous people should be considered most carefully in delimiting boundaries. Relevant areas may occur in the hinterland, well away from corridors and nodes;

x. Park agreements could involve arranging for key historic sites to remain under native ownership or shared control. Leasing or contracts could be the basis for national park uses. In such circumstances, reliance on the biophysical principles set forth in the companion volume (see Theberge and Nelson, 1983, Part I) are of fundamental importance in drawing boundaries. If the ecological principles cannot be applied to key areas, regardless of ownership, then national park objectives cannot be achieved;

xi. In making boundary decisions, opportunities for rehabilitation and, possibly, for subsequent incorporation into the national park should be kept in mind. Certain types of lumbering could fall into this category, whereas hydro-electric projects or comparable developments are not likely to;

xii. Planning could include designating certain areas outside the boundary as part of the park. In other words, the boundary could be staggered or pebble-like in character.

b. In implementing the foregoing guidelines the ability to plan and carry out a co-ordinated inter-agency approach is obviously of critical importance. The possible effectiveness of staggered boundaries, or shared management arrangements, depends very much on good evidence that the institutional means exist to carry them out. An analysis of the available acts and agencies and their advantages and disadvantages for national park and environmentally-significant-area management should therefore be conducted at an early stage in planning for ESAS and national parks. Evaluation criteria like those in the University of Waterloo systems study of ESAS in the Yukon should be considered in making such assessments. For evaluating legislation, these criteria include: 1. agency; 2. purposes, goals, and objectives; 3. available ESA designations; 4. permitted and non-

permitted land uses; 5. tenure types; 6. management procedures, including planning, implementation, and enforcement; 7. monitoring and feedback; and 8. policy co-ordination. For evaluating agencies, the criteria include: 1. mandate; 2. goals; 3. ideology; 4. institutional character, for example, budget size or type and number of professional personnel; 5. the range of permitted activities; 6. institutional comprehensiveness, including links to various agencies, government levels, and interest groups; 7. land-access and control mechanisms, for example, opportunities for leasing, agreements, and non-fee simple arrangements; and 8. experience and image or track record.

(From Nelson, J.G., and B.H. Bastedo, 1983, pp. 215-232.)

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