

Environmentally Significant Areas (ESA) in the Northwest Territories, Canada: Their Role, Identification, Designation and Implementation

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THE ROLE OF ESA AND PROBLEMS WITH THEIR MANAGEMENT

In the Northwest Territories (NWT) during the past two decades many areas have been identified as having special ecologic, geomorphic, biologic, archaeological or other qualities. Examples include 122 International Biological Programme (IBP) areas, six to ten potential national parks, as well as proposed national wildlife areas (NWA) and territorial parks scattered throughout the more than three million square kilometres of land and water composing the territory. In spite of many proposals and recommendations, relatively little action has been taken to commit or designate areas for long term management appropriate to their special qualities. It is true that IBP areas have been flagged under the territorial land use regulations for zoning or other special treatment following proposals for seismic exploration, drilling, or other development. However, such seasonal or other zoning does not adequately cover the needs of many IBP or other special areas and is rather fragile, being based in practice and not in law. The establishment of national parks, territorial parks, or other more comprehensive, legally based management regimes for lands with special qualities has been uncommon. Thus only three national park reserves have been created in the NWT in approximately the last fifteen years, and these were established in the early 1970s.

Why should people be concerned about such slow action in regard to areas with special geologic, biologic, archaeological, or other qualities? Basically because these areas are the foci of natural and cultural features and processes - or functions - which are important to ecosystems, economies, and societies in surrounding and even very distant lands. Areas which are sites for calving of caribou, denning of grizzly bear, or nesting of ducks or other migratory waterfowl are important to the maintenance of animal populations moving over much larger regions, as well as for hunting and associated economic and social activities by northern and southern peoples. Areas which contain ancient tools or other artifacts of past technologies or ways of life are very meaningful in that they link us with our ancestors and are the basis for learning of our heritage.

As a result of such considerations we call these lands with special qualities, Environmentally Significant Areas, or ESA (Theberge, Nelson, Fenge, 1980). Others have termed them special places (DOE, 1982), conservation lands, or natural and cultural heritage areas. They are frequently key foci, nodes, or threads in the fabric of ecosystems, economies and societies. As such they have been of fundamental environmental importance for millenia and will continue to be so for centuries to come, unless their special qualities are damaged or destroyed by unwise development.

The proper identification, delimitation, and management of these lands therefore should be a first step in any comprehensive land use planning program in the NWT. Figure 1, *Balanced Land Use*, is an attempt to make this point in graphic form and to show how preservation, protection, multiple use, and extractive use are related to recreation, tourism, hunting, and other types of land use as well as to national parks, national wildlife areas, and other types of management (Bastedo, Nelson, Theberge, 1984). ESA are very much in line with the three basic objectives of the World Conservation Strategy 1) maintaining essential ecological processes; 2) preserving diversity; and 3) managing for continued resource productivity, or sustainable development. ESA perform a vital role in regard to all these processes.

Why have more NWT ESA not been delimited and designated for protection, use, and management in accord with their special qualities? For one thing their basic importance to ecosystems, economy, and society has not been sufficiently recognized, at least in the sense described above. Other obstacles in the NWT include the interest of native people, petroleum, mining, and other industrial enterprises, and federal and territorial government departments. Included in the government group are park, wildlife, or other agencies which sometimes compete for the same ESA. In other words many private and government groups are in competition or cannot agree upon use and tenure of ESA. In this context it is important to note that native groups have often been supportive of special management for ESA. A large part of the Yukon north slope recently became a national park as a result of the Inuvialuit land claim settlement.

Contributing to conflict and disagreement is uncertainty over the natural and cultural character and

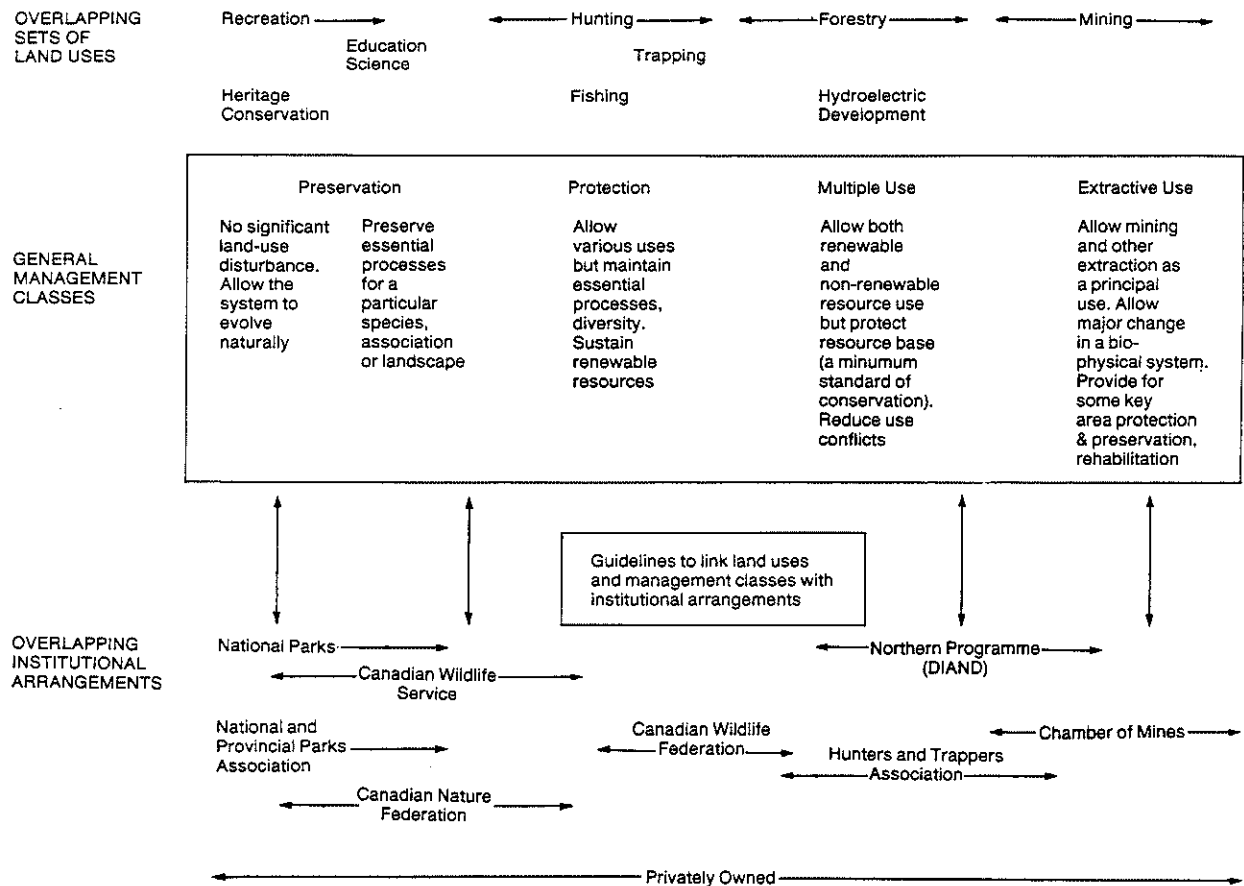


Figure 1 *Balanced Land Use*

significance of ESA. These areas have often been described by different people in different ways. A general idea of their special qualities is frequently all that is available. Also, information may be incomplete or not well organized in reports on various ESA.

In sum, as a result of obstacles like the foregoing, a "logjam" exists, with many ESA having been identified but few selected for appropriate long term protection, use and management.

In 1982, this "logjam" became a serious concern for many interested persons in government and the private sector. Department of Indian and Northern Affairs produced a working paper highlighting many of the problems (DIAND, 1982). A Whitehorse, Yukon workshop was subsequently held on conservation lands throughout the Canadian North. As a result a Task Force on Northern Conservation was established which reported in December, 1984 (Task Force on Northern Conservation, 1985). This task force strongly supported the formal designation and management of ESA and recommended that a Conservation Advisory Committee be formed to get co-operative work underway. The Task Force also proposed a system for describing candidate ESA and deciding upon appropriate forms of management. While this system is a useful one, it does not have some of the key elements needed

to break the "logjam" and permit allocation of ESA among different types of appropriate management and tenure.

The basic purpose of this paper is to present an ESA planning process that has the elements needed to begin progressive ESA planning and allocation. The planning process is applied to seven proposed ESA in a sample area, the eastern Beaufort Sea region (Figure 2). Only the northern part of the region was studied in detail from the abiotic, biotic, and cultural standpoints. The central and southern sections were studied from the abiotic and biotic standpoints but details are not included in this paper. The sample area was selected in association with a consultative committee of federal and territorial officials, organized by the Canadian Arctic Resources Committee which provided much of the funding and general support for this study (Nelson and Jessen, 1984).

THREE BASIC QUESTIONS

Key questions to be addressed in order to reduce conflict and gain support for ESA are:

1. how to identify and describe ESA in terms generally acceptable to all interest groups; important here is

the scientific validity of the concepts, terminology, or criteria to be used;

2. how to decide on management or institutional arrangements for ESA, i.e. the appropriate laws, agencies, and other processes to use in planning and managing each ESA; and
3. how to prioritize ESA so as to assist in allocating limited planning and management staff and funds and make steady progress in designating ESA.

these criteria vary in character and particularly in precision and consistency of meaning as this might be based on research and theory in the biophysical or human sciences. Threat, for example, is a rather vague term, whereas rarity or diversity, have more precise meaning, although this can vary scientifically. In a recent M.A. thesis Smith (1984) critically examined the meaning and general usefulness of all the terms shown in Table 1 and recommended that the eight shown in Table 2 be employed consistently in our study. The

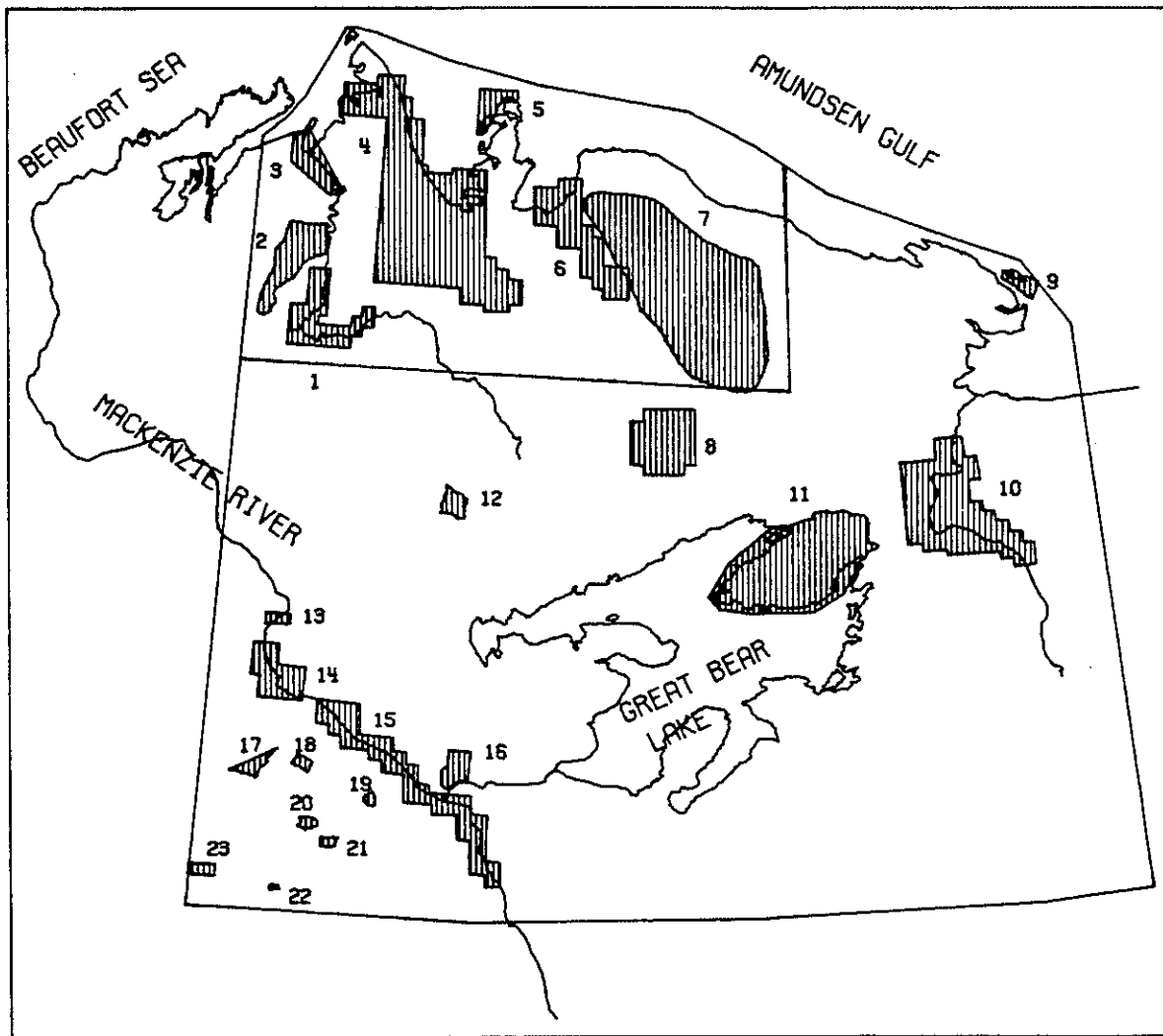


Figure 2 Environmentally Significant Areas in the Sample Area
Reference numbers refer to ESA names listed in Table 3.

HOW TO IDENTIFY AND DESCRIBE ESA IN GENERALLY ACCEPTABLE TERMS

Many concepts, terms or criteria, have been used in different parts of the world to identify and describe ESA (Table 1). These criteria have also been used as a basis for judging the significance of ESA relative to one another. Examination of Table 1 shows that many of

eight criteria were used to describe and evaluate the significance of proposed ESA and also as a basis for adjusting boundaries to include additional areas of high significance or exclude areas of low significance. Details on such matters are forthcoming in longer reports by Smith and Theberge, and Smith and Nelson (in preparation, 1985).

Table 1 *Criteria used to Evaluate Ecological Sites in 22 Selected Studies**

| Criterion | Number of Studies in which Criterion is used | Type of Criterion |
|---|--|--|
| Rarity, Uniqueness | 20 | Biotic, Abiotic |
| Diversity | 20 | Biotic, Abiotic |
| Size | 11 | Biotic, Abiotic, Planning and Management |
| Naturalness | 10 | Biotic, Abiotic |
| Representativeness, typicalness | 8 | Biotic, Abiotic |
| Fragility | 7 | Biotic, Abiotic |
| Importance to Wildlife, Abundance | 6 | Biotic |
| Threat | 6 | Planning and Management |
| Educational Value | 6 | Cultural |
| Recorded History/ Research Investment | 6 | Cultural |
| Scientific Value | 5 | Cultural |
| Recreational Value | 5 | Cultural |
| Level of Significance | 4 | Planning and Management |
| Consideration of Buffers and Boundaries | 4 | Planning and Management |
| Productivity | 3 | Biotic |
| Ecological/Geographical Location | 2 | Planning and Management |
| Accessibility | 2 | Planning and Management |
| Conservation Effectiveness | 2 | Planning and Management |
| Cultural Resources | 2 | Cultural |
| Shape | 2 | Planning and Management, Biotic? |

*Modified from Margules and Usher 1981

A summary of the application of these eight criteria in the eastern Beaufort area is shown in Table 3 and Figure 3. Comments are set forth below on how they and the cultural criteria in Table 3 were applied.

1. Our study did not involve any field visits or direct acquisition of new data on ESA. Rather, information on ESA in the eastern Beaufort was compiled from existing surveys by Parks Canada, IBP, and other sources. Our method therefore served as a mean of screening and ordering existing information.
2. To assess each ESA's importance for wildlife we considered only those species and habitats which can be effectively managed in ESAs, such as seabird nesting colonies and caribou calving areas. For each of these, an area's importance to a particular wildlife population was assessed through a review of existing information. This assessment was some-

Table 2 *Criteria for an Evaluation System for ESAs in the NWT*

| Criterion | Method of Evaluation |
|------------------------------|--|
| Importance for Wildlife | - the ESA is consistently used by a significant percentage of a wildlife population for a particular function |
| Rare Plant Species | - the ESA has a concentration of Rare Plant Species Types of Rarity: - Rare and Endemic - National - Territorial - Peripheral and Disjunct - National - Territorial |
| Rare Animal Species | - the ESA supports Rare Animal Species Types of Rarity: - Endangered and Threatened - Rare - National - Territorial - Peripheral and Disjunct - National - Territorial |
| Unusual Abiotic Features | - the ESA contains one or more significant unusual abiotic features |
| Abiotic Representativeness | - the ESA contains many representative abiotic features |
| Ecoregion Representativeness | - the ESA best represents the characteristics of an ecoregion |
| Diversity | - the ESA contains: - large numbers of Animal Species - large numbers of Plant Taxa - large numbers of Vegetation Communities - large numbers of Landforms |

times a quantitative process, for example the Horton ESA has supported up to 8% of the known nesting sites of the world's population of the tundrus peregrine falcon. In other cases the information is more qualitative.

3. The rarity of biota in ESAs must be assessed with reference to a standardized list of rare species. An existing list of rare plants for the continental NWT (Cody, 1979) was applied to eastern Beaufort ESA as was a working list of rare, threatened and endangered birds and mammals of the NWT developed by Smith (1984).
4. Unusual or rare abiotic features cannot be evaluated in such a concise manner as rare biota as no standardized list of such features seems possible. Evaluation must therefore be based on a review of existing literature on each type of feature. For

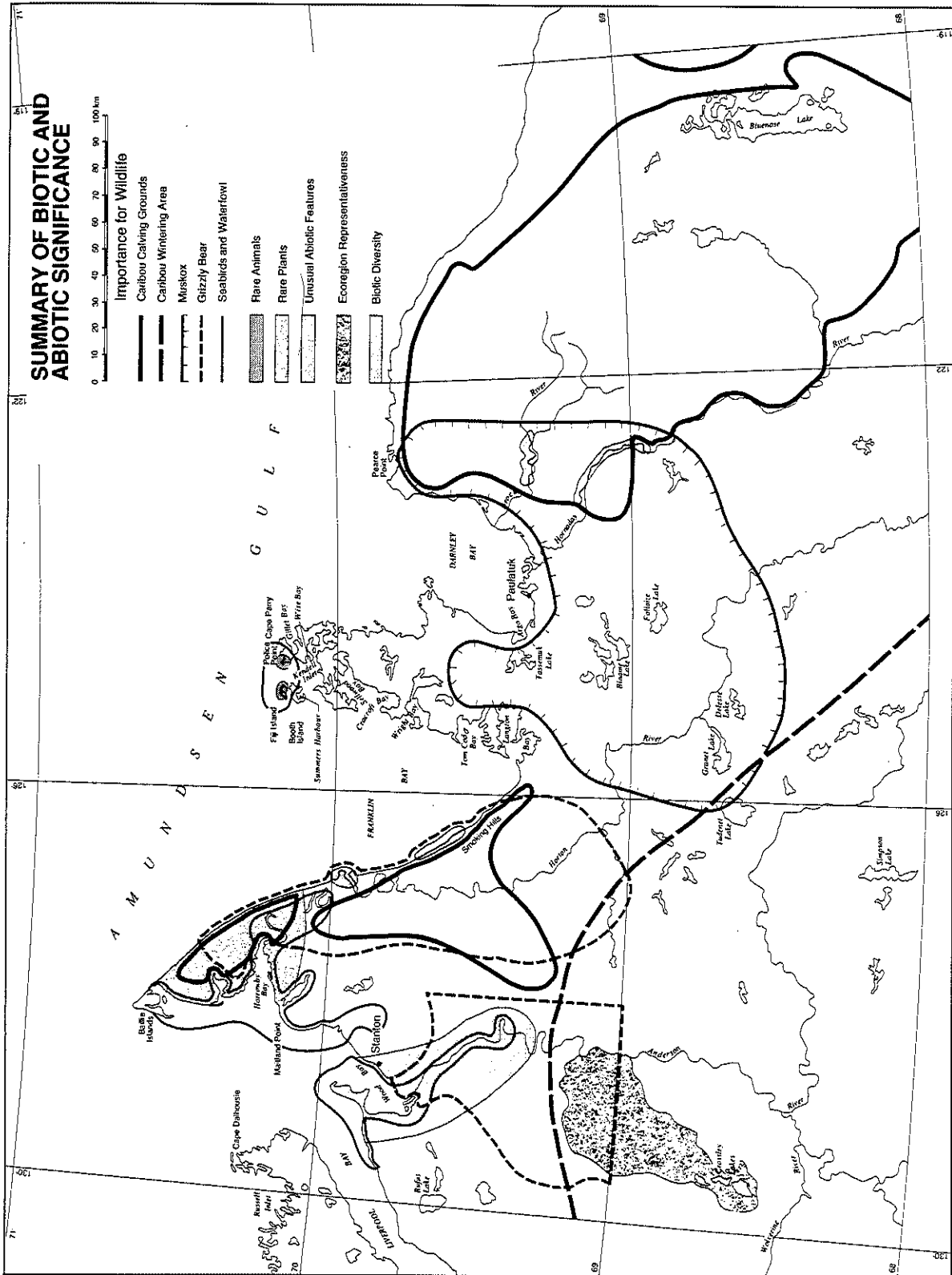


Figure 3 Summary of Biotic and Abiotic

Table 3 Summary of the Significance of the Seven ESAs

| Criterion | Upper Anderson 1* | Crossley Lakes 2 | Anderson River 3 | Horton River 4 | Cape Parry 5 | Brock- Hornaday 6 | Bluenose Lake 7 |
|--|--|---------------------|---|--|--|---|---------------------------------------|
| Biotic and Abiotic Criteria | | | | | | | |
| Importance for Wildlife | Territorial Significance (Peregrine) | | National Significance (Snow Goose, Brant, White- fronted Goose) | National Significance (Caribou, Snow Goose, Peregrine) | National Significance (Thick-billed Murre, Common & King Eiders) | National Significance (Peregrine) | National Significance (Caribou) |
| Rare Animal Species | National Significance | | Territorial Significance (Barrenground Grizzly) | Territorial Significance (Barrenground Grizzly) | Territorial Significance (Black Guillemot) | | |
| Rare Plant Species | | | National Significance | National Significance | National Significance | National Significance | |
| Unusual Abiotic Features | | | | High | | | |
| Abiotic Representativeness | | | | National Significance | | National Significance | |
| Ecoregion Representativeness | | High | | | | | |
| Biotic Diversity | | | High | | | | |
| Cultural Criteria | | | | | | | |
| Symbolic Importance | | | | High | | High | |
| Historic and Archaeological Importance | Potential | | Potential | Potential | Potential | | |
| Importance to Native People | | | | High | High | High | |

*Reference numbers refer to locations on Figure 2.

- example there are no other canyons in the NWT like the Brock and Hornaday which are carved out of Cretaceous substrate into castellated pinnacles and other unusual erosional landforms.
- Assessing an ESA's abiotic representativeness requires reference to a classification of representative abiotic features and a review of their occurrence throughout the NWT. No such classification has been prepared, but a general review of the literature showed, for example, that the Horton ESA contains many representative abiotic features.
 - Selection of a series of ESAs that best represent NWT natural or ecoregions is a basis for conserving examples of the major landscapes of the territory. Evaluation of ecoregion representativeness depends on the mapping of ecoregions and a list of features which characterize each ecoregion. Using such a framework as described by Wiken (1982) the Crossley Lakes ESA was assessed as best representing the high sub-arctic ecoregion.
 - ESA with high diversity are assessed as those with a larger number of species, vegetation communities, or landforms than expected for their size or area. The expected diversity is estimated using regression techniques (Smith, 1984). This method revealed, for example, that the Anderson River ESA supports many more plant and animal species than expected for its size.
 - No attempt is made to blend assessments of each criterion in Table 2 into an index of overall significance because such an index would have little ecological meaning. Criteria such as rarity and diversity are, like "apples" and "oranges", qualitatively different and cannot be added or reduced to one quantity.
- The foregoing discussion does not refer to cultural information, which will be considered briefly now. First, note that no general set of cultural theories, concepts, terms or criteria has been developed for the NWT or the Canadian North. Thus we know that the Dorset, Thule, or other peoples have been present in the NWT in the past, as well as so-called European explorers, whalers, fur traders, missionaries, and other representatives of different types of human activity or cultural process. However, no serious attempt has been made to compile a detailed set of themes or concepts relating to these northern historic phases and assign importance to them in terms of rarity, their age, importance to native people, or other criteria. Therefore we have no strong basis for deciding on the relative significance of sites or places having artifacts or other remains of past human activities in the North.
- In assessing the information on archaeological, historic, or other sites possibly meriting ESA status we therefore developed a relatively simple three part framework: symbolic, historic and archaeological importance, and importance to native peoples (Hans Bastedo, 1983). Decisions (Table 3) on high, medium or

low importance of sites falling in these classes were made rather arbitrarily by consensus.

Although crude, the three criteria do generally organize the sites for planning. Work is needed however, to develop a more detailed set of criteria for assessing the cultural significance of various sites in the NWT. Without such a system it is impossible to make good judgements about which sites should be in ESA or should receive special treatment if land use proposals are made which threaten their quality.

Aside from being employed in identifying and describing areas significant enough to be included in ESA, cultural information is also useful in identifying land use conflicts which can affect the size, boundaries, and character of ESA, as well as management arrangements for surrounding lands. In mapping land use and associated cultural information, we used what has been termed the ABC resource survey method (Bastedo, Nelson, Theberge, 1984). This method was originally developed for use in describing and planning for individual ESA in the Yukon. The resulting information was employed in drawing individual ESA boundaries, identifying land use conflicts, and in other aspects of the establishment and management of Yukon ESA.

Although abiotic and biotic aspects of this method have not been used in describing and comparing the seven ESA within the eastern Beaufort Sea region, the cultural component of the method has been quite valuable at this systems level. The method reveals land use patterns which may affect the type of management appropriate to each ESA. It also provides information which can be employed to confirm or adjust general ESA boundaries recommended by the original sponsoring agency or group. More precise delimitation of boundaries should eventually be made on the basis of more detailed or large scale data at the local or individual ESA level. Under these circumstances the abiotic, biotic, and cultural components would all be employed in the same manner as in Yukon.

In the case of the eastern Beaufort, in accord with the methodology described in detail in a Boundary Delineation Manual: the ABC Method (Grigoriev, Theberge, Nelson, 1985), two basic types of cultural or land use maps were prepared: level one, structural and functional maps, and level two, significance and constraint maps. The structural maps basically are "line and dot" and show buildings or other artifacts of various land uses.

Clearly it is possible to develop a very large number of structural maps, i.e. maps of types of use or culture process. However, in the interests of economy and focus, a relatively small number of uses or processes are generally selected for initial analysis, on the basis of criteria such as historic significance, duration, extent, environmental effects, and heritage value.

The functional maps are a means of grouping the "lines" and "dots" representing the various land uses in the study area into patterns that are important to

planners. The general types of patterns which are mapped are nodes, corridors and hinterlands. As their names imply, the nodes and corridors group activities which are relatively complex and interactive. They therefore deserve careful attention from planners and concerned persons. The significance maps portray areas considered valuable for various purposes by various groups, in this case for symbolic and archaeological reasons, or because of importance to native people.

A constraint map represents an evaluation of structural and functional maps. It portrays constraints in terms of conflict, tension, and compatibility zones. The distinction between conflict and tension zones is rather arbitrary and involves judgements based on number of land uses in an area, changes in land use, population growth, type of technology, and other factors.

These structural, functional, significance, and constraint maps are all used in describing ESA and making judgements about their management as is evident in later discussion and in Tables 3 and 6. Illustrative structural, functional, significance, and constraint maps for the eastern Beaufort are present in Figure 4, 5, and 6.

Study of these maps will provide an understanding of the method and also the human aspects of the eastern Beaufort. The area contains the seven candidate ESA noted previously which are associated with canyons, nesting sites, calving areas, and other abiotic and biotic features summarized on Table 3. The eastern Beaufort area is about 30,000 km² and supports a light population of a few hundred people as well as other users from adjoining areas. Current uses are primarily hunting, fishing, and trapping and hydro-carbon exploration and related activities. Many archaeological and historic sites are located mainly along the coast, where Inuit and other activity is concentrated today.

HOW TO DECIDE ON MANAGEMENT OR INSTITUTIONAL ARRANGEMENTS FOR ESA

All of the foregoing discussion relates to the first question of how to identify ESA in terms generally acceptable to all interest groups; the second basic planning question is how to decide on suitable management or institutional arrangements for these ESA? What laws, policies, agencies, national park, or other arrangements should be applied to each ESA and why?

In thinking about the reasons for choosing one type of management over another, two kinds of considerations are applicable. The first has to do with the characteristics of the ESA as described in terms of the abiotic, biotic, and cultural criteria discussed previously. What range of geologic, plant, animal, historic, archaeological, and other features and processes is the ESA important for? Is it only for one or two species or features, or for many? Perhaps it is a landscape representative of a natural region or ecoregion in NWT? How significant are the various features; processes and

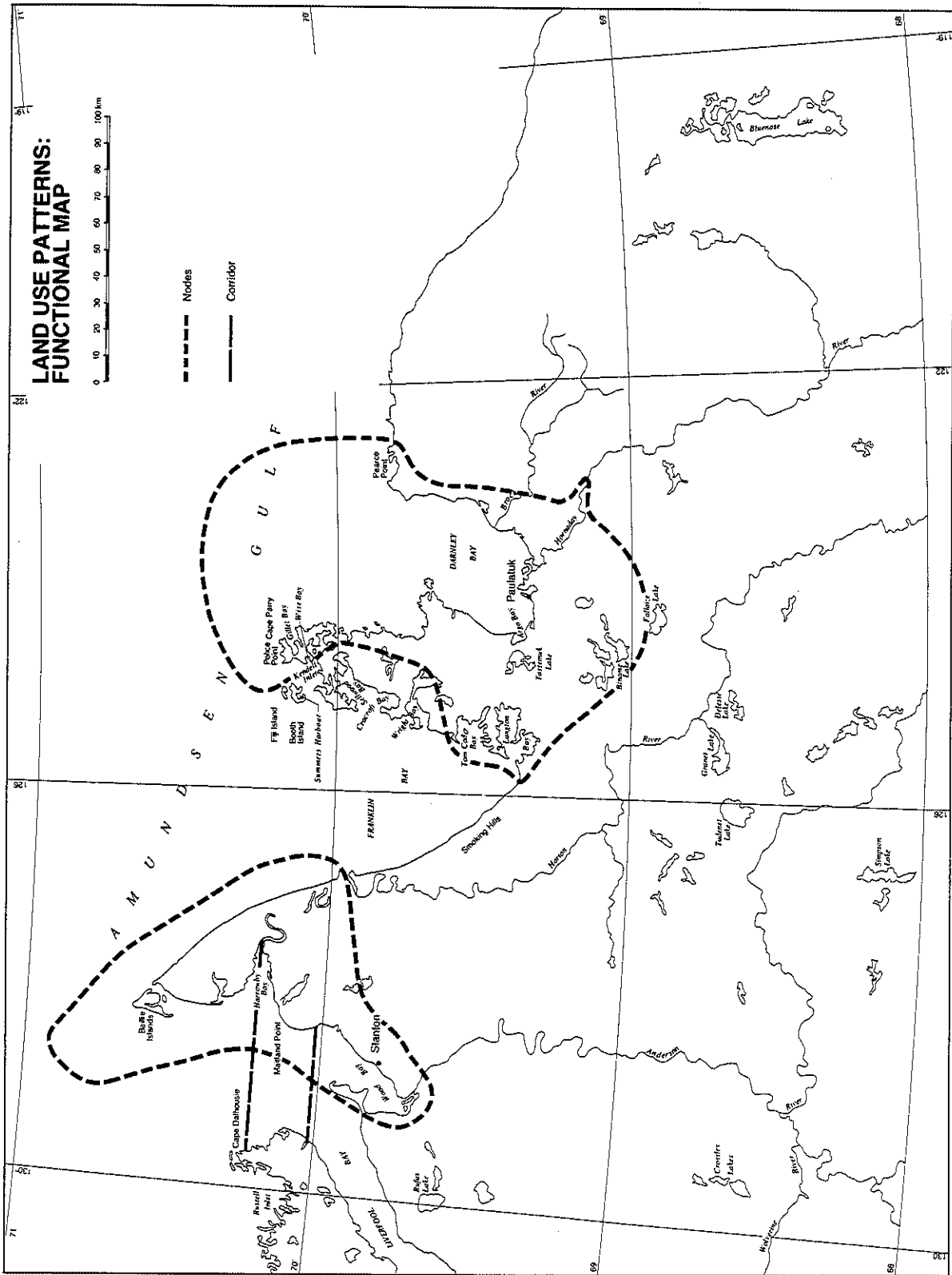


Figure 5 Land Use Patterns: Functional Map

landscapes? Are they important regionally, nationally, internationally? By answering such questions, by describing the ESA in these terms, we actually describe not just the characteristics, but the purposes of the ESA.

The second type of consideration has to do with the characteristics of the laws, agencies, or other institutional arrangements that can be applied to each ESA. The aim is to find an institutional or management arrangement which has the characteristics required to match the abiotic, biotic, and cultural characteristics, or purposes, of the ESA in question. The goal is to match the purposes of each ESA with a management type having appropriate characteristics and strengths.

The first step in finding appropriate ESA institutional arrangements is to compile an inventory and general description of the available array of laws, agencies, and management types. General inventories and descriptions can take various forms. An inventory for NWT ESA is given in Nelson and Jessen (1984) where the arrangements are described in terms of agency, legislation, regulations, policies, and reserves or special designations.

Table 4 also from Nelson and Jessen, is a general inventory of the *Relationship of Reserve Type to Management Objectives*, including notation on NWT reserve types. The focus is on a set of reserve or management types and the area descriptions, management objectives, permitted use and other characteristics applying to them. The reserve types and the associated general descriptions are based on the work of Miller

(1978) and largely conform to the range of ESA management types supported by the IUCN as applicable on a global basis. Theoretically, such a comprehensive framework of management types should provide a place or an appropriate niche for each ESA in regions such as the eastern Beaufort.

Another more detailed way of describing the strengths and weaknesses – or role – of available institutions is to apply analytical checklist or frameworks like those listed in Table 5.

Table 5 Frameworks for Legislative and Agency Analysis

| Legislative Analysis | Agency Analysis |
|--|------------------------------------|
| 1. Legislation | 1. Agency |
| 2. Agency | 2. Mandate |
| 3. Purposes, Goals, and Objectives | 3. Goals |
| 4. ESA Designations | 4. Ideology |
| 5. Land Uses – Permitted – Not Permitted | 5. Institutional Character |
| 6. Tenure | 6. Land Use Types and Activities |
| 7. Management Procedures – Planning, Implementation, Enforcement | 7. Institutional Comprehensiveness |
| 8. Monitoring and Feedback | 8. Land Access and Control |
| 9. Policy Co-ordination | 9. Experience and Image |

Table 4
Relationship of Reserve Type to Management Objectives

| Reserve Type | Description | Management Objectives | Permitted Uses | Tenure | Area | Equivalent N.W.T. ESAs |
|-----------------------------------|--|--|---|---|--|---|
| National parks | 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 co-operation with local private owners | Dependent on habitat requirements of species | Territorial game reserves, territorial game sanctuaries, national wildlife areas, migratory bird sanctuaries, critical wildlife areas, etc. |

Table 4 cont'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 | Variable | Territorial parks |
| Scenic easements & rights-of-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 lands to ensure adequate protection | National historic parks and sites |
| 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 species 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 co-operative 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 does 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 |

Table 4 Relationship of Reserve Type to Management Objectives

Source: Based on Miller, 1978

Largely self-explanatory, such frameworks can be used to describe the character and the strengths of agencies or legislation in terms of mandate, goals, permitted and non-permitted land uses, and other criteria. This information can be used in judgements about matching laws, or agencies with one or more ESA in an area such as the eastern Beaufort. This information and these frameworks can also be used to identify weaknesses or gaps in institutional arrangements and help deal with them.

The foregoing types of institutional analysis have been employed in our work. Some of the results are shown in Table 6 and Figure 7, where each ESA in the Eastern Beaufort is assigned to a reserve or management type or a combination thereof. The basis for the decision can be understood by examining the abiotic, biotic, and cultural characteristics of each ESA as these are generally described on Table 3 and matching these with the characteristics of the reserve types as these are described on Table 4 and in Nelson and Jessen (1984).

HOW TO PRIORIZE ESA FOR ACTION

The third question to be addressed in this ESA planning process is how to prioritize action by planners and managers. Behind this question is the idea that planners and managers wish guidance on which candidate ESA would be appropriate for relatively quick action, which are of longer term interest, and which require further information. In consequence a four part system has been established: 1) short term priority; 2) medium to long term priority; 3) no action at this time; and 4) further information or research needed on an immediate or longer term basis.

As Table 6 indicates such priorities have been set for each ESA in our sample area, but in the context of the Recommended Institutional Arrangement to which the ESA has been assigned. We have not found it possible to rank ESA across or among institutional types on any technical basis. Such ranking is again an "apples" and "oranges" issue which involves value con-

Table 6 Priority Assigned to the Seven ESAs

| | Upper Anderson | Crossley Lakes | Anderson River | Horton River | Cape Parry | Brock-Hornaday | Bluenose Lake |
|------------------------------------|--|-------------------------------|--|---|--|---|---|
| Recommended Management Arrangement | CWA or NWA | No good fit, private | NWA or MBS expanded | Inuvialuit-CWS Management Agreement and Territorial Park (NERP) | Expanded MBS or NWA or ADO | Territorial Park (NERP) or National Landmark | CWA or NWA |
| IUCN Management Class | Wildlife Sanctuary (IV) | | Wildlife Sanctuary (IV) | Natural Monument (III) | Wildlife Sanctuary (IV) | Natural Monument (III) | Wildlife Sanctuary (IV) |
| General Type of ESA | Species-type: Birds | Representative landscape | Species-type: Birds | Multiple Values | Species-type: Birds | Geologic and Scenic | Species-type: Mammal |
| Significance | NWT-WS clearly responsible | No agency clearly responsible | CWS clearly responsible | Several agencies involved | CWS clearly responsible | Several agencies involved | NWT-WS clearly responsible |
| Land Use | generally compatible | a number of conflicts | some conflicts | possible conflicts | generally compatible | generally compatible | compatible |
| Ease of Establishment | relatively easy | difficult | some impediments to expansion at present | difficult to assess | little land involved; simple expansion | relatively easy | already exists; a change in management approach |
| Place in System | should be part of system of raptor areas | no agency link | important expansion | important addition | important expansion | important addition | already part of system |
| Social and Economic Benefits | | | | high potential for tourism and recreation | | high potential for tourism and recreation | secures a critical renewable resource |
| Planning and Management Priority | Immediate, short-term priority | No action needed at present | Medium to long-term priority | Immediate, short-term priority | Immediate, short-term priority | Immediate, short-term priority Medium to long-term information need for Brock Lagoon | Immediate, short-term priority |

Abbreviations used in the Table: CWA, Critical Wildlife Area; NWA, National Wildlife Area; MBS, Migratory Bird Sanctuary; ADO, Development Area under the Area Development Ordinance; NERP, Natural Environment Recreation Park classification of Territorial Parks Ordinance; CWS, Canadian Wildlife Service; NWT-WS, Wildlife Service of the NWT government; IUCN, International Union for Conservation of Nature and Natural Resources.

siderations and so citizen or political input, although some technical advice could be given, based on numbers of ESA in the different management types and other information. One other cautionary note is in order. Only seven ESA have been studied in the eastern Beaufort and this small sample has limited our ability to test the prioritizing system. Further research in other parts of the NWT would be helpful in this regard.

In prioritizing the ESA within each Recommended Institutional Arrangement it has been found helpful to develop a set of criteria as a basis for judgement. These criteria are: 1) the significance of the ESA, whether federal, territorial, or otherwise; 2) land use; 3) ease of establishment; 4) place in the system; and 5) social and economic benefits. These criteria are again largely self-explanatory. "Land use" threats and compatibilities near ESA frequently influence the actions of interested persons. Judgements on "ease of establishment" can be based on the fit between an ESA and agency goals, citizen support, relative lack of interagency or industrial competition, and other factors. "Place in the system" refers to the role that an ESA can play in agency plans or in terms of the NWT ESA system overall.

Social and economic benefits are important, especially in times of constraint or in areas where employment, entrepreneurial or other gains can supplement ongoing or traditional activities. Our thinking in regard to socio-economic benefits can be illustrated by reference to the Horton River ESA as shown on Tables 3 and 6. As a result of the recent Inuvialuit land claim settlement much of the Horton River is now owned or controlled by the Inuvialuit as class 7(1) (a) or 7(1) (b) lands (DIAND 1984). Legally and otherwise, the prospects for a national park in this diverse area are much diminished. The current National Park Act and policy require that all such land be publically owned (Parks Canada, 1982). On the other hand a co-operative management arrangement among the Inuvialuit, the Canadian Wildlife Service and the Territorial Tourism and Parks Branch (territorial park) could result in a valuable management regime combining wildlife and landscape protection with tourism, parks, and employment and benefits for local people.

IMPLEMENTATION

In conclusion we believe that if a planning process like the foregoing were followed, it could do much to break the ESA "logjam" in the NWT. We also believe that this system could be useful in other parks of Canada and the world. An example is in screening, organizing, and prioritizing the 150 new parks recently announced in Ontario.

One other ingredient is needed to make the system work in the NWT, i.e. a co-ordinating body of some kind. This body would bring the various government and private interest groups together to exchange

information, arrange for technical analysis, and make or recommend upon value judgements. Such a body could also arrange for co-operative management of areas under joint jurisdiction, either informally, or where appropriate through mechanisms such as the Man and Biosphere Programme (MAB).

Without such a co-ordinating body the interactions and dynamics needed to make progress would very likely not take place. Such a body would be especially important in early phases, in getting the system going. Further details on possible co-ordinating bodies and responsibilities are presented in Nelson and Jessen, 1984, and Task Force on Northern Conservation, 1985.

Earlier we noted that the institutional analysis described herein could reveal weaknesses in an ESA planning and management system. Such has certainly been the case in this eastern Beaufort study. Of significance in this regard is the lack of a consistently sound method of designating IBP areas, for example an Ecological Sites act of the type found in British Columbia or Quebec. Similarly, the national marine park and national landmark designations are, at present, only possible additions to the National Parks Act and territorial designations to protect wildlife and habitat are not strong, the current wildlife sanctuaries and preserves being vestiges of a dismantled system (Hunt, 1976). The NWT Critical Wildlife Area designation is an ESA type specified in the Wildlife Ordinance but without any regulations promulgated to guide management.

Further to this point recent federal government budget cuts have left the Canadian Wildlife Service, Parks Canada, and other northern programs with relatively little funding and manpower. Parks Canada now has only two planning and co-ordinating staff in its Northern office in Yellowknife. No Canada Wildlife Service personnel seem to be responsible for national wildlife areas in the North. Indeed this management type and the large mammal protection for which it is chiefly intended, seem to be in the process of transfer to the NWT, with little apparent prior discussion of whether territorial institutional arrangements can handle such a responsibility.

The Tourism and Parks Division of GNWT devotes approximately 3½ person-years to planning and developing all 6 types of territorial parks including the many wayside and community parks. One full-time and two contract positions in the NWT Wildlife Service are currently allocated to developing a list of areas of interest to the service.

In sum, the ESA planning procedure described in this paper can be a useful means of addressing the ESA "logjam" but the institutions involved are currently weak overall and probably unable to implement this or any comparable management arrangement. The NWT ESA management system is largely a "paper tiger" unless more resources are forthcoming to NWT agencies to perform the roles from which certain federal agencies seem to be withdrawing. The implications of

this conclusion should be profoundly disturbing to all those concerned with appropriate use and protection of key natural and cultural resources in the NWT, not only for their own sake, but as a basis for sustainable development in the future.

POSTSCRIPT

Table 7 is an attempt to outline in brief ten point form, the general steps that comprise the ESA planning process described in this paper.

Table 7 *ESA Planning Process*

1. Establish character, role, and importance of ESA in a comprehensive land use, resource or environmental management system.
2. Study the social, economic, technical and ecological context and identify obstacles to ESA development.
3. Identify main issues to be addressed to reduce conflict and gain support for ESA; stated generally the key questions are:
 - a) how to identify ESA in terms generally acceptable to all interest groups, important here is the scientific validity of descriptive criteria;
 - b) how to decide on an appropriate institutional framework for ESA, i.e. the appropriate laws, agencies, etc. to plan and manage each ESA;
 - c) how to prioritize ESA in order to make steady progress in establishing ESA.
4. Collection information on ESA proposals by different agencies and groups and do other inventory as funds permit.
5. Use scientifically or other acceptable criteria to describe ESA in common terms for comparative purposes.
6. Establish the regional, territorial, national or international significance of each ESA in terms of abiotic, biotic, and cultural features, using processes and criteria such as rarity, and diversity.
7. Review strengths and weaknesses - or role - of available laws, agencies, or other management arrangements in terms of consistent criteria, such as legal base, permitted uses, track record, budget, etc.; identify gaps in management system.
8. Link each ESA, its characteristics and significance as set forth in points 5 and 6 to an appropriate management or institutional type in terms of the criteria in point 7.
9. Set the priorities for the establishment of ESAs within each management type in terms of agreed upon criteria and advice of advisory groups or other bodies having a membership appropriate for making value judgements.
10. Recommend a means of implementing the coordinated planning and management inherent in this ESA planning system.

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