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OVERVIEW STUDY OF TOURISM AND OUTDOOR RECREATION IN THE NORTHWEST TERRITORIES

Volume I

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Prepared For
The

Division of Tourism
Department of Industry and Development
Government of the Northwest Territories

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STATISTICS CANADA

DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT

1. INTRODUCTION

The Northwest Territories is a large area of one and one-third million square miles of territory, encompassing varying landforms, lakes and rivers. It also possesses a comparatively unspoiled uniqueness for the travelling public found nowhere else in the world. The area is relatively undeveloped in an industrial sense and needs a viable economy.

Tourism, ranking second to non-renewable resources as a revenue producer, is regarded as one of the major industries within the Northwest Territories, with the potential for the generation of employment, income and investment opportunities.

Although the growth of tourism has shown a steady increase since 1959, development has been haphazard with little appreciation being shown for the intricate relationship of supply and demand. Obviously, development of a realistic master policy and program plan is essential to achieve the maximum development of the tourism potential.

It is axiomatic that any planning for tourism development must start by taking stock of the tourism plant, attractions and activities of the territory and market perspectives. The need of a study was clearly recognized and the design for a study was prepared in 1968 by W. M. Baker, Tourist, Park and Recreation Consultant, Scarborough, Ontario.

2. DESIGN FOR OVERVIEW STUDY OF TOURISM AND OUTDOOR RECREATION IN THE NORTHWEST TERRITORIES

General Objectives

The general objective of the Overview Study is to provide a framework of reference applicable to the formulation of short and long range policies to achieve the maximum development of the tourism and recreation potentials of the Northwest Territories. The identification and clear enunciation of the nature and implications of critical features in relation to the decision-making process for future action constitutes the ultimate requirement, and the basic test for the adequacy of the research.

A sufficient appreciation and description of the nature of the supply and demand, together with present infra-structive patterns, is a prerequisite. However, the desirability of costly and time-consuming studies in depth must always be judged in terms of their critical relationships to the decision process.

Although the study will not be concerned with planning at the project level, it is possible that the quantity and qualitative analysis involved in the study will identify some obvious projects. These projects could provide the ideal base for the immediate initiation of programs.

On the other hand, the modest scale of current tourist activities (9,000 tourists: $3.2 million in expenditures when this Design was in preparation) could also set some limits on the intensity of some investigations.

Ultimately though it is the guidelines for future planning that are sought and not a detailed exposition of the economic impact of tourism and recreation in the Territories per se.

Demand Analysis

The aim of the demand analysis is to prepare a realistic qualitative and quantitative appraisal of the character of present and future tourist travel patterns. The appraisal will be confined by the limits of available statistical data and compendiums of information. The appraisal will identify and describe:—

1. Global travel patterns and their implications for the Northwest Territories.

2. Continental and regional patterns and their implications for the Northwest Territories.

3. Volume travel movements to and within the Northwest Territories.

4. Demand prospects in relation to particular segments of the tourist and recreation activity pattern with forecasts as far as is possible on the basis of existing data.

Supply Analysis

The objective is to prepare a realistic macro-analysis of the terrain pattern of the Northwest Territories, including land, water and forests; the historical and cultural resources; and the biological patterns including wildlife and fish. This will result in a clear expression of the character of the supply base for tourism and recreation noting the comparative advantages and disadvantages and guidelines for development. As an integral component of this analysis, a recro-tourist use capability resource classification is required.

Such a classification will be accompanied by maps and will have direct and significant application in subsequent policy and program planning.

It is anticipated that various persons and/or agencies could provide authoritative input into the supply analysis. In particular their reports could:-

1) Summarize the salient features of the particular natural or cultural phenomena under consideration, such as climate, terrain, historic development, etc., that are of significance for tourism and recreation. The emphasis will be upon the description of what exists, rather than upon the genesis of the pattern.

2) Present the most suitable recro-tourist use capability classification that can be devised on the basis of available information.

3) Indicate the major research requirements relative to the tourist and recreation use of the particular phenomena.

The Department of Industry and Development will then have the complete version of the thinking of the specialists in these fields. Some studies, such as that for climate, should find useful application in the work of other groups in the Department in addition to the Division of Tourism.

A summary evaluation of the nature and scale of the present tourist and recreation plant and infra-structure of the Northwest Territories of importance to policy and program considerations, including accommodation, hunting and fishing camps and all road and air transport infra-structure, will require:

1) Considerable input from the Division of Tourism in the form of data assembly.

2) Only those basic features which are an indispensable input to the report.

It is an accepted premise that the development of the tourist and recreation potentials of the Northwest Territories involves a partnership between government and private enterprise. The government assumes regulatory, promotional and development functions designed to encourage and maximize returns to private investment and satisfy public requirements. Furthermore, it maintains and improves the resource base and develops an infra-structure of support facilities.

Government cannot perform these functions adequately without an appreciation of the nature of private operations. The government frequently has no mandate to obtain much of the essential information, hence the co-operation of the private sector is essential.

One objective must be to provide a realistic statement and analysis of current patterns and future prospects for the full range of public and private tourist and recreational facilities clearly indicating their character and scale, strengths and limitations, future requirements and economic implications in terms of investment, employment and income. In all cases, the critical determinants for policy and program planning must emerge.

The summary report will represent the salient findings of the supply and demand analysis in a format useful to, and focused upon, policy and program planning. The intent will be to portray in summary form:

1. The realistic prospects for tourism and recreation inherent in the supply base considering strengths and limitations and the areas requiring further research.

2. The realistic prospects for demand including strengths and limitations and the areas requiring further research.

3. EXECUTIVE SUMMARY

The material presented in this report represents a basic resource inventory and an analysis of travel trends and tourism markets of interest to the Northwest Territories. While the majority of the data has retained its validity, some segments were and are "time critical". The lengthy period of time during which the study was in progress assured invalidation of certain data.

3.1 DEMAND ANALYSIS

The conclusions reached as a result of analyzing travel patterns from global, continental and national perspectives are as follows:

The scale of current and prospective tourist traffic from outside the North American continent to the Northwest Territories is of such modest proportions that the Territories must rely essentially upon the services of the Federal government to develop whatever prospects are present.

The development of a satisfactory advertising and promotion program designed to stimulate visitation from Canadian and American markets must be based upon the recognition of the three major, and quite distinct, market segments; the landscape automobile tour, the landscape air tour and special activity participation, including hunting, fishing and wilderness canoeing and camping.

The order of market importance for the automobile landscape touring is Western Canada (particularly the Province of Alberta), the Pacific Census Region (particularly the States of California and Washington) and the North Central Census Region (particularly the States of Illinois, Michigan and Minnesota).

The general travel patterns for Americans to Canada suggest that there are substantial market prospects for the Northwest Territories in the northern states of the Mountain Census Region. The development of a road into the Keewatin, with direct connections from Winnipeg, could be expected to draw a heavy volume of traffic from the East and West North Central Census Regions of the U.S.A., as well as from Ontario.

Responsibility for the promotion of air landscape tours rests essentially with the carriers and private marketing structure for tourism and recreation. The role of the Territories in this instance is one of secondary promotion support and the stimulation of the development of accommodation, food services and special events.

The market for sports camp operations is focused upon the East and West North Central Census Regions and directed towards the Mackenzie District. There appear to be good market prospects to broaden this market significantly to the Pacific Census Region, in particular the State of California.

The total tourist and recreation market for the Northwest Territories can be expected to broaden substantially within Canada and the United States. The concentration upon certain areas that is currently such a marked feature will shift as landscape touring by aircraft grows and the sports camp operations broaden their locational pattern and consequently their market base. If adequate resource foundations can be found in the Eastern Arctic for sport camps, market prospects are such that the Mid-Atlantic Census Region, together with Ontario and Quebec, could become the leading market for these operations.

3.2 RESOURCE CLASSIFICATION (SUPPLY ANALYSIS)

Volume 2 contains base maps and overlays that serve to summarize much of the Supply Analysis. This executive summary highlights the major features of the maps in Volume 2.

Angling Potential

The era of intensive activity in elaborate large scale angling lodge development may be over. Future enterprises are likely to be smaller in scale and rest primarily upon quality angling for a variety of species rather than trophy considerations. Trophies will be taken but the success of the camp operation will rest upon quality angling defined in terms of a good medium-sized catch per hour of sports fishing activity spread over a number of species. The supply and demand prospects for this type of operation are good insofar as can be determined from the analysis of available information.

In a market sense, the focus will be upon the upper-middle class income group whose demands and expectations can be met by quality angling for a variety of species. Secondly, as road conditions improve and the middle-class income angler group begin to enter the Territories in greater numbers, opportunities for outfitters should improve markedly. The result should be that tent-camp and outfitting operations experience a relative increase in importance.

The future development in the Island Archipelago and a large portion of the lower reaches of the streams flowing into the Arctic drainage basin may be of two types: Outpost camps of lodges (particularly on Great Bear Lake) or linked developments such as Chantry Inlet and Baker Lake.

The future for operations situated in the northern portions of the Territories, based almost exclusively upon char fishing, is uncertain. Char fishing in itself may not possess the comparative advantage necessary to draw anglers, at very high transport costs, to northern waters. The best prospects appear to be locations where char fishing may be combined with angling for other species in nearby waters.

The geographic and time distribution of commercial angling facilities and operations suggest that the industry could be entering a period of substantial adjustment.

Archaeological Resources

The principal achievement of the analysis of archaeological resources of the N.W.T. is the consolidation of existing data. The Government of the N.W.T., however, is still confronted with three problems insofar as the exploitation of the tourist and recreation potentials of the prehistoric resources is concerned.

1. Gaps in knowledge of the prehistoric traditions or cultures, and about the nature and conditions of the known remains and artifacts.

2. The preservation of sites is a costly undertaking, frequently fraught with administrative difficulties.

3. The immediate returns in terms of general education, tourist and recreational benefits are limited for many sites due to their isolated location.

Some modest development is warranted in certain strategic locations, with respect to resident population and emerging tourist traffic.

The following strategy for development appears most desirable from the standpoint of current conditions:

Step 1 The assignment and assumption of responsibility for the preservation and development between the Federal and Territorial governments on a specific sites basis. The National and Historic Sites Branch should determine those sites that it considers desirable to include in the national system, and designate them as National Historic Sites. The remainder could be designated as Territorial Sites. The Federal government will have to carry the bulk of the burden in this instance.

Step 2 The Federal government must assume responsibility to carry out the necessary preservation and custodial functions for the sites designated in Step 1 above, and the Territories likewise. The bulk of the financial burden must rest with the Federal government.

Step 3 For the most promising sites development plans must be prepared for research, site and building restoration and display. The timing, scale and type of development would be fitted to the master tourist and recreation development strategy for the region involved by the Division of Tourism. In this way, maximum impact from federal investment would ensue.

The development program should be realistically attuned to tourist volumes. A major investment by the Federal government in any site is probably not justified at this time, particularly when considered in relation to the total nation-wide framework of responsibilities of the National Historic Sites Branch. Nevertheless, much could be achieved for a modest initial investment that would substantially enhance the tourist and recreation attractivity of some areas.

Climatic Classification

The following classification evolved after a thorough review of those climatic factors that are unique to the Arctic and, in particular, are of a limiting nature in regard to safety and comfort. The emphasis in the classifications is upon non-resident, general outdoor, wilderness activities, with considerations of local and regional access.

Winter Classification:

The classes are graded "A", "B", "C", and "D" as excellent, generally satisfactory, generally unsatisfactory, and highly unsatisfactory respectively. Classes lower than "D" were not considered further.

A	Ideal all factors.	Excellent for non-residents and residents. No significant restrictions.
B	Two ideal, one marginal.	Generally satisfactory for non-residents and residents. Length of daylight may be close to lower limits and windchill factor may approach lower limits for comfort and safety.

C	Two ideal, one sub-marginal.	Generally unsatisfactory for non-residents but considerable activity possible by residents in local area.
D	One ideal, one marginal and one sub-marginal, or more than two marginal, or more than one sub-marginal.	Highly unsatisfactory for non-residents and extremely restrictive for residents.

Summer Classification:

In the grading of the summer classes, however, there is one minor difference. Grades "B", "C" and "D" are classed as generally satisfactory, generally unsatisfactory and highly unsatisfactory, comparable to the case in winter. Because the summer factors are less restrictive than the winter ones, it is possible to identify two "A" classes. They have been graded "A1" and "A2" and are classed as excellent and good respectively. In this way the grading system used in the two season classifications is parallel in structure. It also should be noted that since two of the summer factors have no sub-marginal condition, the number of possible combinations of these factors produces only five categories.

A1	Ideal all factors.	Excellent for non-residents and residents. No significant restrictions and most southern Canadian activities possible.
A2	Two ideal, one marginal.	Generally good for non-residents and residents. Restrictions not particularly severe.
B	Two ideal, one sub-marginal, or one ideal, two marginal.	Generally satisfactory for non-residents. Reasonably good for residents in local areas.
C	One ideal, one marginal and one sub-marginal or three marginal.	Generally unsatisfactory for non-residents. Generally satisfactory for residents in local areas.
D	Two marginal, one sub-marginal.	Highly unsatisfactory for non-residents. Limited activity for residents.

In addition to the above, reference should also be made to Section 5.3 which contains detailed climatic information provided by the Atmospheric Environment Service, Department of the Environment.

Communities

Five major factors were considered important in the recro-tourist classification of communities. These factors were general attraction, transportation, accommodation, food services and banking, beverage service and handicrafts grouped together.

A total point value of 10,000 was established and distributed between the five factors as follows: General attraction — 1,000; transportation — 3,000; accommodation — 3,000; food services — 2,000; banking, beverages and handicrafts — 1,000.

Communities were also classed by population scale. Yellowknife was classed as Primary, clearly standing alone at the top of the list of communities with a population in excess of 5,000 persons. Communities were then rated by population from Class 1 for Fort Smith, Hay River and Inuvik through Class VI for Rocher River and Trout Lake.

Attractions:

The tourist, in planning his holiday in the North, will likely select communities that interest him on the basis of population size, ethnic component and geographic location. The rating afforded in this instance simply reflects the general interest the average tourist might have in these communities.

Eskimo communities may possess the greatest interest to the tourist since they are the most novel in the North American scene as a whole. Indian communities probably possess much less interest for they are also found in the more southerly parts of Canada. Nine communities, possessing a dominantly non-native population, are of general tourist interest mainly due to size, location and as supply centres.

Transportation:

Transportation has been regarded essentially as a portion of the infra-structure of communities, with the three modes of transport being considered.

Air services are divided into three distinct types: scheduled regional air carriers, scheduled air services within the Northwest Territories and air charter services based within the Territories. The point rating afforded a community was based on the types of available air services: points of origin, connector services, frequency of scheduled stops, aircraft size and standards of service.

The reaction of tourists moving into the Territories by the highway system to a specific community depends on three factors. These are the scale of urbanization (services and facilities provided), the presence of outstanding cultural or scenic attractions and the geographic spacing of the community relative to others in the system. Point values assigned to communities served by the highway would be increased by development of a circular route in and out of the Territories through Fort Simpson or Fort Smith. The construction of the Mackenzie Highway from Fort Simpson to Inuvik would increase the point rating of Fort Simpson but decrease the point rating of Yellowknife. The point value allocated here is simply a measure of a community's potential related to the highway connection. The value of tourism to a community depends upon its ability to effectively tap this connection.

Communities were not accorded a point rating for water communications. Although water transport has been a significant factor in development of the Territories, its part within the confines of this study were of little or no magnitude.

Accommodation:

The accommodation plant displays an extremely wide range in quality and concentration. The general decor and appointment of many hotel rooms are modest and a number of developments are sub-standard by generally accepted Canadian standards. Seventy-eight percent of the accommodation plant is located in the Mackenzie Valley. Hotels are absent along the Arctic shore and insignificant in the Keewatin. Motels are confined to the southern portion of the Mackenzie Valley reflecting the road network.

With three exceptions, there are no accommodation facilities of consequence in the northern portions of the Territories in relation to package tour development, while the accommodation capacity in the larger communities in the southwestern portion is substantial. The volume of general business and administrative travel often leaves little capacity for tourists during the peak periods of travel.

Many of the outlying areas with significant natural and cultural resource potentials have virtually no supporting accommodation plant.

These limitations of the accommodation plant represent a serious handicap to the development of tourism. This limitation is considered to be more serious than any other including transport and accessibility.

Food Services:

There are only twenty communities that have any kind of public eating establishment; five of these are small coffee shops. The point rating system does not reflect quality, but simply identifies those communities with facilities and the degree of service available. It was noted that no restaurant or cafe provides any type of unique northern atmosphere; with facilities duplicating those in southern Canada.

Beverages:

The availability of beer and liquor is of considerable significance in the tourism industry. The larger communities possess sufficient liquor outlets at the retail level and beverage room, lounge and club capacities to meet the needs of tourists. This is not, however, the case in many of the smaller communities and any plant accommodation development must provide some form of liquor outlet.

Banking Services:

Banking services are of some importance to the traveller; however, the increasing use of traveller's cheques and credit cards has reduced their significance to some degree. Communities with banks were accorded points on the availability and quantity of banking services.

Entertainment and Leisure Time Facilities:

Libraries and community halls are the most prevalent type of recreation facility, with the latter being slightly more common. The pattern revealed by this study is perhaps of more interest to sociologists and community planners than to those concerned with tourism development. However, community halls provide a base for staging community pageants and other activities that may have some tourism interest.

Arenas and curling rinks provide facilities for inter-community travel. Theatres provide evening diversion to visitors who are seeking familiarity of scene and a change of pace. No point rating was allocated as the community population classes reflect the presence or absence of these facilities.

Handicrafts:

The purchase of native handicrafts is a notable feature of a trip for many tourists and is a significant bonus value. Many Eskimo and Indian handicrafts are available through southern retail outlets. This is undoubtedly in the interests of the producer, but may have an adverse effect on tourism. Similarly handicrafts may be purchased in northern communities other than where they are produced. The point rating system took into consideration the variety of materials available, the degree of scarcity or uniqueness of the objects produced, attractiveness to the tourist as a total body, and availability through retail outlets other than the production point.

Concluding Remarks:

The community point ratings have an extreme range of 1,635 points, from a high of 1,642 for Yellowknife to a low of 7 for Rocher River and Rae Lakes. Yellowknife, Inuvik and Hay River display a reasonable range of recro-tourist facilities. Conditions are satisfactory in Frobisher Bay and Fort Smith, but are only moderately satisfactory in the smaller centres with obvious weaknesses in a number of factors.

The analysis indicates the general weakness of the community facility base of the Territories. Herein lies the Achilles Heel of development. Unless the limitations displayed in this analysis can be overcome, substantial development of tourism outside of Class I and Class II communities will not be possible.

Historic Resources

The preparation of a theme, sub-theme, phase and topic format to guide future research and to provide a framework of reference for tourist and recreation planning was a first essential step in the analysis of the historic resources of the N.W.T. Such a thematic approach has been taken by the Northwest Territories Historical Advisory Board for the recording of data in their Historical Resources Survey.

Two major themes are noted, namely Pre-History and History. Two sub-themes are recognized in the former, including Indian and Eskimo Cultures. Nine sub-themes are identified under the major theme History including Search for the Northwest Passage, Fur Trade Era, Missionary Era, Whaling Era, Exploration of Mineral Resources, Evolution of Northern Transport, Frontier of Government and Evolution of Settlements (includes R.C.M.P.), Recent Indian Culture, and finally Recent Eskimo Culture.

It became apparent, however, that much work remains to be done in this field. From the standpoint of the needs of the Division of Tourism the following strategy for future action in relation to research, preservation and development seems appropriate.

Completion of Theme Papers:

Agencies such as the N.W.T. Historical Advisory Board and the Research Division of the National Historic Sites Service can play a key role in completing the identification and research associated with the various themes or co-ordinating the inputs of government and private agencies.

Identification and Mapping Sites Related to Themes:

Data inputs will come from those preparing theme papers and the results of the Historic Resources Survey launched by the Northwest Territories Historical Advisory Board.

Evaluation of Thematic Research and Site Mapping in Relation to Tourism and Recreation:

This work, which should be executed by the Division of Tourism, would represent an evaluation solely on the basis of documentary evidence. Concentrations of potential should become apparent and site significance emerge. The research will provide a guide to the identification of sites and areas requiring field inspection and archaeological research noted subsequently. There should be material available for the preparation of booklets for distribution to tourists and guidelines for the modest development of some sites in strategic locations. Finally, there should be a factual foundation for the assignment of Federal and Territorial responsibilities for preservation and development.

Evaluation of Site Quality:

This will involve field inspection; a task that could readily be effected by the various field officers of the Department of Industry and Development. Archaeological investigations conducted by Federal agencies will probably be involved in many cases, particularly where development is desired.

Site and Object Preservation:

The preservation of sites and the retention of the historic objects of the Northwest Territories is clearly the most pressing administrative problem of the moment. With increased economic activity in the north, particularly in mineral exploration, and to some extent tourist influx, the protection of buildings and objects is a major concern. The cost of an adequate program of protection is clearly beyond the financial capacity of the Territorial government.

As a minimum the Federal government must assume responsibility for those things considered to be of national importance. This is simply a part of the public costs of northern development. The mere enactment of general legislation and regulations will not suffice. Crucial site designation and enforcement of regulations are necessary. Probably the collection of key objects at central points for later use in development projects will be necessary.

The field staff of the Department of Industry and Development probably could be effectively integrated into a program for site and object preservation.

Site Development:

The latent potential of the historic resources cannot be marketed in sufficient quantities to yield dollar benefits commensurate with development and operating costs. Benefits, however, must be considered in broader cultural terms than simply for tourism and recreation.

The best development opportunities in a cost benefit evaluation related to tourism are in the larger communities and nodal communication points. In many cases, museum development with thematic displays seems the logical course of action to adopt. In other cases, markers, monuments and site displays, involving modest capital and operating budgets, appear feasible.

In accordance with policy statements of the National Historic Sites Service, many of the historic resources of the Territories could be designated as being of national significance. These sites form part of the national heritage and hence their preservation and development is a Federal responsibility. In effect, the Territories should not and must not attempt to handle everything. It is equally obvious, however, that there are sites of mainly Territorial significance, where development could be handled by the Territorial government.

Insect Nuisance

The detrimental impact of the insect nuisance is in large part governed by the range of tourist and recreation activities. A large portion of the Territories from the tree line northward presents no insect problem or only a minor local problem related to one or two insect groups. Moreover, the problem extends over a relatively short period of time. Below the tree line the nuisance problem is moderate over most areas with severe conditions being of a local nature.

Many activities suited to the Territories require considerable exertion, or are carried out on open waters where breezes disperse insects. Sport angling is a case in point.

Indoors the insect nuisance is markedly reduced, where mosquitoes can be kept in check with insecticides.

The tourist is frequently aware that insects are a nuisance in northern environments and has an image expectation of the condition. The Territories are certainly no worse off in this respect than all northern Canada and, in some areas, conditions are noticeably more favourable.

It is against this general set of background conditions that the classification of the nuisance factor in tourist and recreation terms has been formulated. The final evaluation is shown in Table 5.33 in Section 5.6 and the insect map in Volume 2.

Major area divisions are labelled A, B, and C: Zonal divisions are based on the number of insect groups present, their intensity (no nuisance = 0; severe nuisance = 6) and the extent of the nuisance (local = 1; widespread = 2). The higher the zonal number, the more significant the nuisance factor.

Ornithological Resources

Much of the data for the analysis of the ornithological resources has been extracted from the Arctic Ecology Map Series prepared for the Canadian Wildlife Service.

In considering tourist and recreational values, attention has been directed exclusively to the non-consumptive use of the resource. Hunting (or sport shooting) as a consumptive use has not been taken into consideration. Tourist and recreation values are determined solely in terms of observation. In this report, birds are considered as an added attraction for a general landscape tour or as a basis for a specialized tour.

Major concentrations have been identified in Section 5.7 and in the map in Volume 2 but there are many more locations in the Territories that possess significant ornithological resources that might lend support to the development of the landscape tour within a particular region or from a particular community.

There are thirteen migratory bird sanctuaries in the N.W.T.; all are under Federal jurisdiction. Generally, they have been established to protect the nesting grounds of waterfowl. Cape Parry is a notable exception since it has been established to protect a small colony of murres nesting on the face of the cliffs. The areas of the sanctuaries, year of establishment and major purposes are summarized in Table 5.34 in Section 5.7.

The chief problem, from a tourist and recreation viewpoint, is simply one of accommodating tours in these sanctuaries, within the constraints set by the need for privacy during the breeding season.

Game preserves and National Parks also have significant values for bird populations. A classic example is the whooping crane nesting area in Wood Buffalo National Park. This species is in such an endangered state, however, that its nesting and summering grounds are presently protected. There are many other species in these Parks that can be readily spotted and are important tourist attractions.

Marine Mammals

Much of the information for this topic was obtained from the Fisheries Research Board at Ste. Anne de Bellevue, Quebec.

The rich eastern Arctic area that encompasses the waters surrounding the southern portion of Ellesmere, Cornwallis, Devon, Baffin and Southampton Islands together with Hudson Bay possesses the prime tourist development potential. Every species considered in this study is found here and frequently in abundance. Moreover, the harp seal, narwhal and walrus are present only in this area.

There are possibilities in the southwestern Arctic area which is comprised essentially of the linear reach of straits and gulfs from the Boothia Peninsula in the east to Amundsen Gulf in the west, but they are decidedly of a secondary order. Here there is a small variety of species and fewer outstanding areas from a tourist and recreation viewpoint.

Tourists wishing to sample the full range of marine mammals of the N.W.T. have their best opportunity from mid July until the end of August. Prime periods for particular locations, however, vary considerably.

The risk factor for a person desiring to exploit the tourist and recreation potentials associated with marine mammals presents no serious handicap. Of eighty-six marine mammal areas of all types, fifty-six or 65% involve no risk that is abnormal for northern regions, 35% a moderate degree of risk and none involve a prohibitive degree of risk.

The point rating system adopted in this study took into account the variety and abundance of mammals (Class I – 3 points; Class II – 2 points; Class III – 1 point) and the viewing and hunting capabilities (Class I – 2 points; Class II – 1 point). There were some exceptions made in the case of walrus (higher points allocated) and bonus points were given for certain special situations (never more than 2 points).

Cumberland Sound has been awarded the highest point rating, namely 27 points. The classification is summarized in Table 5.36 in Section 5.8 and reference should be made to the marine mammals map in Volume 2.

Terrain

Data developed by the Lands Directorate, Department of the Environment have been analyzed from two perspectives – a Territory-wide and a physiographic regional. The latter approach recognizes that each major physiographic region is an entity in itself with a distinctive type of terrain impact upon the tourist and recreation experience. The objective of the former approach is to consider a unit area in relation to conditions applying throughout the N.W.T., rather than only the physiographic region of which it forms a component.

In the Territory-wide approach 805 areas were grouped in sixteen classes; each class containing five points, with the lowest class containing 20-24 points and the highest 95-99 points. Point values on the Mainland tend to be higher than those in the Archipelago. The mean point value of the 805 unit areas is 55 (see Table 5.44 in Section 5.9).

The point values for the 805 areas were then grouped into seven quality classes, as indicated in Table 5.45. Nearly 32% of the areas have been included in Class V, the designation for average quality terrain. Only three of the 805 areas have been designated Class I (all are in the Cordilleran Region); only thirteen or 2% designated Class II.

In the case of the physiographic regional approach, the following regions were identified: Cordilleran Mountains and Plateaus; Interior Lowlands; Shield; Arctic Mountains and Highlands; Arctic Uplands and Arctic Lowlands. Point classes from 20-24 to 95-100 were established, areas classified, point means calculated and quality classes from I – VII

established for each physiograhpic region. The results are summarized in Tables 5.46-5.51 as well as on the map in Volume 2.

The concluding stage in the terrain classification was the development of a tourist and recreation terrain quality and capability classification from a combined Territory-wide and physiographic regional perspective. Numerical values were assigned to both sets of quality classes developed under the Territory-wide and the physiographic regional approaches. Class I's, for example, were accorded seven points; Class VII's one point. A special situation arose in the case of the Arctic Mountains and Highland Region and the Arctic Uplands Region since these regions possess only six quality classes.

The tourist and recreation terrain capability classification is presented in Table 5.35 and reference should also be made to the map in Volume 2.

Terrestrial Mammals

The initial discussion is grouped around three major terrestrial mammal families, namely, ursidae, bovidae, and cervidae. Directories for individual mammals were obtained from the Arctic Ecology Map Series prepared for the Canadian Wildlife Service or the Game Management Division, Department of Industry and Development, Government of the N.W.T.

Indices of appeal and visibility were developed. Indices range from one to three points, with the best situations indicated by higher values. Examples of mammals rating both three points for appeal and visibility are: barren ground grizzly bears, Dall sheep (summer only) and muskoxen.

Three major Life Zones were identified – Arctic, Hudsonian (a sub-division of Boreal) and Canadian. Notable mammal area groupings were described on an overlay map so that areas of concentration for mammals in combination became apparent. Total point scores for the Life Zones could then be determined. The process involved the listing of the major animals of the Life Zone and the summation of the points for visibility and appeal associated with each.

Although this approach does not really answer the question "which area contains the strongest tourist and recreation values" in a numerical way, some subjective conclusions have been drawn. The results are summarized in Table 5.66 and on the map in Volume 2.

The Redstone, Keele and Carcajou River areas rank first amongst all areas designated within the Hudsonian Mountain section Life Zone. It is clearly one of the best areas in the entire Northwest Territories.

Within the Canadian Life Zone the Slave Valley currently Ranks I. If the buffalo herds introduced into the Fort Providence hinterland build up to substantial proportions in the years ahead, it will probably assume Rank I because it possesses strong woodland caribou resources that are lacking in the Slave River area.

It seems fairly safe to accord Rank I to the Thelon area in the mainland section of the Arctic Life Zone. Only the Melville Hills-Horton River area is a reasonably strong competitor.

Two areas in the Island Archipelago of the Arctic Life Zone have been accorded Rank I, namely, Banks Island, Prince Alberta Peninsula and Bathurst, Cornwallis, Devon Islands. It is impossible to distinguish between these two on the basis of data presented in this report.

If the Peary caribou resources of the Jones Sound area are stronger than indicated in present source data this area would rank equal with the other two.

3.3 CONCLUDING REMARKS

The study brings into one volume a valuable collection of available data. It provides for discussion, an evaluation and interpretation of natural resources in respect of their tourist and recreation potentials. The study established classification schemes or systems upon which to formulate policies and programs leading to Master Planning for Tourism.

The Overview Study is not in itself a final document, but rather a stage in planning development and clearly indicates a need for further definitive research. An accommodation demand study, for example, is in the planning stages and will update the data contained in the Overview Study.

4. TOURIST MARKET PERSPECTIVES FOR THE NORTHWEST TERRITORIES (DEMAND ANALYSIS)

In an area such as the Northwest Territories, where tourism and recreation are in their infancy, it is obviously impossible to place too great a reliance upon past visitor patterns to the Territories in the assessment of future prospects. It is the understanding of the overall patterns of travel, together with an appreciation of the marketing structure that is most useful. The major questions confronting the Territories can be simply stated.

- What are the overall dimensions of the travel market that might conceivably be tapped? The statistical analysis that follows provides the answer to this question.

- What are the means of effectively tapping this market? The report prepared by the Canadian Government Travel Bureau provides an insight into this problem.

The research process in this instance can be best described as one of data assemblage, compilation and manipulation; on the basis of value judgments by the consultant.

Table 4.1 presents a summary of this procedure. The table successively shows the international travel perspective, the continental travel perspective and Canadian travel patterns. The following sections provide analysis of the statistics in Table 4.1 and implications and conclusions that can be drawn from these statistics.

The Dimensions of the Overall International, American and Canadian Tourist and Recreation Travel Patterns – 1968-1980

Statistics presented in Table 4.1 suggest that international direct and indirect inter-regional arrivals, long term American intra-regional arrivals (those travelling by airplane, staying three or more days in Canada, and those travelling by automobile, staying fourteen or more days) together with long distance travel by Canadians in this country (1,000 miles or more in extent) provided a total of 3,692,000 person trips to various parts of Canada for tourist and recreation purposes in 1968. This involved travel for all tourist and recreation or leisure time purposes including visits to friends and relatives and can be said to represent the total long stay, long distance travel visitation in Canada that is of major interest in relation to the marketing strategy for Northwest Territories. This, in effect, is the outer dimension of the leisure time travel pattern within Canada in volume terms.

About 254,000 trips, or 7% of the above 3,962,000 trips, were accounted for by direct and indirect inter-regional person arrivals, that is, by people coming to Canada from other continents directly or via the U.S.A. Another 818,000, or 22%, were attributable to intra-regional person arrivals, that is, citizens of the United States travelling to Canada. Canadians travelling within their own country accounted for 2,620,000 person trips, or 71% of the total.

The foregoing statistics provide one expression of the relative importance of three major geographical population groupings in, what might be termed, major long-haul, long-stay tourist and recreational volume travel within Canada. Here, Canadians were 3.2 times more significant than Americans and 10.1 times more consequential than residents of other continents.

It is difficult to forecast volume visitation for this group of travellers in the year 1980. Data sources are unreliable for trend analysis, and other forms of forecasting are probably no more satisfactory. Forecasts provided in Table 4.1 suggest that there will be between 5.9 and 6.0 million travellers of this type in Canada by 1980. Inter-regional tourist arrivals will

TABLE 4.1

SUMMARY OF TRAVEL VOLUMES BY VARYING PERSPECTIVES

		1967 10^6	1968 10^6	1970 10^6	1980 10^6	1968 10^6	1970 10^6	1980 10^6
A	**International Travel Perspective**							
	I World Inter/Intra Regional Personal Arrivals for all purposes excepting military – All Modes of Travel		147.8	148.2-158.2	226.7-246.6			
	II Inter-Regional Person Arrivals to North America – all purposes excepting military – All Modes of Travel		1.4	1.5-1.6	2.3-2.5			
	III Leisure Time Travel Component of Inter-Regional Person Arrivals to North America		1.050	1.125-1.200	1.725-1.875			
	IV Direct and Indirect Inter-Regional Person Arrivals to Canada – all purposes – All Modes of Travel	0.370		0.454-0.450	0.552-0.750			
	V Direct and Indirect Inter-Regional Person Arrivals to Canada for Leisure Time Purposes –							
	1. Primarily to visit friends and relatives		0.203	0.212-0.288	0.331-0.450			
	2. Primarily for other leisure time pursuits		0.051	0.053-0.072	0.083-0.112			
	TOTAL V		0.254	0.265-0.360	0.414-0.562			
	VI Direct and Indirect Inter-Regional Person Arrivals to Canada 2nd and 3rd quarters of year for Leisure Time Purposes –							
	1. Primarily to visit friends and relatives					0.152	0.159-0.216	0.249-0.337
	2. Primarily for other leisure time pursuits					0.038	0.040-0.054	0.062-0.084
	TOTAL VI					0.190	0.199-0.270	0.311-0.412
B	**Continental Travel Perspective**							
	I. American Travel Pattern							
	1. Person Trips 100 miles – all purposes – all modes of transport – all destinations	361.2						
	2. Person Trips 100 miles – for tourist and recreation or annual leisure time purposes – all modes of transport –							
	a) all destinations	295.4						
	b) destinations in U.S.A.	283.1						
	c) destinations outside U.S.A.	12.3						
	d) destinations in U.S.A. – long distance travel 500 miles plus	33.4						
	e) long distance with destinations bordering Western Provinces	1.85-2.30						
	f) visiting Canada on long stay basis (3 days + for air travellers and 14 days + for auto travellers) – all tourist and recreation purposes							
	(i) all year		0.818	0.899	1.309			
	(ii) in 2nd quarter		0.193	0.312	0.309			
	(iii) in 3rd quarter		0.405	0.445	0.648			
	g) Visitors to Canada with travel pattern and purpose that might have made visits to N.W.T. a possibility –							
	(ii) primarily to visit friends and relatives					0.070	0.078	0.113
	(iii) primarily for other leisure time pursuits					0.137	0.150	0.219
	TOTAL g)					0.207	0.228	0.332
	II. Canadian Travel Patterns							
	1 Household Pleasure Trips – All Modes of Transport –							
	a) To all Canadian destinations 100 miles plus		13.788	15.167	22.061			
	b) To Prairie Prov. – destination 100 miles plus		2.964	3.260	4.762			
	c) Long distance trips 1,000 miles Canadian destinations	2.620	2.882	4.192				
	d) With destinations, timing and travel distance of some significance for N.W.T. market considerations involving –							
	(ii) primarily to visit friends and relatives					0.245	0.269	0.391
	(iii) primarily for other leisure time pursuits					0.338	0.372	0.541
	TOTAL d)					0.583	0.641	0.932
	2. Vacation Trips by Canadians							
	a) Person Trips – all modes of travel, all destinations	7.314	8.035	8.045	11.702			
	b) Household party trips, all destinations		4.097	4.067	5.915			
	c) With destinations, timing and travel distance of significance for N.W.T. market consideration involving –							
	(ii) primarily to visit friends and relatives					0.242	0.266	0.387
	(iii) primarily for other leisure time pursuits					0.252	0.277	0.403
	TOTAL c)					0.494	0.543	0.790
	III. Person travel along corridors to northern parts of continent on margins of N.W.T. for tourist and recreation purposes – all modes of transport –							
	(i) Alaska		0.248					
	(ii) Yukon Territory		0.035					
	(iii) Northwest Alberta		0.024					
	(iv) Churchill CN Rail		0.001					
	(v) Polar Bear Express		0.013					
	(vi) Labrador Coast		0.001					
	TOTAL III		0.322					
	IV. N.W.T. Tourist and Recreation Visitation					1968 (000)	1969 (000)	
	(i) Highway travellers					4.5	6.3	
	(ii) Air scheduled and chartered passenger					0.7	1.7	
	(iii) Lodges and Outfitters					3.5	4.2	
	(iv) Other					–	0.2	
	TOTAL IV					8.7	12.4	

probably be between 414,000 and 526,000. A straight line annual 5% increase from 1968 totals provides an estimate of 1.3 million American visitors and 4.2 million Canadian travellers by 1968.

It is clear from Table 4.1 that inter-regional person arrivals to North America are dominated by leisure time travel. This general purpose category accounted for about 1.0 million person arrivals to North America, or 71% of a total of 1.4 million. The suggestion is that in 1968 Canada received, directly and indirectly, about 254,000 arrivals, or 24% of the total, for tourist and recreational purposes. Considering relative populations and trade and economic positions, Canada appears to be doing extremely well in this international inter-regional travel flow. It is to be noted, however, that the statistics have been derived from two different sources; possibly the estimate of total arrivals to North America is somewhat low, and hence Canada's share appears more favourable than is actually the case.

Considerable refinement in the foregoing totals can be achieved in terms of the objectives of this report through a consideration of time of arrival, primary destination and primary purpose.

Trips motivated essentially by visits to friends and relatives are of limited importance in market considerations for Northwest Territories by virtue of its modest population. In effect, the ability of any area to draw visits of this type is dependent, in a large part, upon its population size, together with other factors, such as the recent immigration patterns. Assuming that factors other than population are similar for the Territories to those in other parts of North America, then population becomes the determinant for volume visitation prospects where visits to friends and relatives are the primary purpose.

When the resource potentials and climatic patterns of the Territories are taken into consideration, it is obvious that conditions for tourist and recreation visitation are satisfactory roughly in the second and third quarters of the year.

Trips by automobile to the Northwest Territories currently must enter via the Mackenzie-Yellowknife highway system. Therefore, it is important to consider the volume of automobile traffic having destinations in the Western Provinces.

Taking into account all these factors in relation to the previously noted inter and intra-regional tourist and recreation travel to Canada, together with long distance trips by Canadians, substantially reduces visitor totals. A careful examination of the values presented in the right hand columns of Table 4.1 is necessary at this juncture.

There were about 980,000 tourist and recreational trips in Canada in 1968 with distance and timing factors and a general location focus insofar as automobile travel was concerned, that might be brought within the purview of the Northwest Territories market considerations. It is expected that this volume will increase by 61% by 1980 to about 1,575,000. The foregoing totals represent, what might be termed, a first refining cut at foreign tourist and recreational visitor patterns and those of Canadian citizens in terms of Northwest Territorial interests. The process has provided an extremely crude result, however, that needs further refinement.

In 1968, about 190,000 person trips, or 19% of the total of 980,000 represented visitation from outside the North American continent, that is, inter-regional arrivals. Another 207,000 trips, or 21% were intra-regional arrivals by American citizens. Some 583,000 trips, or 59%, were undertaken by Canadian citizens.

About 513,000 of the 980,000 person trips in 1968, or approximately 52% were undertaken primarily for general tourist and recreational purposes, other than visits to friends and relatives. The remaining 467,000 trips, or 48% were motivated essentially by a desire to visit friends and relatives. These trips can be considered for most purposes to lay beyond the capacity of the Northwest Territories to tap as previously stated.

There is considerable variation in the percentage allocated to tourism and recreation pursuits other than visits to friends and relatives in the case of each of the major origin area categories. Only 38,000 inter-regional visitors, or 20% of a total of 190,000 were motivated by these purposes. Approximately 137,000 or 56% of a total of 207,000 American visitors came for tourist and recreation purposes other than visits to friends and relatives. About 58% of the Canadian component, or 338,000 travellers were in pursuit of general tourism and recreation activities.

It is true that travellers motivated essentially by a desire to visit friends and relatives might in certain circumstances by induced to undertake side trips to the Northwest Territories. Generally speaking, those coming to Canada from abroad for this primary purpose are inclined to spend as much time as possible with friends and relatives. Moreover, their expenditure patterns suggest that a visit to the Territories would be an impossibility for many. American and Canadian travellers motivated by this purpose might consider a side trip to the Territories in some cases. It is important to note, however, that the bulk of these travellers (87% in the case of Canadians and close to 30% in the case of Americans) were travelling by automobile. For this group, visitation to the Territories was only a practical additional experience for those with destinations in Western Canada. For plane travellers a trip to the Territories would have been possible for those with destinations in the Central, Western or Pacific provinces, but the increased cost involved would have been substantial, and obviously an insurmountable handicap for many.

It can, therefore, be stated that there was a total of about 513,000 tourist and recreational travellers in Canada in 1968, with a trip pattern and a motivating purpose for which the Territories might have represented an alternative attraction.

It is expected that this visitor volume will increase to 795,000, or by about 55%. The percentage distribution between Americans, Canadians and inter-regional arrivals will remain roughly constant.

Of the 513,000 tourist and recreational arrivals in Canada with a trip purpose for which a visit to the Territories might have been an alternative destination, only 38,000 or 7% represented inter-regional tourist arrivals, that is, visitors from outside the North American continent. About 137,000, or 27% were American intra-regional visitors to Canada. About 66% or 338,000 were Canadian travellers moving about their own country.

Of a total of about 4.7 million tourist and recreation trips by Canadians, Americans and persons of other nationalities in Canada in 1968, only 513,000 or about 3.45% had travel patterns and characteristics that might have made a visit to the Territories a reasonable possibility. A total of 254,000 person arrivals of inter-regional type for leisure time purposes, only 38,000 or roughly 15%, fell into this category. Approximately 137,000 of a total of 818,000 American leisure time person trips to Canada in 1968, or roughly 17%, could be categorized as having some territorial visitor possibility. About 338,000 of a total of 13,788,000 Canadian holiday travellers, only 2.45% could be so classed.

It is important at this juncture to introduce a word of caution with respect to evaluation of the 513,000 person trips for tourist and recreation purposes other than visits to friends and relatives. It is not to be implied that the Territories could have obtained this

total volume visitation. Many of these trips were undertaken for very specific tourist and recreation purposes and on occasion within cost limits that would have made the Territories visitation out of the question. Some were interested in visits essentially to urban centres and others were attending special events. All that is to be deduced from this volume total is that it represents an outer parameter of visitors in 1968 with travel patterns that might have made a visit to the Northwest Territories a possibility, or within the realm of consideration. The Territories must compete with all of Canada for this market.

Major Implications and Conclusions:

The dimensions of the travel pattern of significance to market considerations for the Northwest Territories as indicated by Canadians, Americans and international visitation to Canada are modest under the most liberal of interpretations. The Territories were in competition with all of Canada for a total of 513,000 travellers.

Marketing strategies must take into account the realities of the geographic segmentation of the aforementioned total.

Canadians represent the most significant component of the market accounting for 66% of the total. Americans represented 27%, and inter-regional tourist arrivals for 7%. The major thrust of advertising and promotion in relation to general tourist and recreation visitation to the Northwest Territories should be in Canada. The United States should occupy a secondary position.

Prospects for volume visitation from countries outside the North American continent appear to be of such meagre proportions that no large expenditure by the Territories for advertising and promotion in these areas seems justified at the present time. Prospects depend almost exclusively upon capturing a few special interest groups. As a general rule the Territories must rely on the efforts of the Federal Office of Tourism and the numerous trade and diplomatic agencies of the Canadian Government abroad. Virtually nothing should be done in this market on the basis of Territorial resources insofar as general advertising and promotion are concerned.

While the American market represents only 27% of the total, the volume is sufficient to suggest that advertising and promotion effort is desirable here.

It should be noted that the foregoing discussion refers solely to volume visitation for general tourism and recreation. It does not refer to specialized visitation for hunting and fishing camps, which now provides the bulk of the expenditure to the Territories and the market for which is highly focalized upon the U.S.A. It must also be emphasized that advertising and promotion efforts must be highly selective and that cost benefit relationships must be continuously monitored.

The International Inter-Regional Pattern

In Table 4.2, direct and indirect inter-regional visitation to Canada from selected regions and countries is summarized. The four areas indicated in the table, including Great Britain, Germany, Scandinavia and Japan, supplied about 265,100 person arrivals in 1968 for all purposes. This was approximately 72% of the 370,000 inter-regional direct and indirect person arrivals in 1967 from all countries, and 68% of an estimated 552,000 in 1980.

The group provided about 205,300 tourist and recreational visitors in 1968. This was about 81% of 254,000 inter-regional visitors for these purposes shown in Table 4.1. Great Britain was the dominant country accounting for 149,100 visits, or 73% of the total.

Germany is decidedly secondary with a ratio of 15%, Scandinavia with 8% and Japan with 4% and markedly at the lower range of the distribution. Moreover, a very liberal approach has been taken to Japanese visitation as explained in subsequent sections of the report.

About 26,400 tourists from this group were motivated primarily by pursuits other than visits to friends and relatives. This was about 69% of the total of 38,000 similarly motivated visits from residents from all countries outside North America, Britain was, again, the dominant nation accounting for 63% of the total, or 15,900 visitors.

It is expected that visits for tourist and recreation purposes, including visits to friends and relatives, will increase from 205,300 in 1968 to about 444,600 by 1980. Trips primarily for leisure time pursuits, other than visits to friends and relatives, will grow from about 26,400 in 1968 to 54,800 by 1980 or by approximately 119%.

TABLE 4.2

DIRECT & INDIRECT VISITATION TO CANADA FROM SELECTED COUNTRIES

	1968 (000)	%	1970 (000)	1980 (000)	%
1. Visits — All Purposes					
Great Britain	177.5	67	214.4	406.1	72
Germany	44.3	17	50.8	69.6	12
Scandinavia	22.8	9	28.1	54.7	10
Japan	20.5	7	22.5	32.8	6
TOTAL 1	265.1	100	315.8	563.2	100
2. Visits — Tourism and Recreation					
Great Britain	149.1	73	180.1	341.0	76
Germany	32.0	15	36.6	52.2	12
Scandinavia	16.0	8	20.0	38.3	9
Japan[1]	8.2	4	9.0	13.1	3
TOTAL 2	205.3	100	245.7	444.6	100
3. Motivated by Leisure Time Pursuits Other Than Visits to Friends and Relatives					
Great Britain	15.9	60	19.3	36.5	63
Germany	5.8	22	9.2	12.6	22
Scandinavia	1.6	6	2.0	3.8	7
Japan[2]	3.1	12	3.4	4.9	8
TOTAL 3	26.4	100	33.9	57.8	100

1 Assumes that 60% is business travel and 40% leisure time of which virtually 100% involves visits to friends and relatives.

2 Based on assumption that 25% of Japanese business visits are related to primary resource production of which a visit to the N.W.T. is possible and that some pleasure travel would occur. This is a very liberal interpretation of the Japanese market for Tourism.

It is obvious that the volume of visitors from any of these countries, including Great Britain, for tourist and recreation purposes is modest. Moreover, that component primarily motivated by a desire to pursue tourist and recreational activities other than visits to friends and relatives is extremely low.

Implications and Conclusions:

No national or regional market outside North America is sufficiently large to warrant extensive promotional efforts by the Northwest Territories. The costs involved are not justified by the scale of current visitation.

The previous remarks deduced from the more general evaluation of inter-regional visitation to Canada are again applicable.

American Travel Patterns

Attention is focused upon some of the more significant aspects of the overall American tourist and recreation travel pattern of importance to the Northwest Territories market considerations. Secondly, the salient features of the visitation of this group of nationals to Canada are noted.

In 1967, there were about 361.2 million person trips of 100 miles or more to points in the United States and abroad. Approximately 295.4 million, or 82% of the trips were for tourist and recreational purposes. Possibly 310.2 million trips of this type were taken in 1968.

In 1967, approximately 283.1 million, or 95% of all tourist and recreation person trips had destinations in the United States. About 33.4 million, or 11.3% of these trips, were 500 miles or more in extent. It is these long distance trips that are of most interest to the Territories.

There may have been 1.96 to 2.30 million person tourist and recreation trips to states bordering Canada, situated from North Dakota westward. Probably 85% or more of these trips represented automobile travellers. There is, therefore, a long distance tourist and recreational travelling group with destinations in states bordering the western Canadian provinces that should be recognized in territorial market analysis. It is important to note, however, that the bulk of travel to states bordering Canada is associated with those situated from Minnesota eastward.

About 22.2 million, or 49% of all long distance trips involving 500 miles or more of travel for leisure time purposes, had visits to friends and relatives as a primary purpose. Another 18.3 million, or 40% were motivated essentially by a desire to enjoy sightseeing experiences. Only 5.2 million trips, or 11% were occasioned by the pursuit of general outdoor recreation activities.

In the case of trips outside the United States, about 3.4 million, or 28% were motivated primarily by a desire to visit friends and relatives. Another 6.8 million, or 55%, were engaged essentially in general sightseeing. About 2.1 million trips, or 17% were focused upon general recreation activities.

From the foregoing remarks, it appears that only 23.5 million, or 51% of all long distance trips of 500 miles or more to destinations in the United States were motivated by purposes for which the resources of the Territories might have represented an alternative. About 8.9 million person trips, or 72% of those with destinations outside the United States, could be similarly regarded.

There were about 818,000 long term American tourist and recreation visitors to Canada in 1968. About 45.9% of these, or 375,000 represented plane travellers staying three days or more. Another 54.1%, or 442,200 were automobile travellers.

The general origin and destination pattern of the flow of American automobile traffic to Canada is decidedly limiting from the standpoint of visitation to the Northwest Territories. The Northeast Census Geographic Region (Middle Atlantic and New England Regions in Figure 4.1), together with the East North Central Census Region, generated about 74.5% of all visitation on a twelve-month basis, and 64% of that in the third quarter. Only 13% of the trips in this area in the third quarter had destinations in Western Canadian Provinces, including British Columbia. In effect, 87% of this traffic was destined for the Central and Eastern Canadian Provinces.

The West North Central and Pacific Census Regions are the prime market areas for the Prairie Provinces. In 1968, about 43.4% of all automobile travellers staying one or more nights in Canada originating in the West North Central Region, were destined for the Prairie Provinces, and this part of Canada. The Pacific Census Region ranked second. While it sent only 11.4% of all its Canadian visitors to Prairie destinations, they accounted for 20.2% of the American total coming to those provinces.

In terms of automobile tourists in the critical third quarter of the year, three census regions, namely the Pacific, Mountain and West North Central, occupied the leading positions insofar as visitation to Western Canadian Provinces, including British Columbia, was concerned. About 99% of all American visitors to Canada from the Pacific Region were destined for the Western Provinces and they accounted for 61% of all American tourists to this part of Canada. Nearly 99% of the visitors to Canada from the Mountain states were destined for Western Provinces, and they accounted for 13% of the American total to the region. The East North Central Region sent about 17% of its visitors to destinations in this part of Canada and they accounted for 10% of the total to the region. The critical West North Central Region sent 49% of its visitors here but they accounted for only 6% of the total of American visitation to Western Canada.

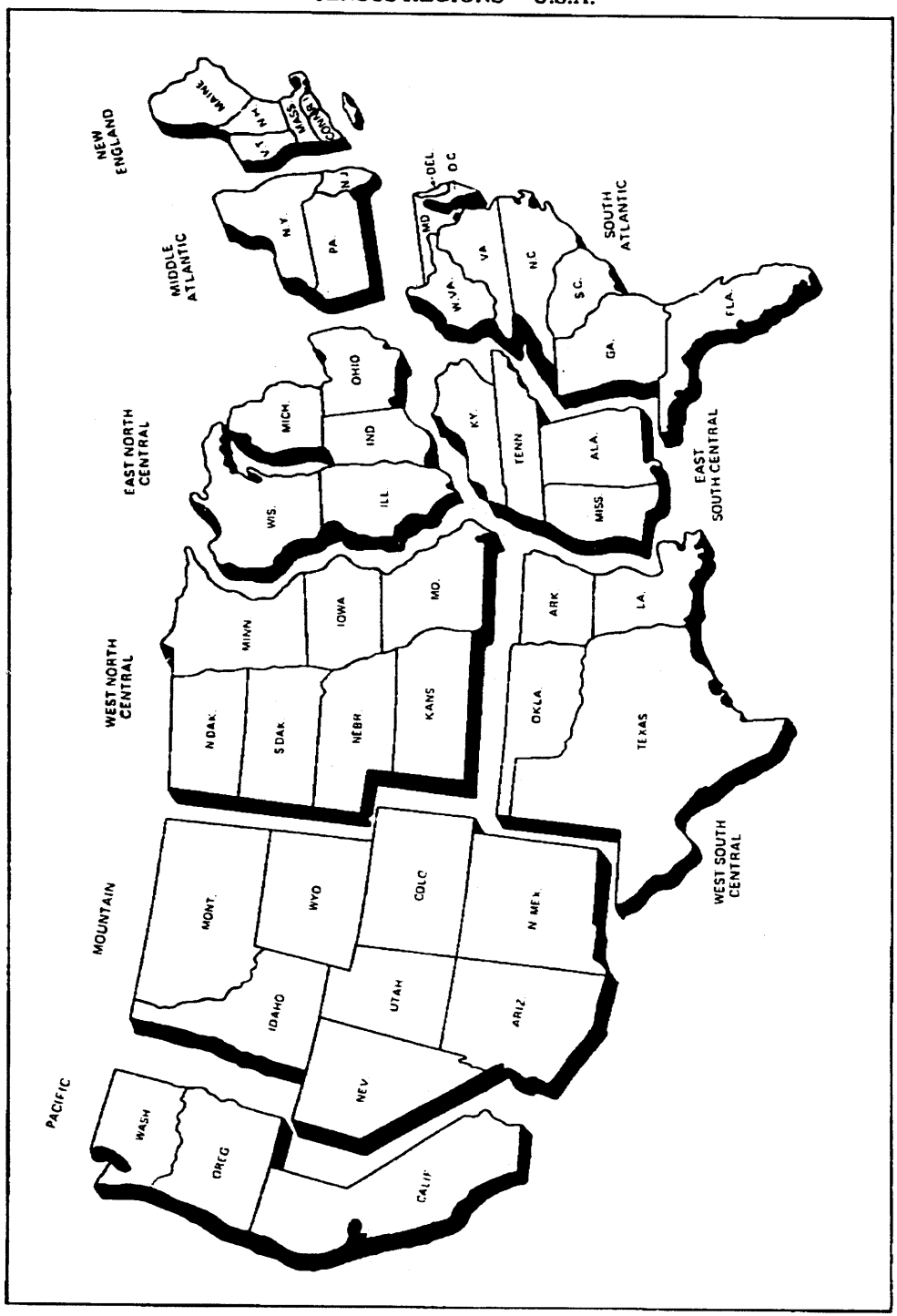
The foregoing pattern is reflected in the origin of automobile visitors to the Northwest Territories. Among the American states, in the Pacific Region, California ranked first and Washington third. Minnesota in the West North Central Region ranked second. Illinois and Michigan in the East North Central Region were about of equal significance and ranked fourth. In effect, the Northwest Territories drew its automobile tourist traffic from American states in the third quarter of the year in proportions roughly similar to American visitation to Western Canadian Provinces. This is precisely what would be expected on the basis of an evaluation of Canadian visitor statistics as a whole.

In contrast to automobile traffic the origin pattern for lodges and outfitters in the Northwest Territories shows a pronounced emphasis upon visitation from the East and West North Central Census Regions. Together they provided 65% of the guests.

It can be stated that the Pacific Census Region, particularly the States of Washington and California currently represent one distinct regional market for the Northwest Territories. This market is of primary signficance for automobile travellers but of modest consequence to angling and hunting camps.

The North Central Census Geographic Region, particularly the States of Minnesota, Illinois and Michigan, represents another major market. This is the primary market for the sports camps but is of secondary importance for automobile visitors.

FIGURE 4.1
CENSUS REGIONS – U.S.A.



It is difficult to determine the prime future market areas of the United States for landscape touring in the Northwest Territories by plane. Origin and destination data for current highway travellers and visitors to sports camps in the Territories are of limited value. General American visitor totals to Canada and the Western Provinces, previously noted, are of little use in this instance. Travel of this type to the Territories is in its infancy and provides no real guide to market prospects.

The future depends on a number of rather specific, but, at the present time, unpredictable circumstances. The emergence of special northern interest groups in specific parts of the United States will be an important factor. While there has been some interest of this type generated in the Northeast Census Geographic Region (Admiral Byrd Society) almost all large cities in the United States have the potential for the generation of this sort of thing. Secondly, much will depend upon promotional efforts of the regional carriers. Interestingly, the cost of air travel to and around the Northwest Territories is of such a magnitude, that there is very little time and cost advantage to the residents of any particular part of the U.S.A. In this respect the situation is much different than that related to automobile travel. Finally, much will depend upon the work of the travel wholesalers and agents.

It is felt that there are probably three future core areas for landscape touring by air. The Pacific Census Region of the West Coast, including the States of California, Washington and Oregon, represents one prime prospect. The logistics of travel in this instance would probably be focused upon the Mackenzie Valley and travel to and through the Arctic Islands from the southwest. Much of the traffic in this instance probably will be built upon the extension of air tourism to Alaska. The East and West North Central Regions represent a second distinct market area. The penetration to the Arctic in this instance would probably be essentially northward through Winnipeg into Keewatin and on to the Arctic Islands. It is felt that the Northeast Census Geographic Region and the Mid-Atlantic Census Region represent a third market. Penetration in this case would be through Montreal northward directly to the Arctic Islands centering on Frobisher.

The three regional carriers serving Northwest Territories obviously have prime vested interest in each of these individual markets. Marketing strategy for landscape air tours should be based upon the aforegoing logistics of travel or geographic market locational factors.

Implications and Conclusions:

While the overall flow of American tourist and recreation visitors to Canada defined in terms of origin and destination patterns is not particularly favourable to the Territories, there is a sizable segment of the visitor volume with travel characteristics that clearly suggest opportunities for the Territories. The exploitation of these prospects, however, requires a selective marketing approach.

It is necessary to recognize at the outset that there is a clear segmentation to the market and its future prospects in terms of three major visitor categories with the prime market location of each differing substantially. Firstly, there is the automobile landscape tourist entering the Territories via the Mackenzie-Yellowknife system. Secondly, there is the air travel landscape tourist. This activity is still in its infancy. Thirdly, there is the visitor to the specialized hunting and fishing camps.

The prime marketing areas for highway landscape tourist are clearly situated in the Pacific Census Region, including the States of California and Washington, and the East West North Central Census Region, particularly the States of Minnesota, Illinois and Michigan.

Current American visitor patterns to the Territories and overall travel to Canada from the United States amply support the foregoing statement. American visitor patterns to the Western Canadian Provinces as a whole, however, suggest that there may be a market in the Mountain Census Region, particularly in the northern tier of states that requires careful evaluation.

Continental geographic patterns dictate that the aforementioned census regions will continue to hold the dominant position in the American market for highway travellers. Volume totals from other areas may increase, but there will be a simultaneous growth in visitation from the current prime market areas that will ensure and perhaps even increase their relative importance.

The development of a highway into the Keewatin District, northward from Churchill, could be expected to have a very significant effect upon tourist patterns. The volume of American highway tourists to the Keewatin and the Northwest Territories as a whole would increase sharply. The East and West North Central Census Regions of the United States would be expected to quickly assume and maintain the dominant position among the market areas of U.S.A. It is possible that within a very few years of its opening, such a road would overtake the Mackenzie-Yellowknife system as a tourist artery. It is possible that such a highway also would substantially reduce volume visitation from these census regions now enjoyed by the Mackenzie-Yellowknife system, at least for a time.

It is of interest to comapre the development of a major highway northward to the Keewatin with a link between the Alaska and Mackenzie-Yellowknife highways through the Liard Valley in relation to tourist market factors. The latter highway would allow the Northwest Territories to more effectively tap tourist highway traffic moving towards the northwest portion of the continent to Alaska and the Yukon. It would not, however, substantially alter the primary market relationships for the region as a whole. In the case of a road into the Keewatin, there would be a major and fundamental change in market relationships. Distances to a primary U.S. Market would be radically altered and the Northwest Territories would represent the only terminal attraction area for travel.

The foregoing remarks are not intended to constitute a recommendation for the development of a road into the Keewatin, that must obviously be determined by a multiplicity of cost-benefit considerations. They merely indicate the impact of such a development upon the logistics of highway tourist travel to the Northwest Territories.

As previously noted, the origin pattern of American highway visitors to the Territories corresponds closely, in a proportionate sense, with that to Western Canadian Provinces. This naturally raises a question with respect to the effectiveness of the promotional efforts of the Territories in the Pacific and East and West North Central Census Regions.

Is volume visitation to the Territories from these regions effected by Territorial advertising and promotion, or is the region simply receiving a normal spillover or percentage share that would be received in any event? There is some suggestion in this analysis that the latter may be the case. Any real build-up of traffic from these areas would probably require a much more sophisticated marketing approach than the mere operation of booths at trade and sports shows in the major urban centres of these regions. Possibly a major impact could be generated by the direction of Territorial efforts toward the northern group of the Mountain Census Region States that appear to have potentials for the Territories that are not now realized.

While no satisfactory answer can be given to this question that admittedly could be raised with reference to the operations of almost all tourist bureau in Canada, it deserves

careful consideration. The answer obviously lies somewhere between a complete rejection of the effects of advertising and promotion and acceptance of a point of view that attributes all or perhaps even most of the volume visitation to its effect. Any government with varied and heavy demands for a multiplicity of tourist and recreation programs and facilities must confront this question in a serious manner.

The highly specialized hunting and fishing camp market for the concentration of lodge operators largely in the Mackenzie District, now rests essentially upon the East and West North Central Census Regions, particularly for the fishing camps. This portion of the U.S. is likely to remain the dominant market for this group of operators. There appears to be market prospects in the states of the Pacific Census Region and probably in the northern states of the Mountain Census Region that could result in a broader market base for current operators.

The market of the states in Mid-Atlantic and portions of the New England Census Region has been very lightly exploited by the current N.W.T. operators. It is likely that this portion of the United States will increase in significance as hunting and fishing operations open up in the Eastern Arctic Islands. This is obviously the key market area for any operations in this part of the Northwest Territories. This market appears to be "wide open" and its exploitation by new operators would cause no conflict with existing enterprises. However, intensive competition from Ontario and Quebec can be expected.

The evaluation of the market for the American landscape tourist travelling by plane to the Northwest Territories is the most broadly based of all markets in a geographic sense. The evaluation of current American travel patterns to Canada, however, suggests three primary and distinct regional source areas and avenues of traffic flow. There is the market of the Pacific and Mountain Census Regions with travel funnelling into the Mackenzie District and the Western Arctic Islands. Here a substantial part of the flow will be built upon a tapping into visitor travel to Alaska. A second district corridor of northern movement through the Keewatin into the Central Arctic Islands will rest upon the market of the West and East North Central Census Regions corresponding with what is now the prime sports camp market area of the Northwest Territories. The third flow through Montreal northward to Frobisher and the Eastern Arctic Islands should stem from the Mid-Atlantic Region and portions of the New England Census Region. Each of these flows, of course, is essentially commanded by one of the three regional carriers. The market area for this type of tourist is much more broadly based in a geographic sense. Moreover, it appears to possess tripartite characteristics.

The Canadian Visitor Patterns

The main focus of Canadian vacation and general leisure time travel in both an origin and destination sense is upon the eastern half of the country and particularly upon the Central Provinces. Only about 2.96 million or 21.5% of 13.78 million tourist trips of 100 miles or more in extent had destinations in the Prairie Provinces. Of about 4.97 million vacation trips undertaken in the third quarter of the year by Canadians, approximately 805,600 or 16% were destined for the Prairie Provinces, and this includes trips undertaken by residents of that region.

There may have been about 185,700 long distance party vacation trips by automobile to destinations in the Prairie Provinces in 1968. This is again a modest proportion of the total for Canada.

There may have been about 493,800 party vacation trips to Canadian destinations of some consequence to Territorial market considerations. About 377,400 of these trips, or 76% were made by automobile. Another 116,400 or 24% were made by plane.

Highway visitor patterns for the Northwest Territories in 1969 indicate that Alberta is the first ranking origin area in a volume sense. British Columbia ranks second and Saskatchewan third. Ontario is fourth among the Canadian provinces. In terms of visits per 1,000 population, Alberta ranks first, Saskatchewan second, British Columbia third and Ontario fourth.

It is clear that in terms of both volume visitation and visits per 1,000 population, Alberta is the leading market area for the Territories, insofar as automobile travel is concerned. While British Columbia ranks second in terms of volume, Saskatchewan is more significant in terms of visits per 1,000 population. The Canadian automobile travel market core for the Territories is clearly focused upon Alberta, British Columbia and Saskatchewan.

Implication and Conclusions:

It is clear from the analysis of the overall travel patterns of Canadians and visitor ratios for the Territories per se that Alberta is the leading market area for highway traffic and worthy of the major focus of the marketing effort. British Columbia and Saskatchewan are decidedly secondary.

The development of a highway connection from Manitoba to the Keewatin District would substantially increase visitation from this province, the North Central Census Region of U.S.A., and perhaps Ontario. Tourist volume flow would soon equal or surpass that of the Mackenzie-Yellowknife system.

In terms of air landscape tourist travel the Canadian market is now occupying a very modest position. Previous remarks with respect to the corridors of movement for American traffic apply in this instance. Alberta and British Columbia appear to offer the best market prospects for air travel through the Mackenzie Basin into the Western Arctic Island Archipelago. The Manitoba market, which will be modest in scale, is best directed towards the Keewatin. There is a substantial market in Ontario and Quebec for travel to the Eastern High Arctic centred on Frobisher. This is the prime market area in Canada for travel to this part of the Territories.

General Summary of Implications for Marketing

Conclusions reached as a result of the analysis of volume travel patterns from the global, continental and national perspective are summarized.

The scale of current and prospective inter-regional tourist travel, that is, visitors coming from outside the North American continent to the Northwest Territories, is of such modest proportions that broadly based, costly and time consuming marketing efforts by the Division of Tourism cannot be justified. General landscape touring by small special interest parties, and by sportsmen, particularly those visiting hunting camps, is the most that can be expected.

The Territories must rely essentially upon services of the Federal government to develop whatever prospects are present. Any unilateral attempt that involves significant time and cost expenditures is unwarranted.

The current foundations and future prospects for tourism in the Northwest Territories are associated with the Canadian and American markets. Furthermore, the development of a satisfactory advertising and promotion program designed to stimulate visitation from markets must be based upon the recognition of the three major and quite distinct segments, including the landscape automobile tour, the landscape air tour and special activity

participation, including hunting, fishing and wilderness canoeing and camping. The prime market areas for each of these differ substantially as does marketing responsibility and process.

Responsibility for and the main thrust in the promotion of the general automobile landscape tour rests with the Division of Tourism working both unilaterally and in co-operation with the Canadian Government Travel Bureau.

Prime market region in this instance is represented by Western Canada, with the Province of Alberta constituting its heart and core. It is here that the expenditure of money and time can be expected to exert its greatest effect in terms of volume visitation.

The Pacific Census Region, and particularly the States of California and Washington, is currently the second most consequential market for automobile travel. Volume visitation from the region will increase but its ranking would likely decline if a road to the Keewatin were developed subsequently.

The North Central Census Geographic Region, particularly the States of Minnesota, Illinois, and Michigan, is the third most significant market region. This would likely become the second ranking region if a highway to the Keewatin were constructed.

The general travel patterns for Americans to Canada suggest that there are substantial market prospects for the Northwest Territories in the northern states of the Mountain Census Region. The expenditure of some time and money within this market area could yield a substantial return in volume visitation.

The development of a road into the Keewatin District with direct connections from Winnipeg northward could be expected to draw heavy volume of traffic from the East and West North Central Census Regions. Moreover, there would be a marked increase in visitors from Ontario.

Responsibility for the promotion of air landscape tours rests essentially with the carriers and private marketing structure for tourism and recreation. The role of the Territories in this instance is one of secondary promotion support and the stimulation of the development of the necessary infra-structure, particularly in the form of accommodation, food services and special events.

The three broad prime market areas in this case appear to be quite clearly related to the regional carriers. There is the Pacific Census Region of the U.S.A., with the flow of traffic through Winnipeg northward into the Keewatin and the Central Arctic Island Archipelago. Finally, there are the states of the American Mid-Atlantic Census Region and portions of the New England Census Region, together with Ontario and Quebec, with the flow of traffic through Montreal and northward to Frobisher and the Eastern Archipelago.

The market for sports camp operations is essentially focused upon the East and West North Central Census Regions and directed towards the Mackenzie District. There appears to be good market prospects to broaden this market significantly to the Pacific Census Region, and particularly to the State of California. This will become increasingly significant with the development of camps in the Keewatin, the essential market area for which will be in the East and West North Central Census Regions. The market potentials of the Mid-Atlantic Census Region and portions of the New England Census Region have not been tapped to any significant degree. New camp operations in the Eastern Arctic should be able to exploit potentials in this instance without encroaching upon present markets, but much depends upon the quality of the resources from a hunting and angling standpoint.

The total tourist and recreation market for the Northwest Territories can be expected to broaden substantially within Canada and the United States. The concentration upon certain areas that is currently such a marked feature will shift as landscape touring by aircraft grows and the sports camp operations broaden their locational pattern and consequently their market base. If adequate resource foundations can be found in the Eastern Arctic for sport camps, market prospects are such that the Mid-Atlantic Census Region, together with Ontario and Quebec, could become the leading market for such operations.

5. RESOURCE CLASSIFICATION (SUPPLY ANALYSIS)

Resource classification and supply analysis can be regarded as synonymous terms in regard to this study. Visitors can only be encouraged to use an area if the resource base is adequate to support the visitor activities.

The general objective of the following reports, therefore, is to identify and evaluate features of the Northwest Territories, both natural and man-made, that constitute its leisure travel and outdoor recreation resources; to determine how fully they are now being exploited; the level of potential exploitation and the means of attaining that level.

The consultant produced eight reports, analyzing the resources from a tourist and recreational viewpoint and they are presented in the following sections.

5.1 AN EVALUATION OF THE ANGLING POTENTIALS OF THE NORTHWEST TERRITORIES

Demand and Supply Considerations

The demand for the utilization of the fish stocks of the Northwest Territories can be separated into three broad categories, namely, domestic, commercial and sport angling. The latter is of concern in this report.

Sport fishing demands in turn are of three general types, each of which possesses a rather distinct set of supply requirements that stem from a particular set of angler attitudes and expectations.

Local Resident Demand:

In the main, sport angling is pursued by the non-native population. Among the native population angling is largely engaged in by children and teenagers. The adult native views the fish stocks of the Northwest Territories primarily as a source of income through commercial fishing and a food supply both of which are obtained through netting practices.

Benefits accruing to the local residents through the pursuit of angling are of several types. A basic protein food is obtained for the individual or the family. It is doubtful, however, if this aspect is of really major significance within the context of a wage-earning economy that characterizes the non-native population. When the cost of travel, equipment purchase and particularly time spent angling are taken into full consideration, significant monetary benefits are not involved. The attainment of a delectable and for some almost exotic taste treat is probably of more consequence than protein. The focus upon char and lake trout and the correspondingly low value attached to pike and pickerel tend to substantiate the foregoing generalization. This exotic food aspect is very important in the case of new residents to the Territories who come from areas where char and lake trout are expensive foods to which a degree of social prestige and gourmet connotation are attached. Thirdly, there are the leisure time and recreational values associated with angling. These are probably the most significant of all motivational factors and benefits.

Non-Resident Specialized Angling Demand:

This sector of the demand is represented by those travellers drawn to the Northwest Territories solely or primarily for the pursuit of its angling opportunities. Visitors to the specialized angling camps represent the core of this grouping. A second and less

economically inconsequential group of anglers, mainly residents of northern Alberta, travel by highway into the Territories particularly for spring angling.

Lake trout and char, especially the former, form the foundation of the specialized non-resident angler interest. The attainment of trophy fish and the prestige attached to an angling trip in the remote areas of northern Canada are the main motivating factors.

Non-Resident General Vacationer Demand:

For this group of visitors the fish resources of the Northwest Territories represent one of several resource inputs in a general vacation travel experience. For some, angling expectations are undoubtedly a major motivational factor in the decision-making process that precedes a trip to the Northwest Territories. In other situations, they may represent a decidedly secondary or tertiary consideration.

While this group of anglers undoubtedly would receive great satisfaction from the landing of trophy fish and the catching of more exotic species, such as lake trout, char and grayling, their expectations can be realized or their desires satisfied by medium size stocks in reasonably plentiful quantities. This is particularly true in relation to the younger members of the tourist party. Moreover, they attach considerable value to pike and pickerel, two species that are accorded very limited value by resident anglers and those coming to fishing lodges. In effect, they call into production somewhat different stocks than the two aforementioned angler groups.

The Angling Resources of the Northwest Territories

The Mackenzie Drainage Basin:

This area contains the Mackenzie Mountains, the Palaeozoic Lowlands of the Mackenzie River and portions of the westerly margins of the Shield. It displays the greatest variety of angling species; six of the seven sport angling species of the Northwest Territories, including lake trout, Arctic grayling, northern pike, pickerel, inconnu and perch are present. The perch of the Northwest Territories are confined exclusively to this area, and the bulk of the inconnu and pickerel waters are found here. The best of the lake trout angling opportunity of the Territories as defined in terms of size and quantity combined is found on the East Arm of Great Slave Lake and on Great Bear Lake.

The Mainland Shield:

This area, which includes all waters on the mainland portion of the Northwest Territories to the north and east of the Mackenzie Drainage Basin, contains four angling species, including lake trout, grayling, northern pike and Arctic char. The best of the char resources of the Northwest Territories are found in the lower reaches of the water of this area draining into Hudson Bay and the Arctic Basin. In a comparative sense, this region is superior in terms of char and generally inferior with respect to every other species found therein.

The Arctic Islands:

Essentially only two main species are present in this region, namely, lake trout and Arctic char. Lake trout are at the northern extent of their range and, from a territory-wide sport angling point of view, are rather weakly represented. Char resources are reasonably strong at points, but are not equal to those of the previously noted area and suffer from accessibility limitations in many instances.

A Species Perspective:

The various game fish species are now examined briefly on an individual basis. Only the more salient features of significance for a subsequent tourist and recreation capability analysis are noted.

Lake Trout:

Lake trout is the most widespread species within the Territories, due to its ability to withstand low temperatures and exploit limited food supplies. This species forms the foundation of sports angling in the Territories.

Sports anglers are attracted by the abundance of trophy fish, the plentiful medium-sized stocks that provide continuous angling action and the prestige of an angling experience in this remote part of Canada.

Arctic Char:

The anadromous Arctic char is a northern species enjoying circumpolar distribution, occurring in North America, Greenland, Iceland, Spitzbergen, Jan Mayen, Europe and Asia. Anadromy conforms roughly to the 50^{o} Fahrenheit isotherm. Landlocked char occur throughout the areas previously noted as well as in mountain lakes of the Alps, Apennines and Pyrenees. Within the Territories landlocked stocks are found in the uplifted lakes near the coast on Somerset and Baffin Islands, together with some of the lakes farther north, within the Arctic Archipelago.

Some exceptionally large char, in the order of 27-28 pounds, have been caught in the Northwest Territories. In general, however, a ten-pound fish is considered to be a trophy. In the better waters of the Territories, at select points along the mainland Arctic Coast and the south and east coast of Baffin Island, the average size fish is in the order of 7.5 pounds.

Char is an exotic Arctic species for which the Territories possess comparative advantage within a North American context. In Canadian waters the fish are larger in the aforementioned select locations.

Up to the present time char have represented a supporting or secondary angling species adding variety to the offering of a sport camp. The exotic aspect of the fish, coupled with its fighting qualities have provided a welcome break in activity for the ardent angler attending these camps.

Northern Pike:

This species is fairly widespread over the mainland sections of the Northwest Territories, but is entirely absent from the Arctic Archipelago. At the present time the Territories possess no comparative advantage with respect to this fish which is at the northern end of its range. Non-residents are not likely to come to the Territories at this time solely for pike fishing which is available at more convenient locations involving far less expenditure of time and money. In a tourist sense this species probably makes its greatest impact in the case of a landscape tourist enjoying a little fishing while travelling in the Territories.

This species is likely to assume increasing importance in future angling patterns in the Territories as the stocks and particularly the larger specimens in more convenient southern locations are progressively depleted.

Arctic Grayling:

This fish is found all over the mainland portions of the Northwest Territories but is absent on the Arctic Islands. It is a species with considerable exotic appeal being found only in the Arctic Watershed.

The grayling is a migratory fish that travels between ocean waters or large inland lakes and stream spawning areas. Landlocked stocks of lake grayling found in various parts of the Territories will not take the hook as a general rule.

Trophy grayling in the Territories are in the order of three pounds. A large percentage of the bigger fish caught is in the order of two to two and one-half pounds.

Grayling is a good fighting fish for its size. Taken on light tackle it offers the angler a considerable challenge, and the eating qualities of the flesh are excellent.

Grayling provide variety and depth to the angling resources of the Territories insofar as non-resident visitation is concerned.

Pickerel:

This species which is confined to the Mackenzie Drainage Basin is far more strongly represented in the more southerly portions of Canada. Some large fish in the order of fifteen to twenty-four pounds are occasionally caught, indicating that there are undoubtedly trophies within the Northwest Territories. On the other hand, they are not easily caught and habitat conditions in the Northwest Territories as a whole are poor, compared with those in the more southerly portions of Canada. Like the northern pike, this species may increase in importance when stocks in southern Canada become depleted. At the present time, however, it is decidedly of minor consequence in the overall angling resource patterns of the Northwest Territories.

Inconnu:

This species which probably spread into the Northwest Territories from an Alaskan refuge is confined essentially to the Mackenzie Drainage Basin and a portion of the Arctic shore from Coppermine westward. In its fresh water environment, as for example Great Slave Lake, it migrates from the larger bodies to the rivers in the spring of the year with the run being from two weeks to one month in length. Inconnu ran from Great Slave Lake into Hay River from about May 15th to July 1st.

Perch:

The range of this species in the Territories is quite limited being confined essentially to the Mackenzie Drainage Basin from Great Slave Lake southward. It is not an important angling resource of the Territories.

Whitefish:

Throughout a large portion of its range it cannot be angled. In those locations where the whitefish will strike a bait, a good fight on a light line frequently results.

The future of this fish in an angling resource depends in a large part on whether a biting strain can be developed. Possibly biting fish might be transferred to other lakes where they may take hold and increase with reasonable rapidity.

Productivity Patterns

Present knowledge of production factors is unquestionably inadequate from the standpoint of policy and program planning for sport angling in the Northwest Territories. Nevertheless, research has progressed to a point where some general patterns and relationships of consequence to the tourist and recreational planner are discernible. While the supporting factual foundations for statements of this type are admittedly shaky and exceptions to generalizations are frequent, these perspectives upon supply cannot be ignored.

There are essentially two approaches to the assessment of supply. Both are of considerable value and the patterns that emerge from each are generally compatible.

The ichthyological approach to productivity evaluation involves the study of the densities, growth patterns and general biological characteristics of fish populations. Commercial catch statistics provide very significant data inputs for this general approach. Unfortunately, comparable data for the angling catch are extremely sketchy and in many respects can be considered virtually non-existent.

The natural environmental approach provides a substantial clue to productivity within a broad geographical framework. The results of limnological studies at specific points within broad natural environments combined with commercial catch information for these locations, provide a basic and indispensable factual input to this approach. Broad natural environmental regions in which there is a uniformity of temperature, length of growing season, precipitation and geological structure are readily discernible. The results of specific instance or site situations are then applied to the estimation of productivity for these regions in general.

Knowledge of the aforementioned regional environmental factors considered to control fish productivity is probably adequate for this approach as a result of the output of natural scientists in past years, including climatologists, geologists, etc. The weakness lies in the fact that limnological studies, coupled with catch information, are available for an insufficient number of points to permit generalization at the regional level with that degree of assurance desired by the tourist and recreational planner.

The results of past research suggest that productivity for all species of fish per surface acre of water in the mainland Shield section of the Territories is about one-half pound. This is a general standard that can be applied to the Territories as a whole. There are undoubtedly numerous instance exceptions to this generalization but within the aforementioned broader geographic context the total body of available fact suggests the value is realistic.

In some of the stronger lake and stream environments productivity may reach one pound per acre. The productivity of Great Slave Lake is probably in the order of three-quarters of a pound per surface acre when all species are considered and the value for Great Bear Lake is probably about one-half pound per surface acre.

The productivity value for the Mackenzie Basin is perhaps in the order of three-quarters of a pound per surface acre. Here waters are somewhat warmer due to the flow from more southerly areas. Calcium, phosphorus and other nutrients are somewhat higher due to sewage inflows and fertilizer washed from agricultural lands in the upper portions of the drainage basin outside the Northwest Territories.

A comparison of productivity values for the Mackenzie Basin and the Shield clearly indicate that temperature is really the basic controlling factor that is only overcome by the aforementioned anomalies to a very modest extent. Moreover, it might be noted that there are large sections of the Mackenzie River proper in which fish production and angling potential are extremely low. The highest productivity of the Mackenzie lowlands is perhaps at the juncture of the palaeozoic plains with the Shield, a situation that is well exemplified by the East Arm of Great Slave Lake.

Production of char at maximum sustainable levels in the arctic portions of the Northwest Territories south of Viscount, Melville and Lancaster Sounds appears to be about one pound per acre of winter or fresh water habitat area. Landlocked char productivity varies depending upon specific conditions within the bodies of water involved. As much as five pounds per acre can be expected from small Arctic lakes containing only char. Landlocked char, however, are usually too small to be of sport fishing interest.

Among the various factors effecting the productivity levels, low temperature values are undoubtedly the most ubiquitous and consequential. Most of the Arctic Islands and a very large portion of the territorial mainland are below the threshold for good growth.

Length of the growing season is also an inhibiting factor. Growing season for fish is generally short. There are long periods when waters of the Territories are ice covered and particularly in the more northerly areas.

Precipitation ranges between five and fifteen inches across most of the Territories. The enrichment of waters from stream run-off, therefore, is not as pronounced as in the more southerly parts of Canada.

The palaeozoic plains of the Mackenzie Lowlands appear to be more productive than the Canadian Shield. The higher values in this instance, however, probably stem from higher water temperatures and nutrient enrichment rather than from variations in lake morphology related to differing geological situations. In effect, if the drainage basin of the Palaeozoic Plains of the Northwest Territories was restricted to northern areas, there is a distinct possibility that there would be no substantial difference between the productivity of its waters and those of the Shield due to the uniform depressing effect of low temperatures prevalent in both situations.

As noted, the foregoing productivity values per surface acre of water include all species and all sizes of fish. Only a portion of these values represent the production of angling species and an even smaller proportion is directly relatable to trophy fish. An attempt is now made to narrow the productivity discussions specifically to angling species.

On the basis of commercial catch statistics, there appears to be a substantial difference between the lakes of the Shield and those of the palaeozoic plains in terms of species composition. This difference is probably of equal or greater consequence than the variations in the productive capacity of the waters in each of these areas. Lakes on the sedimentary palaeozoic plains appear to have about two-thirds of their population in whitefish and one-third in trout. In contrast the deeper and somewhat slower growth waters of the lakes of the Shield tend to display about two-thirds trout and one-third whitefish in their fish population. Since the trout are the foundation species of sport angling in the Northwest Territories, this marked difference in composition that tends to compensate for variations in productivity is of importance.

Combining the aforementioned productivity values with the composition ratios previously noted suggests that the overall productivity for trout in the Palaeozoic lakes is

about four ounces per surface acre and that for Shield lakes 5.3 ounces. In this instance, it is the pattern that emerges rather than the statistical values that is of consequence.

Some authorities feel that the productivity for lake trout, the foundation species for angling, could be as low as two ounces per acre per season throughout its entire range within the Northwest Territories. Moreover, there may be a small group of fish that grow quickly and reach large sizes while another group may grow slowly and never reach trophy size. If this were the case the productivity value of two ounces per surface acre of water in the Territories would be less insofar as trophy fish were concerned. Finally, an analysis of tagged fish reveals that populations may not move about a water body for distances greater than a five mile radius from their home base. This being the case, the populations of large fish within an area could be quickly depleted by excessive angling.

There is no question that the abundance of trophy fish taken from Great Slave Lake has been declining. In the opening years of lodge activity trophy fish probably represented 40% of the catch weight and perhaps 30% of the total number of fish captured. Probably no more than 20% of the fish landed are now trophy size. On Great Bear Lake trophy fish appear to be less plentiful.

Northern pike may represent about 5% of the total production of fish in the Northwest Territories at the present time. Productivity for this fish throughout its range in the Territories may be about 0.4 ounces per surface acre. Much of the area is not suited to pike, water temperatures being too low and weeds less plentiful than in southern lakes.

Productivity with respect to the Arctic char of the Northwest Territories can be rated high in terms of this species which, as previously noted, finds its ideal conditions in this portion of Canada. A recent study on catch per unit of effort on the Tree River is clearly indicative of high quality angling potential. The catch of fish per hour of angling in recent seasons was as follows: 1964 – .35, 1965 – .18, 1966 – .28, and 1969 – .40. Both 1964 and 1969 were exceptionally good years. If it is assumed that the average weight of a fish caught was 10 pounds, then the weight per hour catch in 1964 was 3.5 pounds and that of 1969 – 4.0 pounds. An average of 2.9 trophy char were caught in 12.4 hours of angling, which is a very high quality return.

Shifting Demand and Supply Patterns

To date the comparative angling resource advantage of the Northwest Territories has stemmed from the extensive cropping of the cream of the fish, the quality and quantity of which has been dependent in a large part upon the presence of substantial accumulated stocks. Other elements of consequence, however, have also been present in the pattern of comparative advantage. The situation is summarized below.

The Exotic Element:

There is an exotic challenging appeal to angling in the remote frontier of the Territories that is frequently accessible only with the expenditure of considerable money or effort. Secondly, the Arctic char is a somewhat unique species. This exotic element provides interest, challenge and above all prestige that non-resident anglers are willing to pay high fees to attain.

The Trophy Element:

The presence of exceptionally large fish in abundance compared with other parts of the continent is undoubtedly a major aspect of comparative advantage.

The Quality Element:

The abundance of fish provides a high yield per hour of angling effort or what might be more simply stated as an assured catch and high level of action. In future years there will undoubtedly be an abundance of high quality angling in the Northwest Territories in terms of general North American standards. There is a distinct possibility, however, that there will be substantial shifts in the aforementioned elements that provide comparative resource advantage. These shifts probably will reflect t' mselves in a number of ways.

Within the foreseeable future, the exotic element previously noted will undoubtedly continue to be of significance. In effect, the appeal of the environment and the exotic species will continue to draw non-resident anglers. However, with improved communications, particularly the increased road development that is inevitable in the years ahead, this exotic element should exert somewhat less influence. In effect, the uniqueness of the experience and its prestigious values will be reduced.

Trophy fish are certain to become less plentiful, but it is equally certain that there will always remain a goodly number of trophy fish in the lakes of the Territories. Actually the future of the trophy factor remains somewhat uncertain. If lake trout, pike and pickerel angling declines steadily in the more southerly regions, the trophy opportunities of the Territories will remain constant or perhaps increase even though large fish become scarcer. In effect, the comparative advantage in this instance is dependent in a large part upon the trend of events outside the Territories, and there are indications that it will be favourable for the Northwest Territories.

Angling quality within the foreseeable future undoubtedly will remain high in the Northwest Territories compared with other parts of North America. The degree of comparative advantage, however, is dependent upon the trend of events outside the Territories.

There is a distinct possibility that a marked shift will occur in the public image and expectation with respect to desirable angling species and particularly from the standpoint of local residents. Pickerel and pike that are now regarded by many local inhabitants of the Northwest Territories as something close to trash fish are almost certain to become sought after species in the years ahead. There is a possibility that inconnu can be promoted as an angling species. In effect, the breadth of the angling resource may be materially enlarged in the years ahead.

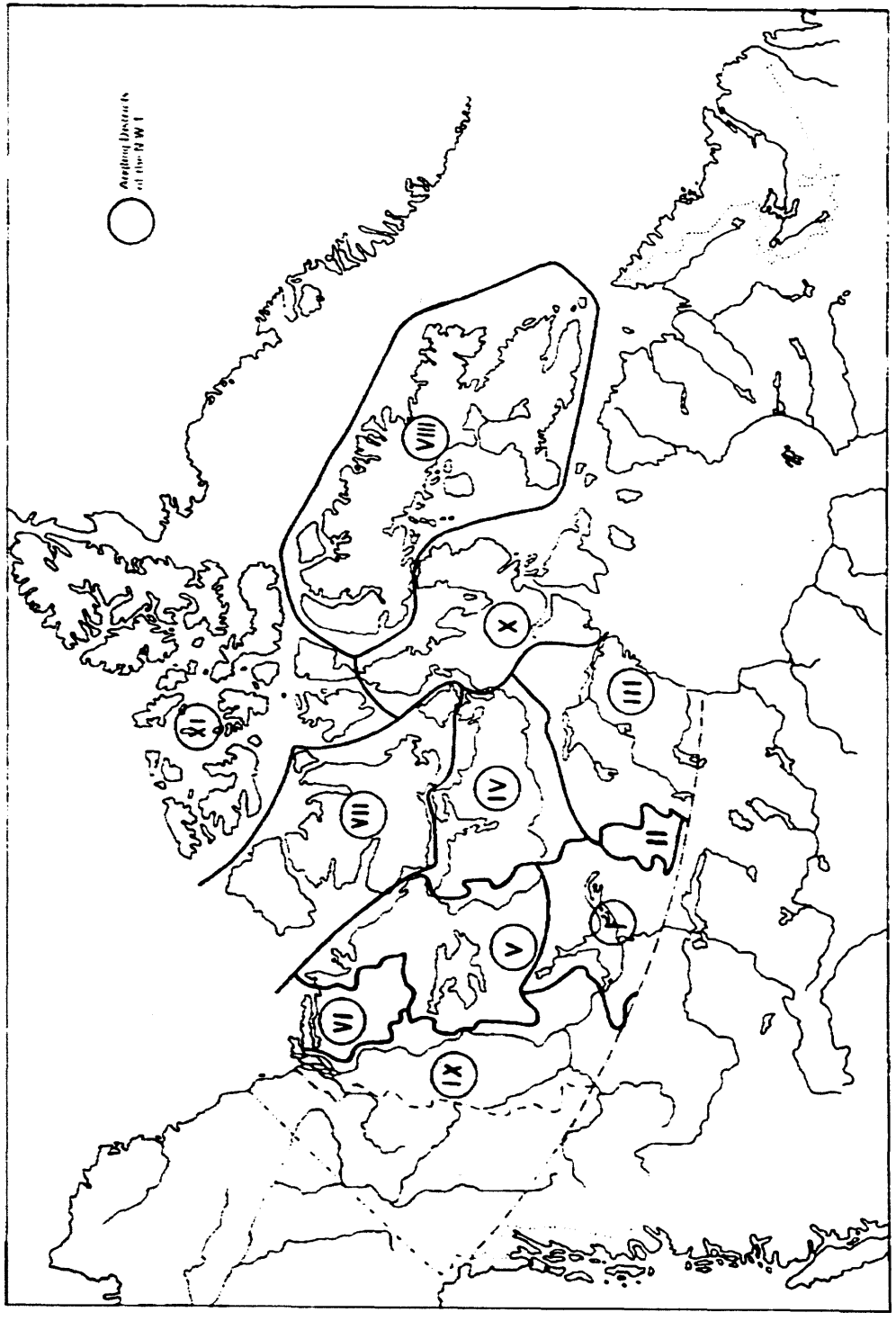
An Approach to a Sports Angling Capability Classification

The preparation of a sports angling capability classification for the waters of the Northwest Territories was the ultimate objective of this entire study. Data limitations and to some extent associated conceptual problems prevented the attainment of this objective in its most desirable form.

The Northwest Territories has been divided into eleven districts, geographically defined on the basis of the drainages of their major lakes and rivers (see Figure 5.1). Within these districts, it is felt that there are broad similarities with respect to available species, productivity and general lake type.

The District numbers in Figure 5.1 indicate a rank order of merit, based on angling opportunities and diversity of species. The proper interpretation of this map is critical since this interpretation centres around a rather difficult set of concepts.

FIGURE 5.1



It is suggested that the Division of Tourism do not distribute this map outside government planning circles in order that difficulties of the type noted may be avoided. This recommendation must receive serious attention for it reaches deeply into the core of the matter of harmonious relationships between the government and private entrepreneurs. In effect, the map and its subsequent discussion should be interpreted exclusively as a generalized tool for policy and program considerations by government.

The map of districts in rank order of merit simply indicates that within any district there is a distinct grouping of available species, productivity patterns and lake type that is of a particular order of merit when compared with that present in all other districts. We cannot conclude, however, that all water bodies within a particular district bear a ranking relationship to those in another district in keeping with the rank values for the districts.

In effect, there are lakes and streams in a lower ranking district, such as District V, that offer first class angling opportunities on the basis of a territory-wide comparison. It is important to emphasize this fact in any consideration of the district rankings shown on the map. It is equally important to note, however, that an examination of the map does permit us to state that the total angling opportunity of District I is superior to that of District II or V, and this is not without value.

Within District I, three sub-districts are shown. On the basis of available information it can be implied that these three possess the highest overall resource potentials of District I and that their numerical ordering is probably indicative of ranking. Sub-district I includes the East Arm of Great Slave Lake together with the Lower Taltson, Rutledge and Snowdrift Drainages. In establishing this sub-district the East Arm of Great Slave Lake was added to the three other areas that are identified as a sub-district. Sub-district II includes the Upper Taltson Drainage and sub-district III the Tagin-Thoa Drainages.

The strongest concentration of char resources in the Northwest Territories is in the lower reaches of the streams draining into the Arctic Ocean from Coppermine in the west to Chantrey Inlet in the east. The Tree River concentration is undoubtedly the most outstanding of the group and represents the highest classed char resource of the Northwest Territories.

The belt of char resources along the west coast of Hudson Bay from Chesterfield Inlet southward to the McConnell River is immediately noticeable from an examination of the map. There are three concentrations within this rather broad belt, including Chesterfield Inlet, Rankin Inlet and the estuary of the Wilson River.

An attempt has been made to rank the major char angling opportunities present in the Northwest Territories. The ranking is established on the basis of the strength of an area compared to all others. It is considered to be a highly subjective estimate.

The aforementioned belt of streams draining into the Arctic Ocean between Coppermine and Chantrey Inlet has been ranked Class I and in many respects is the yardstick by which all other opportunities have been assessed. This, as previously stated, is clearly the number one area of the Territories insofar as char angling opportunity is concerned. The Pond Inlet area has received Rank I. In this instance, a much smaller area of concentration is involved and the resource is not as strong as that of the Tree River. The concentration at the head of Frobisher Bay has been ranked VI with possibilities of improvement to Rank I. This area has been heavily over-exploited. If properly managed, it is the opinion of fisheries experts that it could recover to become a first ranking resource from the tourist angling standpoint. The belt of resources on the west coast of Hudson Bay is ranked I and II and those at the head of Cumberland Sound as II and III.

The fundamental strength of the angling resources of the Territories appears to lie in Districts I, II, III and the southern portion of District V, including Great Bear Lake. The major portion of the potential within these districts is undoubtedly associated with those areas lying within the Boreal Forest Belt and on the margins of the Shield and Palaeozoic Plains in particular. Beyond these areas resource potentials rapidly diminish in terms of quality or variety of species.

The future of the Island Archipelago, Districts IV and X and the northern portion of District V, rests almost entirely upon the char resource. This provides the natural impetous for development of commercial angling enterprises.

District VI together with the northern portion of District IX associated with the Mackenzie Delta appears to possess some opportunities for modest tent-camp development. A very large portion of District IX associated with the Cordilleran Mountains has limited resources that probably find their greatest value as a supplement to hunting-camp operations. Those portions of District IX lying on the Palaeozoic Plains, particularly in its southern portions, appear to offer some opportunity for modest lodge or tent-camp operations. With the opening up of this area by road, the resources are likely to find their greatest value as a supplement to a general landscape tour by automobile. At that time, there may be considerable development of small outfitter operations at strategic points on the road network.

The gist of the foregoing general evaluation of the map is simply that the angling opportunities in the Northwest Territories are not universally excellent. The best areas have probably already been brought into production. Future development prospects appear best in District II and III together with sub-district 2 and 3 of District I. Development of the northern areas depends almost entirely upon the possibility of attracting anglers primarily for char fishing. If this is not possible, development of much of this area, especially the lower reaches of streams draining into the Arctic Ocean between the Coppermine River and Chantrey Inlet, will proceed on the basis of outcamps designed to provide variety to the angling experience offered by the larger established lodges to the south, particularly those on Great Bear Lake.

Lakes Reserved For Angling and Domestic Fishing

As of January, 1972, one hundred lakes in the Northwest Territories had been reserved exclusively for angling and domestic fishing. About 59% of the reserved lakes are associated with District I encompassed by the Great Slave Lake Drainage Basin. They are, therefore, related to the area of highest overall productivity or potential for angling. They are also located in the district that contains the largest resident population. It can be stated, therefore, that the major focus for reservation is in the area of highest productivity and densest population, a pattern which is highly desirable.

The reservation of lakes in District II for angling has been extremely modest considering the high sport fishing capability accorded the area by the investigations of the Fisheries Research Board. Only five lakes have been reserved in this district.

No lakes have been reserved in the Mackenzie Delta area which falls partly in Districts VI and IX. All reservations in the latter district occur within its southerly extremities. As a commercial tent-camp angling operation is emerging in the Delta area, as will be noted subsequently, consideraton should be given to the reservation of lakes specifically for angling in this part of the Northwest Territories.

With the exception of Ferguson Lake on Victoria Island there appear to be no lakes reserved for angling throughout the Island Archipelago. None has been reserved close to the Arctic and Hudson Bay shorelines in Districts III, X, IV and V. The possible development of sport angling enterprises in the northern area based on char supplemented by other species in nearby waters in some cases, suggests that some thought must be given to the reserving of waters within these areas.

Analysis of Angling Lodges, Tent-Camps and Outfitter Operations in the Northwest Territories

In this section of the report the commercial sport angling enterprises of the Northwest Territories including lodges, tent-camps, and outfitters are examined. The base source of information upon which the table rests is a set of File Index Cards for Angling Lodges, Camps and Outfitters supplied by the Division of Tourism. Any errors or omissions in the data presented in the cards will be reflected in this summation. It is felt, however, that the information base was reasonably representative of the situation as of January, 1972. It was necessary to fill some data gaps on the basis of mean values derived from information contained in the file cards. Situations of this type are always clearly indicated in the text or in footnote references to the tables.

The Focus of Lodge, Tent-Camp and Outfitter Operations By Angling Productivity Districts:

As of January, 1972, there were 26 lodge operations in the Northwest Territories with a total guest capacity of between 579 and 583. Twenty-five of these lodges with a capacity of 573 guests are located in the eleven districts. One operation on the Belcher Islands with a capacity between 6 and 10 guests is located outside the aforementioned districts.

There were 12 tent-camp operations with a capacity for 135 guests. All are situated within the districts. In addition, there are 13 outfitter operations. The tent-camps and the outfitter enterprises involve substantially less capital investment than do the lodges and there is lessor degree of stability associated with their operation and geographic location, particularly in the case of the outfitters.

The overall situation is summarized in the accompanying Table 5.1. There are several features associated with compilation that require note.

District I which is considered to possess the strongest overall angling productivity supports the largest combined concentration of lodges, tent-camps and outfitting operations. The difference between District I and District V in terms of total lodging capacity is not great and in a general way they can be considered equal with respect to this type of enterprise.

District II, which is comprised of the Upper Dubawnt and Upper Thelon Drainage Basins, and is considered to have high angling potentials has received no attention from commercial sport fishing enterprises. One must, therefore, conclude that a substantial development opportunity remains unexploited and perhaps even unrecognized by the private enterprise sector.

District III, which includes the large portion of the Canadian Shield in the administrative District of Keewatin, shows a varied pattern of utilization by lodges, tent-camps and outfitters. In each case the scale of the enterprise is modest. Much of the penetration of this area has been by operators with angling or charter aircraft operations based in Saskatchewan and Manitoba.

TABLE 5.1

THE FOCUS OF LODGES, TENT-CAMPS AND OUTFITTER OPERATIONS BY DISTRICTS – JANUARY 1972

Districts	Lodges			Tent-Camps			Outfitters	
	No.	Capacity Guests	%	No.	Capacity Guests	%	No.	%
I	11	240	42	2	23	17	5	38
II								
III	4	62	11	3	28	21	3	23
IV	1	16	3					
V	6	215	38				1	8
VI	1	8	1	3	31	23		
VII	1	24	4				1	8
VIII				2	22 [1]	16		
IX	1	8	1	1	11 [1]	8	2	15
X				1	20	15	1	8
XI								
	25	573	100	12	135	100	13	100
Belcher Is. [2]	1	6-10						
	26	579-583		12	135		13	

1] No information was provided with respect to the size of 2 tent-camps in District VIII and 1 in District XI. Their guest capacity was estimated at 11 persons, the mean value for the 9 tent-camps for which capacity data were available.

2] The Belcher Islands are not included in the Districts. An enterprise here that was formerly licensed as an outfitting operation will be licensed as a lodge beginning in 1972.

District V, which is essentially comprised of Great Bear Lake and surrounding waters, has been an important focus for lodge operations. Tent-camps are non-existent in this district and outfitters inconsequential. Its position in the overall pattern of commercial angling operations, however, is very important by virtue of the strength of its lodging enterprises.

Commercial angling enterprises in the remaining Districts VI to X are modest in scale. There are only three lodges present with an average capacity of approximately 13 guests. Tent-camps are the dominant feature of this group of areas. There are seven such facilities within their confines with a total guest capacity of 84 persons. About 62% of the total tent-camp capacity of the Northwest Territories is found in this group of districts.

It is of interest to note that District XI which encompasses the northern portions of the Archipelago has recieved no commercial sport fishing development of any type. Modest resources coupled with limitations in travel logistics are the main explanative factors in this instance.

An examination of the column for lodges indicates the dominance of District I and District V, the focus of the former being upon Great Slave Lake and the latter upon Great Bear Lake. These two districts support 60% of the lodges in the Northwest Territories and 80% of their total guest capacity. The geographical core of the sport angling enterprises of the Territories is found here, with the remaining districts occupying a decidedly inferior position. It is not likely that any district, including II, will ever display commercial lodge development on the scale and intensity of that experienced in Districts I and V. Commercial lodge development in the future is likely to be less geographically concentrated and smaller in scale. In effect, the hey-day of large scale capital investment in lodges is probably over.

Tent-camps, which are about half as numerous as lodges, but have only about 24% of the guest capacity of the latter are encountered in six of the eleven districts. There is a strong possibility that a substantial proportion of the focus of future investment in sports fishing enterprises in the Northwest Territories will be in tent-camp operations. Their modest investment requirement, compared with lodges permits the exploitation of sport fishing opportunities of a more modest calibre that are present over a wide portion of the Northwest Territories.

Thirteen outfitters are operating within the Northwest Territories at the present time and they are exploiting lakes in six of the eleven districts. This type of commercial enterprise, which requires the least capital investment and offers possibilities for the exploitation of the angling potentials of the Northwest Territories at a modest consumer cost, is likely to increase substantially in the future.

There is a sizeable middle income angler market available to these outfitters. Moreover, future development trends in the Territories, particularly road construction, will likely make angling resource potentials capable of satisfying this group of sportsmen increasingly available.

Time Sequence of Development:

Table 5.2 indicates the time sequence of lodge and tent-camp development in terms of guest capacity. About 53% of the capacity of the lodges became operational in 1966 and 1967. The former year was particularly significant accounting for 36%.

Development prior to these two important years was steady, but not spectacular. With the exception of 1969 annual increase in capacity has been declining steadily since 1967. It is doubtful if there will be another burst of lodge development in future years matching that witnessed in 1966 and 1967. There is more likely to be small, sporadic annual increases resulting from the development of modest scale lodges catering to the upper-middle income market.

Tent-camp capacity has been increasing notably since 1969. It is felt that this type of facility will continue to grow steadily in the years ahead.

The data base for the time sequence of the entrance of outfitters into the field is rather sketchy. Nevertheless, the evidence suggests that this type of operation is undergoing a modest annual increase. The trend is expected to continue.

The future of the elaborate lodge is of major interest since it involves substantial capital investment and exerts the largest income and employment effects. The evaluation of the time sequence of development is certainly not conclusive evidence upon which the future prospects for this type of operation can be determined.

TABLE 5.2

THE TIME SEQUENCE OF LODGE, TENT-CAMP AND OUTFITTER ENTERPRISES 1]

	Lodge Capacity 2]		Tent Camp Capacity 3]		Outfitters 4]
	Guests	%	Guests	%	No.
1961 or Earlier	74	14			
1962					
1963	22	4			
1964	24	4			
1965	48	9	8	6	1
1966	203	36	21	16	1
1967	96	17			
1968	25	4	10	7	2
1969	40	7	20	15	1
1970	15	3	37	27	2
1971			20	15	3
1972	10	2	19	14	
	557	100	135	100	10

1] From File Index Cards of the Division of Tourism.

2] Does not include Bathurst Inlet Lodge or Belcher Island development.

3] Capacities were estimated at 11 for 3 tent-camps, two of which were established in 1970 and one that is expected to begin operations in 1972.

4] There is no information of the year of establishment of four outfitters.

On the other hand, the observed trends cannot be entirely ignored. All that can be stated at this point is that the high water mark for new lodge development in the Northwest Territories appears to have been passed with the exploitation of opportunities on the East Arm of Great Slave Lake and on Great Bear Lake in 1966 and 1967. Developments since that date have taken the form of smaller enterprises on Great Slave Lake and a multiplicity

of water bodies close to the Saskatchewan-Manitoba border in the east. Lodges with a capacity of 10 to 15 guests characterize this latter development.

It is also important to note that lodge enterprises established on Great Bear Lake have been noticeably active in the development of outcamps in recent years. The trend has probably been in response to two situations. Waters surrounding the main camps have not been providing trophy fish with the regularity required to satisfy the expectations of the high paying clientele. Secondly, it has become necessary to add an element of variety and exotic appeal to the angling package through the exploitation of char opportunities on streams draining into the Arctic Ocean.

In 1971 a number of lodges were offered for sale. It is difficult to assess the significance of this situation. The prospect of the introduction of a capital gains tax may have had an effect. Personal factors, including the health and aging of operators, may have been involved. On the other hand, the possibility must be entertained that owners are beginning to feel a degree of uneasiness with respect to the business future of operations of this type and particularly of the supply foundations upon which they rest. Probably all of these aspects were involved to some extent.

Concluding Remarks:

The foregoing analysis of the distribution of sport fishing enterprises and the time sequence of their development have been accompanied by a number of somewhat subjective statements relative to future development prospects and trends. Statements of this type must not be considered conclusive. They simply represent logical deductions drawn from observation with respect to geographic and historic or time sequence distributions. As previously stated such evidence is obviously far from conclusive. On the other hand, it cannot be summarily dismissed as inconsequential. Some of the broader impressions are now summarized.

(i) The era of intensive activity in elaborate large scale angling lodge development may be over. Future enterprises are likely to be smaller in scale and rest primarily upon quality angling for a variety of species rather than trophy considerations. Trophies will be taken but the success of the camp operation will rest upon quality angling defined in terms of a good medium-sized catch per hour of sport fishing activity spread over a number of species. The supply and demand prospects for this type of operation within the Territories are good insofar as can be determined from the analysis of available information.

(ii) The tent-camp and the outfitting operations are likely to increase. Supply prospects are favourable and there is substantial market within the mid-price range that remains untapped. Improved communications will make the exploitation of this market at profit returns favourable to tent-camp and outfitter operators increasingly attractive and feasible.

(iii) There are some areas of high angling potential as revealed by the work of the Fisheries Research Board that remain scarcely or completely untapped. Districts II and III are cases in point.

(iv) Future development in the Island Archipelago and over a large portion of the lower reaches of the streams flowing into the Arctic drainage basin within Districts IV and V may be of two types. Outpost camps of lodges established on the waters to the south, particularly on Great Bear Lake can be expected to increase in number. Linked developments such as that of Chantrey Inlet and Baker Lake could become more common.

The future for operations situated in these northern portions of the Territories based primarily or almost exclusively upon char fishing is uncertain. Char fishing in itself may not possess the comparative advantage necessary to draw anglers at very high transport costs to these northern waters. The best prospects appear to be those locations where char fishing can be combined with angling for other species in nearby waters.

(v) The geographic and time distribution of commercial angling facilities and operations suggests that the industry could be entering a period of substantial adjustment. The major development thrust will likely occur within the modest-priced lodge, tent-camp and outfitter operations based upon an entirely different set of supply and demand relationships than that governing the more elaborate lodge enterprises. In a market sense the focus will be upon the upper-middle class income group whose demands and expectations can be met by quality angling for a variety of species. Secondly, as the road conditions improve and the middle-class income angler group begin to enter the Territories in greater numbers, opportunities for outfitters should improve markedly.

It is repeated that the foregoing statements are based solely upon an analysis of the evidence provided by the geographic distribution and time sequence of present facilities. There are many other factors to be considered. All that is claimed is that on the basis of the type of evidence noted, conclusions of the foregoing type appear to be reasonable.

5.2 TOURIST AND RECREATION DEVELOPMENT ATTRIBUTES OF THE ARCHAEOLOGICAL RESOURCES OF THE N.W.T.

General Concepts

The essential value of the prehistoric and archaeological resources of the Northwest Territories and the basic justification for public expenditure in research, preservation and development stems from their integral component relationship to the total cultural heritage of the nation. Tourist and recreation values, particularly the former, are more in the nature of added benefits that can and should be exploited within the broad limits set by the demands of Territorial and Canadian cultural development and its related benefits. Nothing should be done to obtain tourist and recreation benefits at the expense of a serious deterioration of the quality of the cultural heritage.

The Nature of the Archaeological Inputs to a Tourist and Recreation Experience:

The contribution of the prehistory of the Territories and its archaeological sites and objects to a tourist and recreation experience is varied and complicated. It is essential that the impact process be understood, at least in a general manner, if potentials are to be exploited satisfactorily.

Some people can be motivated to travel to the Territories primarily to visit prehistoric sites and remains. An entire tour to the Northwest Territories could be organized essentially around prehistoric phenomena. Teachers, students and history "buffs" form the essential core of this market. Secondly, there is the group of people for whom the prehistoric resources represent a significant component attraction in a general landscape tour of the Territories or an added attraction in a specific activity pursuit, such as hunting or angling.

The impact of the prehistoric phenomenon or its input to the tourist and recreation experience is of a sensual, intellectual and psychological nature. Sensual impact is related to stimulation and satisfaction stemming from sight and touch. Intellectual impact is associated with the satisfaction of the desire for understanding. Finally, there are inner psychological

stimulations and satisfactions that spring from personal contact or association with the sites and objects of antiquity that form an integral link in the chain of events that has directly or indirectly shaped the visitors present lift pattern.

The combination of the sensual, intellectual and psychological impact in any particular prehistoric or archaeological situation depends upon the nature of the phenomenon and the interest and intellectual capacity of the tourist involved. For some the intellectual impact is weak with the focus being primarily upon the sensual or psychological aspects. Some phenomenon impart a low sensual impact with the development prospects being related primarily to the intellectual dimensions.

A good development program for the exploitation of the tourist and recreation potentials associated with the prehistoric phenomenon of the Territories must give adequate recognition to the three aforementioned general types of impact. All three are always present to some extent and a top quality development prospect is strong in each. In situations where one particular type of impact is inherently weak others must be exploited to their fullest extent as a compensating process.

The Significance of Location:

The location of a prehistoric resource relative to population densities, major arteries of tourist traffic flow or the concentration of specific tourist activity pursuits, such as hunting and fishing, is of vital consequence in the consideration of development prospects. This locational aspect, which is extrinsic to site quality determination within a prehistoric context, is of major importance in management and development considerations.

If the locational or market attributes are poor, then two approaches are possible insofar as tourism and recreation are concerned. The site and objects may be left intact with the focus for public investment directed to preservation until market conditions build up sufficiently to justify development and operating costs. An enormous proportion of the prehistoric resources of the Territories fall into this category.

Secondly, the buildings and objects may be removed from the site and reassembled for display at a central point where market prospects appear strong enough to yield tourist and recreation benefits commensurate with expenditures. This latter procedure involves the loss of genuine site location values which is extremely important, particularly in terms of psychological impact.

On the other hand, a good development program in the new location can do much to offset this loss and the benefits derived in terms of total social satisfaction can be increased enormously. Interestingly, increased public support for the costs associated with prehistoric archaeological research and site preservation in remote areas often can be substantially augmented by this procedure for which there is considerable scope in the Territories.

The Significance of Thematic Concepts:

From the standpoint of tourist and recreation planning the prehistoric sites and objects form an integral component of a larger assemblage commonly termed the Historic Potential. The latter encompasses a time span from the first contact of man with the landscape of the Territories through to the present time. In effect the archaeological resources discussed in this paper must eventually be considered in conjunction with the findings of the report dealing with European contact in relation to tourist and recreation development prospects.

The archaeological and prehistoric resource patterns can be most effectively analysed and their associated tourist and recreation development potentials most profitably presented in terms of major themes and sub-themes. Such a classificatory framework permits the planner to grasp the totality of the situation and significance of detail in an operationally productive manner. Secondly, it stimulates the general interest and broadens and deepens the understanding of the tourist, thereby enhancing the value of any experience with a particular site or object.

The prehistory represents a major theme of the total historic potential of the Territories as previously noted. In turn a number of distinct sub-themes can be readily distinquished on the basis of cultures or traditions. The main cultures and traditions may be identified, their basic characteristics defined and their time sequence and geographic distribution indicated. (see Figure 5.2)[1]

The Development of the Thematic Potentials:

The archaeological resources of the Territories cover a time span of nearly 10,000 years. The western mountain section of the Northwest Territories forms part of the North American threshold area in the migration pattern of man from Asia.

Both Indian and Eskimo cultures and traditions are represented over a wide area. This duality provides a variety to the pre-historic theme that is absent in the southern parts of Canada and the United States. There is a degree of comparative advantage accruing to the northern part of the continent in this respect.

The Territories form the central core or heartland of the Eskimo cultures and traditions in Canada. Their representation in other parts of the country is essentially associated with the fringe of their distribution range. It is also important to note that while these cultures and traditions are not unique to the Territories, being represented in Alaska, Quebec and Greenland, the comparative strength of the resources of the Northwest Territories within a continental perspective is strong.

The Indian traditions and cultures in the N.W.T. are at the northern extent of their range and often represented in earlier and more primitive forms. The interest of the sites is largely related to the artifacts found therein. The competitive strength of these resources within a Canadian or continental perspective in relation to tourist and recreation exploitation appears limited.

An interesting and important feature of the distribution of the cultures by time and geographic range is undoubtedly the phenomenon of contact. Contact usually leads to exchange and conflict, both of which are fruitful subject in terms of tourist interest. In the N.W.T. the zone of contact between Indian and Eskimo cultures and traditions extends over a broad area.

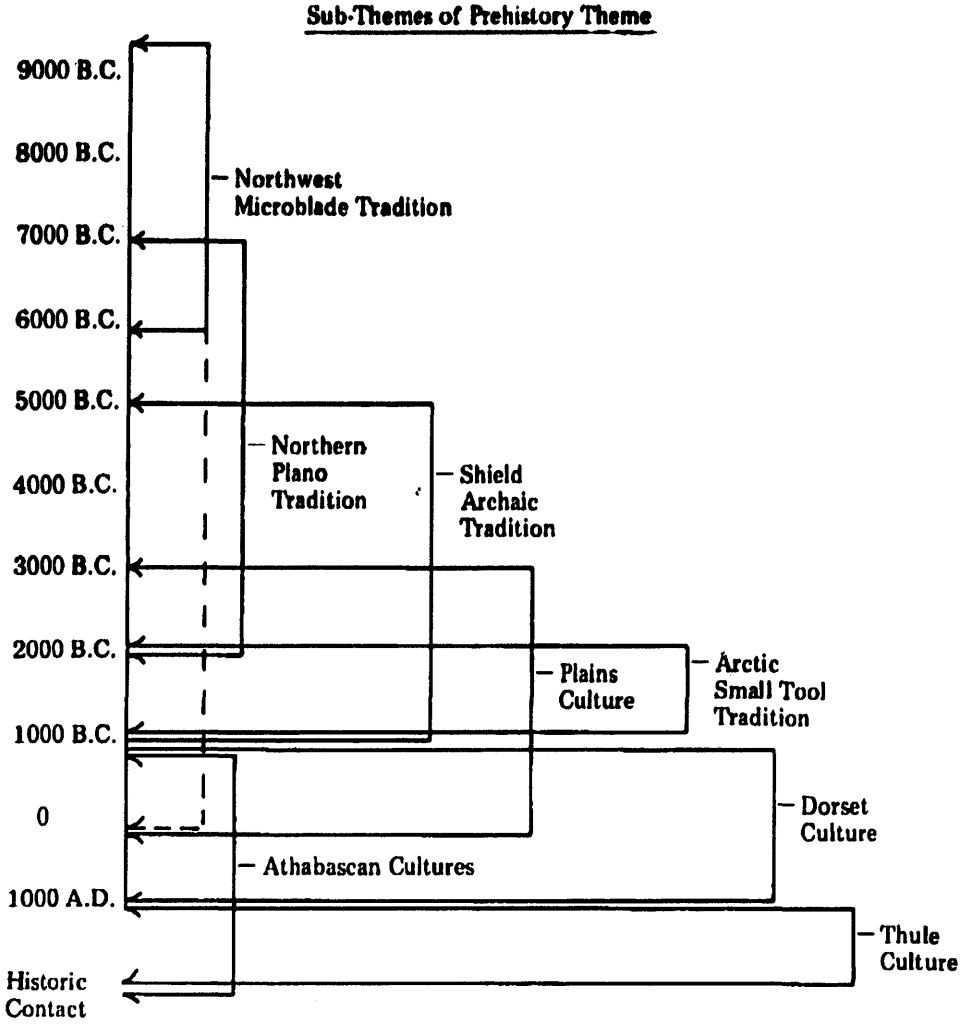
INDIAN AND ESKIMO ZONES OF CONTACT

Contact Zone	Cultures Involved
West Hudson Bay – 60th Parallel to Whale Cove Area	1. Eskimo Arctic Small Tool Tradition 2000-1000 B.C. with Indian Archaic Shield Tradition 5000-1000 B.C.

1] Macro-geographic relationships are shown on map in Vol. 2.

FIGURE 5.2

THEMATIC CLASSIFICATION AND TIME SEQUENCE FOR INDIAN AND ESKIMO TRADITIONS AND CULTURES IN THE NORTHWEST TERRITORIES



_____ Indian Traditions & Cultures

_____ Eskimo Traditions & Cultures

Contact Zone (Cont.)	Cultures Involved
	2. Eskimo Dorset Culture 1000 B.C. - 1000 A.D. and Eskimo Thule Culture 1000 A.D. to historic contact with Indian Athabascan culture 0 A.D. to European contact.
Coppermine to Mackenzie Delta	1. Eskimo Thule Culture 1000 A.D. to historic contact with Athabascan culture 0 A.D. to historic contact.

The thematic pattern may be developed in its own right as an educational and entertainment exhibit in a central musuem or at a major archaeological site. Properly supported by maps, photographs and artifacts, the prehistoric theme and its various sub-components provide opportunities for the preparation of interesting exhibits in the proposed territorial museum at Yellowknife or at a number of key points in the Territories.

When thematic displays of the foregoing type are set up in a museum building with no prehistoric associations, they possess no unique quality or comparative advantage apart from the ingenuity of the display presented or the presence of some unique object that is available for vewing. In effect, the thematic display can be duplicated at any point in the world with the comparative advantage of the end product resting solely upon the calibre of the display. The latter is governed largely by the scale and quality of the intellectual and financial inputs. This situation can place the territory at a disadvantage due to its limited financial resources. The tourist visiting a museum in the distant north may expect to see something outstanding. Unfortunately, the Territories may be able only to show the visitor something decidedly inferior to that available to him in a large and well financed museum in his home area.

If a thematic display is located in or on an important archaeological site and is supported by unique artifacts from the site, its comparative advantage is enhanced. This is largely because the sensual and psychological dimensions of the impact upon the tourist are increased.

In developing a theme exhibit it is desirable to maximize the unique aspects within the limits imposed by finances, in order to enhance tourist and recreation drawing power. In brief, it is necessary to impart the maximum degree of comparative advantage possible.

There are essentially two ways in which this objective can be achieved. Excellence and uniquesness must characterize the thematic display. This is as much a function of imagination or ingenuity as it is of financial inputs although the latter are admittedly of significance. Secondly, the display may possess a degree of uniqueness in terms of its site location or artifact content. In this latter regard the Territories should insure that unique objects are retained within its borders and attempts should be made to regain possession of any that have been lost. Common place but highly representative objects can be sent to museums outside the Territories but unique objects should be retained or sent outside the N.W.T. only on a short-term loan basis.

The Development of a Recro-Tourist Use Capability Classification for Archaeological Sites in the Northwest Territories

An inventory of the archaeological sites in the Territories was prepared by the Museum of Man, under contract to the Territorial Government. The inventory is in the form of a

card index and a series of maps – a 1:1,000,000 wall map and a series of 1:250,000 National Topographic maps. The index and the maps are currently held by the Northwest Territories Historical Standing Committee.

Approximately 1,000 site cards were examined and classified as being of major or minor importance. Table 5.3 shows the representation of cultures and traditions at the major sites.[1]

There are several problems associated with this general mapping procedure that require note. Some have been alluded to in previous sections of the report but their restatement appears desirable.

1. The basic selection process for important sites is open to serious question. A site was considered important if there was an indication on the Index File Card that it had been subjected to considerable research or that substantial remains were present. File Index Cards that do not contain information of this type may have significant development potential.

2. Some sites for which a particular culture is indicated on the File Index Card may in fact contain remnants of additional cultures or traditions, a fact that may be brought to light by further archaeological investigation.

3. The File Index Cards sometimes list the presence of two cultures. If a site was listed as representative of a particular culture, it was assigned to this culture or tradition regardless of the dual notation on the File Index Card.

4. Thirteen sites shown on the map could not be assigned a culture designation on the basis of data presented on the File Index Card.

5. Future archaeological investigations may reveal other sites of major importance. This limitation is of course present in any study of this type.

Designation of Significant Sites:

The focus at this stage of the evaluation is upon the inherent prehistoric archaeological attributes of the site, rather than any logistic or locational features. The file index cards for 145 important sites were examined in detail. Some contained short notes referring to the type and scale of the archaeological building remains and artifacts present. Some contained only references to reports describing the sites and the archaeological research related to them. Some contained no comments of any type. The situation is summarized in Table 5.4.

On the basis of an examination of the information on 100 Index File Cards containing comments on building remains and artifacts, a selection was made of the most significant from the standpoint of inherent development potential. Sites were rated in accordance with the general body of evidence available for the culture or tradition with which they were primarily associated.

Insofar as Indian cultures and traditions were concerned the procedure yielded nothing of any real value. Comment was meagre in all cases. The sites themselves do not appear to have any significant visual impact in their present state.

1] See also Map in Volume 2.

TABLE 5.3

THE REPRESENTATION OF CULTURES AND TRADITIONS AT MAJOR ARCHAEOLOGICAL SITES

Culture or Tradition	Major Sites No.	Major Sites %
1. Indian		
1. Northwest Microblade Tradition	2	1
2. Northern Plano Tradition	10	7
3. Shield Archaic Tradition	4	3
4. Plains Culture	5	3
5. Athabascan Culture	14	10
SUB TOTAL 1	35	24
2. Eskimo		
1. Arctic Small Tool Tradition	17	11
2. Dorset Culture	28	19
3. Thule Culture	54	37
SUB TOTAL 2	99	67
3. Undifferentiated	13	9
TOTAL	147 1]	100

1] At two sites, Dorset and Thule Cultures appear to be about equally represented hence the total of 147 sites as compared to 145 sites indicated previously.

Traditions and the Plains Culture contain only a scatter of artifacts spread over a few square yards or an area up to an acre in extent. The only known structures of the Shield Archaic Tradition are poorly defined circular dwellings marked by pits with a shallow entrance passage, post molds, tent weights and central hearths. Some Athabascan sites display the remains of storage pits, hearths and tent structures.

Sites of the foregoing type obviously yield artifacts for displays in museums. Some could be developed and operated at reasonable costs as tourist attractions of a secondary order through partial site reconstruction, the use of paper mache figures that are stored away each year and the erection of explanative displays. Archaeological practices and procedures can also be effectively displayed at such sites. The major requirements are a reasonably interesting representative site, good locational attributes relative to tourist traffic and local centres and the employment of imaginative display techniques involving modest costs.

Somewhat better results were obtained with respect to the Eskimo cultures and traditions, particularly the Dorset and Thule cultures. Many Dorset sites appear to contain a

TABLE 5.4

EXTENT OF COMMENT ON BUILDING REMAINS AND ARTIFACTS ON FILE INDEX CARDS FOR INDIAN AND ESKIMO SITES 1]

File Index Cards Contain

	No Information		Report Ref. Only		Comments On Bldg. Remains & Artifacts	
	No.	%	No.	%	No.	%
1. Indian Cultures and Traditions						
Northwest Microblade Tradition	0		2		0	
Northern Plano Tradition	3		5		2	
Shield Archaic Tradition	0		2		2	
Plains Culture	0		1		4	
Athabascan Culture	2		1		11	
Sub Total 1	5	14	11	32	19	54
2. Eskimo Cultures and Traditions						
Arctic Small Tool Tradition	0		7		10	
Dorset Culture	1		4		23	
Thule Culture	0		6		48	
Sub Total 2	1	1	17	18	81	81
TOTAL	6	5	28	21	100	74

1] File Index Cards were not provided for every site mapped.

mixture of Dorset and Pre-Dorset structural remains and artifacts. Many Thule sites appear to contain a mixture of Dorset and Thule remains. The results of the analysis are summarized below.

Arctic Small Tool Tradition:

Kettle Lake (TiFo-1) – 23 structure ruins – R.C. dates from 3930 + or - 130 years B.P. to 3760 + or 130 years B.P. 1]

Burin Delta (TgAv-1) – 6 sunken houses.

Inuvik (OkHl-1) – 9 house ruins, many tent rings and caches – may be some Dorset.

St. Mary's Hill (Ndjf-3) – 4 clusters of houses divided into 3 basic shapes, namely, long and narrow, oval and half-ellipse or bell.

Parry Hill (NiHf-1) 2] – 102 Pre-Dorset ruins and 9 Dorset ruins.

Lyon Hill (NiHf-2) – 133 Pre-Dorset ruins.

Dorset Culture

Alarnerk (NhHd-1) – 208 rectangular Dorset house depressions spread over 3 sq. km – 5 typological periods from early to late Dorset – 8 houses excavated 1954.

Kapuivik (NjHa-1) – large site with ruins from Sarqaq, Dorset and Thule cultures.

Tikilik (NiHf-4) – 43 late Pre-Dorset ruins – 24 early Dorset ruins – 1 late Dorset ruin.

Freuchen (NiHf-3) – 11 Pre-Dorset ruins – 32 early Dorset ruins – 15 scattered middle-late Dorset ruins.

Thule Culture

M1 (QeDv-1) – 5 houses and midden – 3 excavated 1949, perhaps late Dorset also.

M2 (QeDv-2) – 9 houses plus 5 stone floors – Dorset and Thule – 1 excavated 1949 – 3 excavated 1954.

Naujan (MdHs-1) – large village – stone houses.

Eqaluit 1 (O1Fv-1) – 16 whale bone and stone houses (Thule and modern) – 1 Thule and 1 modern excavated. Eqaluit II has 20 houses and 3 graves all excavated.

Smith Island (JeGn-2) – 12 houses mixed Thule and Dorset artifacts.

1] R.C. = Radio Carbon and B.P. = Before Present.

2] This site is listed as representative of Dorset Culture. Data on the File Index Card suggest that the bulk of the remains is Pre-Dorset. The listing under Arctic Small Tool Tradition could be in error.

Turnstone Beach (SfFi-1) – 17 houses, caches, Umiak stand.

Kamarvik (LcHu-1) – large village of stone and whale bone houses – midden.

Notshingnark (KN) – 12 stone and whale bone houses.

Koodlootook (KH) – 13 stone house ruins.

Sadlermiut (KkHh-1) – nearly 100 stone and sod house ruins left empty after an epidemic in winter of 1902 and 1903, one of the largest archaeological sites in the Canadian Arctic – 1 house excavated 1954 and 1 house and midden in 1955.

Notable Site Groupings:

Certain notable site groupings emerge when inherent characteristics, settlement patterns, the logistics of travel, and National Park Development Proposals are considered in combination.

It is important to note though, that sites situated outside these notable groupings are not automatically considered to lack development potential. The isolated location of some sites coupled with a low or modest inherent potential compared to others belonging to a similar culture or tradition insofar as can be judged from present evidence, suggests that they offer decidedly lesser development opportunities now and in the foreseeable future. There are others, however, that could lend considerable strength to the tourist attractivity of a community if developed properly.

Notable Groupings Related to Indian Cultures and Traditions

The Fort Liard Grouping:

This concentration of sites in the general vicinity of Fisherman's Lake about 18 to 20 miles northeast of Fort Liard has been classed as notable for a number of reasons.

There are five representative sites here that include the remains of the Northwest Microblade Tradition (Pointed Mountain and Fisherman's Lake), the Northern Plano Tradition (Klondike), the Plains Culture (Fisherman's Lake) and the Athabascan Culture (Julian). Site development would, therefore, encompass the entire gamut of Indian Cultures and Traditions with the exception of the Shield Archaic Tradition.

The future logistical prospects for this group of sites are reasonably good. The nearby settlement of Fort Liard could serve as a organizational centre for tourist visitation. A highway down the Liard Valley from Fort Simpson to the Alaska Highway would undoubtedly give rise to considerable tourist traffic flow. The proposed National Park Development on the Nahanni River will further enhance logistics.

The sites could conceivably be developed and operated by the National Parks and Historic Sites Branch as an integral component of a total South Nahanni River National Park operation. As such it would function as an outlying compartment of the park. Such a procedure would be in complete harmony with national and historic site development principles of the Federal Government and would relieve the Territories of considerable development and operating costs.

East Arm Great Slave Lake Grouping:

In the general vicinity of the East Arm of Great Slave Lake and the Lockhart-Artillery

Lake area there are about 19 representative and important sites. These are associated with the Arctic Small Tool Tradition (McKinley River, Timber Point and Loon) indicating penetration of this area by Eskimos probably moving southward through the Coppermine River drainage systems to Lesser Slave Lake. The Plains and Athabascan Cultures are about evenly represented while the Shield Archaic Tradition appears to be absent.

The grouping makes it abundantly clear that there is potential for the development of early Indian Cultures as a major theme in the interpretive program of any National Park established on the East Arm of Slave Lake. Important sites situated outside park boundaries could be developed as outlying compartments of the park.

Frank Channel, an Athabascan Culture site, is among those recommended for development. The choice in this instance was based to a considerable extent upon its location relative to tourist traffic flow along the Yellowknife Highway and its modest distance by road from the Yellowknife population concentration. The selection was reasonable both in terms of inherent quality and location. It is felt, however, that investment here should be delayed pending possible development of the archaeological resources of the East Arm of Great Slave Lake by the National and Historic Sites Branch of the Federal Government in conjunction with National Park development in this area.

The Coppermine River Basin Corridor Grouping:

Nine representative, one important and 25 minor sites assume a corridor locational pattern through these drainage basins.

Four of the sites (Bloody Falls, Rock Nest Lake, Dismal Lake and Aurora River) are associated with the Arctic Small Tool Tradition. As previously noted, this was likely a corridor of southward penetration by this group of primitive peoples that appear to have reached the East Arm of Great Slave Lake.

Two of the sites (Dismal Lake and Acasta) are representative of the Northern Plano Indian Tradition. Two (Sandwillow and Snare River) are associated with the Athabascan Culture.

The Bloody Falls site, which is representative of the Arctic Small Tool Tradition and was the site of an Indian-Eskimo conflict witnessed by Samuel Hearne, has been recommended for development. The site can be readily reached by boat from Coppermine. Development could represent a useful added tourist attraction for Coppermine.

A Baker-Aberdeen-Grant Lake grouping, consisting of two sites representative of the Northern Plano Tradition (Grant Lake and Schultz Lake) and one representative of the Shield Archaic Tradition (Aberdeen Lake), is discernible from an examination of the map. There are also about 14 minor sites in the vicinity of Grant and Aberdeen Lakes. In addition, there are two sites about 6 or 7 miles east of Baker Lake (Lbjx-4 & 6) where stone structural remains are present. These may belong to Eskimo Cultures although there is no indication of this on the File Index Cards.

These resources might be developed as a part of a waterway tourist and recreation feature centred on Baker Lake. The assemblage was not included, however, in the Notable Groupings related to Indian Cultures.

There is another concentration of sites related to the Shield Archaic Tradition in the general vicinity of Ennadai. These resources were considered to be too isolated to warrant Notable Grouping status at this time.

Notable Groupings Related to Eskimo Traditions and Cultures

The Igloolik Grouping:

On the basis of inherent site quality and promixity to a settlement with air access this appears to be the strongest grouping of development potentials associated with Dorset and Pre-Dorset cultures. Moreover, it ranks with the best of all development potentials associated with Eskimo Cultures as a whole.

The resources in this grouping are strong enough to make it a virtual "must" in any landscape tour of the Territories undertaken essentially to visit archaeological sites. A substantial input to the satisfaction of any general landscape tour of the Territories is present. It could be a major added attraction in any specialized sports tour in the general area.

An enormous group of resources can be readily exploited from Igloolik. Lyon Hill southwest of the Igloolik settlement contains 133 Pre-Dorset ruins. Tikilik on the southwest part of Igloolik Island has 43 late Pre-Dorset ruins, 24 early Dorset ruins and 1 late Dorset. Freuchen on the southeast part of Igloolik Island contains 11 late Pre-Dorset ruins, 32 early Dorset and 15 scattered mid to late Dorset.

Parry Hill on northwest Igloolik Island contains 102 Pre-Dorset and 9 Dorset remains. Abverdjar on northwest Igloolik Island is another representative Dorset site. On and around Jens Munck Island to the northeast of Igloolik are two other major sites. Kapuivik on Jens Munck Island has a large number of ruins from Sarqaq Dorset and Thule times. Kaesaut, on the north half of the Island of the same name situated just to the south of Jens Munck Island has 8 Dorset ruins, three of which have been excavated.

Alarnerk at Arlagnerk Point on the Melville Peninsula to the south of Igloolik contains 208 rectangular Dorset house depressions spread over 35 square kilometers. Five typological periods from early to late Dorset have been recognized and 8 houses were excavated in 1954.

The Repulse Bay Grouping:

The sites in this grouping are primarily related to Thule Culture. Naujan in the mid-portion of the north coast of Repulse Bay contains the remains of a large village of stone houses and represents the central core of the development potentials of the grouping. Iglordjuvartalik on Harbour Island has several stone winter houses and Aivilik contains winter houses and village tent rings.

Naujan is one of the recommended development sites. Repulse Bay would serve as a satisfactory organizational point for the tourist exploitation of these potentials.

The Resolute Grouping:

There are 5 sites on this Island associated with Thule Culture, and in some cases Dorset remains are also present. M2 contains a row of nine houses and stone floored ruins that were partially excavated in 1949 and 1953. This appears to be the strongest component of the group. Mi has several early Thule and perhaps Dorset remains, three of which were excavated in 1949 and five in 1950. Lake contains five underground house ruins and a series of small stone floors, three of which were excavated in 1949. Sherringham Point contains three ruins.

The travel logistics for this grouping are extremely strong with Resolute being a nodal point for air traffic. Several tourists are now brought to this area each year. It is the locational factor that draws attention to the grouping more than the inherent quality of the archaeological development potential.

The resources of Daly Bay to the north of Chesterfield Inlet are also fairly strong but distance from the settlement is a problem. Kamarvik contains a large village of Thule stone and whale bone houses. Silumiut has been studied in some detail. Kogiagotik contains Thule houses and ruins and KkJg-2 is a small burial site with two winter houses. The locational factor, while certainly not inhibiting for development, is a handicap for this group as a whole.

Southampton Island contains a number of resources at varying distances from Coral Harbour. Sadlermiut on Native Point just to the east of Coral Harbour is said to be one of the largest archaeological sites in the entire Canadian Arctic. There are nearly 100 houses here that were abandoned after an epidemic in the winter of 1902 and 1903. One house in the group was excavated in 1954 and another in 1955. Ti in the same general area contains a collection of shallow middens spread over 20 acres with no evidence of houses. Nokshingnak and Koodlootook on the Bay of Gods Mercy on the southwest corner of the island and a considerable distance from Coral Harbour contain 12 and 13 stone ruins respectively. Aivilik on the west side of Duke of York Bay is a major settlement ruin of the Aivilik Eskimos and LgHo in the same general area has house ruins and tent ring remains. Both are a considerable distance from Coral Harbour. Finally, Walrus Island contains six house ruins that are likely of the Dorset period.

There is an obvious concentration of remains on the east shore of Baffin Island in the general vicinity of Broughton Island. This grouping requires further investigation. There does not appear to be any large settlement ruins present and some sites are situated at a considerable distance from Broughton Island settlement. Further investigation may prove that there are development prospects of some value here in relation to tourist development for the settlement of Broughton Island.

There is another concentration of sites at the northern end of Ellesmere Island. Their currently remote location substantially reduces their value in a tourist sense.

Recommended Development Sites:

Eight archaeological sites appear to possess attributes suitable for development as tourist sites — seven are associated with the Eskimo culture; only one with the Indian culture. The selection of Frank Channel representing the Athabascan Indian Tradition, is largely influenced by logistics.

Bloody Falls on the border of the zone of Indian-Eskimo conflict is representative of Pre-Dorset, Thule and Copper Eskimo Cultures. Crystall II and M2 contain evidence of both Dorset and Thule occupation. Kittigazuit, Qilakukan and Naujan are Thule Culture sites and Alarnerk is related to Dorset culture.

The criteria for selection were related to logistics and educational values. Under logistics, accessibility or location relative to air and road routes and population centres were considered, together with site capacity or ability to sustain substantial visitor use without deterioration of site quality. Under education the ability of the site to tell an interesting story about prehistoric cultures or archaeological research was considered.

Concluding Remarks

Through the analysis and organization of existing data considerable progress has been made towards the evolution of a recro-tourist use capability classification for the archaeological resources of the Territories. The achievement, however, remains essentially in the realm of data consolidation. It is doubtful if anything more can be done with the available documentary evidence available at this time.

Important and representative sites have been identified and mapped with the former suffering from severe limitations. On the basis of data contained in the File Index Cards significant sites have been mapped and recommended development sites have been incorporated into the analysis. Finally, Notable Site Groupings selected on the basis of concentrations observable on the map and an analysis of the inherent nature of the ruins and objects present have been discussed in summary fashion. This is about as far as one can safely proceed on the basis of present information.

The results are considered useful in terms of the objectives of the overview study of tourism and recreation, even though they represent only a preliminary step towards a true recro-tourist use capability classification. Additional research obviously lies ahead, however, with the precise course of action being somewhat uncertain.

The source documents indicated on each File Index Card should be read and the content evaluated in terms of tourist and recreation development potentials. This will obviously be a lengthy and time consuming process that will require a professional archaeologist working in conjunction with a tourist and recreation planner. Two objectives should govern this process. An adequate summary of the significant facts related to each site should be prepared. The sites should then be classified in terms of tourist development prospects on the basis of the characteristics of their remains and their archaeological significance. The framework for site comparison should be the culture or tradition with which they are associated.

The high quality sites should then be inspected by a tourist and recreation planner, preferrably in the company of a professional archaeologist, to evaluate their present condition. Only the high quality sites revealed in the documentary analysis require visitation.

On the basis of the two aforementioned procedures a true recro-tourist capability classification of inherent site development potential can be evolved. A consideration of logistical actors would then indicate site suitability for development.

The procedures adopted in this report in essence represent an attempt to short cut the more elaborate costly and time consuming approach noted in the previous paragraphs. Success has been modest and the results should be carefully evaluated by a competent archaeologist.

Essentially the government of the Northwest Territories is confronted with three problems insofar as the exploitation of tourist and recreation potentials associated with its prehistoric resources is concerned.

Firstly, knowledge of the prehistoric traditions and cultures and the nature and condition of the known remains and artifacts is incomplete and disorganized insofar as its application to tourist and recreation planning is concerned. The responsibility for the improvement of this situation must rest essentially with the federal agencies who possess the requisite intellectual skills and financial resources. The function of the Division of Tourism

insofar as tourist aspects are concerned, should be centred upon attempts to influence the focus and timing of future research and information consolidation so that the work will have maximum application in tourist development planning. Obviously archaeological activities cannot be governed primarily by tourist development considerations. On the other hand this practical application of future research in relation to tourist development opportunities is of importance to the Northwest Territories. Moreover, needs can be met in a large part without undue disruption of the normal objectives of archaeological research.

The preservation of sites is a second major problem. This is a costly aspect that is fraught with serious administrative difficulties. It is nevertheless an essential and indispensable function of any archaeological resource administrative program. Both the Federal and Territorial governments have responsibilities in this instance.

The immediate returns in terms of general education and tourist and recreation benefits are limited for many sites due to isolated location, particularly from a national perspective. Some modest development, however, appears warranted in those areas in strategic locations with respect to resident population concentrations and emerging tourist traffic.

Step 1 The assignment and assumption of responsibility for the preservation and development between the Federal and Territorial government on a specific sites basis. In this process the National and Historic Sites Branch should determine those sites that it considers desirable to include in the national system, and designate them as National Historic Sites. The remainder could be designated as Territorial Sites. The Federal government will have to carry the bulk of the burden in this instance.

Step 2 The Federal government must assume and meaningfully carry out the necessary preservation and custodial functions for the sites designated under Step 1 above, and the Territories likewise. The bulk of the financial burden must rest with the Federal government.

Step 3 For the most promising sites development plans must be prepared for research, site and building restoration and display. Insofar as development in relation to tourist and recreation benefits are concerned the following guidelines are offered:

(a) The timing scale and type of development would be fitted to the master tourist and recreation development strategy for the region involved by the Division of Tourism. In this way maximum impact from federal investment would ensue.

(b) The development program should be realistically attuned to tourist volumes. A major investment by the Federal government in any site is probably not required or justified at this time, particularly when considered in relation to the total nation-wide framework of responsibilities of the National Historic Sites Branch. Nevertheless, much could undoubtedly be achieved for a modest initial investment that would substantially enhance the tourist and recreation attractivity of some areas.

5.3 THE CLIMATE OF THE NORTHWEST TERRITORIES

In order to arrive at a meaningful climatic classification of the Northwest Territories with regard to tourism and recreation, it is first necessary to explore those climatic factors that are unique to the Arctic and in particular are of a limiting nature in regard to safety and comfort.

Climatic Controls

What climatic controls are significant over the Northwest Territories? How do they operate? How important are they in identifying the local climates? The above questions must be answered satisfactorily for one to appreciate the varied and extreme climates of the Territories.

The dominant climatic controls are (i) insolation, (ii) distribution of land, water and ice, (iii) semi-permanent high and low-pressure areas and storm tracks, and (iv) topography and ground cover. These controls, acting with various intensities and in differing combinations, produce changes in temperature and precipitation, which in turn give rise to variations in climate.

It should be appreciated that these controls operate simultaneously, and it is difficult, if not impossible, in many cases to discuss satisfactorily the effect of one particular control without mentioning another. The controls are discussed only briefly here with little reference to their many inter-relations. An appreciation of how they operate to produce an unique climate can be gleaned from the section of the general climate of the Northwest Territories, discussed in terms of basic climatic elements.

Finally, it should be mentioned that while the same controls operate at other latitudes, the impact of these controls working in the Arctic regions produces extremes of weather virtually unknown in the more temperate regions of Canada.

Insolation:

The most important climatic control operating in the Arctic regions is the variation of insolation, or heat energy from the Sun, with latitude at the different times of year. The insolation control is responsible for the drastic variation in the length of day over the year in Arctic regions and for the increased attenuation of the Sun's rays as one goes poleward.

Because of the tilt of the Earth's axis of rotation at 23½ degrees from the vertical and its annual revolution around the Sun, the daily hours of daylight vary drastically over the northern latitudes from season to season. At the North Pole, the Sun is continuously above the horizon for six months of the year and conversely below the horizon for the remaining half of the year. These periods are known as the "Polar Day" and "Polar Night" respectively. At 80 degrees North, the Sun is above the horizon for about four months of the year and, of course, is also below the horizon for the same length of time. At 70 degrees North, the corresponding figure is about two months. The effect of the length of day is obviously of paramount importance in the warming and cooling of the surface of the earth in Arctic regions.

Closely associated is the effect of increased attenuation of the Sun's rays as one goes northward. The oblique ray at the North Pole delivers less energy per unit area at the Earth's surface, than does the vertical ray at the Equator, because its energy is spread over a larger surface and because it passes through a thicker layer of absorbing, scattering and reflecting atmosphere.

Distribution of Land, Water and Ice:

Although the insolation control is the most important one operating in the Arctic, the distribution of land, water and ice is also of paramount significance. In the Northwest Territories, the District of Mackenzie and most of the District of Keewatin are "continental", being part of the great North American land mass, while the District of Franklin, comprising mainly the islands of the Arctic Archipelago, is essentially "maritime". Besides the obvious fact that more moisture is available to the atmosphere over water areas than over land areas, the main effect of this control is that land areas warm and cool much more rapidly than do water areas, which in effect means that water areas have a heating effect in winter and, conversely, a cooling effect in summer.

The above situation is true for temperate as well as Arctic regions, but in Arctic regions, the presence of large amounts of ice is of very great significance as well, and any discussion of land-water contrasts necessarily has to include the effect of a large mass of ice and snow in winter and of ice-infested water in summer.

In mid-winter practically all of the waters surrounding the islands of the Arctic Archipelago and also Hudson and James Bays are completely frozen. The effect of this is that the Arctic areas continue to cool through the polar night, and that the coldest time of the winter is frequently February or March. It also ensures that the Territories have a bitterly cold winter. In spite of the frozen Arctic seas, however, there is still a continental-maritime contrast at mid-winter, as the heating effect of the water under the Arctic Ocean ice is quite noticeable, and it can be said that mean temperatures over the Arctic Archipelago at mid-winter would be much lower, probably approaching the values recorded in Siberia (well under forty below zero for the coldest month) if the Archipelago were a solid land mass. The land-water contrasts are much greater in winter in those regions which are adjacent to mostly ice-free water, as is the case over southeastern Baffin Island.

In mid-summer the presence of ice-infested waters intensifies the land-water contrast. Floating ice assures that water temperatures remain near the freezing-point over all of the waters surrounding the Arctic Islands and in Hudson Bay.

Semi-Permanent High and Low-Pressure Areas and Storm Tracks:

Another important climatological element is air pressure. Because of differential heating of the Earth's surface, the varying moisture patterns and the rotation of the Earth, air pressure changes significantly, often rapidly from place to place and from time to time. Areas of high pressure are usually associated with fine weather, while areas of low pressure are often associated with poor weather such as rain, snow, cloud, etc., and are often called storms or disturbances. It should be pointed out, however, that the exceptions to the above rule are many.

Some pressure systems are essentially stationary, but most move with varying speed and direction and also vary in intensity. As a consequence, the pattern of mean pressures averaged over a period of time and plotted on an chart, shows both the average positions of the nearly stationary "highs" and "lows" and the average tracks of the moving low and high-pressure systems. There is virtually always a high-pressure area over the Greenland Ice Cap, and during most of the year, over the Polar Basin as well. This entity is called the polar high-pressure area. In January this area covers Greenland and the high Arctic Sea to the north of Ellesmere Island. By April it extends across the northern islands of the Arctic Archipelago into the Arctic Sea to the west of the Archipelago. This western portion weakens thereafter. There is frequently a nearly stationary low-pressure area to the south of Greenland which is called the "sub-polar low", which is often called the "graveyard" of storms.

Winds and pressure are interrelated. The lines on a map joining places of equal pressure are called isobars, and what is important is that (i) the closer together are the isobars, the stronger are the winds, and (ii) winds at the surface blow more or less parallel to the isobars, although tending to cut across them at a slight angle. Winds blow clockwise around highs and counter-clockwise around lows in the Northern Hemisphere. The prevailing winds can therefore be estimated from mean pressure charts. Generally the winds over the Territories are from a north to north-westerly direction, although an easterly component is evident in the highest latitudes.

Topography and Ground Cover:

Local topography is of prime importance in the Arctic, just as it is in all regions of the Earth, and it sometimes causes remarkable differences in climate over short distances. Extensive mountain ranges act as barriers to large-scale circulations of the atmosphere, and therefore act as an important climatic control, not only in their immediate vicinity but also for a considerable distance to their lee. The lee side of the mountain barrier has much less precipitation and more sunshine than does the windward side, and winds, descending down the leeward side of a mountain range are usually relatively warm, dry and often strong. This is the "foehn" or "chinook" effect.

In addition, temperatures usually decrease with increasing elevation at a rate approximately $3^{o}F.$ for every 1,000 feet. Precipitation also usually increases with height. The combined effect of increasing precipitation and decreasing temperatures with height is that permanent snow and ice-fields are found in the Arctic above three or four thousand feet in elevation in the Archipelago and at somewhat higher elevations in the Richardson and Mackenzie Mountains, with the snow and ice-line lower on northward-facing slopes than on southward-facing slopes.

Smaller topographic features are also of great importance from the standpoint of local climate. Stations near the top of a hill are often windy because of their exposure, but on the other hand, even stronger winds may funnel up or down valleys under certain circumstances. In general, the more rugged the terrain, the more variable the winds. Coastal stations and stations on the edge of large lakes will generally have stronger winds than inland stations. However, the strongest winds are probably felt on the edges of some coastal valleys of those islands of the Arctic Archipelago which have inland sections covered by large ice-sheets, such as is the case on Baffin and Ellesmere Islands. In these cases cold air from the high ice plateaus often drains and funnels down the valleys at a very high velocity, sometimes exceeding 100 miles per hour. On the other hand, stations located in a protected basin often report extremely light winds over long periods of time. Although temperature usually lowers with increasing height, low elevations often cool off more rapidly at night-time than nearby stations at higher elevations. Also, cold air often lies trapped in cold valleys in the winter months, resulting in lower mean temperatures at the lower stations.

The nature of the vegetation surface is also important as far as local climate is concerned in the Arctic. "The Reflection Coefficients for Typical Surfaces" indicate that up to 80% of the insolation from the Sun is reflected back into space when the underlying surface is continuous snow and ice, and only 20% is available for heating the surface and its adjacent atmosphere. This is the situation over vast tundra areas of the Northwest Territories in winter. Compare these values with those for a coniferous forest with snow cover, such as exists over much of southern Canada and also in the Mackenzie River Valley to the south of the tree-line. In this case the reflectivity is only 12%, which means that 88% of the insolation is available for heating the surface and its adjacent atmosphere.

Finally, although land-sea contrasts were mentioned earlier as a large-scale climatic control, water-land contrasts are also of very great importance locally, even on a very small

scale. Consider the situation regarding those stations that are adjacent to large lakes or along coasts. When there is open water there is a moderating effect, and temperatures are usually warmer at night and cooler during the day than at nearby inland localities, particularly if the wind is blowing off the water. This is, of course, the summer situation. In the winter months, provided there is much open water, snowfall is always much heavier along windward coasts than at inland stations. This applies in particular to the early winter months before the lakes and bays are hard frozen.

General Climate of the Northwest Territories

Temperature:

In describing the general climate of the Northwest Territories, temperature is perhaps the most significant of all the climatological elements, as the variations and extremes of temperature that occur in the Arctic regions are virtually unknown in the temperate latitudes of Canada. Due to insolation control, winters in the Arctic regions are exceptionally long and cold and temperatures generally decrease with increasing latitude.

As a result of the long period of darkness in the high Arctic, the coldest time of the winter is not near the time of the winter solstice, December 22, but rather in February or early March. Take Resolute, for example. The snow covered ground and ice continue to cool until a few weeks after the Sun first makes an appearance above the horizon on February 5, after the long polar night. The coldest time of the year at Resolute is normally between February 25 and March 4.

Oceans act as heat sources in winter. Over the southern part of Davis Strait, which separates Baffin Island from Greenland, considerable open water lies all the year around, and in spite of much floating ice, there is enough open water even in January to give a pronounced warming over eastern Baffin Island in comparison with similar latitudes farther to the west. The ocean-land contrast is even more obvious in July, as large amounts of floating ice surround the Arctic Archipelago. As a consequence, mean temperatures during July are much lower over the Archipelago than they are over the Districts of Keewatin and Mackenzie. Also, the inland regions of the Arctic Islands are significantly warmer during the summer than are the surrounding coastal areas.

Other notable climatic features are that the continental stations experience much larger daily and annual extremes of temperature than marine stations. Secondly, that there is usually a lag in seasonal temperatures at marine stations by comparison with continental stations. The coldest month at a marine station is usually February and the warmest, August; instead of January and July respectively in the case of continental stations.

Cloudiness, Precipitation and Fog:

In describing the general climate of the Northwest Territories, next to temperatures, the most important aspect is the general "weather". This can be best discussed under paragraphs dealing with cloudiness, precipitation and fog, although these elements are all related.

Continental areas in winter tend to experience relatively low cloudiness while oceanic areas in summer show relatively high cloudiness. The high relative cloudiness over Davis Strait is associated with the large frequency of storms in the area or in other words with the "sub-polar low". The westward building of the polar high from the Greenland ice cap over the northern part of the Arctic Archipelago from January to April is also reflected by relatively low cloudiness in the higher latitudes of the Archipelago in these months.

Weatherwise, therefore, this is the best time of the year.

Moisture is in sho t supply in the Arctic regions, particularly in winter when extremely low temperatures prevail. Annual precipitation levels are generally so low in fact that much of the Territories could be classified as a "polar desert". Eureka, for example, has the lowest precipitation for any station in Canada - only 2.40 inches.

Annual precipitation is determined by totalling rainfall and the water content of freshly fallen snow over the year. Practically all of the rain falls in summer while most of the snow falls during the remainder of the year. The equivalent of ten inches of newly fallen snow is approximately one inch of water.

The heavy precipitation that occurs along the east coast of Baffin Island is a result of the very large snowfall which occurs in this area. Most of this snow results from a combination of the effects of the mountain barrier that runs northwestward-southeastward along the eastern flank of the island, the large frequency of storms that affect the area and the abundance of moisture available over the open water of Davis Strait. The effect of another mountain barrier, the Richardson and Mackenzie Mountains, is to increase rain and snowfalls over the cordillera itself and to produce a "rain-shadow" area to the east, with lower precipitation amounts.

During the summer months, relatively warm, moist air overlies the icy waters surrounding the islands of the Archipelago and produces widespread fog (a day with fog is one in which there is at least one observation of one half mile visibility or less). Fog occurs on at least one third of the days over practically all of the waters surrounding the Arctic Archipelago and for more than half of the days over Davis Strait. These data are based on land stations where winds would be off shore during some of the observations. As a result, the frequency of fog over the water areas is probably even higher.

Winds:

Winds over most of the year generally decrease from south to north, generally dropping off substantially north of latitude 80°N. that is towards the average position of the polar high. Winds also decrease noticeably from January to April across the north-central part of the Arctic Archipelago. This decrease in mean wind speed is a result of the polar high-pressure area over Greenland in January building westward to cover the northern islands of the Archipelago by April. Wind speeds are almost invariably high over southern Davis Strait because of the influence of the sub-polar low-pressure area. In general, winds are much stronger in winter than in summer.

It is significant that much lighter winds occur in the forested area of the Mackenzie River Valley than do farther east over the open tundra. The strong winds which occur over the tundra areas of the southern half of the District of Keewatin are due to the relatively large number of disturbances that cross Hudson Bay.

Specific Climate of the Northwest Territories

December to February:

This is the "dead of winter" as far as the Northwest Territories is concerned, because much of the higher latitudes are under the influence of the polar night, the period when the Sun is totally beneath the horizon for days or weeks.

Due to the lack of insolation and continued heat loss from the snow and ice surface of the Earth, temperatures are bitterly cold during these months, averaging from 10 to 20 below zero in the southern regions to as low as 30 or 40 below zero in the northern part of the Arctic Archipelago. Only a few coastal stations of southeastern Baffin Island report daily mean temperatures above the zero mark, due to the ameliorating effect of some open water over southern Davis Strait. At Resolution Island, the mean daily temperature during January is 0°F., while at Frobisher Bay, about 200 miles away on Baffin Island itself, the corresponding mean for January is 16°F.

Occasionally warmer air masses from the south penetrate the perimeter of this frigid core of air and give above freezing temperatures to the southern part of the District of Mackenzie, the islands of Hudson and James Bays and over Baffin Island, but such mild temperatures are practically unknown over the central and high Arctic regions of the Northwest Territories. On the other hand, temperatures in mid-winter can fall to 60 or even 70 degrees below zero, even over the District of Mackenzie, where the daily means are much higher than at stations farther north and east. In fact, the lowest temperature ever recorded in the Northwest Territories, -71°F., occurred at Fort Smith, a "continental" station on the Slave River at the Alberta-Northwest Territory boundary. It should be cautioned, however, that records began in 1913 at Fort Smith, so that its long period of record makes its extreme reading not strictly comparable with those at many of the more recent short-term stations.

Even though these extremely low minima do occur over the Mackenzie River Valley, undoubtedly the lowest mean temperatures in the Territories occur at sheltered interior--valley locations in the high latitudes of the Archipelago. An extreme case is at Lake Hazen, Ellesmere Island, where cold air lies trapped in a protected basin for most of the winter. The mean daily temperatures at this site during December 1957 was -48°F., while the corresponding mean at Alert, about 100 miles to the Northeast was -32°F., about 16 degrees warmer. The Lake Hazen area could well be the coldest place in the whole of Canada during the winter months.

Winds are often strong in the winter months, particularly over the open tundra areas to the north of the tree-line, the combination of high winds and low temperatures producing a very high "wind-chill". These high winds usually whip up the snow off the ground, with the result that the visibility can be restricted to a half mile or less.

Actual snowfall, however, is extremely light over practically all of the Northwest Territories during these months, as the available moisture supply is quite limited due to the extreme coldness of the air. Occasional heavier snow does occur around the fringes of the cold core, particularly over southeastern Baffin Island, where weakening storms dump relatively heavy snows on the windward east slopes of the island.

Rain is practically non-existent over the Arctic in the winter, but it does occur occasionally in the Mackenzie River Valley, the islands of Hudson and James Bays and southeastern Baffin Island, usually in the form of "freezing rain".

March and April:

This is the period of fine weather over the Arctic, particularly over the Archipelago, and with the days rapidly lengthening, one would expect that winter was all but over. Except over the southern half of the District of Mackenzie, this is not the case, as some of the coldest weather of the winter occurs in early March after the sunlight again returns. It is not until April that the heat from the Sun finally begins to make a real impression on the severe cold that has prevailed for so long.

Mean March temperatures of about 30 below zero over the northern part of the Archipelago rise to above 15 below by April, while those over the southern islands rise from means of 10 to 20 below in March to 10 or 15 degrees higher a month later. The southern parts of Mackenzie and Keewatin Districts warm up more rapidly in these months than do the stations farther north, and mean temperatures of about zero in March rise to about 25 above by April.

Temperatures rarely rise above the freezing point in March and April over the high Arctic, but readings of 30 to 40 occasionally occur by the end of April over the southern Archipelago as well as the northern parts of Mackenzie and Keewatin Districts. The southern parts of these districts, however, can reach 50 before the end of March and 60 or even 70 by the end of April. These are extreme values, though and are not at all common so early in the Spring. Night-time readings of 40 to 60 below zero can still occur over much of the Territories during March, and even in early April 20 to 40 below values are possible in low-lying stations. Again, these readings are extremes rather than commonplace occurrences.

Winds drop off somewhat during March and April over the high latitudes, thus helping to offset the chill of low temperatures. Farther south over the District of Keewatin, however, even though temperatures are significantly higher than those farhter north, winds remain strong on the average and the wind chill remains severe.

March and April snowfalls are light and infrequent over the Northwest Territories, particularly over the high Archipelago region, which reports some of the sunniest weather of the year during these months. Rains is almost unknown in March in the Arctic, but April temperatures are high enough that at least some precipitation falls as rain south of latitude 70°N.

May and June:

May and June are transition months over most of the Northwest Territories, with the loss of the continuous snow cover by early May over the Mackenzie River Valley and by late June over the high Arctic regions. Because of the transitional nature of these months, temperatures can vary tremendously from one part to another.

The continental sections of the Districts of Mackenzie and Keewatin warm up the most rapidly, the mean daily temperatures rising from the forties in May to the fifties in June. Under the most favourable of conditions extreme maximum temperatures of 60 and 80 and even in the nineties are possible. On the other hand, sub-zero readings are by no means uncommon in May and well below freezing temperatures in June.

Over the Arctic Archipelago, mean temperatures are 10 to 20 above in May and rise, for the most part, into the thirties in June. Extreme daily maximum temperatures occasionally reach into the forties in May and the sixties in June but minima occasionally drop to 20 below zero in May and zero in June. The weather is frequently poor in May and June. Cloudiness and precipitation are generally greater than earlier in the year. There are 24 hours a day of sunlight, during June in the Archipelago which melts most of the snow and ice. Then mild air from the more southerly latitudes gets chilled crossing this ice with the result that extensive fog and low cloud often form and persist along coastal localities.

July and August:

The brief summer season in the Arctic comprises July and August. Over the mainland areas of the Districts of Mackenzie and Keewatin, this period is relatively warm, with mean daily temperatures in the upper fifties and low sixties. Maximum temperatures occasionally

reach into the eighties and nineties, while minima occasionally fall into the thirties during July and the twenties during August. The highest recorded temperature for the Northwest Territories, 103°F., occurred at Fort Smith, District of Mackenzie.

Ice-infested waters surrounding the islands of the Archipelago keep temperatures much lower than farther south over the mainland. Mean daily temperatures average from the mid-thirties to the mid-forties over the Archipelago, the coastal stations having the lowest means. Resolution Island, just off the southeast tip of Baffin Island, and surrounded by the icy waters of Davis Strait, has the lowest July mean daily temperature for any place in Canada, 37.8°F. Daily maximum temperatures rarely rise above 60 or 70 degrees, even in the centre of the Arctic Islands, which warm up more than the frigid coasts, and minima fall frequently well below freezing at night. By late August the days are still 24 hours long even over the high Arctic, but the Sun is at a lower angle in the sky than earlier. The result is that temperatures fall off noticeably after the middle of the month, and minima below 10°F. have been recorded at some stations over the northern part of the Archipelago toward the end of August.

July and August are the wettest months of the year over all of the Northwest Territories. Most of the precipitation falls as rain, but wet snow is by no means rare over the Archipelago, particularly during August. The ocean is still relatively cold and floating ice remains in the channels surrounding the islands of the Archipelago practically all summer. Fog and low cloud are widespread as a result of warm air passing over this cold water, their frequency being somewhat greater in August than in July. Resolution Island, for example, has on the average 19 days with fog during August. Inland parts of the larger, higher islands, however, are rarely affected by this low cloud and fog. Eureka, for example, is quite protected due to its local topography, and the number of days with low cloud and fog during the summer months is much less than at many of the other Archipelago stations, such as Resolute, Isachsen, Alert and Mould Bay, all situated on unprotected coasts.

September to November:

Like May and June, September to November is another transition period. Summer-like conditions still prevail over the Mackenzie River Valley early in September but, a return to a snow cover and below freezing temperatures early in the month heralds the oncoming winter over the northern part of the Arctic Archipelago. As the hours of daylight fall off rapidly, wintry conditions return quickly. By the end of September, mean daily temperatures are below the freezing point over most of the land areas, and below-zero readings are common over the northern part of the Archipelago. Temperature means continue to fall rapidly through the next two months, so that by the end of November, daily means range from about zero in the south to about 20 below zero over the northern Archipelago.

Frequent storms accompany this transition period. In general, these months are the snowiest of the whole winter. This is due in part to the open water surface of the lakes and bays. Cold winds, blowing across open stretches of water, pick up moisture, which is subsequently dumped in the form of snow along the shores and slopes downwind from the body of water. As the numerous lakes, rivers and bays gradually become frozen, this effect diminishes, first in the north and then in the south.

Factors Relative to Recreational Use of the Arctic

A tourist must generally travel great distances in order to reach his activity area. Suitable weather is essential for this travel, since major delays will not be repeatedly tolerated. Once located, the tourist requires suitable weather to get to the actual recreation

site, and when there, to enjoy the activity fully. These three aspects of recreation-climate are discussed in subsequent sections dealing with the impact of climate on regional access, on local access and on outdoor activity in general.

In the Northwest Territories the recreation-tourist emphasis falls into three main categories: (i) landscape touring, which can be sub-divided into general viewing, specialized scientific study and hobby, such as rock and mineral collecting; (ii) specialized activities, mostly of a sporting nature, such as hunting and angling; and (iii) residential, such as camping and cottaging.

Impact of Climate on Regional Access:

Air Travel:

Air travel is the most convenient method of travel in the N.W.T. because of the great distances, short ice free season and the general lack of highways. Three regional air carriers serve the N.W.T. and a number of charter operators. The principal limitations on air travel are very low cloud and/or visibilities. Flying weather over the N.W.T. can be characterized as follows:

i. good flying weather along the Mackenzie River throughout the year, except October to December inclusive;

ii. good flying weather over the open tundra areas of the Districts of Mackenzie and Keewatin in the summer months, but relatively poor in the winter months;

iii. poor flying weather for most of the year over coastal areas of the Arctic Archipelago and Hudson Bay, but especially during the summer months;

iv. good flying weather for most of the year over the inland areas of the Arctic Archipelago;

v. relatively good flying weather from February to May inclusive, for much of the Arctic Archipelago.

Water Travel:

There are three main regional access routes by water in the Northwest Territories: (i) the Mackenzie River, the only significant inland system; (ii) the route through Hudson Strait into Hudson Bay; and (iii) the route through Davis Strait into Baffin Bay and Parry Channel.

On average, the navigation season along the Mackenzie River runs from the last week in May through to the middle of October. South of Fort Providence the season is somewhat shorter since the Great Slave Lake does not break up as early as the Mackenzie River.

The Arctic Archipelago and Hudson Bay have many local anomalies in ice conditions which are related to sea drift, prevailing wind speed and direction, and storm tracks. Many of the islands of the Archipelago are locked in by ice on a year-around basis, and even normally accessible areas may sometimes require ice-breaking equipment. Also, the season is very short for small boats, unsupported by ice-breakers, ranging from less than three and one-half months over southern regions of the Archipelago to less than a month or less as far north as Eureka. Even within these short periods there is considerable floating ice.

Hudson Bay and Hudson Strait usually open up by late July and enough ice has formed by the end of October to halt local small-craft shipping. The navigation season along this route is thus about three months for small boats. Similarly, the Davis Strait-Baffin Bay route is usually feasible for unsupported small craft from mid-August until after mid-September. However, icebergs from the glaciers of Baffin, Devon and Ellesmere Islands and the northwest coast of Greenland, floating southward with the Canadian Current pose a severe hazard on this route.

Ice is not the only restrictive factor affecting water routes through the Arctic Seas. Throughout the navigation season widespread fog occurs whenever relatively warm, moist air overlies this icy water. It is very prevalent along both the Hudson Bay-Hudson Strait and Davis Strait-Baffin Bay navigation routes.As examples, the mean number of days during the year with fog at Resolution Island, Coral Harbour and Frobisher Bay are 81, 33 and 25 respectively, occuring mostly during the summer months.

Highways:

The Mackenzie Highway system is of great importance both from commercial and tourist viewpoints. The major impact of climatic factors occurs at those locations where the highways cross water bodies (e.g. Fort Providence, Fort Simpson, Fort Liard crossings).

There are transition periods (freeze-up and break-up) when the ferries are unable to operate and the icebridges are not strong enough to support vehicles. These periods vary from year to year.

At Fort Providence, for example, the icebridge closes about the middle of April and the first trip of the ferry is three weeks to a month later. The ferry's last trip is generally mid-November and the icebridge reaches a five ton capacity by mid-December. In effect, Yellowknife is cut off by road from the rest of the continent during break-up and freeze-up.

The highway system is extended during the December-April period, with the provision of winter roads. However, large fluctuations in the above patterns do occur since climatic conditions are never uniform.

The Impact of Climate on Local Access:

Air Travel:

Often the only method of transporting a party into a wilderness area or into small communities not linked by the scheduled local carriers is by the use of unscheduled charter flights or by private aircraft. These flights frequently have to land at unimproved landing strips or simply on acceptable areas of ice and snow in winter, or water in summer.

These flights have the decided disadvantage of having to operate mostly in areas not served by official weather observers. To counteract this disadvantage, the charter pilots have unofficial "observers" located in most of the smaller communities who relay to them on short notice estimates of latest ceilings and visibilities. Since they are able in many instances to put their aircraft down on improvised runways, the charter operations are more versatile and are in many cases "grounded" less often than scheduled operators.

Poor flying weather is of particular importance during the summer months over the waters surrounding, and the coastal areas of, the islands of the Arctic Archipelago. Often the centres of these islands have much better flying weather than the coasts. One example of a protected station is Eureka, situated in the centre of the Axel Heiberg-Ellesmere Island land

area, where the percentage of poor flying weather is significantly less than at Mould Bay, Resolute, Isachsen or Alert.

During the winter months the existence of considerable expanses of ice permits aircraft landings at many locations in the Arctic. However, caution must be taken to ensure the safety of the ice sheet. Pressure ridges, rafting and cracks form in the sea ice with freezing, settling and movement. There are also problems regarding the quality of the ice. Sea ice, because of its salinity, has a lower strength than does fresh-water ice. During the spring thaw period, sea ice loses its strength rapidly as temperatures rise above about 20°F. On the other hand, fresh-water ice often retains its strength, even after being separated from the shoreline by local inflow and melt.

It must also be noted that freeze-up dates for a region cannot be used to guarantee adequate ice thickness of lake ice in autumn for landing or crossing. Also, the weather during the freeze-up period must be settled in order to obtain a smooth ice surface. This fact is important, as once a rough ice surface has formed, it will remain for the season, making it difficult to find a level, unbroken surface on which to land. Many lakes north of the treeline are bare of snow during the winter as a result of wind action.

Water Travel:

Canoeing and travelling by small craft, such as Peterheads, are the main methods of local water access.

The dangers involved in transport by canoe or small boat, in addition to those described earlier under regional water transport, include strong winds, particularly squally winds which are variable in direction. Most small-boat activity occurs in the Districts of Mackenzie and Keewatin; however, operations around the islands of the Archipelago must also be considered. Small boats remain near shore, travelling from settlement to settlement. They are exposed, in addition to normal weather hazards, to strong winds that often funnel up and down the fiords and to moving ice, which is more of a problem near the shore than it is farther at sea.

Surface Travel:

The main aspects of surface travel are hiking in summer and skidooing in winter, both of which are very affected by the nature of the surface in relation to climate.

A physical fact that all surface travellers in the Northwest Territories have to accept is that virtually the complete area lies in the permafrost zone, that is where the temperature of underlying materials remains less than 32°F. except for an active layer which thaws each summer and refreezes in the winter.

As far as the surface traveller is concerned, changes in the active layer are vitally important. Travel is easiest when the ground is frozen; however, the traveller is often restricted in this period by wind chill and poor visibility. During the summer months the sub-surface permafrost layer acts as a barrier to percolation, so that extensive wet, boggy areas occur which hinder overland travel.

The Impact of Climate on Outdoor Activity in General:

Many of the traditional southern Canadian outdoor activities, both in winter and summer must be severely curtailed as to both time and space in the Northwest Territories. On the other hand, innumerable opportunities arise in the Arctic for new outdoor experiences that are unique.

The limitations of each climatic factor are dealt with first, since they may relate to safety. While outdoor activity may seem incompatible with common sense and safety in many instances, the rigours of the weather can be offset by the use of proper clothing and by taking sensible precautions, to say nothing of changing one's frame of reference as to what constitutes good activity weather. The emphasis therefore is upon tolerable rather than upon ideal conditions as well as on those which pose real dangers to life and limb.

Winter Factors:

Length of Activity Day:

One of the most critical factors limiting outdoor activity in the Arctic during the early winter months is the shortness of daylight hours. Once the autumnal equinox, September 23, is over, the length of daylight decreases markedly over the Arctic; the higher the latitude, the more quickly the days shorten with time. The winter solstice, December 22, is the shortest day over the Northern Hemisphere, and thereafter, the days lengthen until the time of the vernal equinox, March 21. The length of period that the Sun remains entirely beneath the horizon lengthen rapidly with latitude toward the North Pole. While the Sun is only beneath the horizon for one day or 24 hours right at the Arctic Circle (66½°N) there is a period for about four months at 80°N with no sunlight. At the North Pole itself, the Sun is entirely beneath the horizon for the six-month period from September 21 to March 23. Outdoor activity is severely curtailed once the Sun is beneath the horizon for the polar night.

Twilight is another factor. For a time before sunrise in the morning and after sunset in the evening, there is still enough illumination to enable one to engage in outdoor activity. This twilight period varies with latitude, the farther North the longer the twilight, thus helping to compensate for the effect of the shortening daylight hours. There are two definitions of twilight, astronomical and civil; it is the latter which has the more direct bearing on outdoor activity, since by definition it is in this period that one can engage in normal outdoor work. The period of civil twilight ranges from about one hour or so a day, half an hour in the morning and half an hour in the evening, near 66°N to about four hours per day at the latitude of northern Ellesmere Island.

An activity day may therefore be defined as the sum of sunlight (i.e. hours the sun is above the horizon) and twilight. Outdoor activity of a tourist and recreational nature is almost at a standstill over most of the Northwest Territories and certainly over the Arctic Archipelago from November through January. On the other hand, the length of day is favourable from March to September. The length of day increases rapidly over all of the Northwest Territories during March, so that at least 12 hours of daylight occur everywhere by the end of the month.

Temperature and Wind Chill:

Outside of the crucial factor of the shortness of activity day, the weather phenomenon most limiting to outdoor activity in the Arctic is the winter cold. The extremely low maxima and minima are in themselves limiting enough, but with the effects of wind added, outdoor activity can become extremely hazardous if caution is not exercised. Fortunately, the coldest part of the winter normally occurs during those months when outdoor activity is already at a standstill due to the lack of daylight. Much outdoor activity resumes by March, due to good travelling conditions, the resumption of a reasonable length of activity day and the good weather that normally prevails at that time of year. A formula based upon the cooling rate of human flesh, combines the mean wind and temperature into a wind-chill index in units of kilogram-calories per square meter per hour, referred to hereafter as

wind-chill units. These wind-chill units usually range from values of 1,000 to 2,000 in winter across Canada, but values may exceed 2,300 units in extreme wind-chill situations in the Arctic. The seven comfort classes of wind-chill are listed in Table 5.5 with the corresponding limits of wind-chill units.

Yellowknife is the only location with March readings comparable with those in some southern Canadian cities. At this time most Arctic locations have temperatures colder than 0°F. Maximum readings of 20 below zero or lower are still common to the northern part of the Arctic Archipelago. Minimum readings of 30°F. or lower occur at least half the time over half the Arctic and up to 90% of the time over the far northern part of the Arctic Archipelago. Even in April when outdoor activities are resuming, such minima occur 30% of the time over the far north.

From a comfort standpoint, coldness cannot be based on temperature alone. An air temperature of 0°F. with no wind may be relatively comfortable, while with a 50 m.p.h. gale it would be extremely uncomfortable. The combined effects of temperature and wind is called "wind-chill". Various complicated formulae have been devised to calculate wind-chill to obtain a measure of the cooling rate of human flesh. Some of these given an index of heat loss in calories per unit area and time, while others have attempted to relate this to an equivalent temperature assuming light wind conditions. Even in March and April, when normal outdoor activity is resuming after the polar night, the wind-chill factors are extremely high.

Since winds are generally light, the southern Mackenzie River Valley area is by far the most comfortable for outdoor activity at this time of year. Conditions generally worsen rapidly northward and eastward from this area; however, from the point of view of wind-chill, the Baffin Island area is not so severely cold as the central part of the Territories. Although the northern part of the Archipelago is by far the coldest due to its latitude, lower mean wind speeds make the wind-chill there no more severe than farther south along the central axis of the Territories. As the winter months advance, temperatures rise rapidly, particularly over the continental areas, such as the Mackenzie River Valley. This all means that for outdoor activity during the late winter months, it is best to choose a later time if a choice can be made. The least comfortable conditions at that time will likely occur over the District of Keewatin and the remainder of the Arctic Archipelago.

Visibility:

Another severe restriction on outdoor activity in the Arctic winter is low visibility. Since there are few industrial centres in the Northwest Territories, the air is relatively free from the impurities that cause the atmosphere haze that is common to the southern parts of Canada. The main restrictions to visibility in the Arctic are fog, blowing snow and precipitation. "Arctic sea smoke", as well as ice-fog and smoke near airfields and settlements may also reduce visibility.

At most Arctic stations, the extent to which blowing snow reduces the visibility is directly related to the speed of the surface wind. Surface wind speed and winter visibility in blowing snow is related approximately as follows:

RELATIONSHIP BETWEEN WIND SPEED AND VISIBILITY

Wind Speed (m.p.h.)	under 15	15	20	25	over 30	over 40
Visibility (miles)	over 6	3-6	1-3	½-1	under ½	near zero

TABLE 5.5

COMFORT CLASSES OF WIND-CHILL

CLASS	LIMIT OF WIND-CHILL UNITS	DESCRIPTION
I	less than 800	Comfortable with normal precaution.
II	800 to 1200	Work and travel become uncomfortable unless properly clothed.
III	1200 to 1400	Work and travel become more hazardous unless properly clothed. Heavy outdoor clothing necessary.
IV	1400 to 1600	Unprotected skin will freeze with direct exposure over prolonged period. Heavy outdoor clothing becomes mandatory.
V	1600 to 1900	Unprotected skin can freeze in one minute with direct exposure. Multiple layers of clothing mandatory. Adequate face protection becomes important. Work and travel alone not advisable.
VI	1900 to 2200	Adequate face protection becomes mandatory. Work and travel alone prohibited. Exposure times must be carefully controlled.
VII	more than 2200	Personnel become easily fatigued. Buddy system and observation mandatory.

While this relationship applies to some stations, such as Resolute, it is not universally applicable, and other stations, such as Baker Lake and Isachsen, tend to have low visibilities in blowing snow with relatively light wind speeds. The cooling effects of low temperatures and strong winds, combined with zero visibility in blowing snow, make outdoor activity extremely hazardous.

Snow in itself usually limits visibility to less than six miles, but in the absence of wind, visibilities are seldom reduced to less than two or three miles in mid-winter because of the extreme dryness of the air at such low temperatures. In the early and late winter months, however, when temperatures are much higher, falling snow often reduces the visibility to one-half mile or less.

Arctic White-out:

Arctic white-out is an optical phenomenon which occurs when the sky is overcast with stratiform clouds, the ground is covered with snow, and the sun lies low in the sky. With

these conditions, the greyish-white landscape blends with the grey clouds, so that the horizon disappears, ground features lack shadows, and the sense of perspective is lost. Since there is no horizon or shadow usable for reference, the judgment of distance is limited, although the actual horizontal visibility of dark objects is not materially reduced. Drifts, wind etchings, footprints and tracks produced by sleds or vehicles may not be readily apparent. The reduction of visual contrast may be sufficient to cause a man to stumble over a two-inch "mountain" or into a two-inch "gully".

The white-out condition can occur on ice-covered lakes or the polar sea, whenever there is an unbroken expanse of snow cover. The Arctic white-out effect occurs most frequently near the beginning of the dark season toward the end of October or early November and again in February or March following the close of the polar night.

Obviously, the Arctic white-out condition is extremely hazardous for all forms of travel, both surface and air. Because of its subjective nature, no statistics are available to indicate the frequency at various stations, and it can only be discussed qualitatively.

A zero visibility and ceiling condition caused by blowing snow should not be confused with the "white-out" as described above.

Summer Factors:

Temperature:

Low temperatures during the Arctic summer are not limiting in the same sense as during the winter months. However, care must be taken to dress in a reasonable fashion. Light, casual clothing frequently worn for recreational activities in southern Canada, would be out of the question, particularly in the Arctic Archipelago.

July is generally the warmest month over most of the Arctic. Temperatures in the District of Mackenzie approach levels found in normal summer seasons in southern Canada. Over the Archipelago, the ice-infested waters cause much lower temperatures, usually with maxima in the forties; however, in the inland regions of these islands daily maxima above 50°F. may occur.

Water temperatures in bays and inlets around the Archipelago are uniformly close to the freezing point. Inland on these islands, rivers fed by glaciers and snowfields and small lakes also have low temperatures. In mainland areas of the Districts of Mackenzie and Keewatin, shallow lakes may warm up considerably more, but most rivers and lakes are too cold for swimming and pose a hazard to anyone who is thrown into the water by an upset of a boat or canoe.

Visibility:

As in the winter season, low visibility can be a serious limitation to outdoor activity in summer, particularly as a hazard to aircraft operation. The danger to life in becoming lost in the summer is not as critical as in winter; nevertheless, because of the low density of population and the difficulty of living off of the land, it must be considered a hazard, especially over the Archipelago.

Coastal stations along the ice-infested waters of the Archipelago and Davis Strait, Hudson Strait and Hudson Bay are fog bound much of the time during the summer. Inland areas though are relatively free of fog.

The occurrence of rain usually lowers visibility to six miles or less. Summer snowstorms frequently reduce visibilities to one half mile or less. Alert, for example, has on the average four days with measurable snow in June, five in July and seven in August.

Winds:

Strong winds can also be a limiting factor to outdoor activity during the summer, particularly for travel across lakes in canoes and boats. Generally speaking, wind speeds are much greater over the Open Tundra and along Hudson Strait than over the forested Mackenzie River Valley or the interior of Baffin Island. Local topography and thunderstorms may both cause strong, gusty and variable winds.

Recro-Tourist Climatic Classification

A meaningful recreation-tourism climatic classification should embody those factors that are highly significant with regard to outdoor activity, particularly during the daytime hours. It must emphasize those climatic conditions that are limiting, not merely on the basis of comfort but more particularly from the standpoint of safety. In this regard, the stress was laid upon tolerable rather than ideal conditions, although the term "ideal" was used in the description of the limiting factors.

The choice of the factors and the limiting values, particularly those applying to comfort and human safety, are necessarily a bit arbitrary and subjective. It would be preferable to combine the factors into a single recreation-tourism index, as only the combined effect of the several factors working together have any real meaning from a climatic point of view. However, the complexity of such an approach was apparent, and the time to explore such procedures was not available. The next best approach is to treat each parameter singly, using reasonable limits in describing ideal, marginal and sub-marginal conditions for outdoor activity. This was the approach taken in preparing this report, and it is hoped that some of its limitations are partly compensated for by combining the results graphically.

From a recreation-tourism standpoint, only two seasons need to be considered in detail, winter and summer. These two seasons were dealt with separately, and a different set of factors and limits were chosen for each. Since the short transition zones of spring break-up and autumn freeze-up are not suitable for recreational and tourism activity, no attempt was made for their further classification. For the purposes of this study the seasons were thus defined:

TABLE 5.6

DEFINITION OF SEASONS BASED ON MOBILITY

winter season	— begins when the ground is snow-covered and lakes, rivers and inlets are fast-frozen.
spring break-up	— short transitional period between winter and summer.
summer season	— begins when lakes, rivers and inlets are ice-free (excepting floating ice in waters surrounding the islands of the Archipelago) and the ground is no longer snow-covered (excepting permanent ice and snow-fields)

TABLE 5.6 – Continued

	– ends with the arrival of the autumn snow-cover or with the first appearance of ice in lakes, rivers and inlets, whichever is the earlier.
autumn freeze-up	– short transitional period between summer and winter.

Using snow cover data, and break-up and freeze-up dates, the following data can be tabulated for Yellowknife, Frobisher Bay and Resolute, three fairly representative stations for the N.W.T.

TABLE 5.7

AVERAGE DATES OF SNOW COVER, FREEZE-UP AND BREAK-UP FOR YELLOWKNIFE, FROBISHER BAY & RESOLUTE

	First Snow	Freeze-Up		Last Snow	Break-Up	
		Begins	Ends		Begins	Ends
Yellowknife	Oct. 25	Oct. 19	Nov. 2	May 6	May 26	June 4
Frobisher Bay	Sept. 28	Oct. 11	Oct. 30	June 6	June 13	July 13
Resolute	Sept. 12	Sept. 23	Sept. 25	June 29	July 24	July 31

Using the proposed definition of Arctic seasons, the following table can be constructed, showing the length of the two seasons as well as the transition periods at the three stations.

TABLE 5.8

LENGTH OF SEASONS AT YELLOWKNIFE, FROBISHER BAY AND RESOLUTE

	1 Autumn Freeze Up (Days)	2 (Date)	3 Winter (Days)	4 (Date)	5 Spring Break Up (Days)	6 (Date)	7 Summer (Days)	8 (Date)
Y.K.	13	Nov. 2	187	May 6	27	June 4	138	Oct. 19
F. Bay	29	Oct. 30	222	June 6	36	July 13	78	Sept. 28
Resolute	12	Sept. 25	278	June 29	31	July 31	44	Sept. 12

Columns 1, 3, 5 and 7 indicate the length of the seasons and transitional periods; columns 2, 4, 6 and 8 are the mean dates of beginning and end of winter and summer, respectively.

The Duration of the Winter Season over the Northwest Territories:

The winter season, by the above definition, begins when lakes, rivers and inlets are fast-frozen and the ground is snow-covered, that is, when conditions are suitable for winter transport. The snow cover usually appears well before lakes, rivers and inlets are frozen-over. A body of water may be technically fast-frozen, but this does not mean that the ice is thick enough for over-ice transport. There may be a lag of a month or two between the date of the first complete freeze-over and the time that the ice would be thick enough to enable trucks and winter transport to travel upon the ice in safety. It is noteworthy, however, that ski-equipped aircraft can use the ice much sooner.

Winter arrives early in the high-Arctic; by mid-September the extreme northern part of the Arctic Archipelago, including Ellef Ringes Island, Axel Heiberg Island and the northern part of Ellesmere Island are snow-covered and the adjacent water surfaces ice-covered. By the first of October the wintry fringe extends southward to cover the Boothia Peninsula and all the Arctic Islands north of Viscount Melville Sound and Lancaster Sound as well as Prince of Wales and Somerset Islands. Two weeks later the winter regime extends over most of Banks Island and the northwestern portion of Baffin Island, as well as part of the District of Keewatin immediately to the south of Boothia Peninsula. By the beginning of November, nearly all the Northwest Territories is affected. Great Bear Lake does not usually freeze over until the latter part of November and Great Slave Lake until early December.

Winter is effectively over with the initial breaking of ice in lakes, rivers and inlets or the disappearance of snow cover, whichever is the earlier. In exposed areas and in southward-facing slopes, the snow normally becomes patchy or disappears before the ice in nearby water-bodies begins to break. Mean daily temperatures are normally in the thirties by the time the snow cover has melted.

The spring break-up begins about the beginning of May over the District of Mackenzie to the south of Great Slave Lake. By mid-May areas along the Mackenzie River to the south of Inuvik are usually snow-free. By the end of the month, the break-up is apparent south of a line from the mouth of the Mackenzie River to approximately Lake Dubawnt, while winter prevails to the north. The spring break-up proceeds northeastward during the next two weeks, reaching Sachs Harbour on Banks Island and Chesterfield in the District of Keewatin by mid-June. By the latter half of June, spring has come to the Arctic with the exception of most of Ellesmere Island and the northern part of Axel Heiberg, Ellef Ringes and Prince Patrick Islands.

Winter Season Factors:

It was seen earlier in the report under the impact of climate on outdoor activity, that the winter factors are length of activity day, temperature and wind chill, visibility and Arctic "white-out". The latter factor is not amenable to objective analysis, so no further consideration was given to it. The first factor, length of activity day, being the sum of daylight and civil twilight, is readily definable and is discussed further below. The second factor, temperature, and wind chill, is more difficult, as wind chill considerations require extensive calculations. While a computed wind chill factor is a much better indicator than the air temperature regarding human comfort, it was not possible to analyze it satisfactorily for the purposes of this report. Instead, a wind factor was employed, which was later combined graphically with the other winter factors. The wind factor is also related to the frequency of precipitation, poor visibilities and storms, thereby integrating many other climatic factors which should be included in a more sophisticated approach.

Length of Day:

The length of day factor is perhaps the most significant, as without a reasonable amount of sunlight, few activities can be engaged in, particular if any amount of travelling is involved. Values of six hours and twelve hours were selected for the lowest acceptable and ideal levels, respectively.

Choosing a lower limit separating marginal and sub-marginal conditions is necessarily arbitrary as the hours of daylight necessary for any particular activity depends upon the nature of the activity itself, the travel time to and from the area of activity and the individuals concerned. While two hours might suffice for one situation, ten hours might be needed for another. The value of six hours of daylight (including civil twilight) was chosen, as it seems reasonable to assume that any duration less than this would be quite restrictive for practically all outdoor activity. If a longer duration were chosen, the whole of the Territories excepting the islands of Hudson and James Bays would rate as sub-marginal for at least part of December and January, and this is unrealistic. At least some recreation and tourism is feasible during these months over the southern part of the District of Mackenzie. The six-hour boundary allows for some activity to about 62°N. during the shortest days of the winter; a reduction of five or four hours would not materially increase the area involved.

Choosing an upper limit for marginal conditions is also arbitrary; however, twelve hours seemed reasonable for ideal recreation and tourism activities. Small differences in this value would not significantly affect the results. Changing the limit by one hour either way changes the dates of first and last occurrences by only a week at the latitude of 60°N. and much less farther north.

In summary then, ideal, marginal and sub-marginal conditions of the length of day factor were selected as follows:

TABLE 5.9

LIMITING VALUES OF WINTER LENGTH OF DAY FACTOR		
FACTOR	CLASSES	
Length of Day	Ideal	– more than 12 hours
	Marginal	– between 6 and 12 hours
(Daylight plus Civil Twilight)	Sub-Marginal	– less than 6 hours

Temperature:

The temperature factor is also very significant, as the possible range and the normal deviation of this element is extremely large in the Arctic regions. Since most recreation and tourist activity is engaged in at the time of day when the temperature is highest, the mean daily maximum temperature was chosen for analysis.

Choosing the lower limit to indicate marginal temperature conditions is critical, as too low a value would not adequately define hazardous areas, while too high a value would be unnecessarily restrictive. Use was made of a temperature-wind-chill index to arrive at suitable limits.

Mean monthly wind speeds are in the order of 10 m.p.h. at most N.W.T. stations during the winter months. In order to remain in a marginal wind chill condition, at this wind speed the air temperature can be no lower than -15°F. This temperature was chosen as the limit between marginal and sub-marginal conditions.

The choice of the upper limit of marginal conditions was much less objective; a mean daily maximum temperature of 0°F. was selected. If a much lower value were chosen the two limits would become almost identical. On the other hand, if a much higher value were chosen, practically no ideal conditions would prevail except in early and late winter. The value of 0°F. therefor appeared rational.

In summary then, ideal, marginal and sub-marginal conditions of the temperature factor were selected as follows:

TABLE 5.10

LIMITING VALUES OF WINTER TEMPERATURE FACTOR

FACTOR	CLASSES	
Temperature	Ideal	– higher than 0°F
	Marginal	– between -15°F and 0°F
(Mean Daily Maximum)	Sub-Marginal	– lower than -15°F

Wind:

The wind factor is the most difficult for which to define significant limits. Wind speeds are extremely dependent upon topography, and it is difficult to find stations from which one can obtain representative values. Also, the wind factor is used as an index of "weather" as well as of wind-chill conditions. As a consequence, rather than attempting to relate wind speed to a specific weather element, a very qualitative approach was used.

Mean monthly wind speeds over the Northwest Territories lie generally between 5 and 20 miles per hour. The values of 10 and 15 m.p.h. were chosen for the upper and lower limits respectively, of marginal conditions. A vast area of the central Arctic region, all open tundra, has significantly higher winds in all months than either the forested Mackenzie River Valley or the northern islands of the Archipelago. This significant fact shows up in the classification.

In summary then, ideal, marginal, and sub-marginal conditions of the wind factor were selected as follows:

TABLE 5.11

LIMITING VALUES OF WINTER WIND FACTOR

FACTOR	CLASSES	
Wind	Ideal	– less than 10 m.p.h.
	Marginal	– between 10 and 15 m.p.h.
(Mean Monthly Wind Speed)	Sub-Marginal	– more than 15 m.p.h.

The Duration of the Summer Season over the Northwest Territories:

The summer season as defined above begins when lakes and rivers are ice-free and the ground is no longer covered with snow. The snow cover usually disappears before the ice has melted, but permanent snowfields and glaciers exist at higher elevations on some of the islands of the Arctic Archipelago and on the northward facing slopes of some valleys. While many inlets are essentially ice-free during the summer season, drifting ice occurs in the waters surrounding the Archipelgo.

The extreme southern part of the District of Mackenzie and the islands of James Bay are ice-free by the middle of June. By the end of the month all of the Mackenzie River Valley is ice-free, although Great Bear Lake normally still has ice. By mid-July, it is effectively summer over all of the District of Mackenzie and the southern half of the District of Keewatin, as well as over the extreme southern part of Baffin Island and the southwest halves of Banks and Victoria Islands. By the end of July virtually all of the Archipelago is free of snow, although, as was mentioned earlier, local snow fields are common and many islands are surrounded with pack ice.

Summer is over with the reappearance of snow in the autumn or with the formation of ice in lakes, rivers and inlets. On the average these two phenomena nearly coincide, although it should be pointed out that snow can fall in any month of the year in the Arctic, particularly over the Archipelago and over higher elevations. Mean daily temperatures have usually fallen into the twenties by the time the first snow arrives or the ice initially forms in lakes, rivers and inlets.

Summer is obviously very short in the high Arctic, ice has begun to reform or a snow-cover reappear over the northern half of Ellesmere Island and portions of Axel Heiberg and Ellef Ringes Islands by the beginning of September. By the middle of the month, most of Baffin and Somerset Islands and all the islands north of Viscount Melville and Lancaster Sounds are in the period of Autumn freeze-up. By the end of September, summer has ended for much of the Northwest Territories; only most of the District of Mackenzie and the southeastern part of the District of Keewatin and the islands of Hudson and James Bays are effectively still in this season. By mid-October only a small part of the District of Mackenzie and the islands of James Bay and the Belcher Islands are still technically having summer weather, which terminates before the end of the month.

Summer Season Factors:

It was seen earlier in the report that the critical summer factors were temperature, visibility and winds. Ideally, wind chill should have been used in place of temperature as a measure of human comfort, but for reasons previously explained, this was impractical. In any case, wind chill is not limiting to outdoor activity in the summer to the point of being the major hazard it is in the winter season. The second factor, visibility, was treated indirectly, using cloud amount, which is highly correlated and therefore a good index of poor weather. The third factor, wind, served a dual role; it is limiting from a mobility standpoint, for example, when regional and local access involves travel by small boats, and is also significant with regard to comfort.

Temperature:

The mean daily maximum temperature was chosen as the temperature factor, since most recreation and tourist activity is undertaken at the time when the temperature is highest.

Since temperatures are not limiting in the summer season from the point of view of safety, it was decided to drop the lower marginal limit and have no sub-marginal condition. Choosing the higher marginal limit would seem at first glance to be a hopeless task, since it is so dependent upon the nature of the outdoor activity and the individuals concerned. However, suitable temperatures do occur, and it was expedient to choose some value which showed in relative sense those areas which are more or less ideal. This may involve changing one's frame of reference as to what constitutes "ideal" weather, particularly for southern Canadian residents. Mean daily maximum temperatures over the Northwest Territories vary between 42°F. and 74°F. during the month of July, the warmest month. From a practical standpoint, 50°F. appeared to be a limit which fits actual experience on the mainland areas of the Territories and the inland sections of the large islands. The inland sections of the Archipelago islands are, in fact, much warmer than the coasts, and qualitatively this delineation is quite significant from a recreation-tourism point of view.

In summary then, ideal and marginal conditions of the temperature factor were selected as follows:

TABLE 5.12

LIMITING VALUE OF SUMMER TEMPERATURE FACTOR

FACTOR	CLASSES
Temperature (Mean Daily Maximum)	Ideal — 50°F and higher Marginal — lower than 50°F (No sub-marginal condition)

Cloud Amount:

The cloud amount factor is the most difficult of the three for which to define significant limits. The mean percentage frequency of cloud cover was selected as the more sensitive indicator in preference to mean total cloud amount. The ranges considered were eight to ten-tenths, three to seven-tenths, and zero to two-tenths (cloudy, partly cloudy, and sunny, respectively). The frequencies of cloudy skies (8 to 10/10 cloud) were found to vary significantly over the Territories, and the patterns shown when they were charted were identifiable with known patterns of good and bad weather. High percentages of cloudy skies occur at places where it is known that much poor weather occurs. This factor was therefore adopted for the classification system.

It was necessary to define limits for the cloud-cover factor. Once again a qualitative rather than a quantitative approach was expedient. It is known that weather conditions are indeed very bad, that is, sub-marginal, from a point of view of mobility in many coastal localities during certain times. These areas show up well if a boundary value between marginal and sub-marginal conditions is set at 70% frequency of cloudy skies.

Choosing the higher boundary value between marginal and ideal conditions of cloud cover was more arbitrary. If the 50% frequency is chosen as the upper limit, a reasonably large area is identified as ideal along the Mackenzie River Valley during the summer months. It was felt subjectively that this was consistent with experience.

In summary then, ideal, marginal and sub-marginal conditions of the temperature factor were selected as follows:

TABLE 5.13

LIMITING VALUES OF SUMMER CLOUD-AMOUNT FACTOR

FACTOR	CLASSES
Cloud Amount (Monthly Frequency of 8-10/10 Cloud)	Ideal · less than 50% Marginal — between 50 and 70% Sub-Marginal — more than 70%

Wind:

The main purpose of using a wind factor is to set off those areas that are significantly more windy from a point of view of small-craft operation on lakes and rivers. It also relates to personal comfort. The mean wind speed was selected for analysis, although it tends to obscure short-duration phenomena, such as thunderstorm squalls, which may be relatively more frequent in areas of relatively light winds, such as the southern part of the District of Mackenzie. It has to be kept in mind that wind speeds are extremely dependent upon topography, and it is difficult to find representative stations. As a consequence, the wind factor also was best treated in a qualitative rather than in a quantitative manner.

From the consideration mentioned in the above paragraph, there was little value in sub-dividing the wind factor into three classes. There may be areas in the Northwest Territories where winds are abnormally high most of the time and which therefore would deserve a sub-marginal rating but not enough data were available to define these areas. Since monthly mean values of wind speed in the summer months vary from approximately 5 to 15 m.p.h. in the Territories, it seemed reasonable to choose a mid-value, 10 m.p.h., as the boundary between which winds are suitable or unsuitable for outdoor activities.

In summary then, ideal and marginal conditions of the wind factor accepted for classification purposes were selected as follows:

TABLE 5.14

LIMITING VALUE OF SUMMER WIND FACTOR

FACTOR	CLASSES
Wind (Mean Monthly Wind Speed)	Ideal — less than 10 m.p.h. Marginal — 10 m.p.h. and more (No Sub-Marginal condition)

Problems Inherent in Combining Factors:

The previous two sections have outlined the significant factors pertaining to mobility and safety in the Arctic, and an attempt was made to attach reasonable limits to these factors for their sub-division into sub-marginal, marginal and ideal categories. Since these factors do not operate singly, but collectively, to produce the local climate, their combination must be considered in a meaningful climatic classification.

The first problem in combining the factors is to decide the relative weights that should be given to each. For each season there are three factors, and for each type of activity any one factor may be much more important than another. Determination of a best index for each activity type would require extensive computation which was not feasible at this time. Consequently, equal weighting was assigned to each factor.

The second problem in combining factors is to assess the relative impact of a marginal versus a sub-marginal classification. The answer depends upon the type of activity, the individuals concerned, and which factor is sub-marginal. If a sub-marginal condition is accepted as twice as restrictive to outdoor activity as a marginal condition, and if the three factors are weighed equally as far as their limiting effect, then, for any area, a table can be constructed showing the graded limitations to outdoor activity:

TABLE 5.15

RESTRICTIVE CLASSES OF OUTDOOR ACTIVITY POTENTIAL

"A" — Ideal all factors;
"B" — Two ideal, one marginal;
"C" — Two ideal, one sub-marginal or one ideal, two marginal;
"D" — One ideal, one marginal, one sub-marginal or three marginal;
"E" — One ideal, two sub-marginal or two marginal, one sub-marginal;
"F" — One marginal, two sub-marginal;
"G" — Three sub-marginal.

Obviously class "A" is the best condition with no restrictions, while "G" is the worst with all factors sub-marginal. However, assessing the relative merits of the in-between classes, "B" to "F" posed a problem. It might be argued that if any factor were sub-marginal, then outdoor activity would be out of the question. This approach seemed too restrictive when one studied the actual, contructed winter and summer charts. On the other hand, it was impractical to sub-divide the classes right down to class "G", as the lowest three or four classes are all highly unsatisfactory for outdoor activity. The above scheme of grading, while being highly arbitrary, shows at least qualitatively the relative merits of one area versus another.

The separate winter and summer classifications are discussed in detail in a later section. It is necessary in the meantime, however, to discuss the significance of the classification scheme in terms of recreation and tourism under three different points of view.

What the Various Classes Mean in Terms of Recreation and Tourism:

In attempting to relate the significance of the various classes to recreation and tourism, some further considerations must be stipulated in regard to the nature of the climatic data itself.

The factors have been based necessarily upon average conditions, the only exception being the length of day, which can be accurately calculated and forecast, being basically the same each year at the same date for any latitude. Since the factors are extremely variable over the Territories, both in distance and time, virtually any locality can experience any of the three classes, sub-marginal, marginal or ideal for all factors except the length of day almost anytime during the season in question. Not only will conditions vary significantly over short times in any one season, but also from one year to the next for specified periods.

Although there is usually a very high correlation between the most prevalent class of any factor and the mean, it is possible for a factor to have two frequency maxima, one on either side of the mean value. In such a case it is possible, for example, to have an ideal condition 40% of the time, a sub-marginal condition also 40% of the time, and a marginal condition only 20% of the time, so that the mean condition, a marginal condition, would be the least prevalent. The statistical distributions of the factors have not been examined to ascertain their character. This would have been an extremely useful undertaking, but impossible in view of time and other restraints.

While it is reasonable to assume that the mean values are, in general, useful indicators for classification purposes, the reader should be alerted to the limitations of this assumption. At any one time and place, conditions may be significantly different from what is indicated by the classification for one or more factors, and these differences may persist over a considerable period of time. It should be added that as far as temperature is concerned, the variability both from day to day and from year to year is much greater in winter than in summer.

Two categories of users must be considered, the resident and the non-resident, and the factors in a recreation and tourism classification must take their differing needs into account. The local resident is able to take advantage of brief periods of fine weather since no lengthy planning is necessary for a few hours of outdoor activity when travel time is short. The non-resident, on the other hand, has very limited flexibility in his time budget since planning must take place several months in advance of the experience. The non-resident must also spend a substantial amount of time and money just to reach the area of interest. For the experience to be worthwhile there must be a high compensating return.

Finally, the supplier of goods and services, in order to maintain a reputation and capitalize adequately upon his investment, must provide the tourist with a satisfactory experience, which includes a climate suitable for the activity in question; as the tourist is generally a non-resident, the risk factor for the supplier is very great if he is considering a marginal area.

So far it is assumed that most recreation and tourism activities are outdoor, away from communities. The adopted classification is too severe, therefore, if this assumption is changed. It is quite possible to have a dynamic tourist program within a community under marginal and even sub-marginal climatic conditions.

The Recreation Tourism Climatic Classification

The Winter-Season Classification:

In the following winter classification, the emphasis is upon non-resident, general outdoor, wilderness activities, including consideration of local and regional access. The classes are graded "A", "B", "C" and "D" as excellent, generally satisfactory, generally unsatisfactory, and highly unsatisfactory, respectively. Classes lower than "D" were not considered further.

TABLE 5.16

WINTER RECREATION-TOURISM CLASSIFICATION

GRADE	FACTOR COMBINATIONS	CAPABILITY FOR RECREATION AND TOURISM
A	Ideal all factors.	Excellent for non-residents and residents. No significant restrictions.
B	Two ideal, one marginal.	Generally satisfactory for non-residents and residents. Length of daylight may be close to lower limits and wind-chill factor may approach lower limits for comfort and safety.
C	Two ideal, one sub-marginal.	Generally unsatisfactory for non-residents but considerable activity possible by residents in local areas.
D	One ideal, one marginal and one sub-marginal, or more than two marginal, or more than one sub-marginal.	Highly unsatisfactory for non-residents and extremely restrictive for residents.

The Summer-Season Classification:

In the following summer classification, just as for winter, the emphasis is upon non-resident, general outdoor, wilderness activities, with considerations of local and regional access. In the grading of the classes, however, there is one minor difference. Grades "B", "C" and "D" are classed as generally satisfactory, generally unsatisfactory and highly unsatisfactory, comparable to the case in winter. However, because the summer factors are less restrictive than are the winter ones, it is possible to identify two "A" classes. They have been graded "A1" and "A2" and are classed as excellent and good, respectively. In this way the grading system used in the two season classifications is parallel in structure. It also should be noted that since two of the summer factors have no sub-marginal condition, the number of possible combinations of these factors produces only five categories.

TABLE 5.17

SUMMER RECREATION-TOURISM CLASSIFICATION

GRADE	FACTOR COMBINATIONS	CAPABILITY FOR RECREATION AND TOURISM
A1	Ideal all factors.	Excellent for non-residents and residents. No significant restrictions and most southern Canadian activities possible.
A2	Two ideal, one marginal.	Generally good for non-residents and residents. Restrictions not particularly severe.
B	Two ideal, one sub-marginal, or one ideal, two marginal.	Generally satisfactory for non-residents. Reasonably good for residents in local areas.
C	One ideal, one marginal and one sub-marginal or three marginal.	Generally unsatisfactory for non-residents. Generally satisfactory for residents in local areas.
D	Two marginal, one sub-marginal.	Highly unsatisfactory for non-residents. Limited activity for residents.

Some final words are in order regarding the development of a computer-calculated recreation-tourism index. The following remarks are only briefly stated ideas, and there is no attempt to indicate in any precise fashion how this problem should be tackled. Much research would be required, and it may well be that the present scarcity of climatological data in the Arctic regions is an insurmountable barrier.

Because of the vast amounts of information which must be treated in a recreation-tourism classification system, it is desirable to use electronic data-processing methods. Mapping by such methods is now in the developmental stage, and could be the basis of a computer-oriented index. However, the mapping techniques would have to be developed sufficiently to permit intelligent interpolation and extrapolation of data, having in mind the inherent bias of climatological information resulting from topography.

One of the major problems to be overcome is the proper weighting of factors in computing indices. Combination is simplified by assigning comparable ranges of values, such as zero for the worst and 100 for the best, as was done in a recent study of the tourist-climate of Europe. But such combination is valid only when the impacts of the factors (that is, the weightings) are identical for the assigned scales, and this occurs infrequently, the values varying with activity, individuals and circumstances.

Multi-variable factors, such as "wind-chill", which combine two or more important elements in a comfort-sensible fashion, offer considerably more promise as basic units of a general index, and the possibility of developing comparable factors using other elements should be fully explored. This would seem to be an insurmountable problem if all aspects of tourism were considered collectively. The development of an index for each activity does, however, seem to be a realizable objective. If this were achieved mathematically, then

importance could be assigned on the basis of probable economic return for the specific activity. The sums of estimated dollar returns could then be used as a more viable index which combines climate and economics. This approach would require close collaboration between the meteorologist and the economist.

LIST OF CLIMATOLOGICAL STATIONS IN THE NORTHWEST TERRITORIES WITH THEIR PERIODS OF RECORD

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
1. Aklavik	1	1	68 14	135 00	30	1926-62	1926-60		1956-60	Early record unreliable.
Aklavik East 3										See Inuvik A, Station 77.
2. Aklavik Radiosonde	2		68 14	135 00	30	1953-60	1953-60			
3. Alert	3	2	82 30	62 20	205	1950-69	1950-69		1967-69	
4. Angus Tower			60 26	114 28	780	1968-69				Summer only.
5. Arctic Bay	4	3	73 00	85 18	36	1937-66	1937-64			
6. Atkinson Point	5		69 56	131 24	10	1957-63				
7. Bache Peninsula	6		79 10	76 45	10	1930-33	1930-33			
8. Baker Creek			62 31	114 22	650					Rate of rainfall only 1969.
9. Baker Lake	7	4	64 18	96 00	41	1934-35 1946-69	1946-69	1962-69		1934-35 data at different site (Lat. 64°10').
10. Baker Lake Shell Island			64 00	94 23	—	1946	1946			One month only (August).
11. Bathurst Inlet	8		66 50	108 01	44	1958-62	1959-62	1959-62		
12. Bernard Harbour	9		68 47	114 50	140	1914-16 1957-63	1914-16			First Station (1914-16) may have been at different location.
13. Blacklead Island			—	66 12	50	1903-05 1911-12				
14. Bray Island	10		69 14	77 13	69	1958-63				Precipitation data unreliable.
15. Brevoort Island	11	5	63 21	64 10	1216	1959-69	1960-69			
16. Broughton Island	12	6	67 33	64 03	1905	1958-69	1960-69			Data previous to 1958 not used.
17. Byron Bay	13	7	68 45	109 04	367	1955-69	1957-69			No Precipitation data until 1957. Previous to 1961 called unnamed point.
18. Cambridge Bay A	14	8	69 06	105 07	74	1929-32 1934-69	1929-32 1934-35 1937-69	1955-69	1968-69	Data previous to Nov. 1960 at non-airport site (69°07'; 105°01'; 47 feet).

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
19. Camsell River			63 30	112 00	–	1933-34				
20. Cape Dorset			64 14	77 15	20	1915-17 1963-64	1915-17			Data 1915-17 may not be comparable with 1963-64 data.
21. Cape Dyer			66 39	61 23	2371	1957-59	1958-59			
22. Cape Dyer A	15	9	66 35	61 37	1232	1959-69	1959-69	1959-69		
23. Cape Hooper	16	10	68 26	66 47	1316	1957-69	1957-69			Data 1956-57 at elevation 65 feet not used.
24. Cape Parry A	17	11	70 10	124 41	53	1955-69	1955-69	1959-69		Previous to 1959 non-airport site same location.
25. Cape Peel	18		69 03	107 19	192	1958-63				
26. Cape Young	19	12	68 56	116 55	55	1955-69				Previous to 1961 called Young Point.
27. Chesterfield	20	13	63 20	90 43	21	1930-69	1930-69	1962-68		Data in table and diagram includes Station 28, Chesterfield Inlet.
28. Chesterfield Inlet			63 45	91 50	48	1921-31	1921-31			Much missing data, particularly precipitation. Data included in table and diagram for Station 27, Chesterfield.
29. Clifton Point	21		69 12	118 38	107	1957-63				
30. Clinton Point	22	14	69 35	120 45	330	1956-69	1957-69			
31. Clyde	23	15	70 27	68 33	10	1933-35 1942-69	1942-69		1968-69	1933-35 data unreliable.
32. Contwoyto Lake	24	16	65 29	110 22	1481	1959-69	1959-69	1959-62		
33. Coppermine	25	17	67 49	115 05	28	1930-69	1930-69	1969	1949-69	Short move to present site 1956.
34. Coral Harbour A	26	18	64 12	83 22	193	1933-35 1943-69	1933-35 1945-69	1955-69	1968-69	Data 1933-35 non-airport site (called Southampton Island), not used.

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
35. Craig Harbour			70 20	80 50	10	1922-23				First Station. Much missing data.
36. Craig Harbour	27		76 12	79 35	12	1933-40	1933-40			Second Station. Much missing precipitation data.
37. Devon Island			74 40	84 40	–	1961-62				No precipitation data.
38. Dewar Lakes	28	19	68 39	71 10	1700	1958-69	1958-69			Previous to 1961 called Mid-Baffin.
39. Dundas Harbour	29		74 30	82 30	18	1930-34 1945-50	1930-34 1945-50			Much missing data.
Durban										See Durban Island, Station 40.
40. Durban Island	30		67 06	62 09	2180	1960-63				Precipitation data unreliable. Previous to 1960 called Durban. Previous to 1959 called Padloping Island Site 40.
East Simpson										See Keith Bay, Station 83.
Ekalugad										See Ekalugad Fiord, Station 41.
41. Ekalugad Fiord	31		68 43	68 33	2375	1958-63				
42. Ennadai Lake	32	20	61 08	100 55	1065	1949-69	1949-69	1956-67		
43. Eskimo Point			61 07	94 03	25	1943-45	1943-45			New station, 1968-69 (Latitude 61°06′; 30 feet), wind mileage only.
44. Eureka	33	21	80 00	85 56	34	1947-69	1947-69		1968-69	Elevation 8 feet before 1963.
45. Ferguson Lake			62 52	96 49	400	1953				
46. Flat River			61 58	128 12	3660	1960				Summer only.
Foley										See Longstaff Bluff, Station 89.
47. Fort Good Hope	34	22	66 16	128 39	174	1944-69	1944-50			Previous to 1960 Latitude 66°15′, Longitude 128° 38′, 251 feet.

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
48. Fort Good Hope 2	35		66 15	128 38	214	1897-1903 1907-66	1908-55			Temperature data missing 1897-1903, 1907.
49. Fort Liard			60 15	123 28	—	1892-93				
50. Fort McPherson	36	23	67 26	134 57	100	1892-1900 1907-69	1909-37			Change in site 1914 but same coordinates. No precipitation data 1895-1900. Much missing data, particularly precipitation.
51. Fort Norman	37	24	64 57	125 00	266	1903-28 1930-61	1908-28 1930-51			No temperature data 1903-07.
52. Fort Providence	38	25	61 20	117 40	523	1943-62	1943-62			Minor change in site in 1944.
53. Fort Rae			62 40	115 45	—	1934-36			1934-36	
54. Fort Reliance	39	26	62 43	109 06	539	1948-69	1948-69	1961		
55. Fort Resolution			61 10	113 40	520	1914-36				Much missing data. Data included in table and diagram for Station 56, Fort Resolution A.
56. Fort Resolution A	40	27	61 11	113 41	549	1930-38 1943-69	1930-38 1943-69	1960-69		Data in table and diagram include station 55, Fort Resolution. Data previous to 1968 at non-airport site (latitude 61°10′). Other minor minor changes in location.
57. Fort Ross	41		71 55	94 15	50	1937-48	1938-48			Much missing data.
58. Fort Simpson			61 52	121 35	—	1875-79 1895-1897-1927	1908-27			First Station. No precipitation data 1875-1879. Temperature data unreliable. Much missing data in early years, mostly precipitation. Precipitation data from 1897 included in table and diagram for Station 60, Fort Simpson A.

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
59. Fort Simpson			61 52	121 21	422	1927-63	1927-63	1955-63	1952 1955-69	Second Station. Data included in table and diagram for Station 60, Fort Simpson A.
60. Fort Simpson A	42	28	61 45	121 14	576	1963-69	1963-69	1963-69		Data in table and diagram include precipitation data from 1897 from Station 58 and all data from Station 59, first two Fort Simpson stations.
Fort Simpson Exp. Farm										See Fort Simpson CDA, Station 61.
61. Fort Simpson CDA	43		61 52	121 21	430	1961-69			1961-69	
62. Fort Simpson USAAF			61 52	121 13	572	1943-46	1943-46			
63. Fort Smith			60 00	111 56	600	1913-29	1913-29			First Station. Data included in table and diagram for Station 65, Fort Smith A.
64. Fort Smith			60 00	111 52	680	1928-45	1928-45			Second Station. Data included in table and diagram for Station 65, Fort Smith A.
65. Fort Smith A	44	29	60 01	111 58	665	1943-69	1943-69	1948-69	1953-69	Data in table and diagram include Stations 63 and 64, first two Fort Smith stations.
66. Frobisher Bay A	45	30	63 45	68 33	68	1942-69	1946-69	1951-69	1956-69	Minor moves in location 1942-46.
67. Fullerton			64 00	89 02	–	1904-05	1904-05			
68. Gladman Point	46	31	68 40	97 48	83	1955-69	1957-69			Previous to 1961 called King William.
Hall Lake A										See Hall Beach A, Station 69.
69. Hall Beach A	47	32	68 47	81 15	34	1955-69	1957-69	1958-69		Previous to 1961 called Hall Lake A.
70. Hat Island	48		68 19	100 05	118	1958-63				Precipitation data unreliable.

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
71. HayRiver			60 51	115 57	529	1893-1943	1908-43			First Station. Much missing data early years, particularly precipitation. Data included in table and diagram for Station 72, Hay River A. Previous to 1897 station at Longitude 115°20′.
72. Hay River A	49	33	60 51	115 46	529	1943-69	1943-69	1949-69		Second Station. Previous to 1964 non-airport site (Latitude 60°52′, Longitude 115° 44′). Previous to 1950 at airport. Data in table and diagram include Station 71, first Hay River station.
73. Hay River Paradise Gardens	50		60 39	116 00	700	1962 1965-69				
74. Holman	51	34	70 44	117 47	30	1939-69	1941-69			Previous to 1963 called Holman Island. Previous to 1969 Latitude 70°38′, Longitude 117°38′.
Holman Island										See Holman, Station 74.
75. Horton River	52		70 01	126 56	530	1957-63				
76. Indin Lake	53		64 16	115 13	900	1948-50	1948-50			
77. Inuvik A	54	35	68 18	133 29	200	1957-69	1960-69	1960-69	1961-69	Previous to 1958 called Aklavik East 3 (198 feet).
78. Inuvik CDA			68 18	133 29	220	1961				Summer only.
79. Isachsen	55	36	78 47	103 32	83	1948-69	1948-69		1968-69	
Jenny Lind										See Jenny Lind Island, Station 80.
80. Jenny Lind Island	56		68 39	101 44	60	1956-69				Precipitation data not computed. Previous to 1961 called Jenny Lind.
81. Johnnyhoe River			–	–	–	1941-42				Five months only (November to March).

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
82. Kazan R Base			61 34	100 40	800	1945				Two months only (July and August).
83. Keith Bay	57		68 24	88 13	265	1958-63				Previous to 1961 called East Simpson.
King William										See Gladman Point, Station 68.
84. Kittigazuit	58		69 17	133 56	92	1948-50	1948-50			
85. Kivitoo	59		67 58	64 55	1450	1959-63				Precipitation data unreliable.
Lady Franklin										See Lady Franklin Point, Station 86.
86. Lady Franklin Point	60		68 30	113 13	50	1956-69				Precipitation data not computed. Previous to 1961 called Lady Franklin.
87. Lake Harbour	61		62 50	69 55	54	1909-10 1913-16 1919-27 1930-46	1909-10 1913-16 1919-27 1930-46			Much missing data. Data 1909-10 not used, taken different site (62°51′, 69°50′).
88. Lake Hazen			81 49	71 18	522	1957-58 1963	1957-58 1963			
89. Longstaff Bluff	62	37	68 57	75 18	532	1958-69	1957-69			Previous to 1961 called Foley.
90. Mackar Inlet	63	38	68 18	85 41	1310	1957-69	1957-69			Previous to 1961 called West Melville.
91. Mary River			71 19	79 20	800	1963-65				Summer only.
92. Matheson Point	64		68 50	95 19	230	1958-63				
93. Meighen Island Ice Cap			79 58	99 09	790	1969-62 1969				Summer only. No Precipitation data 1960.
94. Meighen Island North			80 04	99 18	257	1969				Summer only.
95. Meighen Island West			79 58	99 30	330	1969				Summer only.

Continued

TABLE 5.18 — *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
Mid Baffin										See Dewar Lakes, Station 38.
Mid Melville										See Sarcpa Lake, Station 123.
96. Mills Lake			61 16	118 45	484	1944	1944			Seven months only (February to August).
97. Mould Bay	65	39	76 14	119 20	50	1948-69	1948-69		1967-69	
Nicholson										See Nicholson Peninsula, Station 98.
98. Nicholson Peninsula	66	40	69 54	128 58	320	1955-69				Previous to 1961 called Nicholson. No precipitation records until 1957.
99. Norman Wells A	67	41	65 17	126 48	209	1943-69	1943-69	1955-69	1959-69	Non-airport site 1946-49 and 1950-58 (Latitude 65°18', Longitude 126°51').
100. Norman Wells Site 1			65 17	126 50	339	1960				No Temperature data. Summer only.
101. Norman Wells Site 2			65 18	126 50	345	1960				No Temperature data. Summer only.
102. Norman Wells Site 3			65 16	126 45	348	1960				No Temperature data. Summer only.
103. Norman Wells Site 4			65 16	126 45	348	1960				No Temperature data. Summer only.
104. Nottingham Island	68	42	63 07	77 56	54	1927-69	1927-69			Minor move in location 1956.
105. Nueltin Lake	69		60 30	99 00	—	1939-41	1939-41			
106. Padloping Island	70		67 06	62 21	130	1941-56	1950-56	1955-56		Broken record.
Padloping Island Site 40										See Durban Island, Station 40.
107. Pangnirtung	71		66 09	65 30	43	1925-26 1930-42	1925-26 1930-50			Much missing data.

Continued

TABLE 5.18 — *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
108. Pearce Point	72		69 49	122 42	160	1957-63				
109. Pelly Bay	73	43	68 26	89 39	1069	1957-69	1957-69			Previous to 1961 called West Simpson.
110. Pine Point	74		60 50	114 28	780	1953-55 1965				
111. Pond Inlet	75	44	72 43	77 30	10	1921-26 1930-60 1965	1921-55			Much missing data.
112. Port Burwell			60 27	64 50	—	1928-29 1933-34	1928-29 1933-34			
113. Port de Boucherville			—	—	—	1884-86	1884-86			Anchored ship.
114. Port Radium	76	45	66 05	118 02	628	1937-40 1942-61 1967-69	1942-61			
115. Rankin Inlet	77		62 48	92 04	100	1954-55 1961-62				No precipitation data 1961-62.
116. Rea Point A			75 22	105 42	45	1969				
117. Resolute A	78	46	74 43	94 59	209	1947-69	1947-69	1957-58 1962-69	1948-69	Elevation 55 feet previous to 1953.
118. Resolution Island	79	47	61 18	64 53	127	1929-61	1929-61			
119. Resolution Is C Warwick	80		61 35	64 39	1208	1962-69	1962-69			
120. Ross Point	81		68 35	111 06	488	1957-63				
121. Rowley Island	82	48	69 05	79 02	196	1958-69	1960-69			Precipitation data from 1959.
122. Sachs Harbour	83	49	71 59	125 17	277	1955-69	1955-69		1956-69	Previous to 1968 Latitude 17°57', 124°44'.
123. Sarcpa Lake	84		68 33	83 20	901	1958-63				Precipitation data unreliable. Previous to 1961 called Mid Melville (Latitude 68°32', Longitude 83°18', 876 feet).

Continued

TABLE 5.18 — *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev. Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
124. Sawmill Bay			65 44	118 55	562	1948-49	1948-49	1948-49 1956-57		
125. Shepherd Bay	85		68 49	93 26	168	1956-69				Precipitation from 1957.
126. Sherwood Head			78 12	89 43	200		1961-65			
127. Simpson Lake	86		68 36	92 01	1218	1957-63				Precipitation from 1958.
128. Snare Rapids	87	50	63 30	116 00	694	1947-66 1968-69		1956-65		Data previous to 1948 not used. Previous to 1960 called Snare River.
Snare River										See Snare Rapids, Station 128.
Southampton Island										See Coral Harbour A, Station 34.
129. Spence Bay	88	51	69 32	93 31	44	1951-69	1951-69			
130. Sturt Point	89		68 47	103 21	64	1957-63				Precipitation data unreliable.
131. Trout Lake			60 45	121 30	1650	1944-45	1944-45			
132. Tuktoyaktuk			69 28	132 59	—	1948-56				First Station. Precipitation data included in table and diagram for Station 133, second Tuktoyaktuk Station.
133. Tuktoyaktuk	90	52	69 27	133 00	60	1957-69				Second Station. Previous to 1961 called Tuktuk. Data in table and diagram includes precipitation data for Station 132, first Tuktoyaktuk Station.
Tuktuk										See second Tuktoyaktuk Station 133.
134. Tundra Mine	91		64 02	111 10	1545	1963-67				
135. Tungsten	92		61 57	128 15	3750	1966-69				

Continued

TABLE 5.18 – *Continued*

Name of Station	Table No.	Graph No.	N. Latitude ° ′	W. Longitude ° ′	Elev Feet	Temperature and Precipitation	Synoptic Reports (4 Daily)	Hourly Reports (24 Daily)	Sunshine	Comments
136. Tununuk	93		69 01	134 41	160	1957-63				
137. Twin Gorges			60 15	111 48	780	1967-69				Summer only 1967-68.
Unnamed Point										See Byron Bay, Station 17.
138. Walker Bay			71 30	117 50	27	1938-39	1938-39			Five months only (September to January).
West Baffin										See West Baffin Island, Station 139.
139. West Baffin Island	94		68 37	73 12	510	1958-63				Previous to 1961 called West Baffin.
West Melville										See Mackar Inlet, Station 90.
West Simpson										See Pelly Bay, Station 109.
140. Wrigley A	95	53	63 12	122 25	511	1943-69	1943-50			Broken records before 1949.
141. Yadek Lake			–	–	–					Partial hourly reports only. Three months only (June to August 1954).
142. Yellowknife A	96	54	62 28	114 27	682	1942-69	1942-69	1947-69	1969	Previous to 1947 station located in townsite (5 miles from airport).
143. Yellowknife Con Mine			62 28	114 20	515	1941-42				
144. Yellowknife Hydro	97		62 40	114 15	523	1943-69				
Young Point										See Cape Young, Station 26.

5.4 RECRO-TOURIST CLASSIFICATION OF THE COMMUNITIES OF THE N.W.T.

This report is concerned exclusively with the analysis of the communities of the Northwest Territories in relation to their tourist and recreation attributes. The communities are examined with respect to their ability to attract and service tourists and the combined effects of these factors have been termed their Recro-Tourist Capability. It is important to recognize that two concepts are involved in this analysis, namely, attractivity and servicing.

Population concentrations in their own right, represent one element in the total spectrum of tourist resources of any region or area. It is obvious that large metropolitan areas in North America, and throughout the world, are tourist magnets by virtue of the range of cultural facilities that they possess, including museums, art galleries, night life, entertainment, e.c., together with the strength of their friends and relative ties. Since visits to friends and relatives are an important motivation for travel, the latter aspect is of importance. While the populations of the communities of the Northwest Territories are generally small and the scale of their public institutions modest to often non-existent, they nevertheless possess a degree of attractivity for the visitor. In this respect, Yellowknife is obviously the most significant urban concentration, but several other centres of importance are present, including Fort Smith, Inuvik, Hay River and Frobisher Bay.

The ability of any community to provide services to travellers, including accommodation, food and beverage, entertainment and, of course, access and connector transport facilities are certainly of importance in the evaluation of its tourist capabilities. While this aspect of service to travellers is not completely independent of the concept of attractivity, it is useful to make the separation for certain planning purposes.

The analysis begins with the examination of the communities with respect to eight features or factors, including population size, accommodation, transportation, eating or dining services, beer and liquor outlets, banking services, entertainment and leisure time facilities, and finally, the combined production and retailing of Eskimo and Indian handicrafts. Each of these aspects are examined individually with reference to their strengths and weaknesses in the communities. The communities are rated by point system derived with reference to each feature or factor.

The investigation concludes with the synthesis of the results obtained in the analysis of each factor or feature into a single total recro-tourist point rating system and capability classification.

Community Classes by Population Scale

In the accompanying Table 5.19, sixty-four communities with a total of 35,196 residents have been grouped under seven classes on the basis of population scale. These communities probably contain over 95% of the population of the Territories. Nucleated settlement is therefore a primary characteristic of population distribution.

Yellowknife, which has been classed as the Primary, clearly stands alone at the top of the list of communities having a population of 6,500 or 18% of the total for the group. The population in this primary community is 2.4 times the mean value of 2,700 for Class 1 communities. The fact that it is the capital and major administration and organization centre of the Territories, gives it some advantage over communities of comparable size in other parts of Canada. The base of its public institutions and cultural facilities, however, is not strong.

TABLE 5.19
CLASSIFICATION OF COMMUNITIES OF THE NORTHWEST TERRITORIES BY POPULATION 1971 [1].

Class & Community	Total Population	% Native	Community Class Data: No. Comm.	Total Pop.	Mean Pop.	Native % Mean	Total Pop.	Comm. Point Rating
Primary Class								
Yellowknife	6,500	8	1	6,500	6,500	8	18	C 10
Class I pop. 2,500-3,000								
Fort Smith	2,500	20						T 4
Inuvik	2,700	30	3	8,200	2,700	24	23	T 7
Hay River	3,000	23						T 5
Class II pop. 1,200-1,700								
Frobisher Bay	1,680	71						S 8
Rae	1,150	92	3	4,030	1,343	58	12	S 7
Pine Point	1,200	9						H 2
Class III pop. 500-850								
Aklavik	650	69						S 8
Baker Lake	710	90						S 8
Cape Dorset	600	93						8
Cambridge Bay	670	90						8
Coppermine	550	91						8
Eskimo Point	570	96	14	8,845	632	83	25	S 8
Fort McPherson	840	93						S 7
Fort Providence	550	64						S 7
Fort Resolution	680	85						S 7
Fort Simpson	750	40						H 7
Igloolik	500	94						S 8
Pangnirtung	640	92						S 8
Rankin Inlet	525	94						S 8
Tuktoyaktuk	610	93						H 8
Class IV pop. 200-500								
Arctic Bay	250	90						S 5
Belcher Islands	200	95						S 5
Broughton Island	330	88						S 5
Chesterfield Inlet	230	86						5
Clyde River	290	97						5
Coral Harbour	330	91						S 5
Fort Franklin	300	92						S 4
Fort Good Hope	350	94						S 4
Fort Liard	260	88						4
Fort Norman	300	92	19	5,255	277	82	15	S 4
Gjoa Haven	250	94						
Hall Beach	300	66						
Holman Island	220	91						5
Norman Wells	290	7						1

Continued

TABLE 5.19 · *Continued*

Class & Community	Total Population	% Native		Community Class Data: No. Comm.	Total Pop.	Mean Pop.	Native % Mean	Total Pop.		Comm. Point Rating	
Class IV pop. 200-500 – continued											
Pond Inlet	415	93								5	
Repulse Bay	220	95								5	
Snowdrift	220	95								4	
Spence Bay	250	92								5	
Tungsten	250	8								1	
Class V pop. 100-199											
Cape Dyer	110	90	)							3	
Echo Bay	100	9	)							3	
Grise Fiord	100	85	)							3	
Lake Harbour	180	94	)							3	
Lac La Martre	170	97	)	12	1,770	148	85	5	S	4	
Pelly Bay	150	93	)						S	3	
Port Burwell	175	89	)							3	
Resolute Bay	160	63	)						S	3	
Sachs Harbour	130	92	)							3	
Whale Cove	190	95	)							3	
Wrigley	175	83	)							4	
YK Village	130	100	)							2	3]
Class VI pop. less than 100											
Arctic Red River	90	89	)							3	
Bathurst Inlet	50	100	)							3	
Colville Lake	70	98	)							2	
Enterprise	50	10	)							0	
Jean Marie River	50	90	)							2	
Kakisa Lake	45	100	)	12	596	50	88	2		2	
Nahanni Butte	65	93	)							2	
Paulatuk	61	99	)							3	
Rocher River	20	100	)							2	
Rae Lake	40	100	)							2	
Snare Lake	10	100	)							2	
Trout Lake	45	100	)							2	

1] Does not include Meteorological Station or Dewline Station.

2] C=city government, T=town council, H=hamlet status, S=settlement council, blank=unorganized.

3] Rated with lowest community population class.

Yellowknife is essentially a European community with only 8% of the population being of native extraction. This modest percentage, however, represents a concentration of native peoples of a little over 500 which is greater than that found in many smaller centres in which this group represents 80% or more of the residents.

Three Class I communities including Fort Smith, Inuvik, and Hay River have a combined population of 8,200 and a mean value of 2,700 (Table 5.20). This group contains about 23% of the total population in all centres listed in the table. In these centres, native peoples represent 24% of the demographic strength and are virtually all Indians. Centres of this scale are scarcely more than towns by southern Canadian standards and the breadth of their tourist or traveller services is frequently scarcely greater.

Three Class II centres, including Frobisher Bay, Rae and Pine Point have a total population of 4,030 which is 12% of the total. The mean population of the group is only 1,343. On an average, natives make up 58% of the population of these settlements but this value is deceptive. Rae has a 92% native Indian population, while Pine Point, a mining centre, has only 9% of its inhabitants in this category. Interestingly, Frobisher Bay, the main logistical centre for tourist movement into the Eastern Arctic Archipelago, is only a Class II community by population standards. Again, population centres of this scale are in the small village status by southern Canadian standards.

In many respects there is little to choose between Class III, Class IV and Class V communities insofar as population scale relative to tourist and recreation considerations is concerned. These centres possess little or no tourist facility base. On the other hand, by virtue of their location and their predominantly native composition, they frequently represent tourist attractions.

TABLE 5.20

COMMUNITY POPULATION CLASS RELATIONSHIPS

	Mean Population	Index	Times Next Highest Value	% of Next Highest Value
Primary	6,500	100	4.2	—
Class I	2,700	42	2.0	42
Class II	1,343	21	2.1	50
Class III	632	10	2.3	47
Class IV	277	4	1.9	44
Class V	148	2	3.0	53
Class VI	50	1	—	34

A Point Rating for General Community Interest

On the basis of population scale and ethnic composition together with general community location it is possible to establish a point rating for the communities listed in the table. The rating in this instance refers to the general interest that a community would stimulate in the average tourist apart from the reception facilities that it possesses. In effect, if the tourist looks at a map in the course of his general consideration of a holiday experience in the north, he is likely to select communities that interest him partly on the basis of their population size and native component and their general geographic location.

The point rating, therefore, simply reflects the general interest that the average tourist might have in these communities in the Territories, solely on the basis of the aforementioned factors.

In terms of the ethnic composition of the population, communities can be divided into three types, namely European, Indian or Eskimo. It was felt that Eskimo communities possessed the greatest interest to the tourist since they are the most novel in the North American scene as a whole. Indian communities were considered to possess much less interest for they are also to be found in the more southerly parts of the continent. There is little or no difference in the Indian communities in the Territories, compared with those in more southerly locations. The European communities are considered to possess the least interest, since they are to a large extent images on a minor scale of southern pattern of urbanization. There is nothing unique in these communities apart from northern location and perhaps the presence of high-rise developments in Yellowknife and Frobisher. The latter is perhaps more of a novelty than a real interest.

Nine communities that possess a dominantly non-native population were examined as a group. Included were Yellowknife, Fort Smith, Inuvik, Hay River, Pine Point, Norman Wells, Tungsten, Echo Bay and Enterprise. Within this group general tourist interest in communities is largely a function of size and location. Size is clearly reflected by the community population class with which a centre is associated. Considering the group there are three general locational situations. These include northerly, as exemplified by Inuvik, mid-northerly, as represented by Norman Wells, and southerly that characterizes the remainder.

The point rating for this group was derived in the following manner. A maximum of 10 points was accorded the community with the largest population, namely Yellowknife. The percentage of the population of other communities to Yellowknife was then determined. This percentage was then applied to the value of 10 to determine a point score on the basis of size. Four communities, including Norman Wells, Tungsten, Echo Bay and Enterprise, received no points for size. This was felt to be quite realistic since the size of these communities is so small that this factor can have limited influence in terms of tourist attractivity. Location was then considered and points added to the score received for size as follows: -3 for a northern location, 1 for a mid-northern and 0 for a southern. A combining of the points for size and location left two communities namely Tungsten and Enterprise with 0 values. Tungsten probably has some interest by virtue of its mining development and therefore 1 point was arbitrarily accorded this centre. Enterprise was left without any value in terms of its size and general geographic location.

The approach to a point rating of the Indian communities presented some difficulties. Some of the smaller centres, such as Colville Lake, Nahanni Butte and Kakisa Lake, are quite interesting and indeed more native in their complexion than many of the larger centres.

An examination of the range of populations for the 22 Indian Villages listed previously in Table 5.19 suggests a three fold grouping by scale. Class II and III communities stand at one end of the scale and include Rae, Fort McPherson, Fort Providence, Fort Resolution and Fort Simpson. Six communities at the lower end of the range are extremely small with the mean population value in the order of 50. Class IV and V communities between these upper and lower limits perhaps form a third grouping, which, while it displays a considerable range in population size, really involves little variation in settlement pattern, and therefore in tourist interest. It is doubtful if any Indian community actually has greater tourist interest than the European community of Yellowknife, which as previously noted, has received a total of 10 points. This suggests that the upper point limit for Indian

communities should be kept within 10 points. Probably the major difference between the European and Indian communities is found in comparisons involving smaller communities. The smaller Indian communities simply have more interest than the smaller European communities.

Incorporating the variety of concepts noted above, it was finally decided to proceed in the following manner. Native Indian communities included in Class VI were accorded 2 points, those in Classes IV and V received 4 points and those in Classes II and III obtained 7 points. This means in effect, that communities such as Fort McPherson, Fort Resolution or Fort Simpson are considered to have a tourist appeal about equivalent to Inuvik. Communities in the middle range that were accorded 4 points, for example, Franklin, are considered about equivalent to Hay River. The smaller communities, such as Jean Marie River, received 2 points whereas a small community in the European categories, such as Enterprise, received no points. The comparison seems realistic.

The approach to the point rating of the Eskimo communities simply represented a bonus procedure to the point ratings applied to the Indian groupings. In effect, communities in population Classes V and VI received 3 points, those in Class IV – 5 points, and those in population Classes II and III – 8 points.

Results of the point rating are shown in Table 5.19.

The Commercial Accommodation Plant

It proved more difficult than might normally be expected to summarize the salient features of the accommodation plant of the Northwest Territories by type of facility and capacity. A number of central compendiums of information were drawn upon and while the results are probably reasonably accurate there is a possibility that some modest degree of error is present, particularly with respect to hostels and transient centres.

The Northwest Territories community data sheets prepared by the Department of Industry and Development were of considerable value as a basic data source. The accommodation guide published by the Division of Tourism was also a useful source of information. Neither, however, gave any indication of the year in which facilities were opened and in some cases there is differing evidence with respect to capacity. Fortunately this latter problem is not serious in an overall sense.

The Division of Tourism has administrative responsibilities only for establishments in non-incorporated communities and in hinterland areas. This being the case, its records with respect to the accommodation plant as a whole are limited since the bulk of the developments are situated in incorporated communities. Moreover, this situation is likely to become more pronounced as the continuous incorporation of new communities places more of the plant outside its area of administrative responsibility.

The geographical parameters of the operations of the Division of Tourism, noted above, seem unrealistic. As things now stand, a large portion of the accommodation plant, indeed the major portion, lies outside its sphere of responsibilities, and the situation is certain to become more pronounced in the future. If the present situation continues, the Division will have responsibilities in this field that amount to little more than the recording of the capacity and rates of facilities in an annually prepared accommodation guide. There will be no way in which it can meaningfully influence the quality of services which is a legitimate function of an agency of this type. It is recommended that serious consideration be given to the broadening of the area of responsibility of the Division with respect to tourist accommodation. The present situation can only have long run detrimental effects on the growth of the tourist accommodation plant in the Northwest Territories.

In Table 5.21, the accommodation plant of the Northwest Territories is summarized by facility type and capacity in relation to communities and community population classes. Before entering into a discussion of some interesting patterns and relationships, some technical aspects require mention.

Some facilities have been listed as motels on the basis of the type of building present. In actual fact, they really function as hotels. Manton House Motel at Pangnirtung, is a case in point.

Some establishments listed in the accompanying table are in a developing stage while others appear to be passing out of existence. For example, some transient centres and hostels may be phasing out of operation.

The data related to transient centres and hostels are taken almost exclusively from the community data sheets prepared by the Department of Industry and Development. In some cases, it was not clear whether a school hostel offering accommodation to travellers in the off-season was involved or a separate facility operating primarily to serve the travelling public. There is really little difference between hostels and transient centres. The latter were frequently developed by the government to meet the needs of workmen and administrators sporadically requiring accommodation at remote points.

The total person capacity of the entire accommodation plant of the Territories as listed in the table is 1,438. The capacity of two motels in Hay River and one in Yellowknife together with a hotel in Aklavik is not reflected in the foregoing total, due to the absence of information in central data sources. Allowing for these gaps and the possibility that some facilities are under-recorded, the total person capacity of the accommodation plant might range from about 1,485 to 1,500 with the latter estimate probably being an absolute upper limit.

From calculations based on data contained in the table, it is obvious that hotels are the most significant facility type in that they account for 74% of the total person capacity.[1] Motels are decidedly secondary with a ratio of 14%. In a volume sense all other facility types are inconsequential with the ratios being — cabins 3%, transient centres 6% and hostels 3%. The foregoing percentage distribution is not likely to prove to be significantly in error as a result of aforementioned data gaps.

The primary community of Yellowknife contains 28% of the total person capacity of the accommodation enterprises of the Northwest Territories. No other individual centre rivals Yellowknife in this respect.

The three Class I communities combined support 29% of the person capacity. Considered on an individual basis, however, these communities are decidedly inferior to Yellowknife in terms of total accommodation capacity. The value of 183 for Inuvik is only 45% of that of Yellowknife and the value of 169 for Hay River about 42%. Fort Smith, with accommodation capacity of 60 in a single hotel, has a value only of 15% of that of the capital city.

Class II communities contain about 11% of the total person accommodation strength of the Northwest Territories. One centre, namely Rae, which is almost exclusively a native

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1] All percentages and statistical values presented in this section of the report related to capacity are based on totals presented in Table 5.21.

TABLE 5.21

ACCOMMODATION IN THE NORTHWEST TERRITORIES BY COMMUNITY AND TYPE – JANUARY 1972

Community Population Class and Centre	Hotels		Motels		Cabins		Transient Centres		Hostels	
	U*	C**	U*	C**	U*	C**	U*	C**	U*	C**
Primary Community										
Yellowknife										
Yellowknife Inn [2]		250								
Gold Range Hotel	52	75								
Northland Motel			11	42						
Frontier Inn			9	36						
Travellers Rest [1]										
Sub Total	52	325	20	78						
Class I Communities										
Fort Smith										
Pinecrest Hotel	30	60								
Hay River										
Hay River Hotel	42	75								
Ptarmigan Inn	21	66								
Caribou Motor Court			14	28						
Coachlines Motel [1]										
Kozy Kourt Hotel [1]										
Inuvik										
Arctic Inn [2]		24								
Eskimo Inn	27	86								
Mackenzie Hotel	25	73								
Sub Total	145	384	14	28						
Class II Communities										
Frobisher Bay										
Frobisher Bay Hotel	50	100								
Pine Point										
Pine Point Hotel	23	60								
Sub Total	73	160								
Class III Communities										
Aklavik										
Delta Hotel [1]										
Cambridge Bay								10		
Coppermine										
Igloo Inn					5	20				

Continued

TABLE 5.21 – *Continued*

Class III Communities – continued	Hotels U*	Hotels C**	Motels U*	Motels C**	Cabins U*	Cabins C**	Transient Centres U*	Transient Centres C**	Hostels U*	Hostels C**
Fort McPherson							6			
Fort Providence [11]										
Snowshoe Inn			5	15						
Arychuk's Motel			6	24						
Myhren Cabins					2	6				
Fort Resolution										
McPherson's Boarding House									5	7
Fort Simpson										
Fort Simpson Hotel [2]		20								
Eski Motel				24						
Igloolik										12
Pangnirtung										
Manton House [3]	10	20								
Rankin Inlet [4]							25			
Sub Total	10	40	19	63	7	26	41		5	19
Class IV Communities										
Belcher Islands										8
Chesterfield Inlet [5]										9
Coral Harbour [6]							40			
Fort Norman							6			
Holman Island										
Tukovik Tourist Home						5				
Norman Wells										
Mackenzie Mt. Lodge	12	42								
Pond Inlet [7]										12
Sub Total	12	42				5	46			29
Class V Communities										
Resolute Bay [8]		100								
Whale Cove [9]		12								
Sub Total		112								
Class VI Communities										
Enterprise										
El Camino Motel			8	28						
Nahanni Butte [10]						8				

Continued

TABLE 5.21 – *continued*

Class VI Communities – continued	Hotels U*	Hotels C**	Motels U*	Motels C**	Cabins U*	Cabins C**	Transient Centres U*	Transient Centres C**	Hostels U*	Hostels C**
Trout Lake							4			
Sub Total			8	28		8	4			
TOTAL	292	1,063	61	197		39	91	12]	5	48

* U – Units
** C – Person Capacity

1] No data source available for this operation.

2] Number of rooms not indicated in data source.

3] This facility is actually called a motel.

4] Former transient quarters operated by private enterprise.

5] Represents accommodation in the R.C. Mission.

6] An MOT facility.

7] Represents a tourist lodge operated by Toonoonik Soohoonik Co-op.

8] Operated by Tower Foundation Co.

9] Represents Whale Cove Lodge that did not operate in 1971 but likely will serve a hotel function in 1972.

10] Under construction – will open in 1972.

11] Does not include Esso Cabins at Enterprise which caters almost exclusively to truckers.

12] Does not include a transient Centre at Ennadai Lake with an unrecorded capacity.

community, possess no traveller accommodation. Frobisher Bay with 100 person-guest capacity in a single hotel has a value about 25% of that of Yellowknife, while Pine Point with a guest capacity of 60 in a single hotel, is like Fort Smith, inconsequential in comparison with the capital city.

Class III communities contain 13% of the total guest capacity of the Northwest Territories. Of a total of 14 communities in population Class III, 10 or 71% actually possess accommodation but the scale of the enterprise is frequently quite modest.

About 8% of the guest capacity of the accommodation plant is found in Class IV communities. Only 7 of 19, or 37% of the communities in this population class, have accommodation capacity. Again, enterprises are very modest in scale.

Class V communities support another 8% of the person accommodation capacity. The large scale operation of the Tower Foundation Company at Resolute Bay is the main determinant of this ratio. In fact, only 2 of 12 communities in the Class VI population category or 17% have accommodation facilities for travellers.

An extremely modest 3% of the capacity is found in communities in the Class VI population category. Only 3 of 12 communities in this class or 25% have facilities. The pattern is again somewhat distorted by the inclusion of the El Camino Motel in Enterprise which is an extremely small scale highway settlement.

The accommodation plant of the Northwest Territories displays an extremely wide range in quality that is not reflected in the accompanying table. The bulk of the hotel accommodation capacity is modern in the sense that there is running water and toilets in the rooms. Some hotels in smaller communities, however, have a portion of their room capacity based on central facilities and the development at Resolute Bay entirely is of this type. The general decor and appointment of many hotel rooms, even in the larger centres, are modest and little of the total room capacity could be said to approach luxury conditions. In an overall sense, the motel accommodation is extremely modest in scale and a number of developments are substandard by generally acceptable Canadian standards.

The ownership of hotels frequently rests with individuals residing outside the Territory. Motels, on the other hand, display a strong local resident ownership pattern. Native co-operatives or native individuals are inconsequential in the overall ownership pattern of the accommodation plant. Hostels and transient centres are frequently government owned. The M.O.T., a federal agency, operates the facility at Coral Harbour.

It is useful to examine the distribution of accommodation capacity in terms of major regions in the Northwest Territories. The situation is summarized in Table 5.22.

The Mackenzie Valley dominates the situation, containing 74% of the person accommodation capacity of the Northwest Territories. The Arctic Islands rank second supporting 18%. It is the two large facilities at Frobisher Bay and Resolute, each of which has 100 person capacity that boosts this total. Apart from these developments there is little commercial accommodation of significance in the Arctic Islands. Only 7% of the total capacity is found in the entire interior of Keewatin District and 1% along the Arctic shoreline of the Mackenzie and Keewatin Districts. Along the Arctic shore there is no commercial accommodation facilities whatever, apart from a cabin operation at Coppermine.

TABLE 5.22

ACCOMMODATION PERSON CAPACITY IN THE NORTHWEST TERRITORIES BY REGIONS – JANUARY 1972

Regions	Hotels No.	Hotels %	Motels No.	Motels %	Cabins No.	Cabins %	Transient Centres No.	Transient Centres %	Hostels No.	Hostels %	Combined No.	Combined %
Mackenzie Valley												
South [1]	606	57	197	100	14	36	4	4	7	14	828	58
Mid [3]	42	4					6	7			48	3
North [2]	183	17					6	7			189	13
Sub Total	831	78	197	100	14	36	16	18	7	14	1,065	74
Keewatin [4]	12	1					65	71	21	44	98	7
Arctic Shore					20	51					20	1
Arctic Islands	220	21			5	13	10	11	20	42	255	18
TOTAL	1,063	100	197	100	39	100	91	100	48	100	1,438	100

1] From Fort Simpson southward including Yellowknife and Liard Valley.

2] Mackenzie Delta.

3] Area between 1] and 2].

4] Exclusive of Arctic Shore.

The southern portion of the Mackenzie Valley defined as that area from Fort Simpson southward including Yellowknife and Nahanni Butte contains 58% of the accommodation capacity. The northern portion of the valley which is essentially the Mackenzie Delta, and Inuvik in particular, contains 13%. The mid-portion which is largely related to the hotel development at Norman Wells has 3%. The primary focus of commercial accommodation in the south is clear and the lack in the mid-portion of the valley is equally obvious.

Seventy-eight percent of the hotel capacity of the Northwest Territories is found in the Mackenzie Valley. Fifty-seven percent of this is located in its southern portion and 17% in its northern. The two previously mentioned developments of the Arctic Islands, contains 21% of the hotel capacity. Hotels are entirely absent along the Arctic shore and insignificant in the Keewatin.

Motels are confined to the Mackenzie Valley and more specifically to its southern portion. The pattern, of course, is a clear reflection of the road network.

It is obvious from the statistics presented in Table 5.22 that the Arctic shore of the Keewatin District can be considered virtually devoid of commercial accommodation. What is available is related essentially to transient centres and hostels. The Igloo Inn at Coppermine represents the only meaningful exception to this generalization. A twelve-unit hotel development at Whale Cove is scarcely a hotel in the true meaning of the word.

The foregoing summary of accommodation capacity relative to individual centres, community population classes and broader geographic regions clearly portrays the weaknesses of the plant in relation to tourist development. With three exceptions, namely, Inuvik, Frobisher and Resolute, there are no accommodation facilities of consequence in the northerly portions of the Territories in relation to volume tourist development, particularly on a package basis. Moreover, the intensive utilization of the plant in the aforementioned areas which is not particularly large scale in any one community is operating at or near capacity during a large portion of the year, due to general business and administrative travel. In effect, there is often little left to meet the demands of tourism.

Accommodation capacity in the larger communities in the south-western part of the Territories especially in Yellowknife and Hay River is substantial. The volume of the business demand, however, leaves little for tourism at certain times of the year, particularly in relation to large package tour development.

In many of the outlying areas where there are significant natural and cultural resource potentials, as indicated in the evaluation of the supply foundations for tourist development presented in other portions of the Overview Study, a supporting accommodation plant is either totally or virtually absent. A glance at the map makes this abundantly clear.

The limitations of the accommodation plant represent a serious handicap to the development of tourism in the Northwest Territories at the present time. This is considered to be a far more serious limitation than any other, including transport and accessibility to supply.

Educational Hostels as Tourist Accommodation Facilities

It is not the intention to enter into a lengthy discussion of the merits and problems of the use of educational hostels as tourist accommodation facilities during school vacation periods. It is simply stated that they appear to offer accommodation opportunities of a type subsequently noted, providing that a number of administrative problems can be overcome in a manner that is satisfactory to the educational authorities.

Latent tourist and recreation benefits associated with hostels are essentially of two types. The large institutions, many of which are in the bigger settlements that possess substantial commercial accommodation, can be viewed as a reserve of accommodation capacity that could be utilized on special occasions when the community wishes to stage an event that will create lodging demands beyond the ability of the private sector. In effect, the hostels can broaden the accommodation base of a community in special situations. Secondly, some of the smaller hostels in locations where there are no satisfactory commercial accommodations could serve as substitutes until private enterprise enters the field. In this case, they could offer the community an opportunity to enter the tourist field that is not currently open to it because of a lack of accommodation.

The location and capacity of educational hostels in the Northwest Territories are summarized in Table 5.23. The list is complete for the Mackenzie Valley area but may be incomplete for other portions of the Territories.

No attempt is made to rate or classify communities on the basis of their accommodation plant. This feature is incorporated into the final procedure for community rating in a manner noted subsequently. All pertinent information for capacity is contained in Table 5.21.

TABLE 5.23

EDUCATIONAL HOSTELS IN THE NORTHWEST TERRITORIES

Community		Capacity
Yellowknife	Akaitcho Hall	200 *
Fort Smith	Breynat Hall	160 **
Inuvik	Stringer Hall	200 **
	Grollier Hall	200 **
Fort McPherson	Fleming Hall	100 **
Fort Simpson	Bompass Hall	60 **
	La Pointe Hall	150 **
Chesterfield Inlet	Turquetil Hall	35 **
Cape Dorset	Nunnassiaq Lodge	13 ***
Cambridge Bay		30
Fort Liard		12 ***
Fort Franklin		12 ***
Fort Norman		12 ***
Fort Good Hope		12 ***

* Government operated and administered.

** Contract operated.

*** Government operated and administered by Foster Parent Couples.

Transportation Patterns

In this study, transportation has been regarded essentially as a portion of the infra-structure of communities that renders them more or less capable of servicing tourists. Occasionally, comments are made with respect to characteristics of the route pattern in an overall regional sense. Discussions of this type, however, are somewhat peripheral to the main thrust of the analysis.

Air Transportation:

The air services of the Northwest Territories can be divided into three distinct types.

There are the scheduled regional carrier services that bring the tourist from nodal points in southern Canada to the major centres of the Territories. Included in the group are Nordair originating in Montreal, TransAir originating in Winnipeg, Pacific Western Airlines originating in Edmonton and Great Northern Airways 1] originating in Whitehorse. The latter scheduled service is not quite in the same category as the others, but it does form a significant link that can carry tourists northward from Vancouver through the Yukon to the Mackenzie Delta. It is therefore, a regional carrier service in some respects.

There are scheduled air services originating in communities in the Northwest Territories, including Yellowknife, Inuvik, Frobisher, Resolute, Norman Wells and Fort Simpson. It is these scheduled services that are linked to major stops associated with the regional carrier services that permit the tourist to move to outlying areas. The local scheduled air services can be conveniently divided into two groups. There are the short run services from major centres to nearby communities as exemplified by the operations of Northward Aviation out of Inuvik, Arctic Air from Fort Simpson and Northward Aviation from Norman Wells. Secondly, there are the scheduled services involving long hauls that service vast regions. These are exemplified by Northward and Northwest Territorial services from Yellowknife and Nordair (Arctic), a subsidiary company of Nordair, from Frobisher Bay to points on Baffin Island and the west shore of Foxe Basin (e.g. Igloolik).

Finally, there are the charter services that can be obtained at communities on the scheduled stops of regional and local carriers. Almost any point in the Territories can now be reached by charter services. Moreover, larger aircraft can be chartered from the scheduled carriers to any destination that has sufficient landing and takeoff facilities.

An examination of the work completed by the Research Group of the Department of Industry and Development and summarized in community data sheets clearly indicates that most major centres can be reached at all times of the year. In the winter months ice strips are often used, while ground strips are operational during the summer. There is a period of overlap that makes the communities accessible all year insofar as facilities for landing are concerned. Climate and navigational aids for various communities, however, differ substantially. In this analysis, the focus will not be upon landing facilities, but upon scheduled air services in relation to individual communities and community population classes.

Each community was assessed on the basis of the presence or absence of three features including regular scheduled service by a regional carrier, regular scheduled service by a local carrier and what has been termed connector services.

A community that is the major point of origin of the scheduled services of a local carrier, for example, Yellowknife, possesses connector services. The introduction of the connector service aspect was necessary for a number of reasons. Tourists coming into the Territories, and desiring to reach communities served by local scheduled carriers are naturally drawn to the connector points. This obviously increases tourist values associated with this community and particularly when an overnight stay is involved. Secondly, the local scheduled carrier services connect the origin points to the outlying communities. This aspect is taken care of through the introduction of the connector service concept.

1] G.N.A. services replaced by International Jet Air Services.

The concept of connector services can be made a little clearer by reference to Yellowknife. A scheduled service from Yellowknife to Coppermine is recognized in the point rating for the air services of the community. It is equally obvious that the return run from Coppermine to Yellowknife should provide a point score for Yellowknife. This is handled through the point rating system associated with connector services.

The point rating for a community served by a regional carrier on a regularly scheduled basis was established as follows. One point was accorded for each scheduled stop at a community during a seven day period. For example, Yellowknife receives twelve stops per week on the regularly scheduled runs of P.W.A. between Edmonton and Inuvik. It therefore receives twelve points on this basis. Fort Smith receives between five and six stops, depending upon the season. It therefore receives 5.5 points.

The regional carriers generally use larger planes and provide a higher standard of service than locally originated scheduled carriers, such as Northwest Territorial or Northward Aviation. A bonus factor was applied to the point rating per regional carriers to accommodate these differences. Point values at any community serviced by P.W.A. and Nordair were increased by 100%. In effect, the 12.0 point rating for Yellowknife became 24.0 and the 5.5 point rating for Fort Smith 11.0.

There are two special situations to be considered in the loading of point values for community service by regional carriers. The services provided by Great Northern Airways from Whitehorse to Inuvik are in many respects similar to those of scheduled carriers originating within the Territories. As a result, the eight stops made by G.N.A. at Inuvik were not given a bonus value. If they had been loaded, on a 100% basis, the air service factor for Inuvik would have exceeded that of Yellowknife. Such a result was not considered realistic. On the other hand, it is important to note that Inuvik does occupy a very critical position in terms of east-west tourist movement across the Arctic and its future with respect to tourist movement is bright. It is not unrealistic to envisage a higher point rating for Inuvik than for Yellowknife within a few years if certain patterns of package tour development emerge. Inuvik's position now and in the future is strong and must be recognized in all tourist planning.

Secondly, it was recognized that the services provided by TransAir to communities on the west shore of Hudson Bay and the general scale of the ground facilities in these areas were considerably below that encountered at major destinations serviced by Nordair and P.W.A. Recognizing these facts, values for communities serviced by TransAir were weighted by factor of only 50%.

Communities served by internal scheduled airline services were accorded one point for every stop by each airline that serviced them. For example, Coppermine is serviced once a week by Northward Aviation and once a week by Northwest Territorial. It therefore received two points. A community such as Pangnirtung that is serviced by Nordair between two and three times a week received 2.5 points.

In establishing point values for connector services the following procedure was adopted. The number of local carriers originating services from a particular community, such as Yellowknife, was determined. One point was accorded for each stop at each community made by all these carriers during a seven day period. The value for Yellowknife was 13.75 and that for Inuvik 12.5.

As previously noted, it was recognized that two types of connector services of varying significance from a tourist and recreational standpoint were present in the Territories. Some scheduled services involved short hauls to nearby communities. The operations of Northward Aviation from Inuvik to points in the Delta region or of Northward from Norman Wells to nearby communities on the Mackenzie River and Great Bear Lake provide clear examples of this situation. On the other hand, some services such as those from Yellowknife involve long distance travel and make vast reaches of the Territories accessible. The services of Nordair to points on Baffin Island provide another example. In recognition of the greater importance of the latter type of connector service point values were increased by 50%.

The results of the analysis are clearly summarized in the Table 5.24 giving total point values for every community in the Northwest Territories. The pattern is clearly related to community population classes. A brief summation of the salient features of the table is desirable.

Yellowknife, Inuvik and Frobisher are clearly dominant. Values for all other centres are quite low. The results seem quite realistic although perhaps a little disturbing. The fact of the matter, however, is simply that the air communication pattern of the Territories displays serious limitations from a tourist development standpoint that cannot be denied.

A comparison of the total point strength for all communities served by the three major regional carriers, including P.W.A., Nordair and TransAir is of some interest. The total point value associated with all communities served by these three regional carriers is 1,120.

Centres serviced by P.W.A. throughout the Mackenzie River area account for 760 or 68% of the total. The average value for the six communities involved is close to 13 points. If the Fort Simpson stop, which in many respects is akin to a local scheduled carrier situation, is omitted the average point value for the remaining five communities is 15.0.

The total point value for eight communities on the west shore of Hudson Bay served by TransAir is 190 which is 17% of the total of 1,120 points. The average value per community is about 2.4. The limitations of this regional route of access compared with the Mackenzie Valley are clearly displayed in this comparison.

Two points serviced by Nordair, namely, Frobisher and Resolute, account for 170 points or 15% of the total. This is again, low in comparison with the Mackenzie Valley pattern. In fairness, however, it must be noted that Nordair (Arctic) operating from Frobisher Bay provides access to a large number of communities on Baffin Island and the west shore of Foxe Basin. If the point value of 16.8 for these communities is added to 17.0, a total of 33.8 points is obtained. It might then be said that the overall strength of this corridor of access is about 44% of that of the Mackenzie Valley route serviced by P.W.A.

Three northerly points in the Territories, including Inuvik, Igloolik and Frobisher were selected. The cost of travel from large metropolitan areas to these communities via scheduled airlines was examined. The results are summarized in Table 5.25.

An examination of the second column of index values in Table 5.25 reveals that Frobisher is in a decidedly advantageous position with respect to the markets of Montreal, Toronto and New York on the basis of return travel costs. Inuvik stands in a similar position with respect to Vancouver, Los Angeles and San Francisco. Igloolik is advantaged only in terms of the Chicago market.

TABLE 5.24

COMMUNITY TRANSPORTATION PATTERNS [1]

Community Population Class and Community	POINT RATING FOR AIR TRANSPORTATION SERVICES										
	Scheduled Services of the					Connector Services			Total Points	Highway Connection [5]	Grand Total
	Regional Carriers [2]			Local Carriers [2]							
	Carriers	Absolute Weekly Stops [3]	Weighted Point [4] Values	Carriers	Point [3] Values	Carriers	Absolute Point [3] Values	Weighted Point Values			
Primary											
Yellowknife	PWA	12.0	24.0			N,NT,G, PWA	15.75	18.1	42.1	24.0	66
Class I											
Fort Smith	PWA	5.5	11.0						11.0	19.0	30
Inuvik	GNA, PWA	15.0	22.0			N,GNA,R	12.5	12.5	34.5		35
Hay River	PWA	8.0	16.0						16.0	23.0	39
Class II											
Frobisher	NA	7.0	14.0			NA	11.2	16.8	30.8		31
Rae									0.0	24.0	24
Pine Point									0.0	23.0	23
Class III											
Aklavik				N	6.0				6.0		6
Baker Lake	TM	3.0	4.5						4.5		5
Dorset				NA	2.0				2.0		2
Cambridge Bay				N,NT	2.0				2.0		2
Coppermine				N,NT	2.0				2.0		2
Eskimo Point	TM	3.0	4.5						4.5		5
Fort McPherson				N	6.0				6.0		6
Fort Providence									0.0	24.0	24
Fort Resolution				G	2.0				2.0	23.0	25
Fort Simpson				PWA	2.0	AA	4.5	4.5	4.5	20.0	25
Igloolik				NA	1.5				1.5		2
Pangnirtung				NA	2.5				2.5		3
Rankin Inlet	TM	3.0	4.5						4.5		5
Tuktoyaktuk				N,GNA	4.0				4.0		4
Class IV											
Arctic Bay				AT	1.0				1.0		1
Belcher Islands									0.0		0
Broughton Island				NA	2.5				2.5		3
Chesterfield Inlet	TM	0.5	0.8						0.8		1
Clyde River				NA	1.5				1.5		2
Coral Harbour	TM	1.5	2.3	NA	0.5				2.8		3
Fort Franklin				N	2.0				2.0		2
Fort Good Hope				N	2.0				2.0		2
Fort Liard				AA	2.0				2.0		2
Fort Norman				N	2.0				2.0		2
Gjoa Haven				N	1.0				1.0		1
Hall Beach	TM	0.5	0.8	N	1.5				2.3		2

Continued

TABLE 5.24 — *Continued*

POINT RATING FOR AIR TRANSPORTATION SERVICES

Community Population Class and Community	Scheduled Services of the: Regional Carriers 2] Carriers	Absolute Weekly Stops 3]	Weighted Point 4] Values	Local Carriers 2] Carriers	Point 3] Values	Connector Services Carriers	Absolute Point 3] Values	Weighted Point Values	Total Points	Highway Connection 5]	Grand Total
Holman Island				N	0.5				0.5		1
Norman Wells	PWA	5.0	10.0			N	4.5	4.5	14.5		15
Pond Inlet				AT	1.0				1.0		1
Repulse Bay	TM	0.5	0.8						0.8		1
Snowdrift				P	2.0				2.0		2
Spence Bay				N	1.0				1.0		1
Tungsten										24.0	24
Class V											
Cape Dyer									0.0		0
Echo Bay				NWT	3.0				3.0		3
Grise Fiord				AT	0.5				0.5		1
Lake Harbour				NA	1.0				1.0		1
Lac La Martre									0.0		0
Pelly Bay				N	1.0				1.0		1
Port Burwell									0.0		0
Resolute Bay	NA	1.5	3.0	NWT	1.5	AT	5.0	7.5	12.0		12
Sachs Harbour				GNA	1.0				1.0		1
Whale Cove	TM	0.5	0.8						0.8		1
Wrigley	PWA	0.5	1.0						1.0		1
YK Village									0.0	24.0	24
Class VI											
Arctic Red River				N	2.0				2.0		2
Bathurst Inlet									0.0		0
Colville Lake				R	2.0				2.0		2
Enterprise									0.0	24.0	24
Jean Marie River				R	2.0				2.0		2
Kakisa Lake									0.0	24.0	24
Nahanni Butte				AA	2.0				2.0		2
Paulatuk									0.0		0
Rocher River									0.0		0
Rae Lakes									0.0		0
Snare Lake									0.0		0
Trout Lake									0.0		0
											531

1] Based on N.W.T. Tourist Aviation Directory and Community Data Sheets, Department of Industry & Development, N.W.T.

2] Definition of regional and local carriers appears in text. Symbols employed — PWA — Pacific Western Airlines, NA — Nordair, TM — Transair-Midwest, GNA — Great Northern Airways, NWT — Northwest Territorial, N — Northward Aviation, AT — Atlas Aviation, R — Reindeer Air Services, P — Ptarmigan Air Services, G — Gateway Aviation, AA — Arctic Air.

3] Determination of point values explained in text.

4] Weighting procedure explained in text.

5] Point rating discussed in text.

TABLE 5.25

RELATIVE COST PATTERNS FROM SELECTED ORIGIN-AREAS TO INUVIK, IGLOOLIK & FROBISHER – JANUARY 1972

Air Cost and Comparative Indices to Reach

Origin Centre	Inuvik [3]			Igloolik [4]			Frobisher [5]		
	$	Index 1]	Index 2]	$	Index 1]	Index 2]	$	Index 1]	Index 2]
Montreal	538	142	192	438	128	156	280	100	100
Toronto	516	136	152	416	122	122	340	121	100
Vancouver	380	100	100	442	129	116	570	204	150
New York	566	149	165	468	137	136	344	123	100
Chicago	490	129	143	342	100	100	398	142	116
Los Angeles	518	136	100	538	157	104	608	217	117
San Francisco	506	135	100	538	157	106	630	225	125

1] The lowest cost to reach the three destination centres from all origin centres noted was accorded an index value of 100.

2] The lowest cost for any origin centre to reach any of the three destinations in the Northwest Territories was accorded an index value of 100.

3] Assumes that travellers from origin centres enter the Northwest Territories on flights originating in Edmonton.

4] Assumes all travellers from origin centres enter the Northwest Territories on flights originating in Winnipeg.

5] Assumes all travellers from origin centres enter the Northwest Territories on flights originating in Montreal.

The total population of the metropolitan census areas of Montreal, Toronto and New York is 16.2 million. It is considered that Frobisher has a cost advantage in regard to this market. Similarly Inuvik possesses a comparative cost advantage in regard to Vancouver, Los Angeles and San Francisco which together have a population of 11.0 million. The value for Chicago for which Igloolik possesses a comparative cost advantage is roughly 7.0 million. From this perspective, Frobisher is in an extremely strong position. The corresponding value for Inuvik of 11 million is only about 68% of that of Frobisher and the value of 7.0 for Igloolik is only 43%.

There is a very interesting situation with respect to the cost of travel from Los Angeles and San Francisco to Inuvik and Igloolik. The round trip cost to the latter area is only 4 and 6 per cent above that to Inuvik. Igloolik therefore, has a strong competitive position in the Los Angeles and San Francisco markets in comparison with Inuvik insofar as return travel cost is concerned. This is a very important marketing relationship that should not be overlooked.

In terms of the Toronto, Montreal, New York markets, the positions of Inuvik and Igloolik in comparison with Frobisher are rather weak insofar as return travel cost is diagnostic. The future of Inuvik and Igloolik in these markets seems to be closely tied to the development of package tours that include Frobisher, Igloolik and Inuvik. In this situation the round trip travel cost from Montreal, Toronto and particularly New York is evened out. Of course, the cost of the tour becomes quite expensive but it is clear that from a comparative return travel cost perspective, Inuvik and Igloolik cannot compete with Frobisher in the large eastern metropolitan area markets.

There is another interesting comparison with respect to travel from the Chicago origin area to Igloolik or Frobisher. The return trip cost to Igloolik from Chicago is $342.00 while that to Frobisher is only $398.00, or 16% more. The difference is of such a modest order that there is no doubt that Frobisher can compete effectively with Igloolik in the Chicago market.

Igloolik is in an extremely interesting position insofar as return travel costs analysis is concerned. It is in an advantaged position with respect to the Chicago market, but competition from Frobisher could be extremely strong given the difficulties of access to Igloolik. In this overall sense, Frobisher is probably in the dominant position. On the other hand, Igloolik should be able to compete effectively from the mere return travel cost standpoint with Inuvik in its prime markets of Los Angeles and San Francisco. Again, however, it is handicapped by access problems and an inferior regional carrier service.

That which has been noted with respect to Inuvik, Igloolik and Frobisher applies in a large part to the entire regional air travel corridors of which they are northern destinations. It seems reasonable to expect that with satisfactory promotion and facility development, the eastern corridor which has a decided cost advantage in the large markets of Montreal, Toronto and New York should move ahead very rapidly.

The future of the Mackenzie travel corridor depends in a large part on the markets of Vancouver, Los Angeles and San Francisco. The total travel cost from these markets to truly northern destinations, however, is substantially greater than that from Montreal, Toronto and New York via the eastern corridor. The travel corridor along the west shore of Hudson Bay is in a decidedly disadvantaged position. The future here is far from certain and will depend almost entirely upon individual initiative in development and promotion within the Chicago market and to some extent within the markets of Los Angeles and San Francisco. Compared with the other two corridors, however, the situation clearly presents problems.

Highway Access:

It is a simple matter to identify those communities served by the highways system of the Northwest Territories. It is a decidedly difficult matter, however, to assign a point rating for highway access that is meaningful in comparison with the values set for air connections.

The bulk of the tourists moving into the Territories along the highway network are engaged in a landscape tour. Those visiting the Territories basically for the pursuit of a specific activity, such as hunting, fishing, the visitation of friends or relatives, etc., travel primarily by air because the distance is so great that travel by highway leaves little if any time for the pursuit of the activity that is the primary purpose of the trip.

The reaction of the highway tourist to any particular community along the route that he is travelling depends upon three factors. The scale of urbanization of the community, that is to say, the services and facilities it provides is of major consequences. The presence of outstanding cultural or scenic attractions within or nearby the community and the geographic spacing of the community relative to others on the route are other aspects of significance. This latter aspect is of considerable importance in the Territories since communities are so far apart that the traveller frequently feels obligated to stop for gas, and relaxation from the strain of driving.

The first aspect, namely, the scale of urbanization is considered in other sections of this report. The presence of scenic and cultural attractions receive separate consideration in the terrain analysis. Therefore, these are not taken into account in the establishment of a point rating system for the highway connection. This avoids double counting for these aspects in the ultimate compilation of community point values, toward which this analysis is ultimately directed.

It will be arbitrarily assumed that the point value of the highway connection at Yellowknife is equal to the point value established for its scheduled regional air carrier services, namely, 24 points. All things considered, this arbitrary assumption may not be unrealistic. The volume of tourists arriving in Yellowknife via the highway is probably equal to those arriving by scheduled air services. Air travellers, undoubtedly spend more on accommodation and restaurant meals in Yellowknife than do the highway travellers. On the other hand, highway travellers purchase gasoline, groceries and other supplies that the air traveller does not.

The problem now becomes one of assigning point values for the highway connection to other communities relative to the total of 24 points set for Yellowknife. The basic operating principle employed in this instance was location in relation to the main artery of travel towards Yellowknife.

All communities along the main artery received a total of 24 points. Providence, Kakisa Village, Rae and Yellowknife Village are all considered to be situated on the highway since the cutoff distance is extremely small.

Values for all other centres were determined as follows. The total distance from Edmonton to Yellowknife is approximately 1,000 miles. The percentage of the distance of a community from the main highway relative to the total distance from Edmonton to Yellowknife was determined. The ratio obtained in the foregoing manner was applied to the total of 24 points and the value obtained subtracted from 24. Reference to the point value of 19 derived for Fort Smith will illustrate the method. Fort Smith is 195 miles from Enterprise situated on the main highway between Edmonton and Yellowknife. This is 19.5% of the total distance of 1,000 miles between Edmonton and Yellowknife. Now, 19.5% of 24

is 4.6 which was rounded to 5. The point value for the highway connection to Fort Smith becomes 24-5, or 19.

If there were a circular route in and out of the Territories from Fort Simpson or Fort Smith, the point value for these communities would increase to 24. Secondly, if a highway were constructed northward through the Mackenzie Valley from Fort Simpson to Inuvik, the point rating for Yellowknife would decline substantially for the main route would then become Edmonton, Enterprise, Fort Simpson northward to Inuvik. Yellowknife, would then be placed in a position off the main artery. Its point rating would then become about 18 or 19.

If a highway is built from Fort Simpson down the Liard Valley to connect with the Alaska Highway, and the national park on the South Nahanni River is well developed, the main tourist artery could quite conceivably become the circular route from Edmonton, through Enterprise and Fort Simpson to the Alaska highway and thence return to Edmonton. Under these conditions it might be logical to consider the calculation of point value for Yellowknife on the basis of the return distance from Yellowknife to the cutoff from the main circular route. The point value for Yellowknife would then become about 13. With a substantial increase in the volume of tourism along the aforementioned circular route this reduced point value for Yellowknife could be of major significance.

It is important to note, that the highway connection point value is not indicative of the significance of tourism to a community at the present time. It is simply a measure of a potential related to the highway connection. The value of tourism to a community depends upon its ability to tap this connection effectively which is a function of its scale of urbanization, the presence of outstanding scenic and cultural values within or nearby and its geographic spacing relative to other centres on the route, as previously noted. Kakisa Lake Village has received a total of 24 points. Tourism to this community is insignificant compared with Yellowknife or Hay River. Kakisa Lake simply does not possess the resources necessary to effectively capitalize upon the opportunity provided by the physical presence of the highway. On the other hand, it appears that Kakisa Lake has not exploited those opportunities available to it as well as it might have. Lady Evelyn Falls situated nearby are a substantial tourist attraction that Kakisa Lake Village has not capitalized upon. This is simply a case of unexploited opportunity.

Water Access:

It is difficult to determine a realistic procedure for handling this aspect. There is now a tourist excursion boat operating on the Mackenzie River from Hay River. The scale of the craft and the number of runs per season indicate, however, that the volume of tourists is small. The Mackenzie River is an interesting boat artery that over the years is likely to become attractive to recreationists. Communities along its banks should benefit to some extent from such a trend.

Communities on the Arctic Islands on the north and east shores of the mainland of the Territories display considerable variation in their natural harbour conditions and facilities for handling boats. Some have no wharfs and rely entirely upon lightering to bring passengers and goods to shore. Others have wharfs. Some have good natural harbours and others poor natural harbours. At present, however, there is no tourism to the communities based upon water transport. Travel from these communities by Peterhead boat or some other type of suitable craft is possible in all cases. None really has a major comparative advantage except in terms of wharfs. There are a number of points, however, that do possess exceptionally good shore installations, including Tuktoyaktuk, Inuvik and Frobisher Bay.

After a thorough examination of the situation, it was decided that no meaningful rating could be established for water communications. Possibly two or three points might be added to Inuvik and Hay River on the basis of their functions as commencement destination areas for the river cruise. Possibly a couple of points could be added to a centre, such as Tuktoyaktuk, that possesses a harbour and is a major organizational centre for marine transport in the north. All communities with wharfs on the Mackenzie River might have been increased by about one point.

The Total Community Point Values for Transportation:

The total points accorded the transport or communication community are indicated in Table 5.24.

The Great Slave Lake lowlands dominate the pattern. Three hundred and twenty-eight of a total of 505 points for all communities or 65% are found within this area. Only two centres outside this area, namely, Inuvik and Frobisher, display point values in the order of the higher communities in this grouping, exclusive of course of Yellowknife which is in a class by itself.

The communities of the Mackenzie Delta centred on Inuvik have a total point value of 53 or 10% of that shown in Table 5.24. The situation corresponds roughly with the southern Baffin Island-Foxe Basin area centred on Frobisher which has a total point value of 49 or again 10%.

A small pocket centred on Norman Wells has a total community point value of 23 or 5%. Interestingly, the group of centres on the east shore of Hudson Bay, including Baker Lake, Eskimo Point, etc., has a total point value of only 17 which is equal to 3% of the territorial total. The communication factor in this area is decidedly weak and equivalent roughly to that of the regions centred on Resolute Bay which have 15 points or 3%.

All the remaining communities scattered through the vast area of the Territories, outside the aforementioned regional groupings have a total of only 20 points, which is 4%. Obviously, communications are a serious problem throughout this entire region.

Eating and Dining Services

The pattern of restaurants, dining rooms, cafes and banquet room facilities in the communities of the Northwest Territories, is summarized in Table 5.26. It will be noted immediately that only 20 communities have any kind of public eating establishments insofar as can be determined from the community data sheets. In five of these communities there are only cafes or coffee shops. In two, namely, Pelly Bay and Colville Lake, the restaurant facilities are actually associated with lodges that are available to all travellers.

The point rating system was established in a straight forward manner. Three points were accorded any community for each banquet room or restaurant dining room facility located in a hotel or outside a hotel. One point was accorded for each cafe or coffee shop located either in a hotel or in a separate building outside a hotel. Point values for communities obtained in this manner range from a low of 1 to a high of 20.

It is of interest to note that in terms of scale of dining facilities, Inuvik received a higher point rating than Yellowknife or Hay River. It is also important to note, however, that this rating system gives no recognition to quality. Actually, only Yellowknife can readily provide a degree of what is sometimes referred to as atmosphere and luxury dining and even here the level is modest.

TABLE 5.26

EATING AND DINING SERVICES BY COMMUNITY
AND COMMUNITY POPULATION CLASS – JANUARY 1972

Population Class and Community	Hotel Facilities			Separate Facilities		Point Rating
	Banquet Rooms No.	Restaurant, Dining Room No.	Cafe Coffee Shop No.	Restaurant No.	Cafe Coffee Shop No.	
Primary						
Yellowknife 1]	3	3	1	3	1	
	1	2		2		15
Class I						
Fort Smith 2]		1		1		6
Inuvik 2]		3		3	2	20
Hay River 3]		3		2		15
Class II						
Frobisher Bay		1			1	4
Pine Point		1				3
Class III						
Aklavik			1			1
Fort Providence			1			1
Fort Resolution			2			2
Fort Simpson		1				3
Pangnirtung		1				3
Class IV						
Chesterfield Inlet		1				3
Coral Harbour 4]		1				3
Fort Franklin			1			1
Norman Wells		1				3
Class V						
Lake Harbour					1	1
Pelly Bay		1 5]			1	2
Resolute Bay		1				3
Class VI						
Colville Lake		1 5]				1
Enterprise		1				3

1] Yellowknife also has a chicken take-out service.

2] Fort Smith has a chicken take-out service as does Inuvik.

3] Hay River has a drive-in food service.

4] Service to travellers at MOT refractory.

5] Meals at Pelly Bay Lodge and Colville Lake Lodge.

It is of interest to note that no restaurants or cafes in the Northwest Territories provide any type of unique northern atmosphere. Facilities are essentially duplicates of those in southern Canada in terms of the atmosphere. This is one area in which a little imagination could produce substantial tourist benefits. There is no reason why these restaurants cannot have a distinct northern atmosphere that can be imparted at modest to virtually no additional costs.

Availability of Beer and Liquor

This aspect is of considerable significance in tourism. The situation within the Territories is summarized in Table 5.27.

Seven communities within the Northwest Territories possess combined retail beer and liquor outlets. Three have only beer outlets.

There are beverage rooms in five communities, liquor lounges in seven and clubs that are frequently opened to the public in six communities.

In total, twelve communities have beer or liquor available in one form or another. Some have only one form of outlet while others have several.

A straight forward point rating system was employed in this instance. A community with a retail beer and liquor outlet combined, received 5 points for this facility. If only a retail beer outlet was present, 2 points were accorded. Communities also received 3 points if they possessed one or more lounges, 2 points for one or more beverage rooms, and 1 point if they possessed clubs. The club on the air base at Resolute was considered to be a liquor lounge and therefore, received 3 points.

Under this point rating system, five communities including Yellowknife, Fort Smith, Inuvik, Hay River and Frobisher Bay all received 11 points. It is true that there is variation to the number and scale of the beverage rooms, lounges and clubs in these three communities with Yellowknife and Inuvik ranking well ahead of Fort Smith and Hay River. On the other hand, all these communities possess sufficient liquor outlets at the retail level and beverage room, lounge and club capacities to meet the needs of the tourist. In effect, there is no restriction in these centres in regard to the attainment of beer and liquor by the tourist.

Banking Services

Banking services are obviously of some importance to the traveller, although the widespread use of travellers cheques and credit cards has reduced their significance to some degree. In Table 5.28 the banking services of the Northwest Territories are summarized.

A point rating was established as follows. A community with a banking service was accorded 5 points. If more than one bank was present an additional point accrued to a community on the basis of the number of additional banks. Flying banks were accorded a point rating of 2.

Community Entertainment and Leisure Time Facilities

Table 5.29 is based on information contained in the Community Data Sheets. Fourteen facility types are summarized in terms of their representation in the various community population classes previously defined. The pattern revealed is perhaps of more interest to sociologists and community planners than to those concerned with tourist development.

TABLE 5.27

BEER AND LIQUOR OUTLETS BY COMMUNITY
AND COMMUNITY POPULATION CLASS – JANUARY 1972 1]

Population Class and Community	Liquor & Beer	Beer Only	Beverage Rooms	Lounges	Clubs	Point Rating
Primary Class						
Yellowknife	Yes		Yes 8]	Yes	4	11
Class I						
Fort Smith	Yes		1	1	2	11
Inuvik	Yes		3	3	2	11
Hay River	Yes		Yes 10]	Yes	1	11
Class II						
Frobisher Bay	Yes		Yes 7]	Yes 7]	Yes 7]	11
Pine Point	Yes					5
Class III						
Cambirdge Bay		Yes 3]				2
Fort Providence		Yes 3]		Yes		5
Fort Simpson	Yes 4]					5
Rankin Inlet		Yes 5]				2
Class IV						
Norman Wells	Yes			1		8
Class V						
Resolute					1 8]	3

1] Source Ibid.
2] An agency store.
3] Agency store for beer only.
4] Monday, Wednesday and Friday only and limited hours.
5] Through Hudson Bay Store.
6] Lounges unspecified number.
7] Unspecified number.
8] Arctic Circle Club – open to guests.
9] Five lounges and beverage rooms in total.
10] Two lounges and beverage rooms.

TABLE 5.28

BANKING SERVICES BY COMMUNITY
AND COMMUNITY POPULATION CLASS -- JANUARY 1972

Population Class and Community	Branch Bank 1]	Flying Bank	Point Rating
Primary Class			
Yellowknife	B of M) B of NS) CIB of C)		7
Class I			
Fort Smith	CIB of C		5
Inuvik	CIB of C		5
Hay River	RB of C		5
Calss II			
Frobisher Bay	RB of C		6
Pine Point	B of M		5
Class III			
Cambridge Bay		CIB of C 1st Wed. Month	2
Coppermine		CIB of C	2
Fort Simpson	CIB of C		5
Class IV, V & VI			
	none	none	

1] B of M = Bank of Montreal
B of NS = Bank of Nova Scotia
CIB of C = Canadian Imperial Bank of Commerce
RB of C = Royal Bank of Canada

TABLE 5.29

ENTERTAINMENT & LEISURE TIME FACILITIES IN COMMUNITIES
IN THE NORTHWEST TERRITORIES – JANUARY 1972 1]

	Number and Percentage of Communities in a Community Population Class with Facilities													
	Primary Class		Class I		Class II		Class III		Class IV		Class V		Class VI	
	No.	% 2]	No.	% 2]	No.	% 2]	No	% 2]	No.	% 2]	No.	% 2]	No	% 2]
Library	1	100	3	100	3	100	10	71	5	26	3	25	1	8
Community Hall	1	100	3	100	3	100	12	86	7	37	7	58	1	8
Commercial Theatre	1	100	2	66	0	0	2	14	0	0	0	0	0	0
Bowling Lanes	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Arena	1	100	3	100	0	0	0	0	0	0	0	0	0	0
Skating Rinks	1	100	3	100	2	66	6	23	3	16	12	17	0	0
Curling Rinks	1	100	3	100	2	66	9	64	2	11	1	8	0	0
Ski Clubs	1	100	2	66	0	0	0	0	0	0	0	0	0	0
Rifle Range	1	100	1	33	0	0	0	0	0	0	0	0	0	0
Swimming Pool	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Golf Course	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Tennis Courts	1	100	0	0	0	0	0	0	0	0	0	0	0	0
Playing Fields and Ball Diamonds	1	100	3	100	0	0	0	0	0	0	0	0	0	0
Stock Car Track	1	100	1	33	0	0	0	0	0	0	0	0	0	0

1] Based on Community Data Sheets.

2] Represents percentage of communities in the Population Class possessing the facility.

The limited facility development in the communities of the Northwest Territories is obvious from a cursory glance at the table. Only the primary community of Yellowknife possesses all fifteen. About 71% is represented in the group of Class I communities, 29% in the Class II group, 36% in the Class III, 29% in Class IV, 29% in Class V and 14% in Class VI. Throughout the range of classes from II-VI inclusive, the absence of facilities is really the dominant feature. A glance at the percentage of communities within Classes II-VI possessing facilities further indicates the lack of development.

Libraries and community halls are the most prevalent type of facility with the latter being slightly more common. There are five commercial theatres in the Territories located in Yellowknife, Fort Smith, Inuvik, Aklavik and Fort Simpson.

Of the fourteen facilities indicated in the table, only a few have any significance for tourism. Community halls provide a base for the staging of community pageants, etc., that might be of some tourist interest. Arenas and curling rinks provide facilities for inter-community competition which involves travel. Theatres offer evening diversion to community visitors who might be at "loose ends".

Looking at the situation in total, it was felt that any attempt to consider these facilities in the evaluation of communities as tourist service centres would not be particularly fruitful. The community population classes which have been taken into consideration reflect the presence or absence of these facilities to some degree.

Production and Purchase Centres for Eskimo and Indian Handicrafts

Purchase of native handicrafts is a notable feature of a trip to the Northwest Territories for many of its visitors. While few travel primarily for this purpose many undoubtedly consider it a significant bonus value.

A mimeographed release of the Division of Tourism entitled "Where To Buy" indicates the major production centres for the purchase of ten types of Eskimo and Indian handicrafts. In total, 32 communities were listed in this release.

A point rating system incorporating the concepts of variety and scarcity was developed. In effect, this system recognized that the attractivity of a community to a tourist from the standpoint of the purchase of native handicrafts depends upon the variety of materials available and the degree of scarcity or uniqueness of the objects produced. If a particular type of handicraft is produced only at one or two points in the Territories then those communities involved possess added attractivity to the tourist wishing to obtain objects in that type category.

Specifically, the point rating system was established as follows. The total number of communities at which objects in the various type categories could be purchased was determined. The results were as follows:

Eskimo parkas, head gear and foot wear	7
Eskimo fur garments	2
Eskimo toys and replicas	3
Eskimo clay work	2
Eskimo stone carvings	13
Eskimo Ivory carvings	4
Eskimo whale bone carvings	4
Eskimo prints	5
Indian artifacts and birch bark	4
Indian garments	9

A base value of 10 points was assigned to each of the ten major handicraft types. The base value of 10 points was then divided by the number of locations indicated above at which objects in the type category could be purchased. This established a standard value for each of the ten handicraft type categories available in any community. The results, which were expressed in whole numbers, were as follows:

Eskimo parkas, headgear and footwear	1
Eskimo fur garments	5
Eskimo toys and replicas	3
Eskimo clay work	5
Eskimo stone carvings	1
Eskimo ivory carvings	3
Eskimo whale bone carvings	3
Eskimo prints	2
Indian artifacts and birch bark	3
Indian garments	2

Points were then assigned each community as indicated in Table 5.30. The values derived for the communities by this system ranged from 1-7.

There are a number of limitations to the system employed that require noting.

The point rating system implies similarity in the quality of production at each centre. It is known that there is a substantial variation in the range of quality. Unfortunately, no specific information is available for a rating of the quality of production in each of the individual communities indicated in the release "Where To Buy".

Handicrafts can often be purchased in communities other than those listed in the table. For example, Yellowknife has a native arts and crafts store, and handicrafts are merchandised by some retailers. In effect, the availability of handicrafts has been considered solely in relation to merchandising from major production points.

In the establishment of a base value of 10 for each of the handicraft types, an assumption is made that all are equally attractive to the total body of tourists entering the Territories. This is probably not true, but it would be difficult if not impossible to differentiate the variation in interest in mathematical terms. To some extent, the introduction of the concept of scarcity incorporates this aspect.

The structure for the merchandising of Eskimo and Indian handicrafts is such that these can be purchased in numerous large centres in southern Canada and as noted also at points in the Territories other than the community of production. This is undoubtedly in the interests of the native producer, since it enlarges this market. It is not certain, however, whether the practice has an adverse effect upon tourism. If the objects were available only in the communities in which they were produced, those desiring to acquire them would have to travel to the communities unless they could purchase them second hand from owners in their resident locality. On the other hand, the merchandising of the articles in the major population centres to the south has familiarized tourists coming into the Territories with the type and quality of the handicrafts produced and stimulated a desire to obtain them while in the north.

There is a possibility here, of obtaining "the best of all worlds". A certain number of objects of unique type or design might be sold only to tourists arriving in the community. This is one way in which the tourist might obtain a unique memento of his trip from which

TABLE 5.30

NOTABLE CENTRES FOR PURCHASE OF ESKIMO AND INDIAN HANDICRAFTS 1]

Community and Population Class	I	II	III	IV	V	VI	VII	VIII	IX	X	Total 2]
Class I											
Fort Smith										2	2
Inuvik	1							2			3
Class II											
Frobisher Bay	1		3		1			2			7
Rae									3	2	5
Class III											
Aklavik		5									5
Baker Lake	1		3					2			6
Cape Dorset	1			5				2			8
Cambridge Bay	1				1						2
Coppermine					1		3				4
Eskimo Point			3		1						4
Fort McPherson										2	2
Fort Providence										2	2
Fort Resolution										2	2
Fort Simpson									3	2	5
Igloolik						3					3
Pangnirtung						3	3				6
Rankin Inlet				5	1						6
Tuktoyaktuk		5									5
Class IV											
Arctic Bay					1						1
Belcher Island					1						1
Chesterfield Inlet	1										1
Clyde River					1						1
Fort Franklin									3	2	5
Fort Norman										2	2
Holman Island	1							2			3
Pond Inlet					1		3				4
Repulse Bay					1	3					4
Snowdrift									3	2	5
Spence Bay							3				3
Class V											
Pelly Bay					1	3					4
Port Burwell					1						1
Resolute Bay					1						1
Class VI											
Colville Lake									3		3

1] Based on "Where to Buy" distributed by TravelArctic.
2] Point derivation explained in text.

Column I Eskimo Parkas, Head Gear and Foot Wear
Column II Eskimo Fur Garments
Column III Eskimo Toys, Replicas
Column IV Clay Work
Column V Stone Carvings
Column VI Ivory Carvings
Column VII Whale Bone Carvings
Column VIII Prints
Column IX Indian Artifacts and Birch Bark
Column X Indian Garments

great personal satisfaction could be derived. The quantity produced would be tailored to the scale of tourism in the area. This would not take a great deal of effort or seriously impede the production for export. On the other hand, it would provide a community with a rather unique tourist advantage. This aspect requires serious consideration for it is one way in which handicraft production can substantially support tourism.

An Overall Recro-Tourist Capability Classification for Communities (1)

In previous sections of this report point ratings have been established for communities with respect to a number of features of significance to tourism and recreation, including transportation, accommodation, food facilities, etc. In this work a convenient point rating system was established for each on an individual basis. It is now necessary to combine these results into single system. The approach and method adopted are briefly defined.

Five major factors were considered important in the comprehensive or general recro-tourist classification including general attraction, transportation, accommodation, food services, and finally banking, beverages and handicrafts grouped together.

A total point value of 10,000 was arbitrarily set as the value of all facilities under these categories in all communities of the Northwest Territories. In part the value of 10,000 was selected so that numerical scores for each of the communities with respect to any particular factor would be of manageable proportions.

The total value of 10,000 was then arbitrarily distributed between the five factors as follows. General attraction — 1,000, transport — 3,000, accommodation — 3,000, food — 2,000, banking, beverages and handicrafts — 1,000. This procedure in effect, established a weighting for each of the factors relative to the total value of 10,000 points. Hence, the transport and accommodation factors were considered to be three times as important as the general attraction, and banking, beverage, handicraft factors 1.5 times as important as the food factor. These decisions are obviously open to discussion.

The total point scores derived for various factors in previous sections of the report, that is the total of all the points accorded to communities in the Northwest Territories in relation to these factors, were divided into the new values for each factor noted in the foregoing paragraph. Transportation received a total of 531 points for all communities as indicated in Table 5.24. Thus a value of 531 was divided into 3,000 yielding 5.650. Results of this operation for each factor were as follows. General attraction — 3.413, transport — 5.650, accommodation — 2.072, food — 21.505, banking, beverage and handicraft combined — 4.132.

Values obtained for any community with respect to the aforementioned factors in the previous portion of the analysis were multiplied by these amounts. The total point scores obtained for each community by this process are indicated in Table 5.31.

The next step in the operation involved in establishment of classes and sub-classes on the basis of the revised point scores. The results are indicated in the right-hand column of Table 5.31.

There was an enormous range in the point scores of the communities of the Northwest Territories, from a high of 1,642 in the case of Yellowknife, to a low of about 7 for centres

(1) See also map in Volume 2.

TABLE 5.31

RECRO-TOURIST CLASSIFICATION FOR COMMUNITIES IN THE NORTHWEST TERRITORIES – JANUARY 1972

Community Population Class and Community	General Attraction Factor	Transport Factor	Accommodation Factor	Food Factor	Banking Beverage Handicraft Factor	Total	Class and Sub-Class
Primary							
Yellowknife	34	373	835	326	74	1,642	P
Class I							
Fort Smith	14	170	124	129	74	511	II – 2
Inuvik	24	198	379	430	78	1,109	I – 1
Hay River	17	220	350	326	66	979	I – 2
Class II							
Frobisher	27	175	207	86	95	590	II – 1
Rae	24	136			21	181	V – 1
Pine Point	7	130	124	64	41	366	III – 2
Class III							
Aklavik	27	34	21	21	21	124	V – 4
Baker Lake	27	28			25	80	VI – 2
Dorset	27	11			33	71	VI – 2
Cambridge Bay	27	11	21		25	84	VI – 1
Coppermine	27	11	41		25	104	V – 5
Eskimo Point	27	28			17	72	VI – 2
Fort McPherson	24	34	12		8	78	VI – 2
Fort Providence	24	136	93	21	29	303	III – 3
Fort Resolution	24	141	14	43	8	230	IV – 3
Fort Simpson	24	141	91	64	62	382	III – 1
Igloolik	27	11	25		12	75	VI – 2
Pangnirtung	27	17	41	64	25	174	V – 2
Rankin Inlet	27	28	52		33	140	V – 4
Tuktoyaktuk	27	23			21	71	VI – 2
Class IV							
Arctic Bay	17	6			4	27	VI – 7
Belcher Island	17		17		4	38	VI – 6
Broughton Island	17	17				34	VI – 6
Chesterfield Inlet	17	6	19	64	4	110	V – 5
Clyde River	17	11			4	32	VI – 6
Coral Harbour	17	17	83	64		181	V – 1
Fort Franklin	14	11		21	21	67	VI – 3
Fort Good Hope	14	11				25	VI – 7
Fort Liard	14	11				25	VI – 7
Fort Norman	14	11	12		8	45	VI – 5
Gjoa Haven	17	6				23	VI – 7
Hall Beach	17	11				28	VI – 7
Holman Island	17	6	10		12	45	VI – 5
Norman Wells	3	85	87	64	33	272	IV – 1

Continued

TABLE 5.31 — *Continued*

Community Population Class and Community	General Attraction Factor	Transport Factor	Accommodation Factor	Food Factor	Banking Beverage Handicraft Factor	Total	Class and Sub-Class
Class IV — Continued							
Pond Inlet	17	6	25		17	65	VI — 3
Repulse Bay	17	6			17	40	VI — 6
Snowdrift	14	11			21	46	VI — 5
Spence Bay	17	6			12	35	VI — 6
Tungsten	3	136				139	V — 3
Class V							
Cape Dyer	10					10	VI — 9
Echo Bay	10	17				27	VI — 7
Grise Fiord	10	6				16	VI — 8
Lake Harbour	10	6		21		37	VI — 6
Lac La Martre	14					14	VI — 8
Pelly Bay	10	6		43	17	76	VI — 2
Port Burwell	10				4	14	VI — 8
Resolute Bay	10	68	209	64	17	368	III — 2
Sachs Harbour	10	6				16	VI — 8
Whale Cove	10	6	25			41	VI — 5
Wrigley	14	6				20	VI — 8
YK Village	7	136				143	V — 3
Class VI							
Arctic Red River	10	11				21	VI — 7
Bathurst Inlet	10					10	VI — 9
Colville Lake	7	11		21	12	51	VI — 4
Enterprise		136	58	64		258	IV — 2
Jean Marie River	7	11				18	VI — 8
Kakisa Lake	7	136				143	V — 3
Nahanni Butte	7	11	17			35	VI — 6
Paulatuk	10					10	VI — 9
Rocher River	7					7	VI — 9
Rae Lakes	7					7	VI — 9
Snare Lake	7					7	VI — 9
Trout Lake	7		8			15	VI — 8
TOTAL 1]	1,004	3,003	3,000	2,000	1,000	10,007	

1] Values slightly above or below thousands due to rounding.

such as Rocher River and Rae Lakes. It seemed most expeditious to establish a primary class and six main classes in which sub-classes could be distinguished. The range of point values for the community classes and sub-classes is indicated in Table 5.32.

The primary community of Yellowknife, together with the Class I communities of Inuvik and Hay River display a reasonable range of recro-tourist facilities. Conditions are satisfactory in Class II communities, including Frobisher and Fort Smith, but are only moderately satisfactory in Class III centres with obvious weaknesses in a number of factors. Class IV, V and VI communities all display serious weaknesses in their facility base. No substantial tourism can be developed in the Class V and VI communities without major improvements in their facility base, and particularly with respect to transport and accommodation. These facilities are also often marginal to sub-marginal in the Class III communities.

The analysis clearly displays the weakness of the community facility base of the Territories. Herein lies the Achilles Heel of development. Unless the limitations displayed in this analysis can be overcome, the substantial development of tourism outside of Class I and Class II communities will not be possible. Herein lies the statistical proof for many of the more generalized statements presented in the report prepared by the Federal Office of Tourism.

Information obtained in this recro-tourist classification for communities will be combined with that for resource potential in a subsequent report. No further discussion of patterns revealed is presented as the basic facts are obvious.

TABLE 5.32

THE RANGE OF POINT VALUES FOR COMMUNITY CLASSES AND SUB-CLASSES

	Class			Sub Class	
	No.	%	Mean Point Value	No.	Mean Point Value
Primary	1	1	1,642		
Class I	2	3	1,044		
1				1	1,109
2				1	979
Class II	2	3	551		
1				1	590
2				1	511
Class III	4	6	355		
1				1	382
2				2	367
3				1	303
Class IV	3	5	253		
1				1	272
2				1	258
3				1	230
Class V	10	16	144		
1				2	181
2				1	174
3				4	141
4				1	124
5				2	107
Class VI	42	66	37		
1				1	84
2				7	75
3				2	66
4				1	51
5				4	44
6				7	36
7				7	25
8				7	16
9				6	9
	64	100			

5.5 ANALYSIS OF THE HISTORIC RESOURCES OF THE N.W.T.

The preparation of a theme, sub-theme, phase and topic format to guide future research and to provide a framework of reference for tourist and recreation planning is a first essential step. Such a thematic approach has been taken by the Northwest Territories Historical Advisory Board for the recording of data in their Historical Resources Survey.

Two major themes are noted, namely A. — Pre-history, and B. — History. Two sub-themes are recognized in the former, including Indian and Eskimo Cultures. Nine sub-themes are identified under the major theme History including Search for the Northwest Passage, Fur Trade Era, Missionary Era, Whaling Era, Exploration of Mineral Resources, Evolution of Northern Transport, Frontier of Government and Evolution of Settlements (includes R.C.M.P.), Recent Indian Culture, and finally Recent Eskimo Culture.

The following schemata is fairly comprehensive in terms of themes, but less complete in the other categories. No attempt has been made, for example, to define topics such as the Frobisher expeditions under Phase I of the Sub-Theme Search for a Commercial Northwest Passage or the expeditions of Henry Hudson under Phase 2 — Penetrating Hudson Bay.

Schemata of Historic Themes and Sub-Themes

Theme I — Geographic Exploration:

Determining the extent and configuration of the land and water mass — enlarging the bounds of spatial knowledge — breaking the bounds of geographic knowledge.

Sub-Theme — Search for a Commercial Northwest Passage 1576-1748:

Phase 1 — Probing the Eastern Entrance to the Arctic.
Phase 2 — Penetrating Hudson Bay.

Sub-Theme — Fur Trade Era 1747-1883:

Phase 1 — Hudson Bay Company Early Era.
Phase 2 — Hudson Bay and Northwest Company Rivalry.
Phase 3 — Hudson Bay Company Post 1821 Union.

Sub-Theme — British Admiralty Expeditions:

Phase 1 — Approach by Sea.
Phase 2 — Approach by Land.
Phase 3 — Franklin Expedition and Subsequent Searches.

Sub-Theme — American and Norwegian Interest:

Phase 1 — American Explorers.
Phase 2 — Norwegian Explorers.

Sub-Theme — Canadian Sovereignty and Scientific Expeditions:

Phase 1 — Overland Exploration.
Phase 2 — Exploration by Sea.

Theme II – The Fur Trade Era:

Sub-Theme – Independent Traders – XY and Northwest Co. penetration of the Mackenzie Valley:

Sub-Theme – Hudson Bay Company essentially after 1821:

Theme III – The Whaling Era:

Theme IV – The Missionary Era:

Sub-Theme – The Anglican Church
Sub-Theme – The Roman Catholic Church
Sub-Theme – Other Denominations

Theme V – Scientific Resource Exploration:

Sub-Theme – The Geological Survey of Canada.
Sub-Theme – The Mapping and Geographic Survey
Sub-Theme – Botantical Investigations
Sub-Theme – Biological Investigatios

Theme VI – Modern Economic and Industrial Development:

Sub-Theme – Transportation
Sub-Theme – Mining
There are numerous sub-themes here of which only two have been identified.

Theme VII – Frontier Government and Settlement Evolution:

Sub-Theme – Law and Order R.C.M.P.
Sub-Theme – Government Education

Theme VIII – Recent Indigenous Cultural Evolution:

Sub-Theme – Indian Cultures
Sub-Theme – Eskimo Cultures

The foregoing outline should not be considered as absolute or unalterable. Other groups obviously can be formulated. On the other hand, it does provide a fairly complete outline that lends itself to expansion by phase and topic.

Present State of Thematic Research

Theme I – Exploration:

This background study is reasonably complete from the standpoint of tourist and recreation planning in relation to overview. The broad pattern has been clearly portrayed and major themes and phases identified. Topics require further research.

Theme II – The Fur Trade Era:

Possibly no more than 50% of the task has been completed with respect to this theme. Two courses of action appear to be open. A contract could be made with the Historical

Research Section of the National Historic Sites Service to complete the work required for this theme. The Northwest Territories Historical Advisory Board could assume responsibility for the work.

Theme III — The Whaling Era:

Nothing has been done to date on this important theme. With direction from Mr. A. Stevenson who is knowledgeable about this theme, responsibility for the task could be vested on either of the agencies noted in the discussion of Theme II above.

Theme IV — The Missionary Era:

Research has been confined to the Mackenzie Valley. Coverage of the remainder of the Northwest Territories is necessary. It is conceivable that this research could be most effectively completed through contact with church organizations who would direct officials to competent church historians. Modest financial assistance may be required.

Theme V — Scientific Resource Exploration:

This theme and the identification of significant sites can be best developed by the Federal government agencies involved in the work over the years. Some departments and agencies have already prepared histories of various types and the preparation of a synopsis suitable for tourist planning purposes would not involve much additional effort.

Three themes remain virtually untouched including:

Theme VI — Modern Economics and Industrial Development:

Theme VII — Frontier Government and Settlement Evolution:

Theme VIII — Recent Indigenous Cultural Evolution:

Responsibility in this case should rest with the Northwest Territories Historical Advisory Board.

The completion of the theme papers obviously involves considerable work that will stretch over several years. Possibly initial efforts should be confined to the completion of the Fur Trade, Whaling, Missionary and Scientific Exploration Themes.

Theme and Site Development Potentials

The Exploration Theme:

Three elements are associated with any consideration of development of this theme as a tourist and recreation asset.

Sites that are the scene of significant events on a particular expedition or set of explorations. These frequently take the form of landings, cairn markers and wintering quarters.

Artifacts that represent expendables left behind after a trip, including unused or partially used caches, abandoned gear or misplaced items.

Records that take the form of journals, maps and charts brought back to the home base of the expedition.

Several significant problems related to the development of the theme and its site and object elements as a tourist attraction require note.

A very high percentage of the significant and representative sites indicated on the map accompanying this report are in isolated locations. Of the 36 sites about 25 or 69% are situated in the Arctic Island Archipelago and only four are close to settlements with regular air connections. Those on the mainland are frequently close to settlements but there are several exceptions.

Many points of landing offer little more in the way of eye appeal than a cairn marker, cache, or perhaps a grave. Development of such sites would require expensive theme exhibits that cannot be justified on the basis of current tourist visitation.

Most of the records in the form of original charts, maps and journals are deposited in museums and archives outside the Territories. This seriously hampers the development of theme exhibits within the Northwest Territories.

The problem of the pillage of the artifacts of sites is a problem of major importance.

Development of the Exploration Theme for tourism and recreation purposes could take two major forms:

Theme exhibits could be placed in museums in central locations. Possibly an exhibit at airports or at points noted would be effective.

- Arctic Exploration — Frobisher or Resolute theme exhibits at a central museum in a government administration, building or airport.

- Mainland Exploration — Theme exhibit in Yellowknife museum.

Any theme exhibit should be supported by literature available for distribution to the tourist. Mimeographed material is satisfactory. The object is to produce informative text at minimum cost that cannot be obtained elsewhere. In effect, the distributive material has both souvenir and informative qualities.

Mimeographed material produced at modest cost could be prepared for specific sites or developed to support a historic tour as the need arises.

The Fur Trade Theme:

The following points are of significance for tourism and recreation.

The theme and its associated sites contain the most potential for development. There is sufficient depth to compensate for any lack of variety and a vital link with the economic and social history of the Northwest Territories is involved.

An energetic attempt to determine what remains of posts shown on the map is required and represents a first priority for action. Possibly the results of the work of the Northwest Territories Historical Advisory Board will be helpful in this instance.

In depth research should be undertaken on each site with archaeological investigations being essential.

Before any meaningful suggestions can be made in relation to the objectives of "Overview" the following steps are essential:

- Completion of the Fur Trade Theme Paper to cover the whole of the Northwest Territories;
- On site inspection of remains;
- Selection of one or two key sites for development;
- In-depth research on the sites with archaeological investigations;
- Preparation of site development plans;
- Site development.

On the basis of research completed to date it would appear that some of the best development prospects are to be found in the Slave Delta in the general vicinity of Fort Resolution. Five posts and forts were established here from the time of the independent traders through to the Hudson Bay Company and the modern era. There is considerable breadth and depth stretching over an 85 year period for fur trading in this area. In fact, the whole fur trade story of the Mackenzie drainage system could be exploited from here. Archaeological research would probably add depth and interest to the whole story.

At the moment this general area is off the main tourist route but there is road access to Fort Resolution. If a National Park were developed on the East Arm of Great Slave Lake and the main road access were to run north and east from Fort Smith, this historic area could be developed and operated as an outlier of the aforementioned National Park.

The Mission Theme:

The following points are noteworthy in regard to the mission theme.

The theme and its associated sites and objects occupy an important place in Territorial history. The influence of the missionaries upon social patterns was enormous.

The National Historic Site Board has a policy not to commemorate operating churches that will likely be continued in the Northwest Territories. Development of historic operating churches in a development program will, therefore, depend largely upon the churches themselves.

Abandoned structures should be suitably protected and marked.

Future Procedures

It is abundantly clear from preceding comment that the analysis of the tourist and recreation development potentials of the Northwest Territories is incomplete. It is impossible on the basis of present work to prepare a recro-tourist use capability classification or to suggest a really meaningful development program of a comprehensive nature. The historic sites situated close to settlements might be usefully exploited in the development of a total package of tourist attractions for such centres. Nothing more can be achieved at this point with the available information base.

The multiplicity of problems and procedures that lay ahead can be grouped under these general categories, namely, research, preservation and development. These are reviewed in summary fashion following initial comment with respect to the problem of administration.

The major justification for government interest in and public expenditure upon historical resources is to be found in the contribution that they make to the development of Canadian identity, unity and nationhood. Benefits accruing to tourism and leisure time activity are a secondary consideration. Fortunately, their exploitation is frequently compatible with primary government interests.

Throughout Canada, the primary or fundamental government administrative organization for historic research, preservation and development lies outside tourist bureaus and agencies and this holds true in the Northwest Territories. Within Territorial administration the primary impetus for achievement in this field rests with the Northwest Territories Historical Advisory Board and in the future, to a considerable extent, with the staff of any new territorial museum. At the federal level responsibility rests with the National Historic Sites Service. Presumably the bulk of the initiative for co-operation and co-ordination and the main exhortation for action will depend upon the efforts of the aforementioned federal and territorial groups.

In this situation, the Division of Tourism with its fundamental focus upon tourist and outdoor recreation and its interest in historic resources as an input to the attainment of policy and program objectives in these fields occupies a peculiar position. Essentially its role is one of alerting the historic agencies to tourist and recreation benefits to be derived from various courses of action and exhorting them to take the steps required for the attainment of these opportunities.

The urgent requirements of "Overview" and the particular set of administrative arrangements for historic site administration in the Territories forced the Division of Tourism to assume a research role that it may not repeat in the future. The direct contacting of work for historic research is a case in point. In the years ahead its operations in the research area will conceivably be of a less direct nature.

The problem of site and resource preservation and maintenance may, however, open up an area of new responsibilities for the Department of Industry and Development that could be placed within the Division of Tourism's administration. The Department has a substantial field staff throughout the Northwest Territories including regional tourist offices that could assume responsibilities for this work. The historic agencies do not have similar manpower resources. In effect, the department could be drawn into the historic field purely on the basis of administrative practicality.

Serious consideration should be given to placing the whole of the territorial historic site and museum administration clearly under the Department of Industry and Development. In this context the Division of Tourism would have a real opportunity to attain its objectives.

The greatest single problem of the moment confronting the Territories in relation to its historic resources from both the cultural heritage and the tourist development points of view is unquestionably the attainment of a reasonable federal government commitment to the Territories. The Territories simply do not possess the funds or technical expertise required for the tasks that lie ahead. Secondly, an effective mechanism for co-operative and co-ordinated action by federal and territorial agencies on a sustained basis must be evolved.

These requirements can only be met through the development of a master plan for action agreed upon by both levels of government.

From the standpoint of the needs of the Division of Tourism the following strategy for future action in relation to research, preservation and development seems appropriate.

Research Strategy:

Completion of Theme Papers:

A substantial number of background papers that identify and summarize the essential historical elements and patterns associated with the theme, sub-themes, phases and topics in a manner of use for tourist and recreation planning remain to be completed. Responsibilities for the execution of this research should rest with historic research agencies and in some cases government administrations, such as the Geological Survey of Canada. The responsibility of the Division of Tourism should be limited to the preparation of well supported requests to the appropriated agencies for the completion of the studies required, the provision of modest financial assistance of such proves necessary and above all the clear expression of the type of results needed. Possibly the needs of the Division of Tourism can be best presented to outside agencies by the Northwest Territories Historical Advisory Board.

It is clear that the Research Division of the National Historic Sites Service must play a key role in this research effort, completing much of the work and co-ordinating the inputs of other federal agencies. The aforementioned role of the Division of Tourism is based upon the premise that there will be an historic sites administration in the Territories capable of servicing the needs of the Division. If such is not the case, then the role of the Division must be more broad and dynamic.

It is important to note that this work cannot be accomplished overnight. One is tempted to state that the more significant themes should be tackled first and there is an element of truth in such a recommendation. On the other hand, progress will be dictated to a large extent by the availability of information and informed persons and agencies ready and willing to contribute. The latter aspect will probably dictate the course of research to a considerable extent.

The Identification and Mapping of Sites Related to Themes:

Data inputs will come from those preparing theme papers and the results of the Historic Resources Survey launched by the Northwest Territories Historical Advisory Board.

The Evaluation of Thematic Research and Site Mapping in Relation to Tourism and Recreation:

This work, which should be executed by the Division of Tourism, would represent an evaluation solely on the basis of documentary evidence. Concentrations of potential should become apparent and site significance emerge. The research will provide a guide to the identification of sites and areas requiring field inspection and archaeological research noted subsequently. There should be material available for the preparation of booklets for distribution to tourists and guidelines for the modest development of some sites in strategic locations. Finally, there should be a factual foundation for the assignement of federal and territorial responsibilities for preservation and development.

The Evaluation of Site Quality:

This will involve field inspection, a task that could be readily effected by the various field offices of the Department of Industry and Development.

Archaeological investigations conducted by federal agencies will probably be involved in many cases, particularly where development is desired.

Sites and Object Preservation:

The preservation of sites and the retention of the historic objects of the Northwest Territories is clearly the most pressing administrative problem of the moment. With increased economic activity in the north, particularly in mineral exploration, and to some extent tourist influx, the protection of buildings and objects is a major concern. The cost of an adequate program of protection is clearly beyond the financial capacity of the Territorial government. As a minimum the Federal government must assume responsibility for those things considered to be of national importance. This is simply part of the public costs of northern development. The mere enactment of general legislation and regulations will not suffice. Crucial site designation and enforcement of regulations are necessary. Probably the collection of key objects at central points for later use in development projects will be necessary.

The field staff of the Department of Industry and Development probably could be effectively integrated into a program for site and object preservation.

Site Development:

The current limited tourist and recreation activity volumes and future expectations clearly indicate that the extensive development costs, that assuredly will be involved cannot be balanced by economic benefits. In brief, the latent potentials of the historic resources cannot be marketed in sufficient quantities to yield dollar benefits commensurate with development and operating costs. Benefits however, must be considered in broader terms than tourism and recreation for, as stated previously, a significant portion of the cultural heritage is at stake.

The best development opportunities in a cost benefit evaluation related to tourism are in the larger communities and nodal communication points. In many cases, museum development with thematic displays seems the logical course of action to adopt. In other cases markers, monuments and site displays, involving modest capital and operating budgets, seem feasible.

In accordance with stipulated policy statements of the National Historic Sites Service many of the historic resources of the Territories could be designated as being of national significance. Such sites form part of the national heritage and hence their preservation and development is clearly a federal responsibility. In effect, the Territories should not and must not attempt to handle everything. It is equally obvious, however, that there are sites of mainly territorial significance. The development of these could be handled by the Territorial government.

Research by the Northwest Territories Historical Advisory Board

The Historical Advisory Board is collecting information on the location, character and quality of the historic sites in the Territories through a questionnaire procedure. Members of the Board have been charged with the responsibility for the completion of the questionnaire

for various parts of the Territories with which they are familiar.

The theme organization to which the site and object recording is tied differs from that employed in the study of the tourist and recreational potential of the archaeological resources of the Territories, being much less detailed.

Theme Organization:

A. Prehistory

1. Indian Cultures
2. Eskimo Cultures

B. History

1. Search for the Northwest Passage
2. Fur Trade Era
3. Missionary Era
4. Whaling Era
5. Exploration of Mineral Resources
6. Evolution of Northern Transportation
7. Frontier Government and Evolution of Settlements (includes R.C.M.P.)
8. Recent Indian Cultures
9. Recent Eskimo Cultures

It will be seen that the above schemata contains several themes or sub-themes that have value in relation to tourist and recreation planning. These include the whaling era and those related to mineral exploration and frontier government.

5.6 THE DEVELOPMENT OF A TOURIST AND RECREATION NUISANCE CLASSIFICATION FOR INSECTS IN THE NORTHWEST TERRITORIES

This section considers the nuisance factor of mosquitoes, black flies and tabanids and in particular their distribution, intensity and duration. The section focuses on the limitations of insects for tourism and recreation. However, on the other hand, the life cycles, habits and colouration of many insects are also of major interest to both amateur and professional entomologists. Specialized tours by those interested in insects might be developed in the Territories and a publication on insects of the Territories, designed to stimulate interest, would be useful.

Overlay Analysis [1]

An examination of a series of overlay maps including the distribution of nuisance intensity by zones for each insect immediately revealed three major situations. An area with no insects is present in the northern Arctic Archipelago. There is a broad area to the south and east in which the nuisance factor was minor and local. To the south of the tree line moderate widespread to locally severe conditions generally prevailed with all insect pests being present. These situations formed the basis of the major area divisions, A, B and C respectively, shown on the map.

Within Areas B and C there were differences of secondary nature based on the number of insect groups present and the intensity and extent of the nuisance. These characteristics formed the basis of the zonal divisions. The higher the zonal number the more significant the nuisance factor.

The foregoing process that established the essential framework for the classification of the intensity and extent of the nuisance factor for insects considered in combination is essentially qualitative in nature.

Point Rating

An attempt was made to provide some quantitative expression of the situation with the use of a point rating system that recognized the number of pest groups in the zones, and the intensity and geographic extent of the nuisance. The point rating adopted can be summarized as follows.

NUISANCE POINT RATING

Intensity Scale	Points	Extent Scale	Points
No Nuisance =	0	Local =	1
Minor Nuisance =	2	Widespread =	2
Moderate Nuisance =	4		
Severe Nuisance =	6		

An insect with a widespread severe nuisance as in the case of blackflies in Area C, Zone III, located in the Slave River Valley would be accorded 8 points (severe 6 + widespread 2 = 8). Mosquitoes and blackflies in Area B, Zone II, would each receive 3 points (minor 2 + local 1 = 3). In the case where an insect was a widespread moderate and a locally severe nuisance, for example the mosquito in Area C, Zone I, that includes Hay River and

[1] See Map in Volume 2.

Yellowknife, calculations for each intensity/extent condition were made added together, and the sum divided by two. [(Moderate 4 + widespread 2) + severe 6 + local 1] ÷ 2 = 6.5.

The results of the process also are indicated in the following summary schemata of classification. The assignment of points to the various descriptive terms for intensity and extent of nuisance is arbitrary. The main value of the operation lies in the fact that it provides some basis for the differentiation of conditions in the zones that is of greatest advantage in the case of Area C where several combinations occur.

Intensity and Seasonal Timing

The intensity and time distribution of the nuisance factor by individual insect groups are shown in Figure 5.3. Some additional aspects are shown including times for mosquitoes by Area and Zone on the basis of data contained in the climatic study prepared by the Meteorological Branch and the period of maximum insect nuisance. There are several interesting aspects to note.

The maximum intensity ratings with a scale of 4 are greatest for mosquitoes. Those for tabanids and blackflies are slightly below 3 or slightly less than 75%.

The period of maximum insect pest nuisance for all areas and regions seems to occur during a three-week period from about mid-July to the end of the first week in August. At this time all three insect groups are at their height in terms of their nuisance impact.

The nuisance factor tapers sharply for mosquitoes and tabanids after the end of the first week in August and particularly after the middle of that month. The blackfly nuisance is somewhat more prolonged.

The pattern in June and the first half of July prior to the period of maximum combined nuisance is of interest. The nuisance factor for both tabanids and blackflies builds up rapidly in a short period from the first week in July to mid-July. Probably the period of maximum nuisance for these insects can be applied to all points in the Northwest Territories with reasonable accuracy.

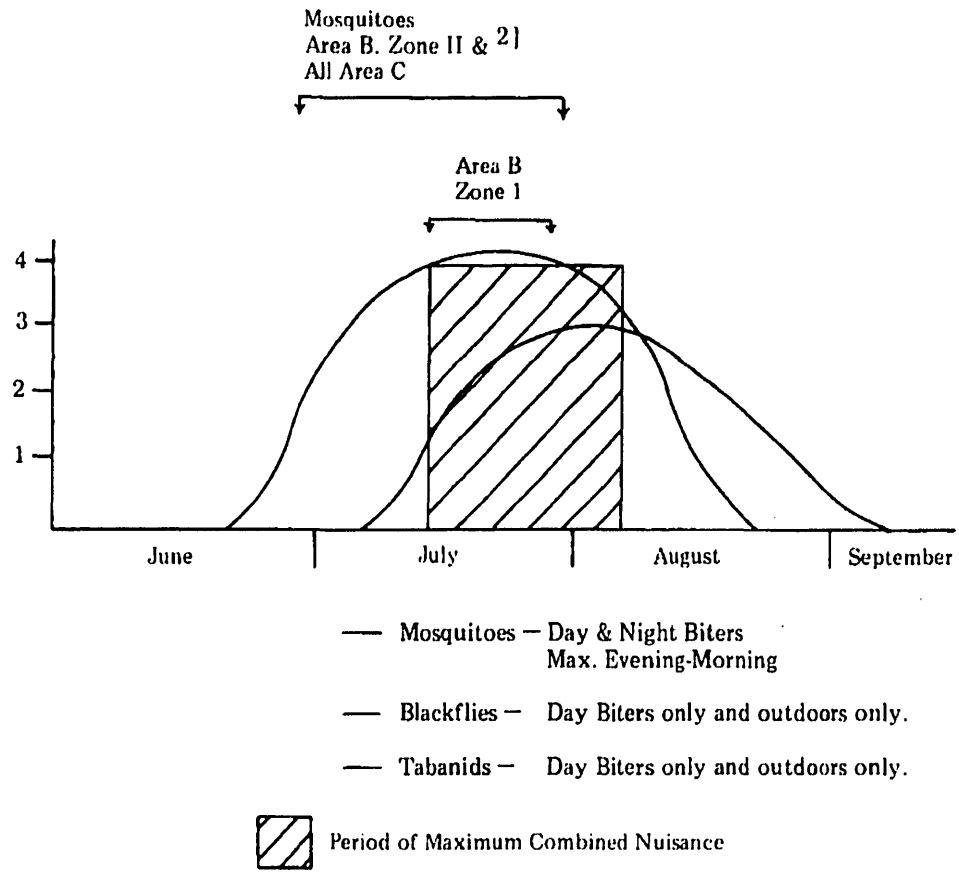
The rapid build-up for mosquitoes in late June and early July to a maximum nuisance intensity stretching from early July to about August 10th cannot be applied to all areas of the Northwest Territories in which the insect group is found. Mosquitoes in Area B are a local nuisance only in July. The insect does not reach its maximum nuisance potential until about two weeks after snow-melt. Using this fact in combination with climatic data suggests that the duration of intensity of nuisance varies considerably in Zones I and II of Area B. In the more northerly Zone I, it probably extends only over about three weeks, from mid-July to the end of the first week in August. In Area B, Zone II, it probably extends throughout, or nearly throughout, the period indicated by the curve. This is almost certainly the case throughout Area C.

Daily Rhythm and Indoor and Outdoor Aspects

It should be noted that there is considerable variation in the biting habits of the insect groups that is of significance for tourism and recreation. The pattern is briefly summarized as follows.

FIGURE 5.3

THE SEASONAL DISTRIBUTION AND INTENSITY
OF THE INSECT NUISANCE 1]



1] Based on data presented by J.A. Downes. Average or normal times are indicated and there may be a range of two weeks in the beginning and ending times in years with abnormal weather conditions.

2] Area and Zone designations are those presented in the combined insect nuisance map and not the Zones presented by J.A. Downes.

INSECT GROUPS	BITING CHARACTERISTICS	
	Diurnal	Indoor/Outdoor
Mosquitoes	Day & Night Max. early morning and evening	Both indoors and outdoors
Blackflies	Day only — especially afternoon and early evening	Outdoors only
Tabanids	Day only — mainly in sunshine	Outdoors only

Two of the pest groups, namely blackflies and tabanids, bite only outdoors. Although they may occasionally wander indoors, they do not bite in these surroundings. Secondly, they do not bite in the dark hours. The nuisance handicap, therefore, is focused upon outdoor day activity. This is an extremely important feature to note for it substantially reduces adverse effects. Secondly, the nuisance intensity varies greatly throughout the day. In the case of blackflies, it peaks in the afternoon and early evening, and only on sunny days in the case of tabanids. Therefore, there are some periods of relative relief from intensive biting in daylight hours.

The most pervasive nuisance factor is associated with the mosquitoes. They bite day and night and both indoors and outdoors with maximum intensity occurring in the early morning and evening. These biting patterns coupled with widespread distribution suggest that the mosquito probably exerts the greatest overall detrimental impact upon the tourist recreation experience of any insect group including blackflies that admittedly are an overwhelming nuisance in some places.

The Significance of the Nuisance for Tourism and Recreation

It is now necessary to confront the problem of interpreting the foregoing data analysis in terms of its significance for tourism and recreation. In effect, the classification system defined in terms of natural entomological features must be translated into tourist and recreation terms that have meaning for policy and program planning.

A few introductory general comparative observations are of value at this juncture. They help to establish a background frame of reference for the problem under consideration.

Admitted the insect nuisance represents a handicap of some significance to tourism and recreation and severe problems are present in certain areas each season. However, a consideration of the situation from the perspective of the Territories as a whole and in comparison with northern Canada environments indicate that the Territories are not in a comparatively disadvantaged position. Indeed, there are many encouraging aspects to be noted.

A large portion of the Territories from the tree line northward presents no insect problem or only a minor local problem related to one or two insect groups. Moreover, the problem extends over a relatively short period of time. Below the tree line the nuisance problem is only moderate over most areas with severe conditions being only of a local nature.

Insect nuisance is a feature of most northern Canadian environments. The blackfly pest reaches far greater overall nuisance intensity in the heart of the Boreal Forest to the south. In comparison, general conditions in the Territories below the treeline for this insect are noticeably better.

The detrimental impact of the insect nuisance is in a large part governed by the range of tourist and recreation activities for which other environmental factors, such as water, terrain and climate, make the Territories suitable. Beach activities, including sunbathing and swimming, are severely handicapped by insect pests due to body exposure. This is a range of activities, however, for which the resource base of the Territories is weak, particularly from a tourist standpoint. Most tourist and recreation activity pursuits for which the Territories are suited can be engaged in with sufficient protective clothing to reduce insect nuisance within reasonable limits. Indeed, the climate frequently necessitates substantial clothing.

Many activities suited to the Territories require considerable exertion, or are carried out on open waters where breezes disperse insects. Sport angling is a case in point.

Indoors the insect nuisance is markedly reduced as noted previously. Here, mosquitoes can be kept in check with insecticides.

As stated at the outset, the tourist and recreationist knows before entering the area that insects are a nuisance in northern environments. In effect, he has an image expectation of the condition. It is a part of a northern outdoor experience in the summer season. The Territories are certainly no worse off in this respect than all northern Canada and in some respects, as noted, conditions are noticeably more favourable.

It is against the general set of background conditions that the classification of the nuisance factor in tourist and recreation terms has been formulated. The final evaluation is clearly indicated in Table 5.33.

TABLE 5.33

A TOURIST AND RECREATION CLASSIFICATION OF THE INSECT NUISANCE FACTOR IN THE NORTHWEST TERRITORIES

					Point Rating
Area A.	—	No Nuisance — No Tourist and Recreation Limitations			0
Area B.	—	Limited Local Nuisance — No Important Tourist and Recreation Handicaps.			
	Zone I	— Mosquitoes	— July 15th - early August		3
	Zone II	— Mosquitoes	— July only	3	6
		— Blackflies		3	
Area C.	—	Widespread moderate to locally severe nuisance — No general inhibiting effect but severely limiting in specific locations for part of summer season.			
	Zone I	— Mosquitoes	— Widespread moderate and locally severe nuisance	6.5	
		— Blackflies	— Widespread moderate nuisance	6	17.5
		— Tabanids	— locally severe	5	
	Zone II	— Mosquitoes	— Widespread moderate and locally severe nuisance	6.5	
		— Blackflies	— Widespread moderate nuisance	6	
		— Tabanids	— Widespread moderate and locally severe nuisance	6.5	19
	Zone III	— Mosquitoes	— Widespread moderate and locally severe nuisance	6.5	
		— Blackflies	— Widespread severe nuiasnce	8	19.5
		— Tabanids	— Moderate local nuisance	5	

5.7 A PRELIMINARY EVALUATION OF TOURIST AND RECREATIONAL POTENTIALS ASSOCIATED WITH THE ORNITHOLOGICAL RESOURCES OF THE N.W.T. (1)

Much of the data in this section has been extracted from the Arctic Ecology Map Series prepared for the Canadian Wildlife Service. The purpose of the series is to identify and map important and critical wildlife areas in the Northwest and Yukon Territories which could be adversely affected or even destroyed by human activities.

The series is based upon an analysis of published reports and other documentation, together with interview procedures. The primary application of the series is as a planning tool for government and industry.

In the consideration of tourist and recreational values, attention has been directed exclusively to the non-consumptive use of the resource. Hunting (or sport shooting) as a consumptive use has not been taken into consideration. Tourist and recreation values are considered solely in terms of observation. In this report, birds are considered as an added attraction for a general landscape tour or as a basis for a specialized tour.

Migratory Bird Sanctuaries

There are thirteen of these sanctuaries in the N.W.T. The individual areas, year of establishment, approximate area and major purpose are summarized in Table 5.34.

Total area involved in the fifteen sanctuaries is estimated to be 39,272 square miles. The estimates of 1,000 square miles for the Bylot and Akimiski Islands are rough approximations made in an attempt to fill gaps in the data provided by the Canadian Wildlife Service.

It is important to note that all migratory bird sanctuaries are under federal jurisdiction. In general, they have been established to protect the nesting grounds of waterfowl. Cape Parry, established to protect a small colony of Murres nesting on the face of the cliffs, represents a notable exception.

"Movement in and around the sanctuaries is restricted during the breeding seasons and the birds should not be disturbed at that time. Viewers are more likely to see spectacles during the migrations of the birds in southern Canada. For example, greater snow geese may be seen at Cap Tourmente, Quebec, during the spring and fall migrations, rather than at their nesting grounds in the Arctic." 2]

The foregoing comment from the Director of the Canadian Wildlife Service is of major significance in the consideration of tourist and recreation potentials associated with migratory bird sanctuaries. Tourist and recreation movement in the area is categorically stated as incompatible with the reproduction of the various bird species during the breeding period. Secondly, and a major consequence, more spectacular aggregations of the species are sometimes present in southern Canada during the migration season and obviously may be seen by those interested in birds at much less cost. In effect, the bird sanctuaries are of major consequence in terms of the perpetuation of species, but of less value in terms of tourist and recreation potential.

1] See also Map in Volume 2.

2] Comments from letter dated July 5, 1971, J.S. Tener, Director, Canadian Wildlife Service to W.M. Baker, Park, Recreation and Tourist Planning Consultant.

TABLE 5.34

MIGRATORY BIRD SANCTUARIES IN THE NORTHWEST TERRITORIES

Sanctuary	Year of Establishment	Area of Sq. Mi.	Purpose
Akimiski Island	1941	1,000 est. * island and 5 mile strip below high water line	Breeding area for ducks and geese.
Dewey Soper	1957	3,150	Protection for blue and snow geese colonies.
Cape Dorset	1958	100	Protection of eider duck colonies.
Harry Gibbons	1959	575	Breeding grounds for snow and blue geese, brant and eiders.
East Bay	1959	450	Breeding grounds for snow and blue geese, brant and eiders.
McConnell River	1959	127	Breeding grounds for blue lesser snow, Canada and white-fronted geese.
Kendall Island	1961	234	Nesting area for ducks, snow geese, whistling swans, black brant and white-fronted geese.
Anderson River	1961	418	Nesting area for ducks, snow geese, whistling swans, black brant and white-fronted geese.
Cape Parry	1961	1	Protects small colony of murres nesting on face of cliffs.
Queen Maud Gulf	1961	24,240	Nesting ground for largest variety of geese, 95% of world's population of Ross's geese.
Banks Island No. 1	1961	7,922	Snow geese, black brant, king eiders.
Banks Island No. 2	1961	55	Snow geese, black brant, king eiders.
Bylot Island	1965	1,000 (Est.)*	Breeding ground of snow geese.
		39,272	

*Estimated

There is no doubt that there are substantial interesting assemblages of breeding birds in these sanctuaries during the summer months. Unquestionably, anyone interested in ornithology would feel that a trip was worthwhile to observe these birds in their northern range. The problem is simply one of accommodating tours within the constraints set by the need for privacy during the breeding season. The tourist and recreational potentials associated with many of the seabirds, noted in a subsequent section of this report, do not seem to be so seriously restricted.

It is important to note that all Game Preserves and National Parks have significant values for bird populations. A classic example is the Whooping Crane nesting area in Wood Buffalo National Park. This species is in such an endangered state, however, that it possesses no tourist and recreational development potential at the present time. Its nesting and summering grounds cannot be disturbed by visitors.

Important and Critical Areas for Seabirds, Waterfowl and Rare and Endangered Species

Information extracted from the Arctic Ecology Map Series is summarized in the directory of areas presented in this portion of the report. An examination of the directory indicates the limits of the factual information that could be drawn from the map series. In some cases the identification of an area is simply representative of the siting of a particular species. In other situations the species is noted as nesting in the area, but the number of birds present is unknown. Where considerable investigation has been carried out, particularly in the bird sanctuaries, estimates of numbers are given with reasonable regularity.

Directory of Areas for Seabirds, Waterfowl and Falcons:

Seabirds

Thick-Billed Murres:

This species occurs in the Arctic Marine Zone of Europe, Asia and North America. The normal range generally extends no farther south than the 5°C isotherm for August. The birds will remain all year where open waters are present, but many migrate south to Labrador and Newfoundland when waters around their nesting colonies freeze over. In the summer months there may be five million birds in the Eastern Canadian Arctic and another five million along the west coast of Greenland.

- Cobourg Island — most northerly colony in the Canadian Arctic — 40,000 birds or more in summer.
- Prince Leopold Island — 350,000 birds observed nesting on the Island.
- Griffith Island — northwest Barrow Strait — colonies reported.
- Limestone Island — southwest Barrow Strait — concentrations reported here.
- Bylot Island — Maud Bight — 1 million birds including 400,000 breeding pairs.
- Bylot Island — mid-east coast — colonies reported.
- Bylot Island — Cape Graham Moore — 40,000 birds.
- Nova Zembla Island — northeast Baffin Island shore — colonies reported.
- Scott Island — colonies suspected.
- Loks Land — colonies present.
- Resolution Island — possible colonies near Cape Bluff.
- Akpatok Island — north shore — 900,000 birds.
- Akpatok Island — south shore — 300,000 birds — most southerly limit of colonies.
- Digges Island — not less than 2 million or more than 3 million birds here.
- Coats Island — several nesting colonies in vicinity of Cape Pembroke — colonies of 10,000 to 20,000 birds.
- Cape Parry — only authenticated breeding area in Western Arctic Islands — 100 pairs.

Fulmars:

This is a bird of the northern oceans and except when nesting is found in open water beyond 100 fathom depths. Breeds on steep slopes or cliffs overlooking the ocean.

- Prince Leopold Island – 150,000 birds.
- Nova Zembla Island off Baffin Island – colonies here.
- Cape Vera, Colin Archer Peninsula.
- Limestone Island – reported here.
- Cumberland Peninsula – islands off coast – not shown in Arctic Ecology Series – breeds here in large colonies.

Kittiwakes:

Breeds in enormous numbers throughout the arctic coasts and in sub-arctic coasts. Nests in large colonies in high cliffs.

- Houston Stewart Island off Northwest of Cornwallis Island – colonies here.
- Prince Leopold Island – 18,000 birds observed.
- Bylot Island – east shore – colonies.
- Resolution Island – colony observed.
- Button Island – colony observed.
- Limestone Island – nest here.

Razor-Billed Auks:

A bird of coastal waters but seldom seen near shore except when breeding. Nests on cliffs and among rocks and boulders with other birds. The birds winter south as far as Long Island.

- Loks Land – breeding colony.

Black Guillemots:

It is an all year resident as long as a small patch of open water is present for feeding, and remains close to nesting areas.

- Prince Leopold Island – 4,000 birds nest here.
- Limestone Island – nest here.
- Marble Island – 2,000-3,000 population.

Ivory Gull:

These birds nest in small colonies on bare or open ground or rock and sometimes on lower cliff edges. The bird breeds in the High Arctic north of Melville Island and on North Baffin Island. In winter, it moves to the edges of the pack ice.

- Meighen Island – seen here 1958, but no breeding area found.

Arctic Terns:

It is an abundant tern of the north in summer where it nests in large colonies. It winters in oceans south of the Equator and many probably reach Antarctica.

- Great Bear Lake — a major breeding area for Arctic Terns.
- Franklin and Darnley Bays — major breeding areas for Arctic Terns.

General Concentrations:

- Cornwallis Island — important nesting area for seabirds.
- De la Roque Island and west coast of Somerset Island — important nesting area.

Waterfowl

Lesser Snow Goose:

It is probably the most abundant goose in North America. The bird seldom mixes with other geese except their close relative the Blue Goose and the rarer Ross's Goose. It breeds in the northern Arctic shore areas and winters in the south.

- West shore, Hudson Bay, Eskimo Point to Thlewiaza River — including McConnell Migratory Bird Sanctuary — important and critical breeding area — 100,000 birds — used June 1 to September 15 — a breeding and staging area.
- Cory Bay, Baffin Island — 5,000 nesting birds — critical area.
- Dewey Soper Sanctuary.
- Harry Gibbons Sanctuary — Snow and Blue Geese — 45,000 nesting and molting breeds.
- East Bay Sanctuary — Snow and Blue Geese — 25,000 nesting and molting.
- Bernier Bay — breeding colony of 40,000 + Greater Snow Geese — critical area for breeding upper end of bay and river mouth.
- Erebus Bay — 300 + nesting.
- Southeast Victoria Island — nesting.
- Queen Maud Gulf Sanctuary — thousands breed here — major area.
- South Darnley Bay — spring migration stop.
- Banks Island, Egg River — 30,000 to 100,000 — a major area for non-breeding birds on Kellett and Lennie rivers.
- Banks Island, Big River — 75,000 breeding pairs.
- Kendall Island Sanctuary offshore — 130,000 geese of all types here — fall staging and molting area.
- Pitt and Oliver Island Delta Region — fall staging area — 30,000 waterfowl here.
- Delta area — spring staging area — 75,000 birds — May 1 to June 10.
- Mackenzie Valley — migration and staging area — primarily in fall.

Blue Goose:

The bird breeds in South Baffin and Southampton Islands in particular, and winters in Louisiana.

- Dewey Soper Bird Sanctuary — 50,000 nest here — largest colony in North America.
- Harry Gibbons Sanctuary — Snow and Blue Geese nesting and molting — 45,000.
- East Bay Sanctuary — Blue and Snow Geese nesting and molting.
- Erebus Bay — 1,000 Blue and Snow Geese nesting.
- Southeast Victoria Island — nest here.

Ross's Goose:

This bird has been reduced in numbers to the point where it needs close protection — breeds in loose colonies in the tundra and mainly in Queen Maud Gulf Sanctuary. It

migrates southwest across Great Slave Lake to winter in the Central Valley of California.

- Queen Maud Gulf Sanctuary – Perry River District – only breeds here – winters in California – unique.

Canada Goose:

- West Shore Hudson Bay – Eskimo Point to Thlewiaza River including McConnell Sanctuary – used May 1 to September 15 – a breeding and staging area.
- Eskimo Point to Tavani – 5,000 birds.
- Lake Harbour (Baffin Island) – 400 nesting Canada Geese.
- Dewey Soper Sanctuary – 50,000 birds.
- Harry Gibbons Sanctuary – 1,000 birds.
- East Bay Sanctuary – some.
- Erebus Bay – 1,000 birds – plus or minus – nesting.
- Jenny Lind Island – nest here.
- Albert Edward Bay, Victoria Island – nest here.
- Queen Maud Gulf Sanctuary – in thousands, major breeding area – molt on shore of gulf – especially Campbell Bay to Atkinson Point.
- South end of Liverpool Bay – critical concentration area.
- Mason Valley – molting area.

Black Brant Goose:

Two populations are present in the Arctic, namely the Pacific and Atlantic Black Brant Goose. The separating line is somewhere to the east and west of Queen Maud Gulf with both populations perhaps appearing in the Sanctuary immediately to the south.

- Dewey Soper Sanctuary.
- Harry Gibbons Sanctuary – 5,000 birds.
- East Bay – 4,000 birds.
- Van Koenig Point Bernier Bay – 200 +.
- Philpots Island – off east coast of Devon Island – important breeding area.
- Matty Island – James Ross Strait – nest in small numbers.
- Erebus Bay – 2,000 + birds.
- Southwest Victoria Island – nest here.
- Albert Edward Bay – Victoria Island – nest here – likely Pacific variety.
- Victoria Island north shore Dease Strait – nest in 3 areas – Wellington Bay – Byron River mouth.
- Queen Maud Gulf Sanctuary – breed – molt here – important area.
- Mouth Kagloryuak River – east end of Prince Albert Sound – large number nesting area.
- Upper Hadley Bay – Victoria Island – nest and molt.
- South Darnley Bay – 250 pairs nesting.
- Banks Island – 5,000 nesting pairs.
- Liverpool Bay – south end lakes – critical concentration point.
- Mason Valley – molting area.
- McKinley Bay area – critical nesting area.
- Kendall Island Sanctuary – molt and staging area.
- Pitt and Oliver Island Delta Region – fall staging area – some molting – May 1 to June 10.
- Anderson Sanctuary – 1,000 breeding pairs – 3,000 birds at molt.

White-Fronted Goose:

These birds nest in the open tundra and also on upland and mountain slopes near water. Winter in Louisiana and Texas.

- West Shore Hudson Bay Eskimo Point to Thlewiaza River, including McConnell Sanctuary — breeding and staging area — May 1 to September 15.
- Rasmussen Basin — spring staging area.
- Erebus Bay — 100 + nesting.
- Queen Maud Gulf Sanctuary — thousands breeding — major area 10,000 nest and molt here — May 25 to August 10.
- Harrowby Bay — 700 +.
- Southend Liverpool Bay — lakes — critical concentration area.
- Mason Valley — molting area.
- McKinley Bay — critical nesting area.
- Kendall Island Sanctuary — molting and staging area.
- Pitt and Oliver Islands Delta Region — fall staging — some molting.
- Delta Area — spring staging — 20,000 birds.
- Mackenzie Valley — migration and staging area — May 1 to September 1.
- Anderson Sanctuary — 1,000 breeding pairs — 5,000 at molt.

Whistling Swan:

- West Coast of Hudson Bay, Eskimo Point to Thlewiaza River, including McConnell Sanctuary — breeding and staging area.
- Jenny Lind Island — nest here.
- Queen Maud Gulf Sanctuary — 300 here — important breeding area.
- South Darnley Bay — 50 pairs nesting.
- Harrowby Bay — 200 + molting area.
- Southend of Liverpool Bay — critical concentration area.
- Mason Valley — molting area.
- Kendall Island Sanctuary — 40 breeding pairs.
- Delta Area — spring staging — 12,000 birds.
- Mackenzie Valley — migration and staging area — September 1-30.
- Anderson Sanctuary — 300 breeding pairs — 900 + birds at molt — used May 25 to August 15 — extremely critical area.

Sandhill Crane:

- Queen Maud Gulf Sanctuary — important breeding area — 1,000 birds.
- Banks Island — 250 nesting pairs — May 25 to July 15.

Eider Ducks:

- Winter on Button and Knight Islands — critical area — 10,000-20,000 birds.
- Meta Incognita Peninsula — Hudson Strait east of Lake Harbour — critical breeding area.
- Nest in Islands of Frobisher Bay — Barrow Peninsula.
- East Bay Sanctuary — some.
- Cape Dorset Sanctuary — breeding area 5,000 — Okolli Island — basis of Cape Dorset Eider Industry.
- Queen Maud Gulf Sanctuary — King Eider nest and molt here — 8,000.
- Dolphin and Union Straits — eastern end — Common or Pacific Eider — colonies common.

- Prince Albert Strait – north side – migration route May 25-June 25.
- Mouth Kagloryuak River east end of Prince Albert Sound – large numbers nesting.
- South Darnley Bay – 500 pairs nesting.
- Banks Island, Bernard River – 150,000 King Eider – breeding area.
- Hutchinson Bay, Cape Dalhousie – Common and King Eider – one million birds in migration – 600,000 in molt also Old Squaw, Scoter and Scoup Ducks.

Old Squaw Ducks:

- East Bay Sanctuary.
- Queen Maud Gulf Sanctuary – important breeding area – 12,000 birds.

Rare and Endangered Species

Peregrines:

- Thelon Sanctuary – north margin Baillie and Back Rivers – critical nesting area.
- Marjorie Hills East of Thelon Sanctuary.
- Thelon River/Aberdeen Lake to Baker Lake.
- Southwest Baker Lake.
- Head Minto Inlet – Victoria Island – seen here.
- Melville Island – Southwest Hecla and Griper Bay – nesting here – critical.
- Melville Island south shore Dundas Peninsula – critical nesting area.
- Southampton Island – critical nesting area.
- Cape Dorset – nesting – one pair of Peregrines or Gyrfalcons every 10 miles of suitable shore.

Gyrfalcons:

- Peacock Hills and Conway to Lake area – critical nesting area.
- Thelon Sanctuary – Baillie and Back Rivers – critical nesting.
- Marjorie Hills Thelon Sanctuary.
- Thelon River and Aberdeen Lake to Baker Lake.
- Southwest Baker Lake.
- Cape Dorset – nesting – one pair Peregrines or Gyrfalcons every 10 miles of suitable shore.

A Tourist and Recreation Area Classification for Non-Consumptive Uses

Two types of areas are identified. Firstly, there are those areas that possess extremely strong resources that would undoubtedly form a significant component of a specialized ornithological tour in the Territories. Secondly there are those areas that possess resources capable of making a significant contribution to the satisfaction of a more general landscape tour.

Area 1 – The McConnell Game Sanctuary – Organization Centre Eskimo Point:

All resources in this area can be readily exploited from Eskimo Point and could represent a significant added attraction to a landscape tour focused in part or entirely on this community and its surrounding area. For some ornithological tours of specialized nature, the McConnell Bird Sanctuary could be of sufficient interest to be included as a particular stop. The resources of this area can be duplicated at other points, but the

accessibility factor for the McConnell Sanctuary relative to Eskimo Point as an organizational centre is extremely favourable. This could enhance its attractivity as a stop in a specialized tour.

While there are bird concentrations, and particularly Canada Geese, to the north of Eskimo Point, the major resources of this area are associated with the McConnell Bird Sanctuary. From ornithological standpoint its concentrations of Snow Geese, which reach 100,000 birds, are perhaps its most significant attraction. This is a major breeding and staging area for this species, that is present from about June 1st to September 15th. Canada Geese are present in fairly abundant numbers and also to the north of Eskimo Point there being about 5,000 birds between this centre and Tavani. The Sanctuary is a significant breeding and staging area for White-fronted Geese from May 1st to September 15th.

Area II — Southampton Island — Organization Centre Coral Harbour:

This is a strong concentration area for waterfowl in the Arctic. Colonies of Murres are present on Coats Island. Digges Island, which is situated some distance outside the area, contains the best Murre colonies in the entire North American Arctic region. There are not less than 2,000,000 and perhaps as many as 3,000,000 birds on Digges Island and surrounding mainland during the summer season. It lies some distance from Coral Harbour, the organization centre for Area II. The quality of the resource, is so high that a visit to this site would be imperative for any special ornithological group. Snow and Blue Geese are abundant in the Harry Gibbons Sanctuary.

Area III — Dewey Soper Bird Sanctuary Organization Centres — Cape Dorset — Frobisher Bay:

This area contains significant ornithological resources but poses some difficulties from the standpoint of access from a major organizational centre. Area III, has the resources required to represent a significant component of a specialized ornithological tour of the Northwest Territories.

The Dewey Soper Bird Sanctuary contains the largest colony of nesting Blue Geese in North America. About 50,000 birds nest here during the summer season. Snow Geese are also abundant in this sanctuary. There are about 50,000 Canada Geese present, which represents a significant concentration. The sanctuary is also an important nesting area for Atlantic Black Brant Geese.

Area IV — Bylot Island Bird Sanctuary — Organization Centre Pond Inlet:

This area contains some significant seabird resources, and all are fairly readily exploitable from Pond Inlet.

The Murre colonies on the cliffs of Maud Bight at the north end of Bylot Island represents the outstanding ornithological resource of this area. There are probably one million birds present each year and 400,000 breeding pairs. Secondary Murre concentrations of less significance are found at the mid-point on the north-east shore of Bylot Island and on Cape Graham Moore where there are about 40,000 birds. There are important colonies of Kittiwakes on the north-east shore of Bylot Island.

Area V — North Shore Somerset Island — Organization Centre Resolute:

Area V, and in particular Prince Leopold Island (off the north-east extremity of Somerset Island) and Limestone Island (off the north-west extremity of Somerset Island) contain high quality seabird resources.

Area V, particularly Prince Leopold Island, has the necessary resources to function as an integral component of any specialized ornithological tour, especially in the High Arctic, with the focus on seabirds. Access obviously presents some difficulties in this instance with Resolute being the closest organizational centre. A boat trip across the Barrow Straits would be necessary for a large group. Plane travel would be possible for smaller parties.

About 350,000 Murres were observed nesting at Prince Leopold Island, which represents a major concentration for Northwest Territories. Concentrations of this species have been reported on Limestone Island, but no precise number is available. Prince Leopold Island supports an outstanding grouping of Kittiwakes, about 18,000 birds being present. This species also nests on Limestone Island. There are about 150,000 Fulmars on Prince Leopold Island and this species is also reported to be present on Limestone Island. There are about 4,000 black Guillemots on Prince Leopold Island, and the bird also nests on Limestone Island.

Colonies of Murres have been reported on Griffith Island. The whole of Cornwallis Island is reported in the Ecology Map Series as an important nesting area for seabirds.

Area VI — Bays and Islands of Victoria Strait — Organization Centre Cambridge Bay:

There are wide variety of seabirds on the islands and bays on either side of Victoria Strait. The area includes roughly the shorelines of the south-east portion of Victoria Island and the northwest portion of King William Island. Cambridge Bay is the organization centre for exploitation of this resource.

In general the bird population of this area can be considered to represent a support resource for a general landscape tour rather than the focus for a specialized ornithological tour. A wide variety of waterfowl species is present but no outstanding concentrations from a Territory-wide perspective appear to be present.

Area VII — Queen Maud Gulf Bird Sanctuary:

This area, because of its somewhat remote location from organizational centres, is difficult to exploit. Cambridge Bay appears a logical point of introductory access by plane.

This is the sole breeding area of the Ross's Goose, giving comparative advantage to the Northwest Territories with respect to this species. The Sanctuary is a major breeding and molting area for Canada Geese, and particularly that portion of the shore from Campbell Bay to Atkinson Point where major concentrations of this species are present. Blue Geese molt and breed here, the sanctuary being an important area for this species. Thousands of breeding White-fronted Geese are present annually. Probably 10,000 birds nest and molt between May 25th and August 10th. The area is also a major location for Snow Geese, with thousands breeding annually. About 300 Whistling Swans come here in the summer months as do about a thousand Sandhill Cranes, also Old-Squaw Ducks are extremely abundant, with about 12,000 birds in the area annually. About 8,000 King Eider Ducks nest and molt within the sanctuary.

Area VIII — The Banks Island Bird Sanctuary — Organization Centre Sachs Harbour:

This area has the necessary ornithological foundations to represent a focal point for a specialized tour. Its resources are also capable of extremely strong support in the general landscape tour that includes Sachs Harbour and Banks Island in its itinerary.

The Egg and Big River portions of the Banks Island Bird Sanctuary No. 1 support marked concentrations of Lesser Snow Geese. About 75,000 breeding pairs are present on Big River and 30,000 to 100,000 birds on the Egg River. It is the Lesser Snow Geese that perhaps represents the major ornithological asset of the area. There is about 5,000 nesting pairs of Pacific Black Brant Geese here. About 150,000 King Eider Ducks are present in the Barnard River section of the sanctuary. This represents a major concentration for this species from a territory-wide perspective. There are 250 nesting pairs of Sandhill Cranes in the area that remain from about May 25th to July 15th.

Area IX — The Tuktoyaktuk Peninsula, Liverpool Basin, Anderson River Complex — Organization Centre Tuktoyaktuk:

There is an enormous variety and concentration of waterfowl in this area. Tuktoyaktuk is the organization centre for the exploitation of these ornithological resources. The south end of Liverpool Bay is a critical concentration area for Canada Geese, and the Mason Valley a significant molting area. The McKinley Bay area is a critical nesting location for the Pacific Black Brant Geese and marked concentrations are present at the south end of Liverpool Bay, with molting areas in the Mason Valley. The south end of Liverpool Bay and the Mason Valley are also significant molting and concentration points for White-fronted Geese. About 200 Whistling Swan molt in Harrowby Bay, and the south end of Liverpool Bay and the Mason Valley are also important concentration and molting points for this species. The Common and King Eider Ducks are present in large numbers from Hutchison Bay northward to Cape Dalhousie. A million birds are present in migration season. Possibly 600,000 molt in the area. Old Squaw and Scoter and Scaup Ducks are extremely abundant. The Anderson River Bird Sanctuary forms a core for Area IX.

Area X — Mackenzie Delta and Kendal Island Bird Sanctuary — Organization Centre Inuvik:

This area has been shown to possess significant supporting ornithological resources for a general landscape tour. There are enormous concentrations of birds in this area during the staging periods that might make it significant in a specialized ornithological tour during these seasons.

Pitt and Oliver Islands in the delta region are a major fall staging area for Lesser Snow Geese with up to 30,000 birds present. The delta area to the south of Aklavik is the spring staging area for about 12,000 birds of this species.

Concluding Remarks

There are many more locations in the Territories that possess significant ornithological resources that might lend support to the development of the landscape tour within a particular region or from a particular community. Nothing more has been achieved in this report than the identification of major concentrations insofar as can be determined from the Arctic Ecology Map Series.

Much more work is required to produce a really definitive tourist and recreation evaluation of the ornithological resources in the Northwest Territories. This report simply represents an introductory approach to the subject but from the standpoint of general tourist and recreation policy and program planning is of some value.

As stated, no recognition is given to hunting values in this report. This omission, however, may not be of major consequence. There are undoubtedly geese hunting possibilities in particular on the margins of the sanctuaries. The cost of exploiting these resources, however, is great and probably represents a significant disadvantage that cannot be overcome by any comparative advantages relative to natural factors. In effect, the areas are transport disadvantaged. There are, however, significant hunting opportunities for the resident population.

5.8 TOURIST AND RECREATION ATTRIBUTES OF THE MARINE MAMMALS OF THE N.W.T.

This report is based upon information obtained from the Arctic Biological Station of the Fisheries Research Board at Ste. Anne de Bellevue, Quebec. Information contained in the Arctic Ecology Map Series, prepared for the Canadian Wildlife Service, relative to marine mammals is incorporated into the study at some points. The factual input from this source, however, is limited.

Macro Regional Productive Relationships

An analysis of the available data for the various marine mammals reveals macro regional productive patterns that are of interest to tourist and recreation planners. On the basis of variety and abundance of mammals present three gross regional units (see Figure 5.4) can be readily distinguished in terms of productivity.

The rich eastern Arctic area that encompasses the waters surrounding the southern portion of Ellesmere, Cornwallis, Devon, Baffin and Southampton Islands, together with Hudson Bay, is readily defined. Every species considered in this study is found here. Moreover, the harp seal, narwhal and walrus are present only in this area. Of fourteen areas of Class I abundance for seals of all types, ten or 71% are found here. Of the twenty-nine Class I viewing and hunting areas for these species, twenty-four or 83% are situated in this area. All Class I areas of abundance and Class I areas for viewing and hunting of Beluga whales are in the rich eastern Arctic area. Only the bowhead whales are somewhat more strongly represented outside the area in the Amundsen Gulf. Since one can never be assured of seeing this species anywhere in the Canadian Arctic the significance of this exception is somewhat limited.

The southwestern Arctic area, which is comprised essentially of the linear reach of straits and gulfs from the Boothia Peninsula in the east to Amundsen Gulf and southerly portions of the Beaufort Sea off the Mackenzie Delta in the west, represents a second distinct marine mammal production region. Here, there is a smaller variety of species and fewer outstanding areas from a tourist and recreation standpoint.

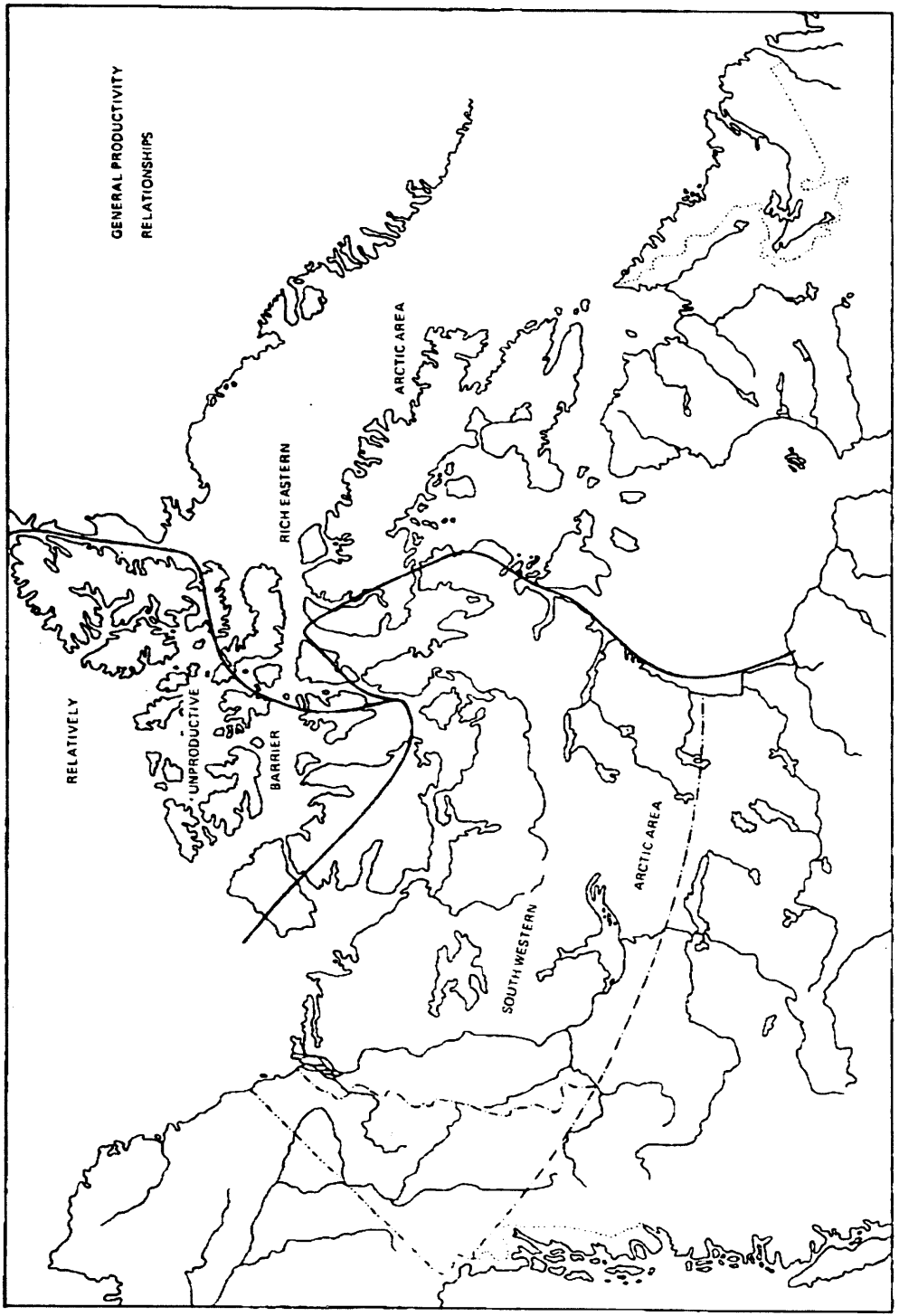
An enormous wedge or barrier of relatively unproductive ice and water between the aforementioned units represents the third region. It serves to separate marine mammal populations of the east and west Arctic Oceans, and perhaps has given rise to distinctive sub-species. Only ringed seals are found in this region. The adults remain under the ice all winter while the young probably migrate out.

From a tourist and recreation standpoint the rich eastern Arctic area possesses the prime development potential. There are possibilities in the southwestern Arctic area, but they are decidedly of a secondary order. The prime seal and walrus areas in this western part of the Arctic are off the west coast of Alaska where there is exceptionally good hunting and viewing each spring. This is a point of major significance from a tourist development standpoint.

General Time Relationships for Viewing and Hunting

Considering walrus and the various species of whales and seals in total, the prime viewing and hunting season for the Northwest Territories covers a six-week period from mid-July to the end of August. This is the time span during which the tourist and recreation values associated with marine mammals are most varied and prolific.

FIGURE 5.4


GENERAL PRODUCTIVITY
RELATIONSHIPS
ARCTIC AREA
RICH EASTERN
RELATIVELY
UNPRODUCTIVE
BARRIER
SOUTH WESTERN
ARCTIC AREA

The seals provide the most noticeable variations in the previous generalization. The prime hunting and viewing season for the ringed seal is in May and June when it is on the fast ice. Secondly, the bearded seal offers prime viewing and hunting in most places in the Territories from the beginning of June to the end of August, and at Jones Sound, Coral Harbour and the west coast of Hudson Bay during June and July. The prime viewing and hunting season for the harp seal is essentially July and August.

The more spectacular marine mammals, including the whales and walrus, have prime viewing and hunting seasons that conform reasonably closely with the previously noted six-week span for all species considered in combination. The longer hunting season for the walrus in the general vicinity of Southampton Island that extends from mid-August to mid-September is a notable exception.

It can be stated, therefore, that those wishing to sample the full range of marine mammals of the Northwest Territories have their best opportunity from mid-July until the end of August. Prime periods for various locations in the Territories, however, vary considerably. This aspect will be noted in a subsequent section of the report.

During the aforementioned six-week period weather conditions in the Arctic, particularly in coastline areas, are at best only generally satisfactory, and often generally highly unsatisfactory. Fog and drizzling rain are common as in most northern maritime climates. For the avid observer of marine mammals the discomfiture factor would not be a deterrent. Moreover, the quality of the experience readily offsets discomfiture considerations for the general tourist with a "yen" to see marine animals.

The major handicap is related to air transportation. Travel schedules can be readily disrupted by the inability of planes to land in fogbound settlements for several successive days. This presents significant difficulties for the exploitation of tourist potentials. Those undertaking specifically to view and study marine mammals must be prepared to be detained from their pre-arranged travel schedule and probably would not find this limitation to be a deterrent.

The problem of increased costs to an operator conducting a specific marine mammal tour or integrating this feature into a more general landscape tour could be onerous if not ruinous in a cost structure as high as that prevalent in the Arctic.

General Aspects of Local Mode of Transport Risk and Strenuousness of Effort

There are four distinct natural situations or environments in which marine mammals are found during prime hunting and viewing times including fast ice, moving pack, open water and land. Fast ice is related solely to the ringed seal and land to the viewing opportunities associated with walrus in four separate areas. Moving pack is the locale for hunting the walrus, and viewing and hunting the bearded seal. Open water is the locale for the harp seal and for all whales with beluga being particularly spectacular in estuaries and river mouths.

A variety of local transport is required to exploit tourist and recreation opportunities. Ski-doo or dog teams are required for the ringed seal and these in combination with small boats or canoes for the bearded seal. Large boats of the Peterhead type are required to reach beluga, narwhal and walrus in many locations. Small boats and large canoes are sufficient at other points.

The location of the marine mammal resources relative to settlement patterns or local organizational centres is generally favourable. Some twenty-eight of the areas noted in the

accompanying map, or 32% require travel only in the immediate vicinity of settlements. In effect, only short distance trips are necessary. Another forty-eight areas, or 56% involve considerable travel from the nearest settlements but operations can be fairly readily organized. Only ten areas, or 12% are isolated locations that require travelling and quartering with native populations outside a main settlement. These present some organizational difficulties, but no insurmountable handicaps appear to exist. Of the ten areas involving isolated locations, one is related to a first class beluga whale area, three to second class seal resources and six to third class seal and walrus areas. Five of the latter group of six represent third class walrus areas in Hudson Bay and off the northeast coast of Baffin Island.

Of fifty-two seal areas, twenty-five or 48% involve only local travel. Another twenty-three or 44% require considerable travel but are readily exploitable. Four, or 8% are in isolated locations. Of twenty whale areas, two or 10% involve local travel. Another seventeen or 85% require travel over some distance. One or 5% is in an isolated spot. Of fourteen walrus areas, one or 7% involve only local travel. Eight or 57% require travel over some distance. Five or 36% necessitate travel to a somewhat isolated spot. Seal hunting and viewing require the least travel from settlements and that for walrus the most.

The risk factor for a person desiring to exploit the tourist and recreation potentials associated with marine mammals presents no serious handicap. Of eighty-six marine mammal areas of all types, fifty-six or 65% involve no personal risk that is abnormal for northern regions. Another thirty or 35% present a moderate degree of risk compared with northern travel in general and reasonable experience in the outdoors is necessary. None involve a high or prohibitive degree of risk.

The risk factor is least in seal viewing and hunting. Of fifty-two areas identified in this study, forty-six or 88% involve nothing abnormal for the region. All moderate risk situations are associated with bearded seals in the moving pack. In the case of whales, two of twenty areas noted or 10% involve no abnormal risk, and eighteen or 90% a moderate risk. Of fourteen walrus areas, eight or 57% involve no abnormal risk and six or 43% moderate hazards.

Northern travel always involves some risks and a degree of caution and judgment backed by experience is necessary. Accidents over a period of time are inevitable and those organizing trips for tourists and sportsmen should be covered by adequate insurance.

The physical effort involved in the pursuit of the tourist and recreation potentials of the marine mammals as a group is not of such a high order as to exert inhibiting effect. Of eighty-six areas identified, forty-nine or 57% involve exertion that could be handled by the average tourist in reasonable physical condition. For thirty-seven areas, or 43% strenuous efforts, requiring good physical condition and experience, are necessary. The strenuousness of the effort in the latter case could be considered dangerous or undesirable for elderly or physically limited persons.

Seal hunting and viewing is the least strenuous activity in an overall sense. Of the fifty-two areas involved, forty-six or 88% could be handled by the average tourist in reasonable condition. Another six areas all associated with bearded seals, necessitate strenuous activity, good physical condition and experience. Of twenty whale areas, eighteen or 90% are in the latter category of strenuous activity and 43% or six of fourteen walrus areas.

Supply Prospects for Hunting

There is an adequate supply of all types of seals to meet sport hunting requirements in all areas.

It is felt that the supply factor is adequate in the case of the beluga whale and narwhal. No bowhead whales can be taken.

It is indicated in data provided by the Fisheries Research Board that perhaps 150 walrus can be harvested by hunters. About thirty would come from the moving pack in the vicinity of Coats and Southampton Islands, 100 from the Upper Foxe Basin and 20 from the Jones Sound area.

The foregoing remarks simply indicate supply conditions in relation to sport hunting. Supply, however, is not the sole determinant in any consideration of the total problem of sport hunting.

Tourist and Recreation Use Capability Classification for Marine Mammals

On the basis of the data provided by the Fisheries Research Board, the distribution of each of the species by abundance and viewing and hunting class was compiled in a series of overlays. This procedure immediately revealed the areas or regions possessing a variety of species and the general quality of the resource present in terms of abundance and viewing and hunting opportunity. 1]

A rating system was then established by which the quality of each of the regional assemblages could be compared and contrasted. The following procedure was adopted.

- Each species present in an area or region assemblage was accorded from 1 to 3 points on the basis of its abundance class ratings as follows: Class I — 3 points; Class II — 2 points; Class III — 1 point. This procedure recognized the variety of species present in a region and the abundance of each mammal. Both factors are obviously significant for tourist and recreation planning.

- The viewing and hunting capability for each species in a regional assemblage was noted and points accorded as follows: Class I — 2 points; Class II — 1 point. In this step the tourist and recreation use capability was evaluated on the basis of conditions for the species throughout the Territories.

Generally, only two hunting and viewing classes were identified in the work submitted by the Fisheries Research Board. This determined the range of point values adopted. In the case of the walrus, however, a different system was employed since only three regions were rated for viewing and hunting and all were accorded a Class I status. In this instance a Class I viewing and hunting opportunity for walrus was accorded 3 points. The remainder of the areas were given points according to the abundance rating as follows: Abundance Class II — 2 points; Abundance Class III — 1 point.

- Bonus points were given for certain special situations but they never exceeded a value of 2.

- Points recorded under the various species in a regional assemblage were then totalled.

The results of the foregoing process are presented in Table 5.35. It is possible that some improvement can be made on the basis of local expert knowledge.

1] See Map in Volume 2.

TABLE 5.35

BASE DATA FOR REGIONAL TOURIST AND RECREATION USE CAPABILITY CLASSIFICATION

	Main Centre	Species Present	Abundance Class	View/Hunt Class	Points
Off Mackenzie Delta	Tuktoyaktuk	Ringed Seal	IIId	II	2
		Bowhead Whale	Ib	II	4
		Beluga Whale	Ig	II	4
					10
Amundsen Gulf	Sachs Harbour	Ringed Seal	IIg	I	5
		Harp Seal	Ia	I	5
		Bowhead Whale	Ia	I	5
					15
James Ross and Rae Straits	Gjoa Haven – Spence Bay	Ringed Seal	Ig	I	5
		Bearded Seal	IIc	II	3
					8
Southwest Hudson Bay	Eskimo Point	Ringed Seal	IIIc	II	2
		Bearded Seal	Id	II	4
		Beluga Whale	Ic	I	5
					11
North Central Hudson Bay	Chesterfield Inlet Rankin Inlet Whale Cove	Ringed Seal	IIh	I	4
		Walrus	III2d		2
					6
Repulse Bay	Repulse Bay	Ringed Seal	IIj	I	4
		Harp Seal	IIa	II	3
		Bearded Seal	Ig	I	5
		Narwhal	I1b	I	4
		Walrus	I14		4
					20
Fisher & Evans Straits and Coats Island	Coral Harbour	Ringed Seal	IIi	I	4
		Harp Seal	IIb	II	3
		Bearded Seal	If	I	5
		Bowhead Whale	IId	II	3
		Walrus	I	I	7 [1]
					22
South East Hudson Bay	Belcher Islands	Ringed Seal	IIg	II	3
		Bearded Seal	IId	II	3
		Walrus	III1d		2
					8
Upper Foxe Basin	Igloolik	Ringed Seal	If	I	5
		Bearded Seal	Ib	I	5
		Bowhead Whale	IIa	II	3
		Walrus	I2	I	7 [2]
					20
South West Baffin Island Coast	Cape Dorset	Ringed Seal	Ie	I	5
		Harp Seal	IIc	II	3
		Bearded Seal	Ie	I	5
		Walrus	II3	I	3 [2]
					16

Continued

TABLE 5.35 — *Continued*

	Main Centre	Species Present	Abundance Class	View/Hunt Class	Points
South East Baffin Island Coast	Lake Harbour	Ringed Seal	IIc	I	4
		Harp Seal	IIf	II	3
					7
Entrance Hudson Strait	Port Burwell	Harp Seal	Ic	I	5
		Bearded Seal	IIe	II	3
					8
Frobisher Bay	Frobisher Bay	Ringed Seal	IIb	I	4
		Bearded Seal	IIb	II	3
		Harp Seal	Ib	I	5
		Walrus	III1b		2
					14
Cumberland Sound	Pangnirtung	Ringed Seal	Id	I	5
		Harp Seal	Ia	I	5
		Bearded Seal	Ic	II	4
		Bowhead Whale	IIb	II	3
		Narwhal	IIa	II	3
		Beluga Whale	Id	I	5
		Walrus	III1a		2
					27
Broughton Island Waters	Broughton Island	Ringed Seal	Ic	I	5
		Walrus	III2c		2
					7
Cape Christian Area	Clyde River	Ringed Seal	Ia	I	5
		Harp Seal	Id	II	4
		Bowhead Whale	IIc	II	3
		Narwhal	IIc		3
					15
Bylot Island Waters	Pond Inlet	Ringed Seal	Ib	I	5
		Walrus	III2cb		2
		Narwhal	I	I	5
					12
Cornwallis Island Waters	Resolute	Ringed Seal	IIp	II	3
		Bearded Seal	IId	II	3
		Harp Seal	IIa	II	3
		Beluga Whale	Ie	II	4
		Narwhal	IIe	II	3
		Walrus	112		4
					20
Jones Sound, North East Baffin Bay	Grise Fiord	Ringed Seal	Ia	I	5
		Harp Seal	IId	II	3
		Beluga Whale	If	I	5
		Narwhal	IId	I	4
		Walrus	III	I	4
					21

1] Two bonus points for spectacular viewing when animals on land on Coats Island, and for a possible hunter take of perhaps 30 walrus.

2] Two bonus points for possible hunter take of up to 100 animals.

It will be noted that the analysis did not take the accessibility risk and strenuous activity aspects into account. It was not felt necessary to introduce these aspects into the rating process for several reasons.

Personal risk and strenuousness of activity were never rated as inhibiting for the physically conditioned person and often presented no problem whatever. Each individual species seemed to present a roughly similar set of conditions in whatever region it occurred. Where differences did occur they were rarely of major significance. Finally, most people desiring to view and hunt marine mammals desire some degree of adventure.

The required travel distance from a settlement also showed variation by species. Perhaps differences in this case are most important with respect to seals, particularly the ringed seal. Since this mammal is widespread, areas that offer access limitations are decidedly at a disadvantage. For the more spectacular mammals travel for some distance outside the settlement generally seems to be necessary.

The distributional pattern of the point ratings was observed and the noticeable groupings identified. One group of six regions displayed values emerging from 20 to 27 points. A second group of four showed a marked concentration of point values between 14 and 16. At the lower end of the scale there were nine regions with values ranging from 6 to 12 points. Three regions in this distribution with 10 to 12 points were clearly at the top of the lower grouping. It was decided arbitrarily to place them in the lower rather than the middle group.

Areas with a Class I capability possess a variety and abundance of marine mammals with associated hunting and viewing opportunities, sufficient to support a rewarding tourist and recreation experience in themselves, or to provide a primary component of a general landscape tour. These areas offer the prime assemblages of marine mammals in the Territories. They can satisfy the requirements of visitors primarily or largely interested in this type of biological phenomena.

While Class I areas have the resources to support a specialized marine mammal tour within their confines, it is obvous that several could be combined into a more extensive tour. The visitor would focus attention primarily on a single species for which each area or region offers outstanding opportunities. The point to note, however, is that each Class I area can support a tour in itself based upon its major organization centre.

Areas with a Class II capability designation possess an assembly of marine mammals that could represent a significant or major input to a general landscape touring experience. Some hunting and interesting viewing experiences are present, but the resources are not of sufficient calibre in themselves to justify visitation. They can provide a major secondary support to a broader based tourist and recreation experience.

Areas with a Class III capability possess marine mammal resources capable of providing meaningful but tertiary support to a general landscape touring experience that would rest essentially upon other resource foundations. Opportunities are present that could be effectively exploited, but in comparison with Class I and Class II areas, they are decidedly of a lesser order of significance.

The various areas included within the broad capability classes have been rated 1 to 3 reflecting secondary variations in quality. This secondary rating is, admittedly, somewhat subjective. Table 5.36 summarizes the results of the classification and rating process previously described.

TABLE 5.36

TOURIST AND RECREATION USE CAPABILITY CLASSIFICATION AND RATING FOR MARINE MAMMALS

Areas	Rating	Marine Area	Organization Centres	Total Points
Class I: Possess variety, abundance and quality marine mammal resources to support a tour based essentially upon the viewing and hunting of marine mammals or to represent a primary component of a general landscape tour.	1	Cumberland Sound	Pangnirtung	27
	2	Fisher/Evans Straits, Coats Island	Coral Harbour	22
	3	Repulse Bay	Repulse Bay	20
	3	Upper Foxe Basin	Igloolik	20
	3	Cornwallis Island waters	Resolute	20
	3	Jones Sound, North Baffin Bay	Grise Fiord	21
Class II: Possess marine mammal resources capable of making a significant or major input to a general landscape tour, but not sufficient to support a tour in themselves.	1	Amundsen Gulf	Sachs Harbour	15
	1	S.W. Baffin Island waters	Cape Dorset	16
	1	Frobisher Bay	Frobisher Bay	14
	1	Cape Christian waters	Cldye River	15
Class III: Possess marine mammal resources capable of providing only tertiary support to a landscape tour.	1	Beaufort Sea off Mackenzie Delta	Tuktoyaktuk	10
	1	S.W. Hudson Bay	Eskimo Point	11
	1	Bylot Island waters	Pond Inlet	12
	2	James Ross/Rae Straits	Spence Bay, Gjoa Haven	8
	2	North Central Hudson Bay	Chesterfield Inlet, Rankin Inlet	6
	2	South Hudson Bay	Belcher Islands	8
	2	S.E. Baffin Island waters	Lake Harbour	7
	2	Entrance Hudson Strait	Port Burwell	8
	2	Broughton Island waters	Broughton Island	7

Use of the Capability Classification:

The prime marine mammal resources are focused essentially upon the eastern half of the Arctic Archipelago, and particularly upon the waters surrounding Southampton, Baffin, Cornwallis and southeast Ellesmere Islands. Thirteen of nineteen or 68% of all Class I to III areas are found here, and 100% of the Class I areas. This is the prime general geographic region of the Northwest Territories for marine mammals. It is here that the Class I resources possess the variety, abundance and quality to compete effectively in a tourist and recreation sense from a continental or global market perspective.

Only three areas are found along the Arctic shore of the Territories westward from Boothia Peninsula to the Mackenzie Delta and Banks Island. Two of this group are Class III areas and one, namely Amundsen Gulf, has received Class II status. This region actually represents the easterly extremity of a larger northern marine mammal population that is much more strongly represented in Alaskan Arctic and Bering Sea waters, where prime tourist and recreation opportunities are present.

Three Class III areas are found in the waters surrounding the Belcher Islands and off the west coast of Hudson Bay from Chesterfield Inlet southward. The occurrence of the beluga whale in the mouth of the Seal River probably represents the prime resource in all three areas. Generally speaking, all marine mammals of importance found in these regions can be duplicated off the coast of Manitoba and Ontario, and sometimes in an equal or more spectacular form. In effect, these areas possess no comparative advantage over opportunities located to the south in Hudson and James Bays.

Cumberland Sound — Organization Centre Pangnirtung

The area has been accorded a total of 27 points, the highest for any in the Territories, on the basis of the presence of seven species. This is the only region in which all of the marine mammals covered in this study are present. It is this variety, frequently coupled with high quality, that lifts the standing of the area. (Table 5.37).

TABLE 5.37

SPECIES PRESENT AND RATING — CUMBERLAND SOUND

Species	Abundance Class	View/Hunt Class	Total Points
Ringed Seal	I	I	5
Harp Seal	I	I	5
Bearded Seal	I	II	4
Bowhead Whale	II	II	3
Narwhal	II	II	3
Beluga Whale	I	I	5
Walrus	III		2
			27

Seals are strongly represented. All three species are present and have a Class I abundance rating. Two species offer Class I and one Class II hunting and viewing conditions.

All three whale species are present. Class I beluga whale opportunities are found here. Millut Bay, at the upper extremity of Cumberland Sound, is a calving area for this species, and they are plentiful in Nettilling Fiord in the summer months. The areas' narwhal resources are only Class II. Pond Inlet and Grise Fiord are better endowed with this interesting and somewhat spectacular species. The giant bowhead whale that appears and often calves in Millut Bay are spectacular.

The walrus resources have been rated Class III in terms of abundance. No sport-hunter quota was given for this area. There is a good population of walrus, in the hundreds, in the Lemieux Islands and in Abraham Bay at the south and north entrances to Cumberland Sound respectively.

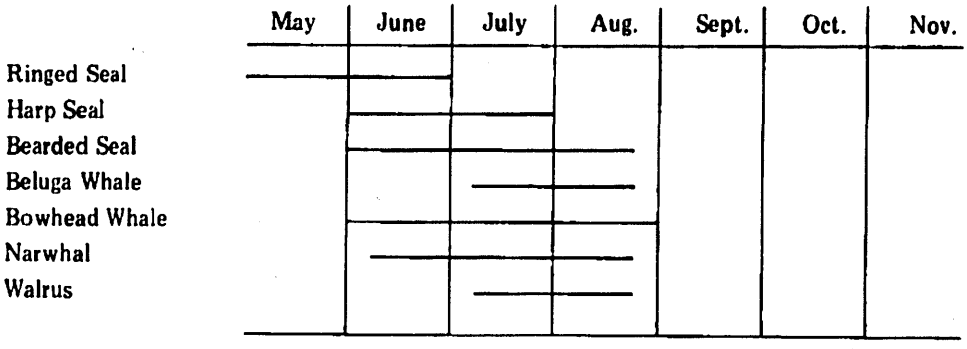
The only population of freshwater ringed seal on the North American continent is to be found in the Nettilling Lake to the west of the upper reaches of Cumberland Sound. This is an added attraction for the region not recorded in the point allocation.

The prime hunting and viewing season from a tourist and recreation standpoint appears to run from about mid-July to the beginning of the fourth week in August (Figure 5.5).

During this time span all seven mammals of the region are present. The prime hunting season for the ringed seal on its fast ice locale, during May and June, is over. During these summer months this mammal spends its time in open water.

FIGURE 5.5.

PRIME VIEWING AND HUNTING SEASON — CUMBERLAND SOUND



The climatic classification for tourism and recreation shows that conditions are generally favourable around Cumberland Sound from July 15th to early August. From August 15th through to September 1st, Pangnirtung appears to enjoy satisfactory weather; however, conditions are generally unsatisfactory around the outer or eastern one half to one third of the Sound. By September 15th, weather conditions are generally unsatisfactory throughout the entire region.

To exploit the marine mammal resources to any extent, travel for considerable distances away from Pangnirtung is always necessary. Invariably travel is by boat and usually of the large Peterhead type. Rough water conditions in Cumberland Sound are frequent at this time of year.

The personal risk factor associated with all mammals except the ringed and harp seals is rated as I. In effect, a moderate degree of risk is present, and reasonable outdoor experience is necessary. The risk factor for the two aforementioned seals is 0.

Hunting and viewing for all species except harp seal involves strenuous effort, requiring good physical condition and some experience. The activity can be dangerous or undesirable for the elderly or physically limited.

It is clear that the exploitation of the full tourist and recreation potentials of the marine mammals of this area will require considerable organization. Visitors must be transported great distances. Adequate boats and skills to handle their basic food, accommodation and trip logistics are required. The resources cannot be exploited on a haphazard basis.

As previously noted, the point rating system adopted in this study has accorded Cumberland Sound the highest value, namely 27 points. This is five points, or nearly 22% above the rating for the Coral Harbour region, its closest rival. Admittedly, the Sound is very rich in marine mammal resources, but the rating system may have tended to over emphasize the merits of the area. It is assuredly a Class I area, but perhaps not as superior to other Class I areas in the Territories as suggested. Moreover, its resources cannot match those of Repulse Bay, Coral Harbour and Igloolik when combined in a single travel experience.

Fisher/Evans Straits and Coats Island Waters — Organization Centre Coral Harbour:

This Class I area received 22 points in the classification process, the second highest value recorded. The pattern is summarized in Table 5.38.

TABLE 5.38

SPECIES PRESENT AND RATING
FISHER/EVANS STRAITS AND COATS ISLAND WATERS

Species	Abundance Class	View/Hunt Class	Total Points
Ringed Seal	II	I	4
Harp Seal	II	II	3
Bearded Seal	I	I	5
Bowhead Whale	II	II	3
Walrus	I	I	7
			22

All three seal species are present in the area. Hunting and viewing possibilities are Class I for the bearded and ringed seals, but only Class II for the harp seal. The seal foundations of the marine mammal assemblage are good, but not exceptional.

Only one of three whales, namely the bowhead is present and in particular in the waters off Seahorse Point. Its abundance, and viewing and hunting condition, is Class II. The whale populations are, therefore, somewhat weak. The Arctic Ecology Map Series records that 100-200 beluga whales are found in Native Bay on Southampton Island, but this is a limited resource for the Hudson Bay area.

It is the walrus population that represents the strong foundation of the tourist and recreation potential of the marine mammals of the area. This spectacular animal, in an overall sense, is perhaps at its best in the Northwest Territories. It is important to note, however, that the mammal is several times more numerous in Alaska.

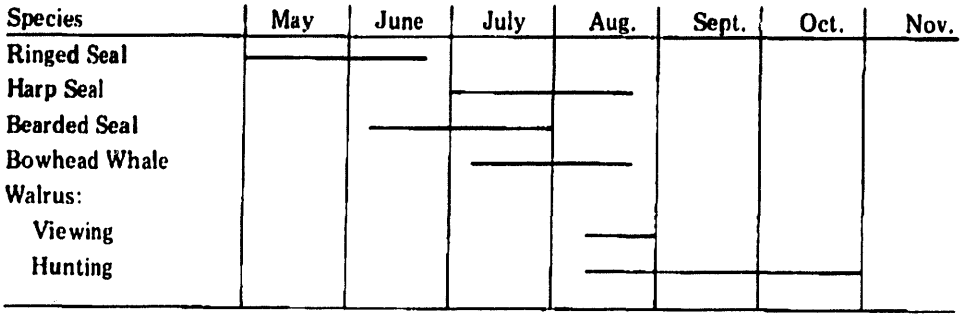
The native hunting quota for the year is 180 animals with the average annual domestic take being about 150 animals. There appears to be a sport hunting potential of about 30 animals annually.

About 2,000 walrus have been observed in the area south of Cape Pembroke. When the herds assemble on Coats Island the tourist would be presented with a spectacular viewing prospect that cannot be duplicated on such a scale anywhere in the Northwest Territories. They are reported common at Seahorse Point on Southampton Island. It appears that walrus move from Walrus Island to Bencas Island and Cape Pembroke during August and September. From these points they generally move to Seahorse Point and Gorden Bay in October, with some moving west again in the late fall.

On the basis of its strong walrus resources the area received two bonus points. Its walrus population, with a hunter residue of thirty animals and a spectacular viewing possibility on Coats Island, accounted for seven or 32% of its 22 points.

FIGURE 5.6

PRIME VIEWING AND HUNTING SEASONS
FISHER/EVANS STRAITS AND COATS ISLAND WATERS



The prime tourist and recreation season for the area appears to be from about mid-July to the end of August (Figure 5.6). In this period four or five animals offer their best viewing and hunting prospects. The ringed seal, which is hunted on the fast ice in May and June, has returned to the open waters of the region by this time.

It is important to note that the prime viewing for walrus on Coats Island covers only a two-week span from mid-August until the end of that month. Prime walrus hunting in the region, however, extends from mid-August until the end of October. When the walrus viewing on Coats Island is over, the area has lost its most unique marine mammal tourist attraction.

The tourist and recreation climate classification for this part of the Territories reveals generally unsatisfactory conditions in the southeastern part of Southampton and Coats Islands from August 1st to September 1st. Conditions become highly unsatisfactory after

that date. In effect, there is a serious climatic limitation associated with the exploitation of this regional assemblage of marine mammals.

The tourist and recreation utilization of all resources, except the ringed seal, requires travel outside the community. The accessibility factor was rated 1. Large Peterhead boats are necessary for travel in most cases.

The risk and strenuous factor for all forms of hunting in the area is negligible with the rating scale being 0 in every case. Walrus and bowhead whale have a risk and strenuous factor of 1 in each case. Hence, there is no serious handicap of this nature associated with the marine mammal tourist and recreation resources of the area.

Repulse Bay – Organization Centre Repulse Bay:

This area has been accorded a total of 20 points on the basis of the abundance and tourist and recreation values associated with five marine mammals. All the seals and walrus are present as in the Fisher and Evans Straits area. In effect, the region differs in species composition from the Coral Harbour centred area in its whale population (Table 5.39).

TABLE 5.39

SPECIES PRESENT AND RATING – REPULSE BAY

Species	Abundance Class	Viewing and Hunting Class	Point Total
Ringed Seal	II	I	4
Harp Seal	II	II	3
Bearded Seal	I	I	5
Narwhal	II	I	4
Walrus	II		4
			20

All three seal species are present as in the case of the Fisher and Evans Straits and Coats Island area, and the abundance and viewing and hunting classes are identical with those of Coral Harbour. The areas, therefore, possess similar strength in this respect.

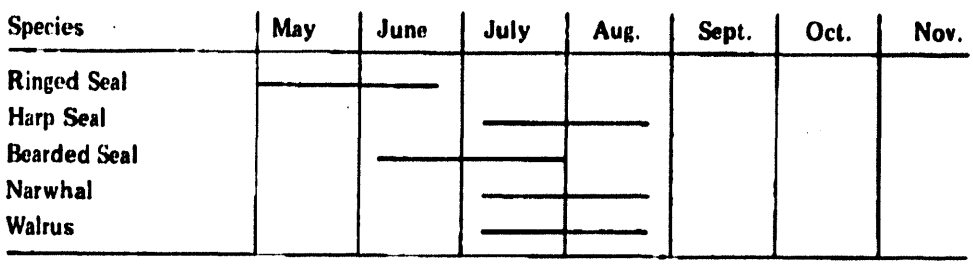
The narwhal is an extremely interesting marine mammal. While having only a Class II abundance rating in this area, it nevertheless has a Class I tourist and recreation hunting and viewing potential. Resources in this instance, however, are decidedly of a lower scale than those present at Pond Inlet on Baffin Island.

The walrus resources from a tourist and recreation standpoint are decidedly inferior to those encountered in the Evans Strait/Coats Island area. The species is present in considerable quantities, however, but no hunter residue is indicated.

It is the variety of species present and their generally high quality in terms of abundance and hunting and viewing opportunity that establishes the high point total for the area. No unique resource for the Territories as a whole is present.

FIGURE 5.7

PRIME VIEWING AND HUNTING SEASON – REPULSE BAY



During the last two weeks in July, viewing and hunting conditions are prime for all species except the ringed seal which is in the open water at this time (Figure 5.7). From the first week in June to the last week in July, conditions are prime only for the bearded seal. The narwhal and harp seal come in force about the first week in July but remain well into August. There is only a very short period of about three weeks in July in which the prime tourist and recreational values of the four marine mammals coincide.

Weather conditions are generally satisfactory through July to mid-August. By September 1st, they become generally unsatisfactory. Overall the Repulse Bay area appears to have better climatic conditions during its prime viewing and hunting tourist season for marine mammals than does the area to the south centred on Coral Harbour.

All three seal populations present minimum problems of risk and strenuous activity, and the same is true for the walrus. These factors have the normal value of 1 for the bowhead whale. In effect, these aspects are rougly similar to the situation at Coral Harbour.

Upper Foxe Basin – Organization Centre Igloolik:

Four species are present in this region which was accorded a total of 20 points (Table 5.40). Its seal resources are somewhat weaker than those of Coral Harbour and Repulse Bay centred areas due to the absence of the harp seal. Its whale resources are roughly equivalent to those of Coral Harbour.

The walrus population is very strong and the area was accorded 2 bonus points on the basis of a residue of 100 animals that could be taken annually by hunters in addition to the average domestic kill of 200 per year. Walrus are found in the thousands in the Foxe Basin all year, particularly in the ice floes and edges of ice sheets. North and South Igloolik Islands, together with Manning Island, are notable hauling-out grounds.

TABLE 5.40

SPECIES PRESENT AND RATING – UPPER FOXE BASIN

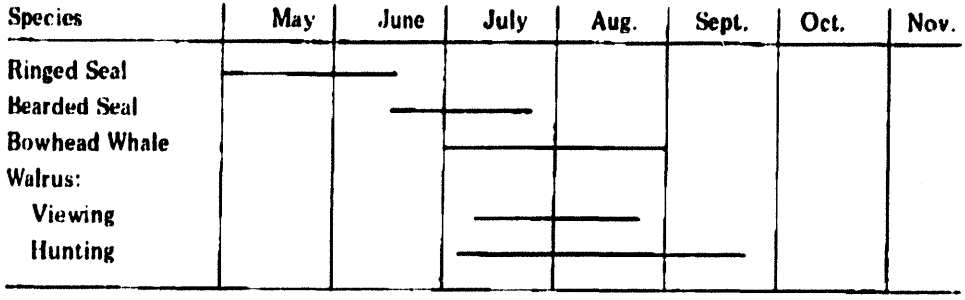
Species	Abundance Class	Viewing and Hunting Class	Total Points
Ringed Seal	I	I	5
Bearded Seal	I	I	5
Bowhead Whale	II	II	3
Walrus	I	I	7
			20

The area lacks the beluga and narwhal, two of the more spectacular marine mammals. This represents a serious limitation that tends to be masked to some extent by its high quality walrus resource.

All species, with the exception of the ringed seal, offer prime viewing and hunting from mid-July to the end of that month (Figure 5.8). Conditions are prime for bowhead whale until the end of August.

FIGURE 5.8

PRIME VIEWING AND HUNTING SEASON – UPPER FOXE BASIN



Weather conditions in this area are somewhat complicated and definitely represent a handicap to tourist and recreation use. During the last two weeks of July there is a transition from winter conditions to the summer climate. By August 1st summer climate prevails in the area around Igloolik, but there is generally unsatisfactory weather due to fog and drizzle. On the opposite coast of the Foxe Basin on Baffin Island weather conditions are good. By August 15th, the pattern is roughly similar but conditions around Igloolik itself, have become highly unsatisfactory mainly due to fog. By September 1st, the whole of Upper Foxe Basin is affected by highly unsatisfactory weather.

Travel distance, risks and degree of strenuous effort are normal for the various species present in the area. In effect, no abnormal limitations are present.

Regions Centred on Coral Harbour, Repulse Bay and Igloolik Considered in Combination:

The geographic distribution of these areas leads almost automatically to an evaluation of the tourist and recreation potential of their combined marine mammal resources. This aspect is now examined in some detail (Table 5.41).

As previously noted, there are significant gaps in each individual area in terms of the species present, and the beluga whale is absent or weakly represented in all areas. The harp seal is absent at Igloolik, the narwhal at Coral Harbour and Igloolik, and the bowhead whale at Repulse Bay. Any visitor coming to the Territories primarily to view marine mammals or to engage in a landscape tour in which marine mammals are required to provide a major role, therefore cannot completely satisfy his requirements by a visit solely to one of these areas.

When the resources of the three areas are combined the pattern is radically altered. All species, except the beluga whale, are present. Either the abundance or the viewing and hunting ratings are Class I for ringed seals, bearded seals, narwhal and walrus. Ratings are Class II for the harp seal and bowhead whale. Viewing conditions for the walrus on Coats

TABLE 5.41

SPECIES PRESENT AND RATING – COMBINED CENTRES OF CORAL HARBOUR, REPULSE BAY AND IGLOOLIK

Species	Abundance Class			Hunting & Viewing Class			Point Rating		
	C.H.	R.B.	Igl.	C.H.	R.B.	Igl.	C.H.	R.B.	Igl.
Ringed Seal	II	II	I	I	I	I	4	4	5
Harp Seal	II	II		II	II		3	3	
Bearded Seal	I	I	I	I	I	I	5	5	5
Narwhal		II			I			4	
Bowhead Whale	II		II	II		II	3		3
Walrus	I	II	I	I		I	7	4	7
							22	20	20

C.H. = Coral Harbour
R.B. = Repulse Bay
Igl. = Igloolik

Island are exceptional and good when the mammal is in the moving pack. Moreover, there are sport hunting possibilities in the Coral Harbour and Igloolik centred areas and particularly in the latter. Only Cumberland Sound offers a wider range of species. It does not, however, offer a land viewing opportunity for walrus comparable with Coats Island.

It is obvious from the foregoing discussion that the three areas considered individually have substantial weaknesses from the point of view of species composition. Considered in combination they possess one of the strongest marine mammal assemblages of the Northwest Territories.

The prime hunting and viewing times for the various species in each area is shown in Figure 5.9. There are several interesting aspects associated with this figure.

The prime hunting and viewing time for the ringed seal extends from May until about the third week in June, which is found in the open waters of the area. Hence, its prime viewing and hunting time is over before that of other marine mammals begins, with the exception of the bearded seal, which has a prime time beginning about the end of the first week in June and extending until the end of July. This earlier prime season for the ringed seal is common throughout the North.

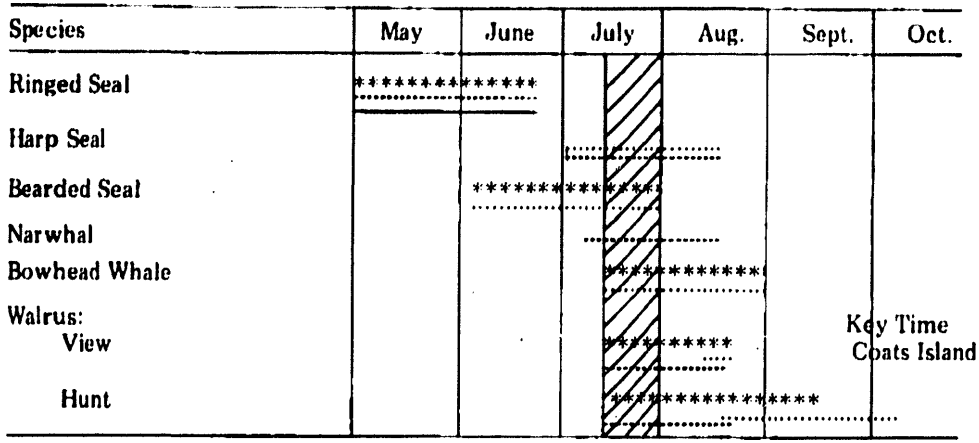
During the final two weeks in July, all marine mammals associated with the various areas are in some stage of their prime viewing and hunting time. This is obviously a critical period in any tourist and recreation planning involving a substantive input from marine mammals.

It will be noted that prime times for three mammals, including the harp seal, narwhal and walrus, extend to the end of the third week in August. The bowhead whale offers prime conditions until the end of August.

FIGURE 5.9

PRIME VIEWING AND HUNTING SEASON

COMBINED CENTRES OF CORAL HARBOUR, REPULSE BAY AND IGLOOLIK



***** Igloolik
..... Coral Harbour
----- Repulse Bay
All Species in prime hunting and viewing somewhere in the three areas combined.

Prime viewing times for walrus on Coats Island occur about the middle two weeks in August. This spectacular scene is almost an indispensable input to any tourist trip focused essentially upon the viewing of marine mammals. This time span, therefore, occupies a critical position in tourist and recreation planning in which the marine mammals occupy a cardinal position.

It should be noted that the spectacular occurrence of beluga whales in the mouth of the Seal River, just north of Churchill, from June through to August would have a strong appeal for those interested in marine mammals. The three areas under consideration are deficient in this species as noted. The long time span for the prime viewing time for the mammal in the Seal River and the reasonably close location of the resource to Churchill suggest that it might be incorporated in tourist and recreation plans for these three areas.

It is clear that the marine mammal resources of the three areas possess the variety, abundance and viewing and hunting opportunities required to support a first class touring and recreation experience. The walrus opportunities are among the very best, if not the best, in the Territories.

The pivotal or crucial time span centres around the middle two weeks of August when the walrus that can be reached by Peterhead boat from Coral Harbour are on Coats Island. All tourists involved in a trip of this type, of which there could be several trips in a summer season, must reach Coral Harbour and thence Coats Island at this time.

All tourists must arrive at Repulse Bay sometime from mid-July to the end of the third week in August to see the narwhal.

The best walrus hunting opportunity for the sportsman in all the Territories appears to be found in the Igloolik area where perhaps 100 animals could be taken annually.

Having met the requirements of the tourist for a visit to Coats Island and the viewing of narwhals in Repulse Bay, there are numerous possibilities for the distribution of trip time in various centres.

The beluga whales at Seal River could perhaps be best visited on the way out of the Territories. They might represent an added bonus, time permitting.

The biggest handicap in the development of a flow of tourists into the region over the summer period is climate. A large portion of the area has, at best, generally satisfactory weather and often generally to highly unsatisfactory weather prevails. Fog and drizzle, particularly with respect to its restricting effect upon air travel, is the principle difficulty. This obviously makes the execution of a trip of the type envisaged somewhat hazardous from the standpoint of timing. The combined use of the three areas, however, might make matters somewhat easier in that each area has the resources to interest the tourist. The two-week period in August for prime walrus viewing on Coats Island does present a compelling demand upon the organization of visitor travel schedule.

Cornwallis Island Waters – Organizational Centre Resolute:

This area that contains six species as indicated in the chart below received a total of 20 points in the rating system (Table 5.42). Only the great bowhead whale is absent and this is an elusive species from a tourist view standpoint.

With the exception of the beluga whale the rating for abundance is Class II in every case. Viewing and hunting opportunities also are rated Class II in every case. It is really the variety of species present rather than the quantity and quality that builds up the point total for the area. It is also important to note that no species presents any special qualities or attributes. The resources of the area are clearly not as strong as those of Cumberland Sound or the waters of Igloolik, Repulse Bay and Coral Harbour considered in combination.

TABLE 5.42

SPECIES PRESENT AND RATING – CORNWALLIS ISLAND WATERS

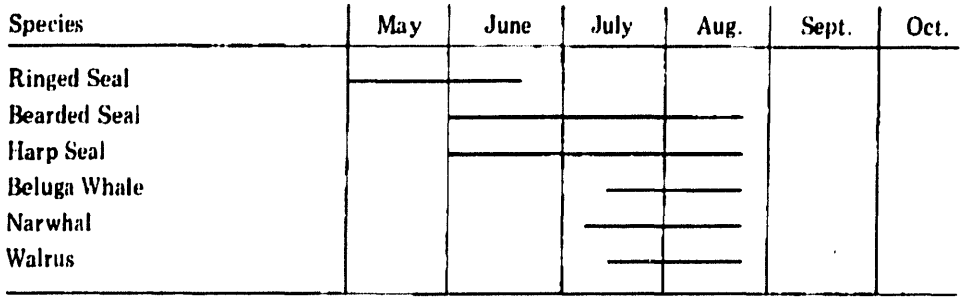
Species	Abundance Class	Viewing and Hunting Class	Total Points
Ringed Seal	II	II	3
Bearded Seal	II	II	3
Harp Seal	II	II	3
Beluga Whale	I	II	4
Narwhal	II	II	3
Walrus	II		4
			20

As in other areas, the prime viewing and hunting time when the ringed seal is in the fast ice is over before the main marine mammal season begins. After the middle of June the animal is in the open water (Figure 5.10).

From mid-July to the beginning of the fourth week in August, all other marine mammals of the area are in their prime hunting and viewing time. Interestingly there is a sharp cut-off in the prime time factor for all mammals about the beginning of the fourth week in August.

FIGURE 5.10

PRIME VIEWING AND HUNTING SEASON – CORNWALLIS ISLAND WATERS



The area faces a severe weather handicap. Conditions are generally unsatisfactory in July and early August. They become highly unsatisfactory from mid-August through to early September.

There is considerable travel away from the community required to exploit all mammal resources, the travel distance factor being one in every case. The risk and strenuous activity aspects are not abnormal, but good physical condition is usually necessary.

Jones Sound and N.E. Baffin Bay – Organization Centre Grise Fiord:

The area was accorded a total of 21 points on the basis of five species of marine mammals present (Table 5.43). Class I viewing and hunting opportunities are associated with the ringed seal, beluga whale, narwhal and walrus. The area appears to be superior to the waters around Resolute Island.

TABLE 5.43

SPECIES PRESENT AND RATING – JONES SOUND AND N.E. BAFFIN BAY

Species	Abundance Class	Viewing and Hunting Class	Total Points
Ringed Seal	I	I	5
Harp Seal	II	II	3
Beluga Whale	I	I	5
Narwhal	II	I	4
Walrus	II	I	4
			21

Two species are absent from this area, namely, the bearded seal and the bowhead whale. The variety of mammals is sufficient, however, for a good tourist and recreation experience. There is an estimated annual residue of twenty walrus available to sport hunters in this area.

From mid-July to the beginning of the fourth week in August all species, except the ringed seal, are simultaneously in their prime viewing and hunting period (Figure 5.11). The

season for harp seal begins about two weeks earlier and extends until the end of September. The prime time for the beluga whale, narwhal and walrus terminates about the beginning of the fourth week in August in each case.

Walrus are plentiful throughout Jones Sound. The animals are present in the hundreds around Cobourg Island. The waters between North Kent Island and the southwestern tip of Ellesmere Island are open in winter and represent an important wintering area for walrus. Belugas and narwhals may also winter here, but this remains uncertain. Glacier Strait off the southeastern tip of Ellesmere Island is an important summering and migration area for hundreds of beluga whales.

FIGURE 5.11

PRIME VIEWING AND HUNTING SEASON JONES SOUND AND N.E. BAFFIN BAY

Species	May	June	July	Aug.	Sept.	Oct.
Ringed S.	—	—				
Harp. S.			—	—	—	
Beluga W.			—	—		
Narwhal			—	—		
Walrus			—	—		

Weather conditions are highly to generally unsatisfactory around Grise Fiord during mid-July and August. Fog and rain are the major problem.

Travel distance, risk and strenuous activity factors are reasonable for the area. Interestingly, walrus are present around the community, and the rating for three aforementioned factors for this mammal at Grise Fiord is 0 in every case.

Notes Related to Class II and Class III Areas:

The pertinent data for each of these areas are contained in the information for individual marine mammals presented in a previous section of this report. Some additional notes gleaned from data presented in the Wildlife Ecology Map Series, prepared for the Canadian Wildlife Service, are summarized in this final section of the report.

Waters of Beaufort Sea adjacent to Mackenzie Delta – Organization Centre Tuktoyaktuk – Class III:

Mackenzie Bay from Herschel Island eastward is an important late June pupping area for whales. In late August staging thousands are in the area. The estuaries of the entire Mackenzie Delta eastward to Cape Dalhousie are a summer pupping area of major beluga populations. They migrate westward in late fall to winter in the Bering Sea. Kugmallit Bay is reported to contain strong beluga concentrations from July 1st to August 15th.

Peel Sound – Franklin Strait between Prince of Wales Island, Somerset Island and Boothia Peninsula:

While this area did not stand out in data provided by the Fisheries Research Board, its marine mammals received considerable attention in the Wildlife Ecology Map Series.

Beluga whales are reported to be in the hundreds in Peel Sound, off the west coast of Somerset Island in the summer, with marked concentrations in Aston Bay and the vicinity of Bellot Strait.

Narwhals are reported in Franklin Strait and Peel Sound generally, with marked concentrations at times near Bellot Strait. In addition, Creswell Bay on the east side of Somerset Island, the eastern entrance of Bellot Strait and Brentford Bay are said to contain noticeable narwhal concentrations.

Navy Board Inlet – Eclipse Sound and Pond Inlet – Bylot Island Waters – Organization Centre Pond Inlet – Class III:

The narwhal is the strongest marine mammal of this area. There are concentrations in Eclipse Sound and Pond Inlet in June and July. Milne Bay is a reported calving area with several thousand narwhal present at certain times.

Wollaston Island off the northwest tip of Bylot Island is occasionally used by walrus as a hauling out ground.

West Coast of Hudson Bay, Rankin Inlet to 60th Parallel:

Beluga whales are a prime resource of this area being in the thousands along this coast. The Seal River estuary is particularly noted for its concentrations. It is important to note, however, that major concentrations of belugas are reported along the entire coast from James Bay to Repulse Bay. Apart from the estuary of the Seal River, the area does not possess comparative advantages for this species.

Walrus are said to occur from Rankin Inlet to Dawson Inlet.

5.9 TOURIST AND RECREATION TERRAIN QUALITY AND CAPABILITY [1]

Classifications for the N.W.T.

This section is concerned with the transformation of a point rating system developed by Canada Land Inventory (Federal Department of the Environment) into quality and capability classifications. Numerous approaches and methods were possible, hence the results presented in this section represent only one of several solutions.

To maximize the effectiveness of the material presented by Canada Land Inventory, their terrain point rating map has been analyzed from two distinct perspectives — a Territory-wide perspective and a physiographic regional perspective.

In the former case, the point ratings of the unit areas mapped must be considered in relation to conditions prevailing throughout the Northwest Territories. Such a procedure provides an indication of the comparative strength of the terrain of any individual area or group of areas in relation to the entire land mass of the Northwest Territories, irrespective of regional structural and physiographic differences. In effect, the numerical ratings for units in the Western Cordillera, Interior Lowlands, Shield, Arctic Highlands and Mountains, Arctic Uplands, and Arctic Lowlands are compared. No consideration is given to the fact that each unit is a component part or member of one of the aforementioned regions that are structurally and physiographically unique and provide a significantly different type of tourist and recreational terrain impact.

The physiographic regional approach recognizes that each major physiographic region is an entity in itself with a distinctive type of terrain impact upon a tourist and recreation experience. The objective in this instance is to evaluate terrain quality for each unit area mapped in relation to the physiographic region of which it is an integral component.

On the basis of structural and physiographic characteristics, the surface of the Northwest Territories can be divided in numerous ways. An evaluation of the information provided by the Canada Land Inventory group in relation to the specific objectives of this study, suggested that the following procedure would be most appropriate.

Initially, two divisions in the terrain of the Northwest Territories were recognized, namely, Mainland and Archipelago. These divisions are of some consequence to tourist and recreational planning and should therefore be recognized at some stage in the analysis of the raw point rating data. The following physiographic divisions are considered within these two divisions:

Mainland Area:

Cordilleran Region – Mountains and Plateaus.
Interior Lowland Regions — Plains and Plateaus.
Shield Region — Uplands, Plateaus, Plains and Lowlands.

Archipelago Area:

Davis Region — Mountains and Highlands.
Arctic Upland Region — Uplands and Plateaus.
Arctic Lowland Region — Plains and Lowlands.

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[1] See also maps in Volume 2

Terrain Quality Classification from a Territory-Wide Perspective

As will be seen from Table 5.44 point values for 805 areas were grouped under sixteen point classes. Each class contains range of five point values with the lowest class containing 20-24 points and the highest 95-99. An examination of the mean values indicated for each of the point classes suggests that the weight of the observations and the point values in almost every case lies at or close to the mean value of the point class.

The mean point value of the 805 areas mapped throughout the Territories is 55. The value of the median observation of the classified data is 55.4. In effect, both the mean and median point values lie fairly close to the lower extremity of the median point class, that is to say close to 55. Finally, the distribution is essentially normal in character with the extreme low and extreme high values being quite a few in number.

A comparison of the point values for the Mainland and Archipelago Areas is of considerable interest. Initially, it might be noted that the number of observations in each area is reasonably close although there are 27 more units in the Archipelago Area.

Point values in the Mainland Area tend to be somewhat higher than those in the Archipelago. The mean point value for the Mainland Area is 57 and the value for the median observation 57.9. Corresponding values in the Archipelago Area are 53 and 53.4.

The absence of any mapped units in the point classes 80-84 and above in the Archipelago Area is another notable feature. About 4% of the mapped unit areas in the Mainland Area fall into these higher valued point classes.

The next stage of the analysis is to group the point values for the 805 mapped areas into seven quality classes, as indicated in Table 5.45.

The point ratings for the 805 areas range from a high of 96 recorded in two units in the Cordilleran Region, namely, the Nahanni Valley and the smaller Little Doctor and Cli Lake combination, to a low of 24 in two units on the Great Plain of the Koukdjuak along the shores of Foxe Basin in the southwest portion of Baffin Island. As noted in Table 5.44, the mean point value for the 805 areas mapped is 55 and the value of the median observation is 55.4.

Considerable attention has been focused upon the value of the mean in the derivation of terrain capability classes. A brief discussion of the significance of the mean is therefore desirable.

Mapped units with a point rating at or close to the mean can be considered to be neutral from a territory-wide perspective from the standpoint of the impact of terrain quality upon a tourist and recreation experience. Neutrality in this instance implies a sufficient or adequate terrain impact upon a tourist and recreational experience in comparison with the situation prevailing throughout the Territories. The terrain impact exerted by units with point values at or close to the mean, however, does not provide any comparative advantage or disadvantage within this broad geographic perspective. It is important to note that neutrality in this instance does not imply no impact whatever, but simply a mean or average impact.

It will be observed that the mean and median point values of 55 and 55.4 respectively lie at the lower end of the range of values contained within the point class 55-59. Considering this fact in conjunction with the degree of subjectivity in the derivation of point ratings, as previously noted, it was decided that the designation average could be

TABLE 5.44

TERRAIN POINT RATING CLASSIFICATION FROM A TERRITORY-WIDE PERSPECTIVE

Point Classes	Mainland						Archipelago						Combined					
	Areas			Points			Areas			Points			Areas			Points		
	No.	%	Total	%	Mean [1]	Median [2]	No.	%	Total	%	Mean [1]	Median [2]	No.	%	Total	%	Mean [1]	Median [2]
20-24							2		48		24		2		48		24	
25-29	3	1	77		26		1		27		27		4	1	104		26	
30-34	6	2	198	1	33		6	2	190	1	32		12	1	388	1	32	
35-39	25	6	917	4	37		27	7	1,010	5	37		52	7	1,927	4	37	
40-44	31	8	1,314	6	42		42	10	1,770	8	42		73	9	3,084	7	42	
45-49	44	11	2,067	9	47		73	18	3,430	15	47		117	15	5,497	12	47	
50-54	47	12	2,460	11	52		85	20	4,420	20	52		132	16	6,880	16	52	
55-59	67	17	3,837	17	57		61	15	3,463	16	57		128	16	7,300	17	57	
60-64	60	16	3,709	17	62		54	13	3,351	15	62		114	14	7,060	16	62	
65-69	46	12	3,090	14	67		34	8	2,264	10	67		80	10	5,354	12	67	
70-74	21	5	1,500	7	71		22	5	1,579	7	72		43	5	3,079	7	72	
75-79	23	6	1,771	8	77		9	2	688	3	76		32	4	2,459	6	77	
80-84	7	2	576	2	82								7	1	576	1	82	
85-89	6	1	524	2	87								6	1	524	1	87	
90-94	1		92	1	92								1		92		92	
95-99	2	1	192	1	96								2		192		96	
Total	389	100	22,324	100	57	57.9	416	100	22,240	100	53	53.4	805	100	44,564	100	55	55.4

1] Indicates the mean of the raw data included in any point class.

2] Indicates the value of the median $(\frac{n}{2})$ observation of the classified data.

TABLE 5.45

TERRAIN QUALITY CLASSIFICATION FROM A TERRITORY-WIDE PERSPECTIVE

Quality Class Point Limits	Entire N.W.T. No.	%	Mainland Portion No.	%	Archipelago Portion No.	%	Cordilleran Mts. and Plateaus No.	%	%	Interior Lowlands No.	%	%	Shield No.	%	%	Arctic Mts. & Highlands No.	%	%	Arctic Uplands No.	%	%	Arctic Lowlands No.	%	%
Class I 90 + Points	3	1	3	100			3	6	100															
Class II 80-89 Points	13	2	11	100			11	21	77				2	1	23									
Class III 70-79 Points	75	9	44	59	31	41	24	45	32	2	1	2	18	10	24	14	28	19	17	13	23			
Class IV 60-69 Points	194	24	106	55	88	45	15	28	8	19	13	10	72	39	37	14	28	7	59	47	30	15	6	8
Class V 50-59 Points	260	32	114	44	146	56				44	30	17	70	37	27	14	28	5	41	32	16	91	38	35
Class VI 35-49 Points	242	30	100	41	142	59				76	51	31	24	13	10	8	16	3	9	7	4	125	52	52
Class VII Less Than 35 Points	18	2	9	50	9	50				8	5	45	1		5				1	1	5	8	4	45
	805	100	387		416		53	100		149	100		187	100		50	100		127	100		239	100	

Classification	Points	Quality Description
Class I	– 90 +	Exceptionally high class terrain
Class II	– 80-89	High class terrain
Class III	– 70-79	Moderately high class terrain
Class IV	– 60-69	Above average terrain
Class V	– 50-59	Average terrain
Class VI	– 35-49	Below average terrain
Class VII	– Less than 35	Well below average terrain

applied to all units with point values between 50-59. This seems to be a reasonable and sensible procedure to adopt.

An examination of the distribution of point value above 59 suggested the advisability of a grouping into four classes. There was a group of areas with point values ranging from 60-69 that appeared to possess terrain qualities above average but below what might be considered high class terrain. Areas with point ratings between 70-79 were considered to possess moderately high class terrain. Those with point values between 80-89 were said to represent high class terrain and those with 90 points or more exceptionally high class.

The distribution of point values below the lower limit set for average terrain, that is those units possessing 49 or less points, appeared to fall into two groups. Point ratings ranging from 35-49 were considered to represent terrain somewhat below the average. There were a few units possessing 35 or less points which were obviously well below average terrain conditions.

The results of terrain quality classification derived in the foregoing manner are summarized in Table 5.45. Some of the more salient features of this distributive pattern require mention.

About 32% of the areas mapped throughout the Northwest Territories have been included in Class V, the designation for average quality terrain. About 44% of the units mapped on the Mainland Area, and 56% of those in the Archipelago Area fall into this class.

It will be seen from Table 5.45 that all units in the Cordilleran Mountain and Plateau Region have point values above the limits for Class V. On the other hand, 30% of the areas mapped in the Interior Lowlands fall into this quality class and 37% of those in the Shield. Approximately 28% of the areas in the Arctic Mountains and Highlands Region are in this mean or average Class V, 32% of those in the Arctic Uplands and 38% of those in the Arctic Lowlands.

The quality classification adopted has been noticeably stringent with respect to the designation of Class I and Class II areas. Only three areas in the Territories, all of which are in the Cordilleran Region, have received a Class I designation. Only 13 areas or 2% of the total have been accorded Class II status. Eleven of these areas are in the Cordilleran Region and two in the Shield. It can therefore be stated categorically that high and exceptionally high terrain capability mean precisely what the terms imply.

The Class VII designation representing well below average terrain quality has also been applied with considerable stringency with only 18 areas or 2% of the total within the Territories falling into this grouping. Moreover, they are equally distributed between the Mainland and Archipelago Areas.

No Class VII areas are found in the Cordilleran or Arctic Mountain regions while the Shield and Arctic Uplands have one area each. Sixteen of the areas are found within the Interior Lowlands and the Arctic Lowlands with each regional grouping have 8. The bulk of the low class terrain is therefore located in the lowland regions of the Northwest Territories.

Class IV quality terrain which represents above average conditions and Class VI which represents below average conditions includes 54% of the units mapped throughout the Northwest Territories. Units of these classes are well represented in both the Mainland and Archipelago areas.

It will be noted that Class VI units, that is, units with terrain below mean values, are somewhat more significant than Class III, being 1.2 times as numerous. On the other hand, the point limits adopted for Class IV and Class VI quality terrain, that is, terrain somewhat above and below the mean, appear reasonable from a statistical point of view.

Class III terrain quality undoubtedly represents fairly high values in relation to the total distribution of points recorded and it was felt that it must be accorded high quality status. At the same time, it was equally evident that values were noticeably below those associated with Class I and Class II terrain. Therefore, it was felt necessary to establish this class to accommodate the nature of the distribution of the point values above the mean. The distribution of point values below the mean, however, suggested that the designation of an additional class between VI and VII was not desirable.

A very large portion of the Interior Lowlands Region that corresponds roughly to the Mackenzie Valley Drainage Basin fall into the average to below average terrain quality classes. The highway network of the Northwest Territories is restricted largely to areas with below average terrain quality. Only very insignificant portions of the highway to Fort Simpson on the south side of the Mackenzie River possess average terrain quality. Within the Mackenzie Lowlands the Colville Hills have the highest terrain quality reaching Class III designation, which is indicative of moderately high values.

On the Mainland portion of the Territories there are two noticeable concentrations of high quality terrain, namely, the Mackenzie Mountains in the Cordilleran Region and the western margin of the Shield Region. The high terrain qualities in the latter area are associated with the belt of land 190 to 200 miles in width running southward from Great Bear Lake to the boundary of the Northwest Territories and lying immediately to the east of the junction of the Shield Region with the Interior Lowlands Region.

An enormous extent of the Shield Region lying to the east of the aforementioned belt possesses terrain of average quality to somewhat above average. As has been previously stated, there are undoubtedly higher values within this area and, of course, there are some stretches of terrain of lower quality.

Within the Arctic Archipelago Area, the high quality terrain is clearly associated with the mountains, highlands and uplands of Ellesmere, Devon and Baffin Islands. It is probable, however, that a Class III designation in an overall sense is reasonably accurate.

The remainder of the Archipelago Region, which includes essentially the Arctic Lowlands, has received very low quality designations. There are enormous areas with values below the mean, and in some cases well below the mean. Average terrain quality covers much of the areas. Class IV areas indicating above average conditions are not particularly extensive.

The Shaler Mountains on Victoria Island clearly stand out in terms of terrain quality in the group of islands comprising the Western Arctic Archipelago. These mountains, however, have been included within the Arctic Mountain and Highland Region as previously noted. This is undoubtedly the best of the terrain quality in this portion of the Northwest Territories.

Terrain Quality Classification from a Physiographic Regional Perspective

It is of importance to understand the varying quality of terrain encountered in each of the previously identified physiographic regions. Each has its own particular type of landscape impact upon the tourist or input to a tourist and recreational experience. In this section of the report the evaluation of terrain quality within the framework of a particular physiographic region is the objective.

The need for this approach can perhaps be best illustrated by comparing the point ratings shown on the map, prepared by the staff of the Canada Land Inventory, for the East Arm of Great Slave Lake with those for the Nahanni Valley country. The East Arm of Great Slave Lake has been accorded a point rating of 86, the highest value for any portion of the Shield physiographic region. The value of 96 for the Nahanni in the Cordilleran physiographic region is a full 10 points higher. Each of these areas is a component of a different physiographic region and in many respects it is insufficient to compare their numerical ratings. A complete appreciation of the situation can be obtained only by an additional comparison of the values for these areas with those for all other areas within the region of which they are an integral component. In effect, the point rating for the Nahanni Valley must be compared with those for other areas in the Cordilleran Region and that of the East Arm with other areas in the Shield. Comparison within this perspective provides a valuable additional insight into terrain quality for tourism and recreation.

To effect this type of comparison, separate point classes have been prepared for each region. As in the previous development of terrain classes from a territory-wide perspective, distribution of points and the mean value occupy a central position in the method adopted.

The distribution of points is such within some physiographic regions that it was not always possible to identify seven classes. Such is the case with the Arctic Mountains and Highlands and the Arctic Uplands. This problem is discussed subsequently.

The descriptive terminology applied to each of the quality classes is identical with that used in the previous analysis based on a Territory-wide perspective.

Cordilleran Region:

The point rating and quality classification of the areas mapped within this physiographic region is summarized in Table 5.46. While the results are rather obvious a few points require mention.

The mean point value for all areas mapped in this physiographic region is 76. The value for the median observation is 75.

Class V, which has been designated average terrain, includes all areas shown on the map prepared by the staff of the Canada Land Inventory with a point rating between 75 and 79. The mean and median values for all areas mapped in this physiographic region therefore lie at or close to the lower extremity of the range of values included in the point class 75-79. It was felt desirable however, to restrict the Class V quality designation to areas within the point class 75-79.

The procedure adopted has been very restrictive insofar as the designation of Class I and Class II terrain is concerned. Only three areas or 6% of all those mapped fall into these high quality classes.

Eleven areas or 21% of the total fall into Class IV and Class III that designate areas with above average or moderately high class terrain respectively. Again, the procedure adopted has been fairly stringent in terms of high quality designation.

Some 25 areas or 47% of the total have been included in Classes VI and VII. These areas possess terrain quality below or well below the average for the Cordilleran Region. Admittedly, there are some high terrain qualities in areas accorded Class VI or VII designation when viewed from a territory-wide perspective. As stated at the outset, however, this analysis is based upon a physiographic regional perspective. As might be expected a

TABLE 5.46

TERRAIN CLASSIFICATION FOR CORDILLERAN MOUNTAINS AND PLATEAUS

Point Rating Classification						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class	Quality Description
65-69	15	28	1,020	68		VII	Well below average terrain
70-74	10	19	718	72		VI	Below average terrain
75-79	14	26	1,080	77		V	Average terrain
80-84	6	11	496	83		IV	Above average terrain
85-89	5	10	438	88		III	Moderately high class terrain
90-94	1	2	92	92		II	High class terrain
95-100	2	4	192	96		I	Exceptionally high class terrain
	53	100	4,036	76	75		

large portion of the terrain is simply below average when compared with conditions prevailing throughout that portion of the Cordilleran Region within the Northwest Territories.

Interior Lowlands Region:

The results of the point rating and quality classification evolved for this physiographic region are summarized in Table 5.47. While the pattern is obvious a few comments are again in order.

The mean point value for all areas mapped within this physiographic region is 49. The value of the median observation is 47.

Quality Class V, representing average terrain, was accorded all areas with point values ranging from 45-54. Inclusion of areas with point values between 50-54 within quality Class V rather than Class IV tended to depress somewhat the overall pattern for this physiographic region. It was felt, however, that since the mean value for all areas is 49, and the mean value for the point class 50-54 is only 52, that such a grouping is desirable. It is obvious from the mean value of 52 for the point class 50-54 that a large number of the areas must have point ratings close to the mean value for the point class. In fact, 55% of the areas included in the point class 50-54 have point ratings of 52 or less.

Quality Classes I and II representing high and exceptionally high class terrain, contain only 3% of all areas within this physiographic region. Only 8 areas or 5% of the total have been included in quality Class VII representing terrain with well below average conditions.

TABLE 5.47

TERRAIN CLASSIFICATION FOR THE INTERIOR LOWLANDS

Point Rating Classification						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class	Quality Description
25-29	3	2	77	26		VII	Well below average terrain
30-34	5	3	164	33			
35-39	20	13	734	37		VI	Below average terrain
40-44	23	16	976	42			
45-49	33	22	1,546	47		V	Average terrain
50-54	22	15	1,151	52			
55-59	22	15	1,254	57		IV	Above average terrain
60-64	16	11	990	62		III	Moderately high class terrain
65-69	3	2	200	67		II	High class terrain
70-74	2	1	140	70		I	Exceptionally high class terrain
	149	100	7,232	49	47		

A total of 43 areas or 29% of all those mapped within the physiographic region fall within quality Class VI designating terrain below average. Class IV status, indicating above average terrain quality, includes 22 areas or 15% of the total. Moderately high quality terrain, as represented by Class III status, has been accorded only 16 areas or 11% of the total.

Shield Region:

The results of the point rating and quality classifications for the Shield Region in its mainland portions are summarized in Table 5.48.

The mean point value for all areas in this physiographic region is 59. The value of the median observation is 61.

Class V status representing average terrain quality was accorded all areas displaying point values between 55 and 64. Considering mean and median values previously noted, the point limits for this class appear satisfactory from a statistical point of view.

Remarks made with respect to quality Classes I, II, III, and VII in previous discussions of the classification for Cordilleran and Interior Lowlands Regions are applicable in the Shield Region.

Arctic Mountains and Highland Region:

The results of the point rating and quality classification for this physiographic region are summarized in Table 5.49. Several explanatory comments are necessary in this instance.

TABLE 5.48

TERRAIN CLASSIFICATION FOR THE SHIELD

Point Rating Classification						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class	Quality Description
30-34	1	1	34	34		VII	Well below average terrain
35-39	5	2	183	37			
40-44	8	4	338	42		VI	Below average terrain
45-49	11	6	521	47			
50-54	25	13	1,309	52		V	Average terrain
55-59	45	24	2,583	57			
60-64	44	23	2,719	62		IV	Above average terrain
65-69	28	15	1,870	67			
70-74	9	5	642	71		III	Moderately high class terarin
75-79	9	5	691	77		II	High class terrain
80-84	1	1	80	80		I	Exceptionally high class terrain
85-89	1	1	86	86			
	187	100	11,056	59	61		

TABLE 5.49

TERRAIN CLASSIFICATION FOR ARCTIC MOUNTAINS AND HIGHLANDS

Point Rating Classification						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class[1]	Quality Description
35-39	1	2	39	39		VII	Well below average terrain
40-44	4	8	166	42			
45-49	3	6	143	48		VI	Below average terrain
50-54	8	16	423	53			
55-59	6	12	336	56		V	Average terrain
60-64	7	14	434	62			
65-69	7	14	468	67		IV	Above average terrain
70-74	7	14	499	71		III	Moderately high class terrain
75-79	7	14	536	77		II	High class terrain
	50	100	3,044	61	62.0		

1] For explanation of absence of Class I see text.

Capability Class V, representing average terrain corresponds with point classes 55-64. Mean value of all areas mapped within this physiograhipc region is 61 and the point score for the median 62.0. The aforementioned means, therefore, are located close to mid-point of the range included within point classes 55-64.

It will be immediately noticed that no quality Class I appears in the table. In effect, the highest designation for any area in the Arctic Mountains and Highland Region is quality Class II.

Point ratings are depressed to a considerable extent by the absence of vegetation on the ice cap formations which resulted in zero values for this factor. No compensating point rating is used for ice cover conditions. The terrain suitable for tourist and recreational facility development and general outdoor activity is minimal in many locations. Over a large portion of this mountain and highland area the landscape tourist receives the greatest scenic impact from off-shore observation. In effect, some of the greatest scenic qualities are found when penetrating the Fiords and Sounds by boat.

It is important to note that this region is not structurally homogeneous. The Davis Highlands are a 1,200 mile belt of elevated and deeply dissected highland composed of pre-Cambrian rock. The formation extends along the easterly portion of Ellesmere Island southward from Alexandra Fiord across Devon Island and down Baffin Island to culminate in the Cumberland Peninsula. Summit points 5,000 feet or more above sea level are common throughout. The sea penetrates a belt of uplifted terrain as Sounds and Fiords and, in some places, such as Pangnirtung Pass, as overland defiles. Ice caps are common with the largest being the Penny formation at 6,000 to 7,000 feet elevation.

The Grantland, Axel Heiberg, Victoria and Albert Mountains are composed of folded Palaeozoic sediments with minor igneous intrusions. Their higher elevations that are frequently crowned with ice caps reach 8,000 feet. This fold mountain formation is structurally and geologically akin to the Cordilleran Region.

Arctic Uplands Region:

The Arctic Uplands Region as defined in this report includes the Baffin, Hall and Frobisher Uplands on Baffin Island, the Eureka Upland on Ellesmere Island and the large portion of the Lancaster Plateau on southern Ellesmere, Devon and northern Baffin Islands. There is substantial geological and structural diversity in this region but the similarity of the point value accorded the various units by the staff of the Canada Land Inventory suggested that grouping was feasible and logical.

The Baffin, Hall and Frobisher Uplands are actually broad upland surfaces with elevations between 3,000 and 5,000 feet that have been cut by pre-Cambrian rock. In the northeast, the Baffin Upland joins with the Davis Highland Mountain Region. Ice caps are common with the Barnes being the most prominent.

The Eureka Upland on Ellesmere Island is a mosaic of ridged uplands and valleys 20 to 100 miles long and 10 to 30 miles wide. It also includes the plateau area of folded sediments around Hazen Lake. In essence, the Eureka Upland is composed of folded Palaeozoic sediments and is structurally associated with the Grantland, Victoria and Albert and Axel Heiberg Mountains.

Sections of the Lancaster Plateau on southern Ellesmere Island, Devon Island and northern Baffin Island have been included in the Arctic Uplands Region. They are composed of elevated palaeozoic rocks that are sometimes in folded patterns similar to those encountered on the Eureka Upland.

Results of the point rating quality classication evolved for the Arctic Upland Region are summarized in Table 5.50. The mean point value for all areas included in the region is 61, and the value for the median observation 60.5.

As in the case of the Arctic Mountains and Highland Region, no quality Class I was recorded. The series of conditions leading to this situation and the factual basis of the ultimate decision made to restrict the upper quality designation to Class II are identical with those previously discussed in connection with the Arctic Mountains and Highland Region.

Areas with point values between 55 and 64 inclusive have been accorded quality Class V status representative of average terrain. It will be noted that the mean point value for all areas mapped, namely 61, and the value of the median observation, namely 60.5, are fairly close to the mid-point in the range of values included in point classes 55-64. The relationship to the mean was the major determinant of average terrain quality.

Arctic Lowlands Region:

This is a very extensive region in the Archipelago Area of the Northwest Territories, and includes considerable diversity of terrain. Nearly flat Palaeozoic sediments are characteristic of the area, but some Mesozoic and Tertiary rock is present. Some uplifted and ridged terrain associated with the Parry Plateau has been included within the Arctic Lowlands Region, but the similarity of point ratings with other areas in this region suggests that this grouping is desirable.

In many respects, the Arctic Lowlands Area is the counterpart of the Interior Plains Region on the mainland portion of the Northwest Territories. A comparison of the point values clearly reflects this similarity.

As will be seen from Table 5.51 all areas within the point class 45-49 were accorded Class V quality status representative of average terrain conditions. The mean value of all areas mapped in this region is 48 and the value of the median observation 47.5. The mean and median values, therefore, lie very close to the upper limit of the point class 45-49.

Consideration was given to the inclusion of areas in the point class 50-54 within this average terrain quality class, particularly since the mean value for this group of areas was only 52. After a careful examination of the distribution of point values for areas included in point class 50-54, it was felt desirable to place their entire group of areas in Class IV quality status, representing above average terrain condition.

The Development of a Tourist and Recreation Terrain Quality and Capability Classification from a Combined Territory-Wide and Physiographic Regional Perspective

The discussion that follows moves progressively through several distinct stages. Initially, a methodology for combining class values from Territory-wide and regional perspectives is explained. The results of this combining process are then analysed. On the basis of the insight provided by this analysis, quality classes are established. Finally, the quality classes are translated into capability classes, essentially through a descriptive process.

The procedure for combining the results of the quality classifications is quite straightforward, since seven terrain quality classes have previously been established. The following numerical values were assigned to each of these quality classes: Class I — 7 points, Class II — 6 points, Class III — 5 points, Class IV — 4 points, Class V — 3 points, Class VI — 2 points and Class VII — 1 point. The same procedure was adopted for the assignment of numerical values to the quality classes established from a physiographic regional perspective.

TABLE 5.50

TERRAIN CLASSIFICATION FOR ARCTIC UPLANDS

Point Rating Classifications						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class[1]	Quality Description
30-34	1	1	34	34			
35-39	1	1	38	38		VII	Well below average terrain
40-44	2	1	81	41			
45-49	6	5	285	48			
50-54	16	13	832	52		VI	Below average terrain
55-59	25	20	1,428	57			
60-64	36	28	2,240	62		V	Average terrain
65-69	23	18	1,531	67		IV	Above average terrain
70-74	15	12	1,080	72		III	Moderately high class terrain
75-79	2	1	152	76		II	High class terrain
	127	100	7,701	61	60.5		

1] For explanation of absence of Class I see text.

TABLE 5.51

TERRAIN CLASSIFICATION FOR THE ARCTIC LOWLANDS

Point Rating Classifications						Quality Classification	
Point Classes	Areas No.	%	Points Total	Mean	Median	Class	Quality Description
20-24	2	1	48	24			
25-29	1		27	27		VI	Well below average terrain
30-34	5	2	156	31			
35-39	25	10	933	37			
40-44	36	15	1,523	42		VI	Below average terrain
45-49	64	27	3,002	47		V	Average terrain
50-54	61	26	3,165	52		IV	Above average terrain
55-59	30	12	1,699	57		III	Moderately high class terrain
60-64	11	5	677	62		II	High class terrain
65-69	4	2	265	66		I	Exceptionally high class terrain
	239	100	11,495	48	47.5		

A special situation arose in the case of the Arctic Mountains and Highland Region and the Arctic Uplands Region. Each of these regions possesses only 6 quality classes, ranging from II – VII. Obviously, a choice was involved in this instance. Seven points could have been accorded to quality Class II with appropriate downward grading towards Class VII. This would have meant that Class VII terrain would have received 2 points in these regions as compared with 1 point in others. Secondly, the point values ascribed to classes as previously noted, could be maintained. This would mean that Class II terrain, the highest quality class in both these regions, would receive 6 points. With this procedure no area within the Arctic Mountains and Highland or the Arctic Upland Regions could receive 7 points.

An evaluation of the overall situation suggested that the latter approach was advisable. In effect, within the Arctic Mountains and Highland Region and the Arctic Uplands Region a Class II quality terrain received 6 points, Class III – 5 points. etc. It was felt that if any adjustment were required as a result of the adoption of this procedure, it could be most expeditiously completed in the final stages of the work.

A brief explanation of the combining process appears desirable. If an area received Class I quality status from a Territorial-wide perspective, it was accorded 7 points. If it received Class I quality status from a regional perspective, it was also accorded 7 points. These two point values were then combined giving a total of 14. The Nahanni Valley in the Cordilleran Region provides an excellent example of this type of combination. If an area was accorded Class II quality status, from a territory-wide perspective, it received 6 points. If it was also accorded Class I quality status from a regional perspective, it received another 7 points. The combination of the two point values totals 13. The East Arm of Great Slave Lake provides a classic example of this situation.

Reference to the Nahanni Valley and the East Arm of Great Slave Lake provides good examples of the value of the point rating system adopted. When the situation is evaluated from a territory-wide perspective, the extraordinary high point values for the outstanding scenic qualities of the Cordilleran Mountains tend to depress quality ratings for high class terrain in other physiographic regions, that within the narrower regional perspective actually possess exceptionally high quality. The combining of point values tends to overcome this difficulty.

As will be noted subsequently, the system adopted does not lift any areas in the Arctic Mountains and Highland or the Arctic Uplands Regions into point values between 12 and 14 which are the values set as limits for exceptionally high terrain. It is felt, as noted in previous sections of this report, that there may be areas in these regions that warrant point values between 12 and 14, but the coarseness of the mapping has failed to identify them. On the other hand, the true overall situation may be truly reflected in the combining system adopted. In effect, areas within the Arctic Mountains and Highland and the Arctic Upland Regions may not possess the strength in an overall tourist and recreational use and development sense to warrant exceptionally high quality designation, due to the somewhat narrower range of activity pursuits and viewing experiences that they offer.

Table 5.52 shows the distribution of areas by their assigned point values. The point values range from two to fourteen. Table 5.53 then summarizes the number of areas that are allocated to each point division.

The distribution by point values of the 805 areas mapped by the staff of the Canada Land Inventory is indicated, both in absolute numbers and on a percentage basis. The value of the median observation for the 805 areas is 5.7. Only 67 of the areas or 8% of the total were related to the point value 6, while 23% had a point value of 7, and 24% a point value of 5. The distribution of point values by areas is, therefore, not normal.

TABLE 5.52

AREA DISTRIBUTION BY POINT VALUES FOR TERRAIN QUALITY CLASSES FROM A COMBINED TERRITORY-WIDE AND REGIONAL PERSPECTIVE

Assigned Point Values	Cordilleran No.	%	Interior Lowlands No.	%	Shield No.	%	Arctic Mtns. & Highlands No.	%	Arctic Uplands No.	%	Arctic Lowlands No.	%	All N.W.T. No.	%
14	2	4											2	
13	1	2			1	1							2	1
12			2	1	1								3	
11	5	9					7	14	2	2	4	2	18	2
10	6	11	3	2	9	5	7	14	15	12	11	5	51	6
9			16	11	9	5							25	3
8	14	27			28	15	7	14	23	18	30	12	102	13
7	10	19	22	15	44	24	7	14	36	28	61	25	180	23
6			22	15	45	24	3	6	3	2			73	9
5	15	28	33	22	25	13	11	22	38	30	64	27	186	23
4			43	29	19	10	3	6	6	5	61	26	132	16
3					5	3	5	10	3	2			13	2
2			8	5	1	—			1	1	8	3	18	2
	53	100	149	100	187	100	50	100	127	100	239	100	805	100

TABLE 5.53

THE ANALYSIS OF POINT VALUES FOR TERRAIN QUALITY CLASSES FROM FROM A COMBINED TERRITORY-WIDE AND REGIONAL PERSPECTIVE

Point Values	Entire Northwest Territories Areas No. 1]	%	Points No. 2]	%	Quality Classes Class	Description
14	2		28			
13	2	1	26	2	I	Exceptionally high
12	3		36			
11	18	2	198	4	II	High
10	51	6	510	10		
9	25	3	225	4	III	Above Average
8	102	13	816	16		
7	180	23	1,260	25	IV	Average
6	73	9	402	8		
5	186	23	960	19	V	Below Average
4	132	16	528	10		
3	13	2	39	1	VI	Well Below Average
2	18	2	36	1		
Total	805	100	5,064	100		

1] Median Value 5.7

2] Mean Value 6.3. Value of Median 6.9.

The total number of points obtained by all areas associated with any point value listed in the first column is 5,064. This value is derived by the multiplication of the number of areas by the point value and subsequent addition. For example, the total of 28 points shown at the head of the appropriate column was obtained by multiplying 14 by 2. Mean value for the total of 5,064 points is 6.3.

From an analysis of the distribution of areas and points and the aforementioned mean and median values, quality classes were established as indicated. It was decided that point values of 6 or 7 were representative of average terrain quality conditions. This decision accords an average class or quality status to a range of point value that includes the aforementioned mean point value of 6.3 and the value of the median observation, namely, 6.9. In total, 31% of the areas fall into the average Class IV terrain quality designation.

Employing the same principles discussed in previous sections of the report, to the distribution of point values on either side of those for the average class, a set of quality classes above and below were designated.

In Table 5.54 the percentage of the areas falling under various terrain quality classes is indicated for the Territories as a whole and by physiographic regions. There are a number of significant features to be noted.

TABLE 5.54

PERCENTAGE OF AREAS IN TERRAIN QUALITY CLASSES BY PHYSIOGRAPHIC REGIONS

Quality Class	All N.W.T.	Cordilleran Mtns.	Interior Lowlands	Shield	Arctic Mtns. & Highlands	Arctic Uplands	Arctic Lowlands
	%	%	%	%	%	%	%
I	2	6	1	1	—	—	—
II	14	20	2	5	28	14	7
III	20	27	11	20	14	18	12
IV	31	19	30	48	20	30	25
V	29	28	51	23	28	35	52
VI	2	—	5	3	10	3	3

Class IV, representative of average terrain quality conditions, includes 31% of the areas mapped by the staff of the Canada Land Inventory, throughout the Northwest Territories. This percentage value is closely approximated in the Interior Lowlands and the Arctic Uplands Regions where percentage values for Class IV terrain are 30% in each case. Only 19% of the areas in the Cordilleran Region and 20% of those in the Arctic Mountains and Highland Region fall under quality Class IV. The average quality class is very pronounced in the Shield Area, with 48% of all areas mapped included in this grouping. This is explainable to some extent, by the fact that an enormous portion of the terrain of the Northwest Territories lies within the Shield Region, although this is not the whole answer.

The percentage values for extremely high class terrain as represented by Class I designation and for extremely low quality terrain as represented by Class VI designation are low. The percentage being 2 in each case. It will be noted that the Cordilleran Region with 6% of its areas in quality Class I stands well above all other regions in this respect.

The value of 10% for areas in the Arctic Mountains and Highlands included in quality Class VI is perhaps somewhat disturbing, as is the absence of any percentage value for quality Class I. The explanation for the high percentage value for quality Class VI in the Arctic Mountains and Highlands is explainable in part by the fact that no points were received by areas in this region for vegetation. This percentage value of 10 would be substantially lowered if some point values had been provided in the rating system for ice formations.

On the other hand, the point rating may be reasonable if one considers ice caps to be of a very limited tourist and recreational value, and the development terrain over much of this region to be limited in scale and diversity of opportunity. The absence of any area in the Arctic Mountains and Highlands in quality Class I is probably explainable in a like manner. On the other hand, the results attained may be a true reflection of terrain quality in a comparative sense.

A capability classification must provide a clear indication of the variation of terrain quality as a natural supply factor in varying types of tourist and recreational activities and experience. Knowledge of variation in the quality of terrain in relation to its impact upon user experience is obviously of major significance in the formulation of government policies and programs for tourist and recreational development in terms of physical plan formulation and the direction of financial and administrative effort.

As previously noted, the point rating system employed by the staff of the Canada Land Inventory implies terrain capability in terms of general user satisfaction. The quality classes developed in this report carry a similar implication. All that is necessary in this instance is to express this implication in somewhat more precise capability terminology.

The capability rating however, is of such a generalized nature that it can be related only to general categories of tourist and recreational activity, rather than to the specific pursuits. In this regard, the value of the terrain input is best expressed in relation to two activity groupings, namely, the general landscape tour and specific activity pursuits.

Tourist satisfaction in general landscape tour is largely, and sometimes primarily, dependent upon terrain impact in both a sensual and intellectual context. For many, the visual sensual impact is the really significant factor. In this respect, the terrain classes can be directly and significantly linked to the landscape tour and the linkage described in terms of quality and satisfaction. Moreover, some generalized statements with respect to comparative advantage within a Territorial, continental and global perspective are possible.

In the case of specific activity pursuits, such as hunting or fishing the quality and satisfaction of the experience, is dependent primarily upon resource factors other than terrain. Terrain conditions may be a neutral or even a somewhat debilitating factor in relation to the total experience. On the other hand, they may contribute substantially to a satisfaction and in some instances be of such a high calibre as to almost equal the input from the basic or fundamental supply requirement such as fish or game.

Government policy and program planning in relation to tourism involves the allocation of terrain between various conforming and non-conforming uses. The question of the maintenance of terrain quality throughout the Territories and particularly in high class areas is of significance. Some portions of the Northwest Territories possess such high calibre terrain that their reservation as park areas is clearly a logical course of action. Other areas may be devoted primarily to other forms of resource production, without serious consequences to the total supply foundation for tourism and recreation. Variation in terrain quality for tourism and recreation have implications for the discreet applications of general government policies and programs for environmental maintenance including pollution control and the harvesting of renewable resources. The terrain quality classes developed in this study can be related in a general way to matters of the foregoing type.

The terrain quality classification provides good indication to the private investor of the quality of the terrain input that can be generally expected within a particular area in relation to any facility development proposed. Similarily, it provides an indication of the possible impact of terrain in a particular area insofar as the development and promotion of landscape tours are concerned.

All of the aspects noted in the foregoing paragraphs are generally embodied in the wording of the tourist and recreational capability classification that follows. No reference has been made to Territorial campsite development in the foregoing description of terrain capability classes. There are undoubtedly numerous locations suitable for developments of this type within areas included in all terrain capability classes. A classification designed to effectively incorporate this feature, which is essentially in the realm of project rather than policy and program planning would have to be extremely detailed. Moreover, it would have to be closely tied to the detail of highway and waterway planning.

TABLE 5.55

TOURIST AND RECREATION TERRAIN CAPABILITY CLASSIFICATION

Capability Class	Description
I	– Capable of a unique or outstanding terrain input to a tourist and recreation landscape tour or specific activity pursuit with terrain quality being of national and international strength in a market attractivity sense. – Areas in this class in whole or in part are integral components of the national heritage and possess the terrain attributes required for inclusion in whole or in part in the National Park System. – Tourist and recreation values must receive primary consideration in all current or proposed resource development programs or projects in areas within this terrain capability class with landscape quality controls of the highest order being continuously enforced.
II	– Capable of a high terrain input to a tourist and recreation landscape tour or a specific activity pursuit. Some areas in this class on Ellesmere and Baffin Island have terrain qualities of national and international strength in a market attractivity sense. – Areas within this class are suitable in whole or in part for inclusion in a Territorial Park System. – Multiple use practices are permissible, but the maintenance of landscape qualities is an incontestable prerequisite in the consideration of all forms of land use and should not be seriously compromised.
III	– Capable of an above average terrain input to a tourist and recreation landscape tour or specific activity pursuit. – In general, terrain quality in these areas as a whole is not sufficient in itself to justify Territorial Park Development. Other factors such as convenient location would be of major importance. – Multiple land use practices are desirable with satisfactory environmental quality controls and the preservation of the tourist and recreation resources that are present.
IV	– Capable of an average terrain input to a tourist and recreation landscape tour or activity pursuit that tends towards neutrality in its overall effect.

Continued

TABLE 5.55 — *Continued*

	— Multiple use practices are desirable with appropriate environmental controls and preservation of any key tourist and recreation resources present.
V	— Capable of somewhat below average terrain input to a tourist and recreation landscape tour or activity pursuit. User satisfaction rests largely and at times primarily upon other resource factors.
	— Multiple use practices are desirable with appropriate environmental quality controls.
VI	— Capable of well below average terrain input to a tourist and recreation landscape tour or activity pursuit. User satisfaction must rest upon other resource factors.
	— Multiple land use practices desirable with appropriate environmental quality controls.

5.10 AN EVALUATION OF THE TOURIST AND RECREATION POTENTIALS OF THE TERRESTRIAL MAMMALS OF THE N.W.T. (1)

Wildlife is considered in terms of non-consumptive and consumptive uses and native resident and non-resident hunters. The salient features related to each use are summarized below.

Non-Consumptive Uses — involves viewing or observation of mammals as a prime purpose for travel or as an input to a general northern travel experience.

Limitations Present:

- The Taiga and Mackenzie Valley populations are not concentrated enough to guarantee good viewing.

- Concentrations of Tundra mammals occur but at the times when animals cannot be disturbed.

Suggestions:

- winter travel with hunters and trappers appears to offer best viewing opportunities.

Consumptive Uses — involves hunting for meat and sport, and often both aspects are involved to varying degrees.

- Meat acquisition as the primary purpose for hunting is most significant in the case of the native population. It is a secondary consideration for most resident white hunters. For non-resident hunters it is of minor importance but some meat may be taken back for social or entertainment purposes.

- Sport hunting is increasing in importance in the native population in a wage economy. Sport is paramount in the case of the resident white hunter, and non-resident activity is related almost entirely to this with the trophy being very important.

Native Hunting:

- Caribou and Moose are the main mammals involved.

- Caribou hunting is regulated by Zone and Quota.

- This hunting can be increased where populations are under-utilized. Moose are scarce around settlements but plentiful in remote areas.

Resident Hunting:

- Bag limits are generous particularly for those whose residence is temporary.

- Licensing is the only hunting control at present and the increasing population of the N.W.T. can result in overhunting.

- The establishment of Territorial Shooting Areas with bag and season limits for all species should be considered. These should be set up on margins of reserves and preserves where control is easiest, costs minimal and sport or recreation return high.

1] See also map in Volume 2.

Non-Resident Hunting:

- The designation of Zones 12 and 19 for non-resident hunting under guides and outfitters was a forward step that should be extended where adequate research has been completed, mammal populations are high and management is possible. Consideration must be given to both the economics of the sport hunting operation and the return to the sportsman in quality hunting.

- Provincial systems for big game and waterfowl hunting by Canadians in other provinces that cannot afford to use the facilities of expensive camps should be introduced. In effect, the Northwest Territories mammal resources should be opened to all Canadians at a moderate cost. Government revenues from licenses and the increased business activity in restaurants, bars, gas stations and auto repair shops will make this procedure economically worthwhile.

- From an overall global perspective, sport hunting safaries are decreasing, and the photographic safaries increasing.

- Guides for river and lake travel will reduce hunting risks in the Northwest Territories to the normal for other parts of Canada.

An Evaluation of Individual Species

The following discussion is grouped around three major terrestrial mammal families, namely the Ursidae, Bovidae, and Cervidae. The Ursidae represents the family of largest living carnivores that walk on the entire foot, have five toes on front and back feet, short tails and smallrrounded ears. The Bovidae represent the family of animals with two unbranched horns that are never shed. Both sexes have horns. The Cervidae includes the group of hoofed animals with antlers that are shed each year.

Family Ursidae:

The three species of the Family Ursidae found in the Northwest Territories are noted, including the black bear (Ursus americanus), the grizzly bear (Ursus horribilis), and the polar bear (Thalarctos maritimus). Four species of the Family Bovidae, namely, plain and wood buffalo (Bison bison and Bison bison athabascae), the muskoxen (Ovibos moschatus), Dall sheep (Ovis dalli) and the mountain goat (Oreamnos americanus) are discussed. Among the Cervidae family, the whitetail deer (Odocoileus virginianus), the moose (Alces americana), the woodland caribou (Rangifer caribou), the barren-ground caribou (Rangifer arcticus) and Peary caribou (Rangifer pearyi), are mentioned.

The Northwest Territories Game Management Division provided information on the Family Ursidae, which is summarized in Table 5.56. Some brief comment with respect to the salient features is desirable.

Black Bear:

The black bear has been accorded the lowest index of appeal, namely one. This animal is found throughout the Boreal forest of North America, and the population in the N.W.T. possesses no marked comparative advantage over black bear populations elsewhere.

The index for veribility of the black bear, on the other hand, is three since the bear population is moderately dense, in view of the available range conditions and they are fairly easily spotted on the landscape.

TABLE 5.56

BASIC DATA SUMMARY FOR FAMILY URSIDAE [1]

Bear	Indices of [2] Appeal	Visibility	Population and Distribution Data
Black	1	3	No population studies — density considered moderate for species ranges over all timbered areas of Northwest Territories.
Grizzly	2-3	3	No population studies — hunting permit data suggest moderate density for species — ranges throughout Mackenzie Mountains.
Barren-ground Grizzly	3	3	No population studies — considered light population — ranges across large portion of barrens.

1] Data from notes provided by Game Management Division, Government of the Northwest Territories.

2] Indices range from 1 to 3 with the best situations indicated by higher values.

Their presence simply adds variety to a general landscape touring experience and offers the opportunity for the taking of additional species — on trips motivated eventually by the desire to hunt other animals.

The Grizzly Bear of the Mackenzie Mountains:

There are probably several species or sub-species of grizzly bear within that portion of the Mackenzie Mountains situated in the Northwest Territories. No attempt is made in this report to distinguish the various sub-divisions made, particularly by sports hunters.

This bear will not be seen by landscape tourist moving along the highway network of the Northwest Territories or flying between settlements on a general landscape tour. Contact requires travel to remote locations in the Mackenzie Mountains. However, once "on site" the visibility index is classified as three (i.e. fairly easily spotted).

Grizzly bear population can be considered to represent an important component of a group of mammals in the Mackenzie Mountains of interest to the sportsman lending variety and excitement to the hunt. It is doubtful, however, if the grizzly bear population of the Mackenzie Mountains, at least at the present time, would attract the hunter primarily concerned with this species. He is more likely to be drawn to Alaska or the Yukon Territory where grizzly bear have received wide publicity and to other parts of the Cordilleran Mountains, farther to the south.

Four major areas for the grizzly bear are north of the Keele River, the Upper Redstone River, North Nahanni and Rat River Pass areas. The former two are labelled critical areas while the latter two are classified as important areas for the grizzly bear.

Extreme caution must be exercised in the interpretation of the tourist and recreational significance of the four areas noted in the foregoing directory. It cannot be claimed the areas noted are the four best locations in the Northwest Territories. All that can be stated is that on the basis of present information there appears to be significant concentrations of this species in the areas indicated. There may be denser concentrations or more select animals in other places.

The Barren-ground Grizzly Bear:

This bear receives the highest index rating (i.e. three) from the standpoint of appeal. The light population will not support sport hunting but the bears might attract tours specializing in terrestrial mammals.

The bear ranges widely throughout the barren-grounds, from the edge of the treeline northward and eastward towards the southern limit of the range of the polar bear. Areas of significant populations include: Horton River Slopes, Majorie Hills, Coppermine River and the lower portions of Jackfish Creek and Ringling River, north of Arctic Red River.

The visibility index in such areas is again rated as three.

The Polar Bear:

Polar bears are found throughout the southern margins of the Arctic Basin. There seems to be a marked concentration on Banks Island, the surrounding waters of Amundsen Gulf, the Beaufort Sea and M'Clure Strait. A second concentration is present in eastern Arctic waters from about latitude 73 degrees north, southward to latitude 63 degrees north and westward from longitude 60 degrees west to longitude 100 degrees west. Some of the best viewing and hunting opportunities of Canada undoubtedly are to be found in these areas.

It is to be noted that the number of animals available for hunting is decidedly limited. Secondly, polar bear range southward through Hudson and James Bays in considerable numbers and can be seen by the landscape tourist on trips involving far less cost than those into the far reaches of the Arctic Archipelago of the Northwest Territories. Finally, polar bear are plentiful in Alaska offering competition to the resources of Banks Island and its surrounding waters.

The polar bears are frequently found on ice floes in open waters during the winter, spring and fall seasons while during the summer months the bears range inland for distances of 100 miles or more.

All things considered, it seems fair to state that the polar bear represents a major attraction for any specialized mammal tour of the Territories and a significant added attraction to any general landscape tour directed into area where it is in abundance. Some hunting opportunities are present, and it is clear that the species is capable of drawing the sportsman in its own right. In effect, hunters will come to the far northern reaches in the spring of the year, with virtually the exclusive intent to hunt the polar bear.

The Arctic Ecology Map Series, prepared for the Canadian Wildlife Service, provided considerable additional information with respect to this species, which is summarized in the following directory (Table 5.57).

An examination of data taken from the Arctic Ecology Map Series suggests that seven areas of denning, cubbing and general polar bear activity are present on the land and

TABLE 5.57

DIRECTORY FOR POLAR BEAR

- Amundsen Gulf – possible polar bear migration route to Alaska, March to June – bears return on same course later in year.

- Amundsen Gulf – remain all year here in mid-gulf if open water – good number here for parts of year.

- East End Dolphin and Union Straits – important polar bear area.

- West Coast Banks Island – important area all year – a migration route March to June for females and cubs moving off Banks Island to broken ice for food – a critical area for species.

- Banks Island – an important denning area – river valleys seem to be important – need more data.

- Bathurst Island – polar bear pass – move westward in summer hunting seals – denning area here.

- Usual ice crack between Bathurst and Cornwallis Island – south McDougall Sound – winter here.

- West Barrow Strait – a spring and fall investigation route, with bears pushed back and forth by ice conditions.

- Ice crack in winter between Limestone and Russel Islands – congregate here.

- East Side Russel Island – bears numerous.

- North Prince of Wales Island – critical denning area.

- Northwest Somerset Island – spring area for females and cubs.

- Southwest Devon Island Coast – critical denning area in mouths of Bays and Rivers – bears hunt in Barrow Channel and South Wellington Channel.

- Bears found in Coker Bay.

- West Fiord Northwest Devon Island – an important year around area – Grise Fiord people hunt here.

- Bear Bay, North Devon Island – denning and important offshore area.

- Shores of Cobourg Island -- concentrations hunted by Grise Fiord people.

- North Kent Island Waters – here all year – critical area of concentration.

- North Bjorne Peninsula – denning area.

- A migration route some years along open water leads but not a consistent area.

- Harrison Island Area – a critical all year area for Polar Bear.

Continued

TABLE 5.57 — *Continued*

— Simpson Peninsula — critical denning area Oct. 1 to Mar. 31 — use land mass all year.

— Wales Island — denning frequent here.

— Bylot Island — Cape Graham Moore — haul-out here.

— Northeast Baffin Island — Cape Coutts — denning and hunting area.

— Air Force Island — Waters Foxe Basin — may be important bear hunting area. Island is an important area and may extend to Baird Peninsula on Baffin Island.

— East entrance to Hudson Strait — spring and fall migration route — may be a last remnant of Labrador-Ungava Bay sub-poplulation of polar bears on verge of extinction — common off Resolution Island.

— Akpatok Island, Ungava Bay — denning area and summer refuge.

— Waters southwest Baffin Island — normal annual migration route.

— Smith Island — northeast Hudson Bay — critical for polar bears, a summer refuge and sanctuary when ice retreats — spring offshore seal hunting area.

— South Mansel Island — sanctuary when stranded because of lack of ice floe — perhaps some denning here.

— Coats Island — throughout island January to October — sanctuary when ice floes gone — denning reported on north side of Island.

— Seahorse Point — Southampton Island — summer sanctuary.

— Southampton Island — Gore Point to Gorden Bay — critical denning area.

— Southampton Island Bear Cove — critical denning area.

— Southampton Island Bay of Gods Mercy — beaches, a summer loafing area.

— Waters west coast of Hudson Bay — a historically important area, but bears not numerous now — two distinct populations move north and south of dividing point of arrow.

— Lowther Island Barrow Straits — west side of Island — a secondary hauling-out area — no denning recorded.

— Northeast Coast Southampton Island — important denning area.

adjacent waters of the Northwest Territories. It is difficult to rate or classify these areas in terms of tourist and recreational potential on the basis of the information available. An attempt has been made, however, solely on the basis of the recordings within certain regions.

Area A:

This is the most northerly area of concentration, and is centred around the north and south shores of Jones Sound and the eastern waters of Norwegian Bay. Grise Fiord is the major organization and communication centre. The area appears to support a strong population of polar bear.

It would seem that a visitor to Grise Fiord on a landscape tour would have a good possibility of viewing the polar bear in a high northern environment. It would appear the hunter success in the region in the spring of the year would be fairly high. Available data does not provide an indication, however, of the number of animals that might be taken. It is important to note also that most of the areas identified lay at a considerable distance from Grise Fiord, the major organization centre.

Area B:

This area which includes the waters and surrounding lands of Barrow Strait with a linear extension along the north shore of Lancaster Sound has Resolute as its major organization centre. It contains very notable concentrations of polar bear. Opportunities for viewing appear strong. Polar bearing hunting has already been introduced on a limited scale and somewhat on an experimental basis.

The resources of this area are extremely strong, within a territorial context. Moreover, Area B probably represents one of the major concentrations of polar bear in the high Arctic waters of North America.

Area C:

This area which includes the Island Archipelago at the northern end of Hudson Bay and reaches from Smith Island westward to Southampton contains a notable concentration of polar bear and a large number of denning and cubbing areas. Coral Harbour is its major organization centre. Opportunities for viewing the mammal appear to be good. Hunting possibilities remain unknown insofar as available animals are concerned.

Area D:

This area, which includes Banks Island and the surrounding waters, and has Sachs Harbour as an organization centre, appears to contain the most noticeable concentration of polar bear in the Western Arctic. Viewing and hunting possibilities seem reasonably good. The sport hunting quota for the area, however, remains uncertain.

Area E:

This area, which centres upon the Simpson Peninsula and includes the Harrison Islands to the north and Wales Island to the south seems to be reasonably rich in polar bear insofar as can be determined from data contained in the Arctic Ecology Map Series. Spence Bay to the northwest appears to be the closest major organizational centre for the exploitation of this resource but considerable travel from this community is necessary.

Area F:

This area that stretches from Cape Graham more southward to Nova Zembla Island, off the northeast shore of Baffin Island appears to have some modest concentrations of polar bear. Its major organizational centre, Pond Inlet, is only a short distance to the west.

Area G:

The area that centres upon Akpatok Island and stretches north-eastward to the waters of Resolution Island appears to contain a considerable number of polar bear at a certain season of the year. Akpatok Island is a denning area and summer refuge. Bears should be fairly visible during the summer season on Akpatok Island.

Areas A to G previously listed cannot be said to contain all possible tourist and recreational potential associated with the polar bear in the Northwest Territories. All that can be said is that, on the basis of the present information, marked concentrations of this mammal appear to occur in these areas. By inference the areas are considered to have the best viewing and in some cases hunting opportunities.

The polar bear spends most of its life on the broken and floating ice offshore where it hunts, particularly for seals. The mother dens only when she is having cubs on alternate winters. Four significant denning areas have been recognized in the Canadian Arctic. These include southern Banks Island, the Simpson Peninsula, eastern Southampton Island and eastern Baffin Island. These are all included in the Areas A to G previously noted. In effect, Areas A to G contain the core locations where the mammals appear most abundant and breed most successfully.

The animal prefers pack ice where it has a hunting platform and protective cover. Its association with land is related largely to denning and a search for auxiliary food supply. It may occasionally penetrate a hundred miles or more inland.

It is difficult to estimate the total number of bear in the Canadian Arctic. Some say that the population is in the order of five to eight thousand, while others place it closer to six or seven thousand. Estimates of seventeen to nineteen thousand polar bear in the entire Arctic Basin have been made. Accepting these values there would appear that the Canadian Arctic contains about 35% of the population of that within the whole Arctic Basin. Alaska, Canada and perhaps Norway appear to have the healthiest and strongest populations.

Family Bovidae

Four species are included in the Family Bovidae grouping namely buffalo, wood buffalo, muskoxen, Dall sheep and mountain goat. The basic data provided by the Game Management Division of the Northwest Territories with respect to the species of this family are summarized in Table 5.58. Indices of appeal and visibility are indicated together with some aspects of population strength and distribution.

It will be noted that the index of appeal and visibility for three of the species, namely, muskoxen, Dall sheep and mountain goat is 3 in each case. In effect, appeal and visibility received the highest rating accorded. Buffalo and wood buffalo have been given an appeal rating of 2 and visibility index of 3.

The Buffalo (Bison bison and Bison bison athabascae):

The buffalo resources in the Territories are strong. The major concentration in Wood Buffalo National Park is readily observed by a general landscape tourist travelling by

TABLE 5.58

BASIC DATA SUMMARY FOR FAMILY BOVIDAE [1]

Animal	Indices of Appeal	Indices of Visibility	Population and Data Distribution
Buffalo	2	3	Approximately 2,500 outside Wood Buffalo National Park – density moderate with relatively high density at Grande Detour and Hook Lake, particularly in August.
Wood Buffalo	2	3	Approximately 70 animals northeast of Ft. Providence between Calais-Falaise Lake – increasing at good rate in this new area.
Muskoxen	3	3	Approximately 9,000 animals.
Dall Sheep	3 (sum) (win)	3 1	Population study now underway – high densities in Redstone and Keele drainage basins and to North are known.
Mountain Goat	3 (sum) (win)	2 1	No population studies made – population, however, appears to be relatively low.

(sum) = summer
(win) = winter

[1] Data obtained from notes provided by Game Management Division, Government of the N.W.T.

automobile. A strong population of buffalo on the margins of this Park permit sport hunting. The development of an additional populations of wood buffalo in the area to the northeast of Fort Providence has been proceeding satisfactorily. Within a few years a second concentration visible to the motoring public with some possible hunter reserve in future years is likely to evolve. In earlier times there was apparently a population of wood buffalo between the lower reaches of the Nahanni and Root Rivers, but animals were last seen in this area in 1928. There is a possibility that wood buffalo will be re-introduced into this historic bison range.

Insofar as hunting is concerned, the Territories appear to possess a meaningful degree of comparative advantage with respect to this species. Similar opportunities are not available in other parts of North America. The present hunt can probably be expanded to a considerable degree both in terms of market and supply. In the past, however, the supply foundations have been seriously undermined by outbreaks of anthrax, that have exerted a disruptive affect upon the development of sport hunting.

Insofar as the general viewing of the animal by the landscape tourist is concerned, the degree of comparative advantage possessed by the Territories with respect to this species is modest. The reputation of Wood Buffalo National Park as a haven and refuge for this species, however, is sufficiently strong to draw some tourists into the Fort Smith area that are travelling in these northern reaches. On the other hand, buffalo can be viewed quite satisfactorily at a number of points in southwestern Canada, particularly Elk Island National Park. Bison can also be seen at a number of points in northwestern United States. It is doubtful if the population of Wood Buffalo Park currently exerts any major force in the decision-making process of tourists considering visitation to the Territories.

The Muskoxen (Ovibos moschatus):

In terms of the global distribution of this species, which is restricted to the northern portions of the mainland of the Territories and its Island Archipelago, together with the northern perimeter of Greenland, some comparative advantage accrues to the Northwest Territories, from a tourist and recreational standpoint in that it possesses the most accessible and strongest representative samples of this mammal.

No hunting of this animal is permitted at the present time. If the population increases substantially, however, some hunting may be allowed at particular points of concentration.

The animal would obviously form an integral component of any tour in the Northwest Territories motivated essentially by a desire to view and study mammals. Secondly, it is of sufficient interest and attraction to provide a significant resource input to a more generalized landscape tour.

Varying estimates have been made of the total population strength of Muskoxen in Canada. Some claim that there are about 1,500 animals on the mainland, and an additional 8,500 on the Arctic Archipelago. Others place the population closer to 12,000. An attempt is made to group the population by geographical area in Table 5.59.

Approximately 83% of the animals are found on the Arctic Islands and 17% on the mainland. Ellesmere Island, with an estimated population of 4,000 muskoxen, contains 43% of the total for Canada. The High Arctic grouping, including Ellesmere and Axel Heiberg, have approximately 5,000 muskoxen, or 54% of the Canadian total. The Mid-Arctic Island grouping, including Melville, Bathurst, Cornwallis and Devon, support another 18%. The Low Arctic Islands, including Banks Island, Victoria, Prince of Wales and Somerset, about 11%.

Observing the situation as a whole, one major concentration including Ellesmere and Axel Heiberg Islands is readily distinguishable, supporting 54% of all mammals. Melville Island, with about a thousand muskoxen or 11% is a second noticeable grouping. Victoria Island contains about 7% of the mammals.

Herds tend to vary in size, by location and season. Observations in the Thelon Game Sanctuary, for example, revealed mean herd sizes of 11.3 animals in the summer and 19.7 in winter. Observations on the Queen Elizabeth Island group, including Cornwallis, Bathurst, Melville, Axel Heiberg and Elizabeth, showed an average herd size of 8.2 animals.

The Arctic Ecology Wildlife Map Series contains twenty-two individual references to muskoxen and they are summarized in Table 5.60.

While the data extracted from the Ecology Map Series provides additional aspecificity with respect to the location of muskoxen, a limited amount of information from the tourist

TABLE 5.59

MUSKOXEN POPULATION GROUPINGS

		No.	%
A. Arctic Islands			
High Arctic (Group 1)	Ellesmere Island	4,000	
	Axel Heiberg Island	1,000	
		5,000	54
Mid-Arctic (Group 2)	Melville Island	1,000	
	Bathurst Island	460	
	Cornwallis Island	50	
	Devon Island	200	
		1,710	18
Low-Arctic (Group 3)	Banks Island	100	
	Victoria Island	670	
	Prince of Wales Island	100	
	Somerset Island	100	
		970	11
	TOTAL A	7,680	83
B. Mainland			
	Melville Hills		
	Bluenose Lake Herds	300	
	Bathurst Inlet Herds	400	
	Thelon Sanctuary Herd	400	
	N.E. Keewatin Herds	300	
	Muskoxen Lake Herds	200	
	TOTAL B	1,600	17
GRAND TOTAL		9,280	100

and recreational standpoint emerges. No additional insight was provided with respect to the populations of Ellesmere Island which are important in a total volume sense. It is known, however, that there are substantial herds of muskoxen in the vicinity of Lake Hazen, that have been investigated by research workers to a considerable extent.

The Dall Sheep (Ovis dalli):

The Dall or white sheep are found throughout the mountain regions of Alaska, the Yukon Territory and northern British Columbia. That portion of their range situated in the

TABLE 5.60
DIRECTORY FOR MUSKOXEN

— Banks Island – Mercy Casel Bay hinterland — a critical Muskoxen calving area — total population 1970 — 635 animals.

— Banks Island – northwest portion — 300 animals in north, most of year, drift south in summer.

— Banks Island – northeast section — summer calving and wintering area — May 1970 — 64 animals.

— Banks Island – southeast inland section — scattered herds of 10 to 20 animals common.

— Victoria Island, Genelg Bay — a few animals seen here.

— Victoria Island — Prince Albert Peninsula — summer and winter range for a few animals.

— Victoria Island — observed here and may remain all year.

— Melville Island — Mecham River Lowlands — concentrations all year — a critical area.

— Melville Island — reported in southeast portion of Island but no data available.

— Melville Island — to west of Hecla and Griper Bay — concentrations.

— Melville Island — Cape Mudge area — present all year.

— Melville Island — to east of Ibbett Bay — lush vegetation and critical all year area.

— Melville Island — inland from Cape Russell — an important area.

— Prince of Wales Island — vicinity Browne Bay — critical and spread north to summer range — 73 animals.

— Prince of Wales Island — critical year-round range for 25 plus or minus animals.

— Bathurst Island — important range south end of May and Franklin Inlet.

— Bathurst Island — southern end — a non-breeding herd at present. No young in 2 years but conditions excellent.

— Cornwallis Island — 50 plus or minus animals all year.

— Axel Heiberg Island — all year herd 400 plus or minus — extends over into Fosheim Peninsula.

— Melville Hills south of Paulatuk, Darnley Bay and vicinity of Bluenose Lake — observed spring and summer — important area — population 425-625.

— Bear Slave Back Uplands — scattered herds — Tree River scattered herds in winter — reported in vicinity of Takajua Lake in 1970 — frequently on upland plateaus both sides of Bathurst Inlet — north of Back River all year.

— Devon Island — critical all year area — breed here — 100 plus or minus animals. University of Alberta and Manitoba research station on Devon Island.

Mackenzie Mountains in the Northwest Territories forms only a very limited part of the total continental range. However, the major area of concentration in the N.W.T. is to be found in the mountain reaches between the Redstone and Keele River drainage basins.

The strength of the Dall sheep resources of the Northwest Territories are unquestionably capable of continuously supporting modest hunting exploitation.

Their remote location is such, however, that they cannot be viewed by landscape tourists travelling by automobile into the Northwest Territories. It is of interest to note that for some portion of the year both sheep and goats can be seen by automobile travellers moving along the Alaska Highway, and bighorn sheep and goats are visible to highway travellers in the National Parks of the Rocky Mountain chain to the south. Dall sheep, however, would form an integral component of a general mammal tour of the Northwest Territories, particularly of its Mackenzie Mountain sector. On the other hand, those interested primarily in viewing this animal would likely be attracted elsewhere.

The Mountain Goat:

In terms of mountain goats, the Northwest Territories possess no comparative advantage. The range of this animal in the Western Cordillera Region extends from Washington and Idaho states northwards to the Yukon and a small portion of southeastern Alaska. The major population strength of the animal lies outside the Northwest Territories.

Insofar as general landscape tour and that based upon a specialized interest in mammals are concerned, previous remarks with respect to Dall sheep apply. Insofar as hunting is concerned goats are likely to remain a species of secondary interest adding variety to a hunt based essentially upon other animals, particularly Dall sheep. In this respect, their presence in sufficient quantities is significant, but their role is one of secondary support.

Family Cervidae

There are five representatives of the Family Cervidae considered in this report including whitetail deer, moose, woodland caribou, barren-ground caribou and Peary caribou. Their indices of tourist appeal and visibility, together with significant aspects of population density and distribution are summarized in Table 5.61. Brief mention is made of the domesticated reindeer herds of the Mackenzie Delta region in the discussion of individual species that follows.

The Reindeer:

The herds of reindeer introduced into the Mackenzie grazing preserve could have significant tourist appeal to a general landscape traveller. It can be expected that this resource would represent a major attraction in any landscape tour by automobile over the Dempster Highway into the Mackenzie Delta or along any road that might be built up the Mackenzie Valley providing secondary road access was available in the future. In effect, this species while not natural to the area possesses considerable latent tourist appeal that awaits access to exert its effect.

The Whitetail Deer:

This species is at the northern limit of its range and confined essentially to southwest portion of the Mackenzie lowlands. While providing some sport hunting for local residents, it is of no significance in terms of non-resident tourist visitation. The species is distributed

TABLE 5.61

BASIC DATA SUMMARY FOR FAMILY CERVIDAE

Animal	Indices of Appeal	Indices of Visibility	Population and Distribution Data
Whitetail Deer	1	1	Few sightings and no population count – density low – animal at northerly limit of range in Fort Smith area.
Moose	2	2	Moderate density along Slave and Mackenzie rivers with some high concentrations – few more than 150 miles to east.
Woodland Caribou	2	1	Research just beginning – areas of concentration only partially known. Mackenzie mountain populations may migrate considerably with remainder having limited migrations.
Barren-Ground Caribou	3 [1]	2	Populations based on census of 1966-67 – migrate between summer and winter ranges.
Peary Caribou [2]			

[1] Rating is for migrating herds.

[2] No data provided.

widely throughout the non-mountainous portions of the North American continent. It can be viewed and hunted readily at much less trouble and cost in locations outside the Territories.

There is a possibility that the mule deer is present in portions of the Northwest Territories. The writer observed one animal in the Yukon Territory during the summer of 1962. The species is known to be present in fair abundance in northern British Columbia, Alberta and Saskatchewan.

The Moose:

While the range for this species extends roughly to the limits of the forested area of the Territories, major concentrations are found in the Mackenzie, Liard and Slave River valleys. Some concentrations also occur in the valley bottoms of the Cordilleran region, particularly in the Flat and Caribou rivers that are tributaries of the South Nahanni River. There are a few moose more than a hundred and fifty miles east of the Mackenzie River.

The moose, a prominent mammal of the Boreal forest, is of limited significance from the standpoint of its contribution to the satisfaction of a general landscape touring experience in the Northwest Territories. It may be viewed at much less cost and trouble over a wide portion of the Boreal forest to the south. There is excellent moose hunting in the Lesser Slave Lake area of Alberta to the south. On the other hand, the animal does and can continue to provide an important additional supplementary species in a hunt based primarily on other animals. There appear to be some fair-sized animals in the Territories with racks of trophy size. Europeans have a strong interest in this species and undoubtedly avail themselves of any opportunity to take an animal while engaged in a hunt in the sport camps of the Mackenzie Mountains. Indeed, some consider this trophy to represent a substantial contribution to the satisfaction of their hunt.

The Woodland Caribou:

This animal ranges throughout the northern portions of the Boreal Forest Belt from Labrador westward to the Northwest Territories. Its range in the Territories covers most of the Palaeozoic plain section of the Slave and Mackenzie River basins and the mountain areas to the west. Table 5.62 indicates seven prime concentrations.

TABLE 5.62

DIRECTORY OF WOODLAND CARIBOU AREAS

- East of Fort Good Hope — abundant all year, but no data on numbers or seasonal disruptions.
- Upper Carcajou River — a critical winter range area.
- Lower end of Keele River south to Root River — a winter range — animals hunted by Fort Norman people.
- Horn Plateau and Willow Lake — an important range with 4,000 animals.
- Upper South Nahanni River — critical winter range.
- Flat River — critical winter range.
- Upper Red River — wintering area.

The Barren-ground Caribou:

This animal is similar to the woodland caribou in general appearance but slightly paler in colour. Its range includes all of the mainland of the Territories, east of the Mackenzie River and the southern portions of the Arctic Island Archipelago — together with portions of northern Alberta, Saskatchewan, Ontario and Northwestern Quebec. The N.W.T., however, has some of the most spectacular concentrations. Table 5.63 presents a brief review of the N.W.T. herds and movements.

Hunting of the barren-ground caribou is restricted to the native populations. The viewing possibilities for the tourist, however, appear to be unrestricted even in their massive concentrations during calving time. There are undoubtedly some great viewing spectacles associated with this animal.

TABLE 5.63

DIRECTORY FOR BARREN-GROUND CARIBOU

Population Estimates (1972):

	Number	%
Mainland Herds	500,000	86.6
Arctic Islands	77,000	13.4
Total	577,000	100.0

Mainland Herds

Kaminuriak:
- Population — 70,000
- Winter Range — Northern Manitoba
- Calving Area — Lake Kaminuriak
- Movements — Northward in April - May
  Southward in Sept. - Oct.

Beverley:
- Population — 160,000
- Winter Range — N. Saskatchewan and South and East of Great Slave Lake
- Calving Area — Beverley Lake
- Movements — Northward April - May
  Southward Sept. - Oct.

Bathurst:
- Population — 150,000
- Winter Range — Between Great Slave Lake and Great Bear Lake
- Calving Area — East side of Bathurst Inlet
- Movements — Northward April - May
  Southward Sept. - Oct.

Blue Nose:
- Population — 20,000
- Winter Range — Colville Lake
- Calving Area — Blue Nose Lake
- Movements — Northward April - May
  Southward Sept. - Oct.

Porcupine:
- Population — 100,000
- Winter Range — Two sections of herd —
  a) Richardson Mountains
  b) Porcupine Area
- Calving Area — Arctic Coast near Alaska-Yukon border
- Movements — Northward April - May
  Southward Sept. - Oct.

Continued

TABLE 5.63 – *Continued*

Arctic Island Herds

Queen Elizabeth Islands:	
Population	– 26,000 (8,000-10,000 on Melville Island)
Winter Range	– No detailed information
Calving Area	– No detailed information
Movements	– Some inter-island movements
Banks Island:	
Population	– 11,000
Winter Range	– South end of Island
Calving Area	– North end of Island
Movements	– Not available
Victoria Island:	
Population	– 8,000 - 10,000
Melville Peninsula:	
Population	– 5,000 - 6,000
Coats Island:	
Population	– 3,000 - 4,000
Southampton Island:	
Population	– 200 (transplanted from Coats Island in 1967)
Baffin Island:	
Population	– 20,000 in two herds a) Amadjuak Lake in S.W. Baffin Island b) Steensby Inlet in N.W. Baffin Island

Source: Data provided by Game Management Division, Government of the Northwest Territories.

Life Zones of Northwest Territories

The distribution of the Life Zones in Northwest Territories is now reviewed.

Arctic Zone

Major Mammals – Polar Bear)
Muskoxen) Key Mammals
Peary Caribou)
Barren-ground Caribou
Reindeer (Local and Introduced)
Barren-ground Grizzly Bear (Mainland only)
Wolverine

In terms of species composition, this Life Zone possesses enormous comparative advantage within a Canadian context. The core of the Life Zone is in the Northwest

Territories. Only a small portion extends along the shore of Labrador, Northwestern Quebec and the margins of Hudson Bay in Manitoba and Ontario. In these peripheral areas some of the principle mammals of Life Zone, such as muskoxen, are absent and others are poorly represented. Polar Bears, however, are strong in the peripheral areas.

Hudsonian Zone

The Hudsonian Zone is a subdivision of the Boreal Life Zone that includes both Hudsonian and Canadian Life Zones. The Hudsonian in the Northwest Territories has two distinct sections, namely, the Mountain and the Shield.

Mountain Section:

Major Mammals —	Mountain Goat	)	
	Dall Sheep	)	Key Mammals
	Woodland Caribou		
	Moose		
	Grizzly Bear	)	Key Mammal

It is this section of the Hudsonian Zone that possesses the most prized assemblage of mammals from a tourist and recreation standpoint. The Zone, however, is strongly represented in the Yukon and British Columbia. In effect, the mammal resources of this part of the Territories are not unique and it does not possess comparative advantage over some other parts of the continent.

Shield Section:

Major Mammals —	Moose
	Black Bear
	Barren-ground Caribou
	Wolverine

The Territories possess no significant comparative advantage in this instance. The section is strongly represented over a huge portion of the Shield in Quebec and is also found in Ontario, Manitoba and Saskatchewan.

Canadian Zone

Major Mammals —	Moose		
	Black Bear		
	Wolverine		
	Woodland Caribou		
	Wood Buffalo (introduced)	)	Key Mammal

The mammal assemblage of this Zone offers no comparative advantage to the Territories. The Life Zone extends throughout the commercial forest regions of Canada. The Territories contain only a modest northerly extension of the Zone.

The presence of large numbers of bison in and around Wood Buffalo National Park, together with the hunt now operated on its northerly borders represent one significant exception to the foregoing generalization. If buffalo are successful in the area between the Mackenzie River and the North Arm of Great Slave Lake, the Territories could have a substantial and unique sport hunting potential here.

In the previous summation, key mammals have been designated. These species, either by their uniqueness or their strong representation, establish the foundation framework for

the tourist and recreation potential of the mammals of the Zone. Other species are present and substantially broaden and deepen potentials, but they do not provide, nor determine, the fundamental character and comparative advantage of the Zone.

Tourist and Recreation Evaluation on the Basis of Life Zone Concepts and the Range of Major Species

Life Zone concepts and patterns, together with the range of major species, provide a basis for a crude evaluation of tourist and recreation values associated with the mammals of the Northwest Territories. While a more refined analysis is undertaken subsequently, some general relationships of value can be deduced.

Table 5.64 indicates the essential elements of species composition within each area. Both viewing and hunting have been considered in the designation of these classes and it is noted that the mammal resources of other areas can enhance the value of a general landscape touring experience. The areas with assigned class potentials, however, appear to have the resources to support hunting or viewing as a major objective for tourist travel or as a very strong support to general landscape touring.

Western High Arctic Islands — Class I:

This area possesses a full range of the major non-marine mammal species that characterize the Arctic Life Zone. Their distribution is extensive throughout the area and the population dense, relative to general conditions for the species.

If a tourist is coming to the Northwest Territories essentially to hunt or view the species of this Life Zone in their most dynamic environmental setting, the biological foundations are ideal. This is the prime area of the High Arctic from an overall perspective that includes biological conditions coupled with a stereotyped Arctic setting.

Mackenzie Mountains — Class I:

This is the area of the Hudsonian Life Zone that offers the prime viewing and hunting opportunity in an adventuresome mountain setting. While the area is not unique and does not offer any significant comparative advantage within a continental perspective, its resource base is strong enough to supply the hunter or viewer with an experience commensurate with costs.

Kazan Region — Class II. - I:

This region includes parts of the Back Lowlands, Kazan Uplands, Thelon Plain and the Bear Slave Uplands. It contains a good representation of the major mammals of the Arctic Life Zone but the polar bear is missing as is the Peary Caribou. It would be possible at times, however, to see the polar bear on a trip to coastal areas.

Delta Region — Class II:

The major attraction here is the domestic reindeer population for the "viewing" tourist.

Slave Delta and Providence Region — Class II:

The major attraction here is the wood buffalo from both a viewing and hunting standpoint.

TABLE 5.64

SCHEMATA FOR ZONE AND AREA DEFINITION

Life Zones	Areas	T & R* Class	Tourist and Recreation Species Value	
			Key Species – are unique or strongly represented so as to substantially enhance or give comparative advantage to Area Attractivity.	Species of Interest – but no comparative advantage – simply broaden and deepen visitor experience.
Arctic	A	I	Polar Bear Muskoxen Peary Caribou	
	B (a)		Polar Bear	Peary Caribou (N.W.T. Victoria Island only)
			Barren-ground Caribou	Wolverine Northern Muskoxen Limit of Barren-ground Range Grizzly
	(b)		Polar Bear Barren-ground Caribou	
	C	II	Muskoxen Barren-ground Caribou Barren-ground Grizzly	Wolverine
	D		Barren-ground Caribou Barren-ground Grizzly	Wolverine
	E		Barren-ground Caribou Barren-ground Grizzly	Wolverine
		II	Reinder (introduced)	
	F		Barren-ground Caribou	Wolverine
Hudsonian	A	I	Mountain Sheep Mountain Goat Grizzly Bear Woodland Caribou Moose	Black Bear Wolverine Barren-ground Caribou (Peel River Plateau only)
	B		Barren-ground Caribou	Black Bear Moose Wolverine
Canadian	A		Wood Buffalo (introduced)	Moose Wolverine Black Bear Woodland Caribou
	B			Woodland Caribou Moose Black Bear Wolverine

* Tourist and Recreation Potential Class

The Identification of Notable Mammal Area Groupings:

The objective is the identification, summary, description and comparative rating of those portions of the Territories that possess the strongest groupings of mammals from a tourist and recreational development standpoint.

The first step in the area identification and rating involved the noting of concentrations of individual species on an overlay map; so that areas of concentration for mammals considered in combination became apparent. Total point scores for the Life Zones were then determined. The process involved the listing of the major animals of the Life Zone and the totalling of the points for visibility and appeal associated with each. The results were as follows in Table 5.65.

TABLE 5.65

POINTS FOR ANIMAL APPEAL AND VISIBILITY

Zone	No. Animals	Total Points for Animal Appeal	Visibility	Mean
Arctic	6	18	15	16.5
Hudsonian Mountain Sector	5	13	11	12.0
Shield Sector	3	6	7	6.5
Canadian	4	7	9	8.0

Through this step, a rough yardstick was provided by which any area, with a noticeable grouping of mammals, could be rated relative to the Life Zone, of which it represents a component part; or compared with other areas observed within that Life Zone. In effect, an area can be evaluated relative to the maximum number of points assigned to a Life Zone.

A number of areas have been designated where there are noticeable concentrations of tourist and recreation values associated with groupings of mammals.

Areas in the Hudsonian Life Zone — Mountain Section:

The Redstone, Keele and Carcajou River Area: Mean point value 13. This rather broad area is unquestionably the strongest of the groupings of the mountain section of the Hudsonian Life Zone in terms of the variety and quantity of mammals present. It is a core of the present hunting camp operations of the Northwest Territories.

All major mammals that characterize the Life Zone are present. It therefore displays a total of 13 points for appeal and 11 for visibility with the mean being 12.0.

Insofar as can be judged on the basis of data assembled for this study, the area undoubtedly contains the strongest tourist and recreation values for the Life Zone of which it is a component part and clearly ranks 1 in this respect. From an overall Territorial perspective that encompasses all Life Zones it is also a leading ranking area.

The South Nahanni and Flat River Area: Mean point value 9. In many respects this area might be considered to be an extension of the Redstone, Keele, Carcajou River Area, but since the mean point values for the appeal and visibility of its mammal agglomeration are decidedly lower, it has been separated. Goats, woodland caribou, moose and sheep

concentrations are present. It has a total of 10 points for appeal and 8 for visibility with the mean value being 9.

The woodland caribou population appears to be very strong in this area and the moose good. Goats and sheep appear much weaker in comparison with the Redstone, Keele, Carcajou River areas.

This mammal assemblage undoubtedly draws additional attention by virtue of its close proximity and possible inclusion within the proposed Nahanni River National Park to which it would undoubtedly add strength.

The North Nahanni River Area: Mean point value 10. This area might also have been considered as an extension of the Redstone, Keele, Carcajou River Area, but it has been separated for similar reasons. Sheep, goat, grizzly and moose concentrations of note are present. It has a total of 11 points for appeal and 9 for visibility with the mean value being 10.

The Richardson Mountains: Mean point value 7.5. Concentrations of note are indicated in this area for woodland caribou, Dall sheep and grizzly bear. It has a total of 8 points for appeal and 7 for visibility giving a mean value of 7.5.

The reindeer populations in the Mackenzie Delta area might be included in a trip to this area based on wildlife interests. They are as readily accessible by a short air trip from Inuvik as the Richardson Mountain area itself.

Areas in the Canadian Life Zone:

Slave Valley Area: Mean point value 6.5 or 4.5. Notable concentrations of moose and buffalo are present. In addition the black bear is abundant. Including the black bear, for which no concentrations are actually shown, the point value for appeal is 5 and that for visibility 8, with the mean being 6.5. Excluding the black bear the appeal point value is 4 and that for visibility 5 with the mean being only 4.5.

The Fort Providence Hinterland Area: Mean point value 8.0 to 6.0. Notable concentrations of moose and woodland caribou are present and the introduced buffalo are progressing favourably. Black bear are also abundant although no concentrations are indicated. Including black bear the total point rating for the appeal of the mammal assemblage is 7 and that for visibility 9. The mean value is 8. Exclusive of the black bear point values are as follows: appeal 6, visibility 6, mean 6.

If the buffalo herd introduced to this area builds up sufficiently it will have stronger mammal tourist and recreation values than the Slave Valley area. This is due, of course, to the presence of notable concentrations of woodland caribou.

Fort Simpson Area: Mean point value 5.5 to 3.5. Concentration of moose and caribou are the marked feature of this area and black bear are present. Actually, it is the strong concentration of woodland caribou that is the most important feature.

The total point values for the mammal grouping of the area including black bear, are as follows — appeal 5, visibility 6, and mean 5.5. Exclusive of black bear they are — appeal 4, visibility 3, and mean 3.5. It is clear from the above point values that this area is not too strong and has been identified largely because of the woodland caribou concentrations.

Areas in the Hudsonian Life Zone – Shield Section:

No areas have been designated in the Shield Section of the Hudsonian Life Zone. The Thelon Sanctuary area subsequently noted actually lies on the juncture of the Hudsonian and Arctic Life Zones displaying concentrations of the characteristic mammals of each which renders it somewhat unique. It was decided, however, to include it with the area groupings of the Arctic Life Zone.

Areas in the Arctic Life Zone Mainland Section:

In a consideration of the barren-ground caribou, the calving areas have been taken as the unit of concentration. Winter range and migration route factors previously noted have been omitted. The animals move regularly towards these calving grounds and therefore the reliability factor for tourist and recreation viewing is high at these points and the concentrations are spectacular. Sport hunting of barren-ground caribou is not permitted so the hunting ranges of this mammal are not a factor of consequence for tourism and recreation at the present time.

The Thelon Area: Mean point value 8.5. Three of the notable species of this Life Zone including barren-ground caribou, muskoxen and barren-ground grizzly bears are encountered here in strong concentrations compared with conditions generally prevailing for each. The total point score of the grouping for appeal is 9 and that for visibility 8. The mean value is therefore 8.5.

This is the strongest mainland area for any grouping of mammals of the Arctic Life Zone. Moreover, many species of the Shield section of the Hudsonian Life Zone are present but being at the northern edge of their range are often not as strongly represented as in areas to the south.

The Kaminuriak Calving Area: Mean point value 3. The main point of interest here is the calving ground of the Kaminuriak herd of barren-ground caribou.

The Bathurst Inlet Area: Mean point value 5.5. Two major animals of the Arctic Life Zone display concentrations in this area, namely, the barren-ground caribou and the muskoxen. The total point value of the grouping for appeal is 6 and that for visibility 5 with the mean being 5.5.

The Melville Hills Lower Horton River Area: Mean point value 8.5. Concentrations of barren-ground grizzly, barren-ground caribou and muskoxen are reported here. The herds of muskoxen are perhaps only half as strong as in the Thelon and its calving grounds for caribou are decidedly secondary by comparison with the situation in the Beverley Lake area. The point rating, therefore, is somewhat deceptive and indeed misleading when compared with that of the Thelon area.

Areas in the Arctic Life Zone – Arctic Island Section:

This proved to be perhaps the most difficult major region of the Territories to handle. Information is sketchy. Estimates for the muskoxen population are given on a rather broad island basis. Some areas are remote from major settlements and air communications. There are values associated with some mammals considered individually that tend to be lost on a grouping basis.

The Banks Island-Prince Albert Peninsula Area: Mean point value 9. The polar bear resources of this area are very strong and among the best in the Canadian Arctic. Peary

caribou are present in substantial numbers for this species. There are about 100 muskoxen in the north end of Banks Island. There is a good air connection to Sachs Harbour by northern standards.

The total point value for the appeal of the assemblage of characteristic Arctic mammals present is 9 as is that for visibility in summer. This is undoubtedly one of the leading areas of the Island Archipelago.

The Bathurst-Cornwallis-Devon Islands Area: Mean point value 9. The situation here is almost identical with that noted above. The Peary caribou population, however, appear to be somewhat stronger. The polar bear resources are equal to or perhaps slightly superior to those in Area (a).

Jones Sound Area: Mean point value 6. The polar bear and muskoxen are well represented in this area. Concentrations of Peary caribou have not been recorded by they have on Axel Heiberg Island to the north. The muskoxen population of Ellesmere Island as a whole is estimated to be 4,000.

The total point value for the major mammals present is 6 for appeal and 6 for visibility. The mean value is therefore 6.

A question naturally arises with respect to the comparative rating of the notable areas previously discussed. Which area is the best or contains the strongest tourist and recreation values? How much better is one area than another and will the point values provide a guideline in this case?

For reasons previously noted it is difficult, if not impossible, to compare areas associated with different Life Zones. The comparison of areas within similar Life Zones is difficult on the basis of the sketchy data available. The point ratings are really of limited value, because data with respect to the absolute numbers involved in the concentrations are often lacking. Hence it is virtually impossible to measure how much better one area is than another. All that the designated notable areas really indicate is that a variety of animal concentrations are present. From this it is implied that concentrations of tourist and recreation values also are present. The numerical values are simply a crude measure of the total appeal and visibility factors associated with the group of species present. They therefore provide an imperfect indicator of comparative area strengths at best.

In spite of all that has been stated above, it was felt desirable to attempt some type of first order ranking on the basis of available data and general impressions. The results are summarized in Table 5.66.

The Redstone, Keele, Carcajou River areas rank first amongst all areas designated within the Hudsonian mountain section Life Zone. It is clearly one of the best areas in the entire Northwest Territories.

TABLE 5.66

MEAN POINT VALUES AND RANKING FOR DESIGNATED AREAS

		Mean Point Value	Ranking
A.	Areas in the Hudsonian Life Zone – Mountain Section		
	I. Redstone, Keele and Carcajou River Area	13.0	I
	II. South Nahanni and Flat River Area	9.0	II
	III. North Nahanni River Area	10.0	II
	IV. Richardson Mountain Area	7.5	
B.	Areas in the Canadian Life Zone		
	I. The Slave Valley Area	4.5-6.5	I - II
	II. The Fort Providence Hinterland Area	6.0-8.0	II - I
	III. The Fort Simpson Area	3.5-5.5	
C.	Areas in the Hudsonian Life Zone – Shield Section		
	Non designated.		
D.	Areas in the Arctic Life Zone – Mainland		
	I. The Thelon Area	8.5	I
	II. The Kaminuriak Calving Area	3.0	
	III. The Bathurst Inlet Area	5.5	
	IV. The Melville Hills and Lower Horton River Area	8.5	II
E.	Areas in the Arctic Life Zone – Island Archipelago		
	I. The Banks Island Prince Albert Peninsula Area	9.0	I
	II. The Bathurst Cornwallis Devon Island Area	9.0	I
	III. The Jones Sound Area	6.0	

Within the Canadian Life Zone the Slave Valley currently ranks I. If the buffalo herds introduced into the Fort Providence hinterland build up to substantial proportions in the years ahead, it will probably assume rank I because it possesses strong woodland caribou resources that are lacking in the Slave River area.

It seems fairly safe to accord Rank I to the Thelon area in the mainland section of the Arctic Life Zone. Only the Melville Hills-Horton River Area is a reasonably strong competitor.

Two areas in the Island Archipelago of the Arctic Life Zone have been accorded Rank I, namely, Banks Island-Prince Albert Peninsula and Bathurst-Cornwallis-Devon Islands. It is impossible to distinguish between these two on the basis of data presented in this report. If the Peary caribou resources of the Jones Sound area are stronger than indicated in present source data, this area would rank equal with the other two.

OVERVIEW STUDY OF TOURISM AND OUTDOOR RECREATION IN THE NORTHWEST TERRITORIES

Volume II

EXPLANATORY GUIDE

TO VOLUME II

This folio contains four base maps and ten overlays. The overlays are color coded to the information printed on the base maps. The system provides for variation in combinations of overlays over a base map. However, the basic format relating to the text of Volume I is as follows:

BASE MAP	OVERLAY COLOR	VOLUME I (Section - Page)	
Angling Districts	Dark Blue Line	5.1	31
Archaeological Sites	Green Line	5.2	47
Ornithological Resources	Red Line	5.7	153
Classification of Communities	Coloured Dots	5.4	101
Insect Nuisance Classification	Magenta Line	5.6	147
Marine Mammals	Brown Line	5.8	164
Terrestrial Mammals	Blue Line	5.10	207
BASE MAP			
Terrain Recro-Tourist Classification from a Territory-Wide Perspective	Red	5.9	187
BASE MAP			
Terrain Quality Classes from a Physiographic Regional Perspective	Purple	5.9	191
BASE MAP			
Terrain Quality and Capability Classification, Combined Territory-Wide and Regional Physiographic Perspective	Green	5.9	197