

The Ecological Knowledge of Belcher Island Inuit:

**A traditional basis for contemporary
wildlife co-management**

Douglas J. Nakashima
Department of Geography
McGill University, Montreal
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Abstract

This thesis focuses upon the traditional ecological knowledge of southeastern Hudson Bay Inuit. It provides a detailed assessment of Inuit use and knowledge of a single species, the Hudson Bay Eider (*Somateria mollissima sedentaria*). Data collected on Inuit classifications of animals reveal the highly-ordered systems whereby Inuit structure their extensive knowledge of the biological diversity of their environment. A lexicon of Inuktitut terms illustrates the refinement of their anatomical knowledge, while detailed data on one anatomical element, the eider skin, serve to indicate the considerable volume of information lying behind these labeled categories. Furthermore, Inuit knowledge of eider ecology provides exacting biogeographical information and identifies important ecological patterns and processes for the species. These findings run counter to preconceptions about traditional knowledge which linger in the wildlife professionals' milieu. Neither anecdotal, narrowly pragmatic, unverified nor non-ecological, traditional knowledge provides a sound argument for greater Native autonomy in wildlife management.

Résumé

Cette thèse est centrée sur le savoir écologique traditionnel des Inuit du Sud Est de la Baie d'Hudson. Elle examine l'utilisation et la connaissance d'une seule espèce, l'Eider de la Baie d'Hudson (*Somateria mollissima sedentaria*). Les données recueillies sur les classifications inuit des animaux mettent en évidence un système hautement structuré grâce auquel les Inuit ordonnent une connaissance extensive de leur environnement. Un lexique des termes inuit illustre le raffinement de leur savoir anatomique. Des données détaillées concernant un élément anatomique, la peau de l'eider, donnent une indication du volume considérable d'informations qui sous-tend les catégories désignées. Enfin la connaissance inuit de l'écologie de l'eider fournit des informations biogéographiques, et identifie des modèles et processus écologiques pour cette espèce. Ces résultats contredisent les idées a priori sur le savoir traditionnel qui persistent dans le milieu des gestionnaires de la faune. Ce savoir, qui ne se révèle ni anecdotique, ni étroitement pragmatique, ni non-écologique, fournit un argument de poids à ceux qui prônent une autonomie autochtone accrue dans le domaine de la gestion de la faune.

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Chapter One

INTRODUCTION**1.1 Research Context and Principal Questions**

Native people have not demonstrated to society that they possess either the will or the capability to assume responsibility for the management of wildlife, even where it is in their best interest.

Brynaert in CSEB 1982

During the last decades, northern Native peoples and state wildlife managers have been engaged in a vigorous and at times acrimonious debate over the management of wildlife by Native peoples. The discussion revolves around several key questions. Did hunter-gatherers, prior to European contact, manage the animal populations upon which they subsisted? If so, has the influx of Western technology and ideology undermined the traditions of knowledge and practice upon which this management system was based? Do contemporary Native knowledge and subsistence practice provide a reliable foundation for a Native management of wildlife in the North today?

The debate over these issues has a profound impact upon northern wildlife management institutions, which are currently under-going a period of rapid transition. It reflects and influences not only the structure and process of

management, but also the balance of power between Native communities and Euro-canadians.

Until recently, power over wildlife management rested almost exclusively with state authorities, who unilaterally established priorities, policy and regulations and imposed them upon resource users. During the 1970s, efforts to extend into the North, a centralized and hierarchical management regime developed in the South, elicited angry resistance from Native hunters. Confrontations between wildlife managers and Native resource users triggered a polarization of positions which left many pressing wildlife issues unresolved and apparently unresolvable (cf. Wilkinson 1981; Meredith 1983; Feit 1988).

During the last decade, a novel institutional arrangement between state wildlife managers and Native resource users has attracted a great deal of attention. "Co-management", also referred to as joint or cooperative management¹, has been proposed as a potential solution to the management dilemma of the previous decade. The term "co-management" is applied to a variety of cooperative management agreements whereby

¹ Note that in some regions, notably Manitoba and Alaska (R. Wolfe pers. comm.), a distinction is drawn between cooperative management and co-management. In these cases, cooperative management implies a limited involvement by resource users, while co-management indicates a broader sharing of powers and responsibility. In both of the regions indicated, state authorities prefer to speak of cooperative management and avoid the term co-management

government authorities share decision-making powers with resource users in exchange for the latter's assistance in realizing management goals (Pinkerton 1989). Several state-Native co-management regimes have been established in northern North America (Osherenko 1988) and others are in the making (Doubleday 1989; Tungavik Federation of Nunavut 1990). Some of the better-known examples include the Beverly-Kaminuriak Barren-ground Caribou Management Agreement (Cizek 1990), the James Bay and Northern Quebec Hunting, Fishing and Trapping Regime (Drolet et al. 1987; Berkes 1989) and the Alaskan Eskimo Whaling Commission (Freeman 1989).

For many individuals, co-management represents the wave of the future for northern wildlife management practice (Osherenko 1988; Stirling 1990). Agreements of this type have been praised as "the most promising policy solutions to (resource management) problems" (Pinkerton 1989). Yet other observers urge caution. They warn that co-management may in fact represent a vehicle of co-optation, undermining Native aspirations for self-management (Feit 1986; Usher 1986). They contend that if co-management leads only to "the entrenchment of the state system at the local or regional level rather than a significant transformation in the direction of the indigenous system" (Usher 1986: 69), then its "success" may be short-lived.

Ideally, co-management implies more than a decentralization of power. It suggests something beyond seating an equal number of state and Native representatives around the same table. True co-management would provide for an equality between parties, a consultation of two sets of knowledge about the environment and two different ideologies about human-environment relationships. It further implies a balance of power which would insure that both parties have equal opportunity to air their views and that these views are received in an open-minded forum which is not ideologically committed to an exclusively Western nor Native world-view. This is an ambitious goal which contemporary co-management regimes have yet to realize. Thus far, Western science and state management priorities and procedures have dominated the co-management process. Native representatives have found limited purchase for traditional knowledge and ideology in bureaucratic institutions little changed in structure and orientation from their antecedents (Cizek 1990; Usher pers. comm.). Can co-management overcome this impasse?

Progress in the co-management arena is linked to the debate over the management capabilities of Native peoples. To move beyond the present stalemate, foundations must be laid for a fuller comprehension of Native-environment relations in general and Native systems of knowledge and management of

wildlife, in particular. This thesis attempts such a contribution. It addresses several preconceptions about traditional knowledge and management which remain firmly-entrenched in the wildlife management community. These preconceptions contribute significantly to the atmosphere of inertia and friction which continues to cloud Native-wildlife manager relationships. Through a detailed examination of Inuit² use and knowledge of one wildlife species, the Hudson Bay Eider (*Somateria mollissima sedentaria*), it is hoped that some of these ideological barriers to true co-management can be surmounted, opening the road to a more equitable and effective process by which wildlife may be managed.

It must be recognized that wildlife management professionals exert considerable influence on the evolution of state management institutions. As the active representatives or agents of the state, their attitudes, values and beliefs limit the degree to which new and innovative management arrangements may stray from the status quo (Usher 1982). It is perhaps to be expected that wildlife professionals, trained in the Western scientific tradition, should have particular confidence in Western scientific approaches to identifying and resolving management issues. Yet this professional confidence, in combination with what

² Following the Inuit Circumpolar Conference of 1977, the term Inuit is used to designate all Eskimo groups. On occasion, Eskimo may be employed in order to be consistent with the usage of a cited author.

Johannes (1981: ix) has described as an "elitism and ethnocentrism that runs deep in much of the Western scientific community", as well as a general paucity of information about traditional knowledge and management systems, has in some cases led to the proliferation of ill-founded notions about Native knowledge and management. While these preconceptions are not shared by all members of the wildlife management profession, they are sufficiently widespread to continue to hamper efforts to move towards more comprehensive forms of state-Native co-management. Accordingly, a central and recurrent theme throughout the thesis is an examination of wildlife manager preconceptions and an assessment of their validity based upon an analysis of Inuit use, knowledge and management of wildlife.

Wildlife management can be envisioned as consisting of two major components: knowledge of wildlife, their habits, habitats, numbers, distribution etc; and management practice, actions taken based upon this knowledge and guided by management principles toward predefined objectives (Bailey 1984). The organization of this thesis follows this two-part structure. The first and major part (Chapters 2 to 6) focuses upon traditional ecological knowledge and wildlife manager preconceptions about it. The second and concluding portion of the thesis (Chapters 7 and 8), drawing upon the

conclusions from part one, extends the analysis and discussion into the realm of wildlife management principles, objectives and practice.

Before beginning the assessment of traditional knowledge, it is important to clarify the domains which we wish to explore, for knowledge is an immense realm touching all aspects of human existence and thought. Our interest is in what Lévi-Strauss (1962) has dubbed the "science du concret": Native knowledge of the natural milieu. This knowledge set spans a broad spectrum, including both the ideological and symbolic as well as the empirical and objective. Several authors have explored the ideological dimensions of traditional knowledge of human-nature relationships (eg. Saladin d'Anglure (1978) and Fienup-Riordan (1990) with respect to Inuit; Feit (1978), Martin (1978) and Tanner (1979) for subarctic Indians). Following in the tradition of *La Pensée Sauvage* (Lévi-Strauss 1962), these authors have focused upon Native conceptualization of their natural milieu as represented in myth, rites and ritual.

But Nature as symbolic system is only one aspect of Native knowledge of the natural environment. Knowledge and thought which for lack of more appropriate terms has been variously designated as empirical, objective or rational, constitute another dimension of Lévi-Strauss' "science of the concrete".

With rare exception (eg. Nelson 1969; Muller-Wille 1987), this substantial body of traditional empirical knowledge has been the subject of "surprisingly few systematic studies" (Laughlin 1968: 314). Lévi-Strauss (1966: 3) has described this "thirst for objective knowledge" as "one of the most neglected aspects of the thought of people we call 'primitive'". It is this body of knowledge to which the term traditional ecological knowledge refers and which provides the focus of this study.

This assessment of traditional ecological knowledge centres upon the Inuit of southeastern Hudson Bay. To do justice to the detail and subtlety of Inuit knowledge, a single subset of their information is focused upon, that pertaining to one species: the Hudson Bay Eider. Having described in the following section (1.2) the methodology employed, this chapter concludes with an overview of some widely-held preconceptions about traditional ecological knowledge which persist in the wildlife management milieu. The following views held by some members of the wildlife management profession are to be examined in particular detail: that traditional knowledge is 1) anecdotal; 2) limited to pragmatic matters; 3) non-ecological; 4) unverified; and 5) on the verge of disappearing. Recent expressions of all of these contentions have been collected by the author from both the scientific literature and through informal communications

with wildlife professionals.

Chapter 2 focuses upon the first of these preconceptions: that traditional knowledge is anecdotal. Through an analysis of the Qikirtamiut (Inuit of the Belcher Islands) system of classifying animals in general and eiders in particular, certain elements of this recurrent wildlife manager view are drawn into question.

Chapters 3 and 4 investigate the common preconception that traditional knowledge is limited to matters of practical (i.e. economic) importance. In Chapter 3, the complex nature of subsistence is revealed, calling into question the notion that knowledge for subsistence survival (i.e. practical know-how) is limited in scope. A survey of anatomical terms and knowledge in Chapter 4, further indicates the futility of attempting to explain the content of traditional knowledge within the restricted framework of pragmatic importance.

Chapter 5 juxtaposes preconceptions about the restricted ecological capacity of Native thinkers, with a comprehensive survey of Inuit knowledge of Hudson Bay Eider ecology. Finally, chapter 6 considers some common wildlife manager views on the validity and continuity of Inuit knowledge. It concludes with a summary of the major findings about the

nature and content of traditional ecological knowledge.

In the final portion of the thesis, the focus shifts from traditional knowledge to traditional management. In the same way that skepticism and a lack of information about traditional knowledge has hampered efforts to integrate it with scientific knowledge, so the misgivings of some wildlife professionals about Natives as managers have slowed progress towards true co-management. In order to better understand the views expressed by some wildlife professionals about the relationship of Native peoples to wildlife, it is instructive to first explore attitudes, values and beliefs about the human-nature relationship in general, which are shared by members of the wildlife management profession as a whole. This endeavour is the primary objective of Chapter 7. On the basis of this general analysis of wildlife professional ideology, wildlife manager views on Native use and management of wildlife are interpreted within the context of this shared ideological system.

To conclude, Chapter 8 returns to the questions posed at the opening of the thesis, considering the case for a traditional Inuit management of northern wildlife. Based upon the major findings about contemporary Inuit ecological knowledge and indications of the persistence of a traditional ideology, the present-day status of Inuit wildlife management

is explored. Drawing together these findings with those on wildlife manager views about Native-wildlife relations, the thesis closes by addressing the issue of whether the evolving institution of co-management can encompass the needs and aspirations of both Native peoples and state wildlife managers.

1.2 Methodology

This research involves Inuit from three communities in southeastern Hudson Bay (Fig. 1). The majority of field work was conducted in Sanikiluaq, N.W.T., a community of some 450 individuals which is located in the Belcher Islands. In Inuktitut, the Belcher Islands are the qikirtait (lit. "islands") and as a consequence, the people of the islands are collectively referred to as Qikirtamiut. This denomination is used throughout the text wherever specific reference to the Inuit of Sanikiluaq is intended. Field work was also conducted in the adjacent communities of Inukjuak and Kuujjuarapik which are located along the shores of Hudson Bay in Nunavik (northern Quebec).³

The research methodology varies in accordance with the nature of the information to be collected. The majority of

³ Interviews in Kuujjuarapik were conducted before the new community of Umiujaq was established.

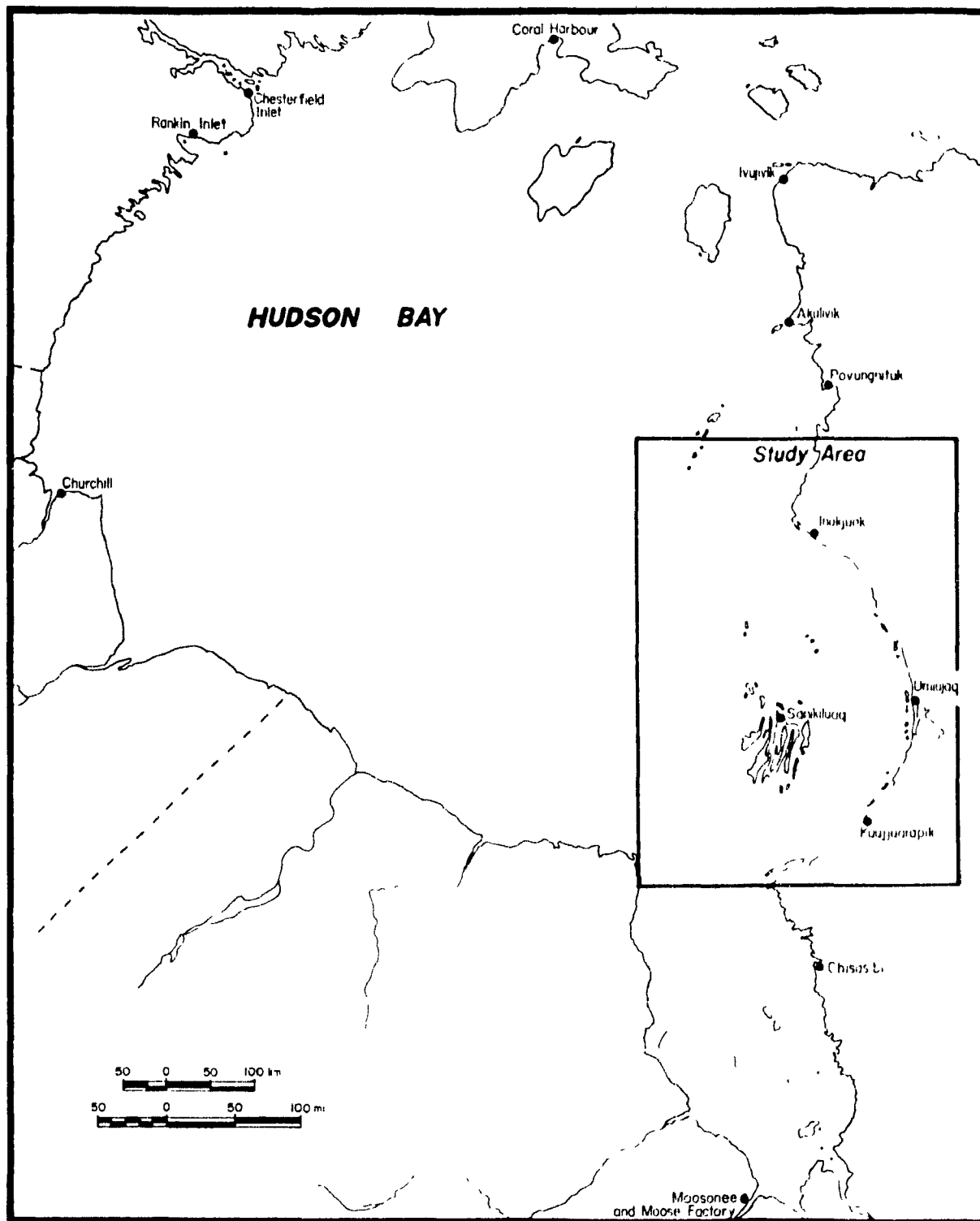


Figure 1. Map of Hudson Bay showing the study area and the locations of the communities of Sanikiluaq, N.W.T. and Inukjuak and Kuujjuarapik, Nunavik (northern Québec).

information was collected by semi-directive interviews, an open and flexible interview format which avoids the rigidity of questionnaires. Only the general theme of the discussion is set, and apart from focusing the discussion on this theme, the interviewer's role is to encourage the individual who is being interviewed to speak freely about those aspects that s/he feels to be most pertinent. This technique requires that the interviewer be perceptive, open-minded and flexible, for opportunities to explore new and insightful avenues of traditional knowledge and thought may be quickly passed over and lost.

Discussion themes were sometimes broad such as "what do you know about eiders?", and at other times specific, focusing upon taxonomy, anatomical terms, eider hunting, etc. While themes helped focus on specific subsets of Inuit knowledge, they were not rigidly adhered to. If interesting opportunities for discussion on other topics presented themselves, these leads were followed.

Interviews were conducted in most cases with single individuals and occasionally with two persons. Only rarely were group interviews conducted. Individuals who were particularly informative were interviewed on several occasions. This allowed for the cross-checking of

information and the exploration of several different domains of their knowledge.

As many persons interviewed spoke only Inuktitut, interpreters frequently had to be used. Interpreters played a key role in the interview process and were carefully selected. I was fortunate to have worked with a number of extremely capable individuals. Their contribution to the research process involved a great deal more than translation. Discussions were held with interpreters before and after interviews in order to insure mutual understanding of the methods involved, the type of information sought and the nature of information received. Interpreters were asked to transcribe and translate key interviews or sections of interviews from tape recordings, in order to record as accurately as possible the information conveyed by an interviewee.

Biogeographical information was collected on acetate overlays on topographical maps at a scale of 1:250,000. A mounted specimen of a Common Eider permitted the accurate recording of anatomical terms. To document the Inuit system of classification, species names were recorded in Inuktitut on slips of stick-on paper which could be easily arranged and re-arranged by the interviewee. In this manner, species were grouped so as to reflect the interviewee's conception of

taxonomic order.

Some 80 interviews were conducted with over 50 different individuals⁴ for a total of more than 200 hours of interview time. This total includes over 150 hours in Sanikiluaq, 38 hours in Inukjuak and 16 hours in Kuujjuarapik. Five trips were made to Sanikiluaq: November-December, 1985; April, 1986; July-August, 1988; November-December, 1988; and March-April, 1989. Inukjuak was visited on two occasions in November, 1985 and March-April, 1986. Kuujjuarapik was visited on one occasion in November, 1985.

Finally, in 1988-89, a project to document women's knowledge of the eider was organized. With support from the Québec Musée de la Civilisation, an eider skin coat was reconstructed (Nakashima 1989). All stages of the process from the eider hunt, to skinning, to the preparation of the skins, to the final completion of the coat were carefully observed and documented with photographs and on video tape. Throughout the project, the women involved in the reconstruction project were encouraged to explain all aspects of the technological process, revealing by this means their extensive knowledge of eiders.

⁴ In the text, individual informants are designated by letter(s) in order to preserve their anonymity.

1.3 Preconceptions about "Primitive" Thought and Knowledge

His extremely unabstract, practical philosophy and ability to live in the present have not fitted him in his own culture to indulge in reflection on the dynamics of animal populations or to consider questions of conservation from a developed point of view.

Leopold and Darling 1953: 42

"Extremely unabstract", limited to the "practical", restricted to the "present" and lacking a "developed point of view", Leopold and Darling provide a succinct summary of their views as wildlife professionals about the limitations of Eskimo thought. Today, some four decades after Leopold and Darling committed these views to paper, sentiments similar to these continue to be encountered in the wildlife management milieu. While not all wildlife professionals subscribe to these preconceived notions about traditional knowledge, views such as these nonetheless remain prevalent in certain circles, hindering progress toward more equitable wildlife management arrangements for Native peoples.

Do these preconceptions have a basis in empirical fact or do they reflect a persistent ethnocentrism which distorts manager views of Native peoples and traditional knowledge? This question is to be explored in depth in the following chapters. As a prelude to this detailed investigation of Inuit ecological knowledge, some of the most frequently

encountered of these preconceived notions about traditional knowledge are outlined below.

While no systematic study of wildlife professional attitudes and beliefs has been conducted, the following compilation reflects informal discussions, comments and remarks accumulated during many years of work and research in the North. Where available, these observations are further substantiated by published references. Written documentation, however, is difficult to procure as individuals are often reluctant to commit potentially controversial views to paper. The following representations of wildlife manager preconceptions are believed to accurately apply to a substantial proportion of the profession's membership.

Traditional knowledge is anecdotal

Perhaps the single most common critique expressed by members of the wildlife management profession is that traditional knowledge amounts to little more than a collection of anecdotes.⁵ By designating traditional knowledge anecdotal, wildlife professionals may imply a number of things. First, the term suggests that the content

⁵ It is interesting to note that in Newfoundland, fisheries biologists express similar views. In this case they dismiss the knowledge of local, non-native fishers as anecdotal and thus not worthy of serious consideration (B. Neis pers. comm.).

of traditional knowledge is fortuitous. Knowledge is accumulated by chance rather than by design. This characterization contrasts with the accepted view of science, which emphasizes a directed step-wise pursuit of specific, critical elements of information.

Second, anecdotal implies the absence of a discriminatory process. Observations are conferred equal weight and are accumulated piecemeal as received. Correlations or contradictions with previous observations are not considered to be particularly significant. One expression of this view is provided by Gunn, Arlooktoo and Kaomayok (1988: 25) who state that "Inuit hunters ... do not always ascribe more importance to multiple than single observations". Finally, to designate traditional knowledge as anecdotal is to imply an absence of order or structure. It assumes that organizing principles or logic are missing.

The contention that traditional knowledge is anecdotal will be discussed in the following sections of this second chapter, in conjunction with an analysis of the Qikirtamiut system of animal classification.

Traditional knowledge is limited to the practical

Another widely-held belief about traditional knowledge is

that its scope is limited to matters of practical significance for subsistence survival. Thus, some wildlife professionals are willing to concede that Inuit are well-versed in matters pertaining to the hunting of particular species, but beyond this minimum horizon of knowledge, they conclude that Inuit have little to contribute. According to this view, traditional knowledge is specialized, narrowly adapted for application in a single domain. Once removed from this restricted context, it is believed to be of little interest to the wildlife scientist. Leopold and Darling (1953: 42) describe Eskimo philosophy as "practical". They account for the Eskimo's inability to reflect upon impractical, complicated matters (such as population dynamics and conservation) by referring to "his ability to live in the present". Various aspects of the preconception that traditional knowledge is merely pragmatic will be explored in Chapters 3 and 4, along with an investigation of Qikirtamiut use of eiders and their knowledge of eider anatomy.

Traditional knowledge is non-ecological

On occasion, some wildlife professionals unveil a social evolutionist stance when speaking of Native intellectual capacities eg. "primitive" cultures lack "a developed point of view" (Leopold and Darling 1953: 42). By describing Inuit

as subject to "age-old hunting instincts" which are slow to adjust to change, Calef (1981: 165) seems to suggest that Inuit intellectual abilities are somewhat inferior to those of Euro-Canadians. The inclination to assume that "primitive" peoples are our intellectual inferiors, provides the basis for a related view: that "primitive" societies have a limited capacity for abstract thought.⁶

Once again, Leopold and Darling (1953: 42) offer a statement to this effect, describing Eskimo "philosophy" as "extremely unabstract". Lawrie (cited in Kelsall 1968: 209) also endorses this view, suggesting that Inuit do not conserve wildlife because conservation is too abstract an idea for them to grasp.

The presupposition that "primitive" thought is intellectually limited and incapable of abstraction has lead some wildlife professionals to assume that traditional knowledge lacks an ecological perspective. Ecology is arguably the most abstract of the natural sciences. Its objects of study, relationships, are immaterial and can only be apprehended second-hand, through the observation of the organisms or elements in the environment which are thought to be in interaction. That ecology as a discipline is a most

⁶ These views are not by any means the exclusive domain of wildlife professionals. Lévi-Strauss (1966) demonstrates the prevalence of such views about "primitive" peoples and reveals the faulty logic which underlies them.

recent addition to Western science, furthers the sentiment that a well-established ecological perspective must be alien to "primitive" thought. The contention that traditional knowledge is non-ecological is evaluated in Chapter 5.

Traditional knowledge is unverified

It is a common assumption that "the Eskimo seldom doubts what he has been told by others" (Nelson 1969: 374). Gunn et al. (1988: 25) formulate their view as follows: "Inuit hunters rarely question observations related by others". This characteristic is presumed to result in a set of traditional knowledge which remains largely unverified. Gunn et al. (1988) represent this open and indiscriminating attitude towards observations by others as the antithesis of science. The stereotype of the unquestioning Native is called into question in section 6.1.

Traditional knowledge is on the verge of extinction

A widespread conviction, voiced by both natural and social scientists, is that traditional knowledge will disappear with the passing of the present generation of elders. Nelson (1969), writing in a chapter that he entitles "The Death of Hunting", makes a particularly strong statement to this

effect. In light of this clamour over traditional knowledge's imminent disappearance, some wildlife scientists have concluded that traditional data warrant little attention for they are in the process of rapid erosion and extinction. This recurrent myth of the disappearance of the last elders and with them the extinction of traditional knowledge provides the basis for discussion in section 6.2.

Chapter Two

Inuit Taxonomy: anecdotal or ordered system?**2.1 Qikirtamiut Classification of Northern Animals**

The group of organisms which Inuit refer to as uumajuit¹ corresponds most closely, but not precisely, with the group which scientists refer to as the Animal Kingdom. As shall be seen below, however, not all of the scientist's "animals" are included by Qikirtamiut as uumajuit and some uumajuit are not, by Western scientific standards, "animals". The term uumajuk translates literally as 'it is living'. But as AA., a Sanikiluaq elder explains, in spite of the literal meaning of the term, not all things that Inuit recognize as living are included in this group.

Although I recognize that everything is alive - the plants, sea life under the ocean and things on the land, as well (i.e. things that are living but not uumajuk) - still the general term is just the way it means: uumajuk "it is living". (brackets added).

AA., Sanikiluaq

To move from the literal translation of uumajuit to a definition of the term, AA. precises that uumajuit are the ones that eat and the ones that move. They search for food.

¹ The transcription of Inuktitut terms has been verified with my Qikirtamiut assistants. In several instances, their spelling departs from standard Inuktitut orthography.

The Inuit of the Belcher Islands subdivide uumajuit into six major categories as follows (Fig. 2): 1. puijiit, a group corresponding to the sea mammals of scientific taxonomy; 2. igaluit, which includes anadromous and fresh water fish; 3. irgamiutait, a diverse assemblage including most macroscopic members of nearshore marine habitats; 4. pisutiit, a group corresponding to our land mammals; 5. timmiat, the larger birds; and 6. qupanuat, the small birds.

The membership of each of these uumajuit categories will be presented below. Of the six categories, particular attention has been paid to the large birds (timmiat) and as a consequence our understanding of Qikirtamiut organization of this group is more complete.

2.2.1 Puijiit: The Sea Mammals

The first group of uumajuit to be considered is that referred to as puijiit. The term literally translates as those that rise to the surface or those that "pop their heads out of the water" (Schneider 1985: 267). In this category Qikirtamiut place whales, walrus and seals. In both interviews conducted on classification, the first species mentioned was the qilalugaq or beluga whale (*Delphinapterus leucas*) and the aiviq or walrus (*Odobenus rosmarus*).

UUMAJUIT
"ANIMALS"

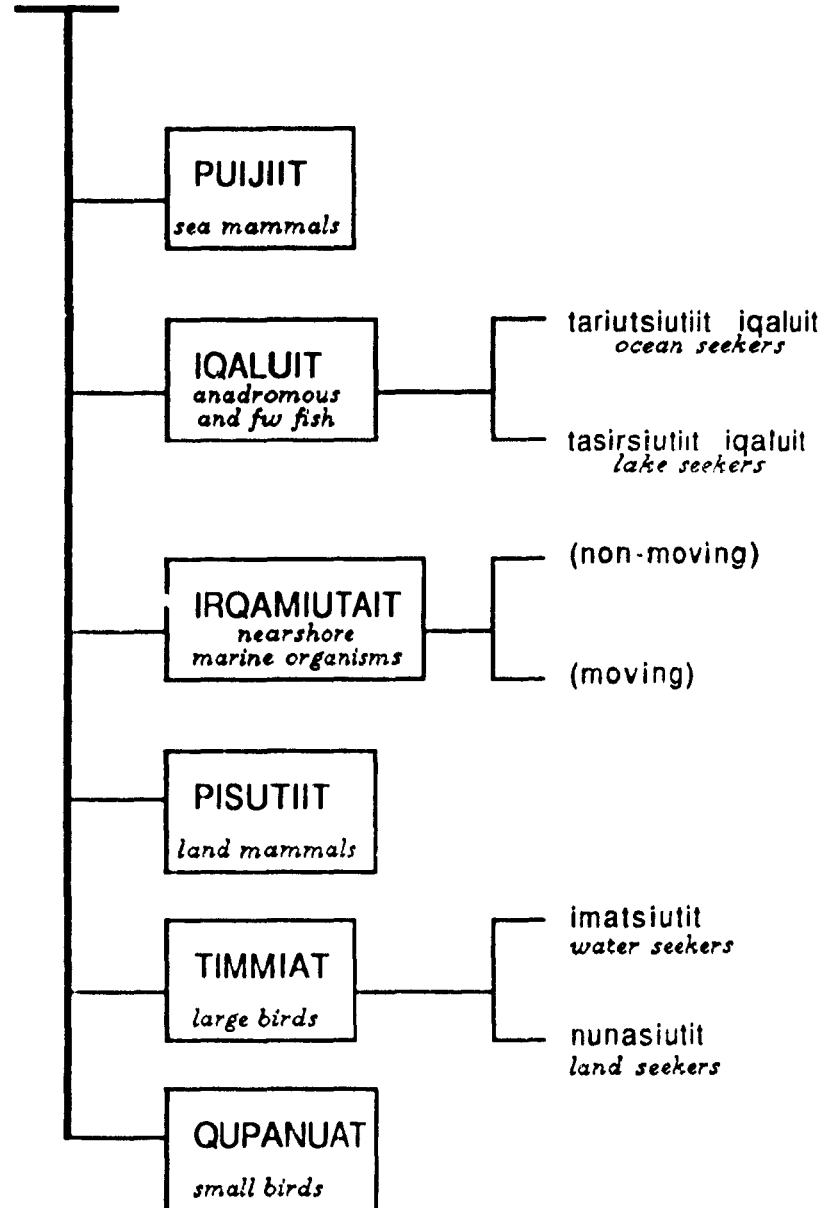


Figure 2. Qikirtamiut classification of UUMAJUIT

The remaining members of the puijiit constitute a group which although unnamed, is recognized as distinct from the beluga and the walrus. These are the "seals" of Western scientific taxonomy: ujju or bearded seal (*Erignathus barbatus*); natsiq or ringed seal (*Phoca hispida*); gasigia or fresh-water harbour seal (*P. vitulina*); and gairulik or harp seal (*P. groenlandica*). AA. also included two species of seals which he has never himself seen but he has heard were encountered in the old days. He described silaag as larger than the ringed seal and completely white. Iyak was about the size of the bearded seal with long whiskers reaching back to the shoulders. The identity of these latter two seals, whether mythical or real, remains to be determined.²

2.2.2 Igaluit: The Anadromous and Freshwater Fish

The second major category of uumajuit, is called igaluit. From the list of species included in this group, membership appears to be limited to freshwater or anadromous fish. Of the eight distinct fish types included as igaluit, the equivalent Western scientific identification has as yet been

² Although informants knew the names of other species of puijiit (eg. bowhead whales, killer whales and narwhals) they specified that they would only deal with animals native to the Belcher Islands.

determined for only a few types. The eight types of igaluit are: 1. igaluk (Arctic charr, *Salvelinus alpinus*)³; 2. ipitaaruk (unidentified)⁴; 3. aanaki (Brook trout, *S. fontinalis*)⁵; 4. kapisilik (whitefish spp.); 5. igalutuina (lit. common or ordinary fish; unidentified); 6. piviakali (unidentified); 7. igaluga (unidentified); and 8. kakilisag (stickleback, Gasterosteidae).

According to AA., the members of the category igaluit are divided into two groups: there are the tariutsiutiit igaluit (lit. ocean-seeking fish) and the tasirsiutiit igaluit (lit. lake-seeking fish) (Fig. 2). The ocean-seekers are described as having their home in the salt water but also living in freshwater. The lake-seekers live only in fresh-water. AA. indicates that aanaki (Brook trout) and kapisilik (whitefish) are lake-seeking fish. The division of igaluit into lake-seekers and ocean-seekers parallels the scientific distinction between anadromous and freshwater or land-locked fish.

³ Freeman (in McAllister et al. 1987) collected the name igaluppik for Arctic char in the Belcher Islands. My informants preferred the term igaluk, although they recognized that igaluppik was used by neighbouring Quebec Inuit.

⁴ According to lists of Inuktitut names collected by McAllister et al. (1987), ivitaarug is the Arctic char in its bright red spawning phase.

⁵ Freeman (in McAllister et. al. 1987) collected the name igaluk tasirsiutik (lit. lake-seeking fish) for the Brook trout in the Belcher Islands.

2.2.3 Irgamiutait: The Nearshore Marine Community

The third category of uumajuit is the largest, and by Western scientific standards, the most diverse. Its name, irgamiutait, refers to the inhabitants of the bottom of a body of water, in this case the sea floor.⁶ Its membership is divided into two groups. No specific names for the groups themselves were collected. One group includes those animals that do not move and the other, those that are free-moving (Fig. 2). In the former group the following types of uumajuit are included: 1. uviluq (blue mussel, *Mytilus edulis*); 2. kukiujaq (lit. like a fingernail; a cockle-like bivalve); 3. tallurunnak (cockle-like bivalve)⁷; 4. ipitsaunak (clam, *Macoma baltica*); 5. siupira (a dogwinkle-like gastropod); 6. qa'rauja (a type of sea tunicate); 7. quursujuq (sea cucumber); 8. mirguli (sea urchin, probably *Strongylocentrotus droebachiensis*); 9. iguupilluk (another type of clam); 10. a'ajaa (starfish); 11. kuaniit (a type of seaweed); 12. qiguat (a type of seaweed); 13. papikata (a type of seaweed); and 14. kinguk (a shrimp-like gammarid).

The free-moving members of the category irgamiutait

⁶ Related terms included in Schneider (1985: 96) include irgaani meaning "at the bottom of anything containing a clear liquid" and irgalijaarpug meaning "it is possible to see the bottom" (said of a lake, river or recipient filled with clear water).

⁷ Schneider (1985) identifies tallurunnak as a scallop.

include: 1. several types of sculpin (kannaju; kivatait; kanajura; aaka; papitjuk); 2. ugaq, (*Gadus ogac*); 3. nipisak, a type of lumpfish; 4. qujjauna (unidentified); 5. nimiria (unidentified); 6. quliliga (capelin, *Mallotus villosus*); and 7. ammaja (sand lance, *Ammodytes* sp.).

2.2.4 Pisutiit: The Land Walkers

Pisutiit, literally meaning those that walk, constitute a fourth major category of uumajuit. By Western standards, pisutiit closely corresponds to the category land mammals. Both informants BB. and AA., listed the members of pisutiit largely in order of body size, from largest to smallest. BB.'s list is presented here although the order and content of AA.'s list differed only in minor details. Pisutiit, according to BB. include: 1. nanuq (polar bear, *Ursus maritimus*); 2. amaruq (wolf, *Canis lupus*); 3. tuttu (caribou *Rangifer tarandus*); 4. a group consisting of six types of tirigania or fox [qakurta/white fox and naliktujaag/blue fox (*Alopex lagopus*); kajuqtuq/red fox, aangasi/cross fox, and qinnitaq /black fox (*Vulpes vulpes*); and pittusali, described as a rare fox with somewhat shorter front legs]; 4. ukali, (hare *Lepus* spp.); 5. tiriaq (weasel, *Mustela erminea*); and 6. avinnga (lemming, *Dicrostonyx hudsonicus*).

Classification of the dog is of particular interest and

will be discussed here even though Qikirtamiut consider dogs neither pisutiit, nor even for that matter, uumajuit. The resemblance of dogs to other members of the group pisutiit is fully recognized, but this is not the salient criterion for their classification. To make this point clear, AA. commented that even though female dogs occasionally get loose and mate with wolves, this does not alter the fact that the dog's place is not alongside wolves. Dogs occupy a separate sphere, outside uumajuit and shared only with humans and human body lice. According to AA., in this intimate class of three, humans are the central being, but dogs and humans are equals. Dogs and humans are classified together because they have been together ever since they came into the world. "Dogs are equal to man because they came first with men" (AA., Sanikiluaq).

Furthermore, dogs are said to differ from animals used by other societies. These animals were domesticated. The dog was not. Dogs have been with humans ever since the beginning. It is this unique and intimate relationship that Qikirtamiut reflect in their system of classification.

Given the Qikirtamiut system of classifying dogs with humans, it is interesting to note that among the Netsilik Inuit, dogs, like humans, have name-souls (Rasmussen 1976

[1931]: 150). Consequently, dogs are named after dead dogs or living or dead persons. By acquiring the name, they are believed to also acquire the traits and abilities of the dog or person after whom they are named. Furthermore, they are given many names for in this manner they are believed to be better shielded from sickness. The extension of the name-soul tradition to dogs provides another indication of the special bonds linking humans to dogs and the equality of their status.

Before returning to the classification of uumajuit, brief mention must be made of the third member of this intimate taxonomic group: human body lice (kumak). Like the dog, lice are included in this group because of the intimacy of their relationship with humans. Their intimacy, however, is of a rather different sort. According to Qikirtamiut, human lice come directly from the human body. Their taxonomic position is not a product of equal status but a function of origin, being from humans they are classified with humans.⁸

2.2.5 Timmiat: The Large Birds.

To continue our survey of uumajuk classification, we turn

⁸ Animal lice are also said to come directly from the body, in this case, the body of the animal. Presumably, they are classified with the animal in question. This interesting taxonomic twist has not as yet been verified.

to the composition of the last two major categories, those pertaining to birds. For Qikirtamiut, a conceptual category equal to our term "birds" does not exist. One can only speak more precisely of large birds (timmiat) or small birds (qupanuat). As this research focuses on the Common Eider and as eiders are classified as timmiat, this category of uumajuit has been investigated somewhat more thoroughly than the others. Accordingly, the additional taxonomic detail presented in this section should not be mistakenly interpreted as a greater preoccupation on the part of Qikirtamiut with classifying timmiat as opposed to puijiit or any other category of uumajuit. Instead it provides some indication of the degree to which this present research into Qikirtamiut classification falls short of capturing all of the subtlety and detail which is inherent in the system. Further research into this aspect of Inuit knowledge would be of considerable interest.

The more detailed information on the classification of timmiat also provides us with the opportunity to look at variations in systems of classification between individual Qikirtamiut. The broad outlines of the classification system for uumajuit is strikingly consistent, not only among Qikirtamiut, but also among eastern Arctic Inuit in general (cf. Brody 1976). But as one moves down the hierarchy from the general to the specific, differences in opinion on the

finer details of the ordering of animal types become more common. The Inuktitut system of classification shares this trait with the Western scientific taxonomic system and most likely with classification systems in general. Individual variation in classification will be illustrated in the course of our discussion of the group timmiat.

Information on Qikirtamiut classification of the large birds was collected during two interviews: one with a single Qikirtamiut elder, BB.; the other in a joint session with two elders, AA./CC. To facilitate the presentation of data and to highlight the similarities and differences between the two classification schemes, we will first describe the AA./CC. system (Fig. 3) and then discuss how BB.'s system (Fig. 4) departs from the former. This order of presentation has been chosen to facilitate discussion. AA./CC. tend more to group bird types (in Western taxonomic slang they are "lumpers") whereas BB. tends to split them apart (i.e. he is a "splitter").

To begin our discussion of Qikirtamiut classification of the large birds (timmiat), we note first that like the category irgamiutait (marine nearshore animals) which is divided into free-moving and not free-moving, or the igaluit (fish), divided between lake-seekers and ocean-seeker, the category timmiat is also separated into two. In this case,

Qikirtamiut refer to one group as imatsiutiit or water-seekers and the other as nunasiutiit or land-seekers. Within each of these two groups, bird types are further organized such that those sharing common traits are grouped together.

Imatsiutiit: the water-seekers

Considering first the water-seekers (imatsiutiit), AA./CC. attribute 15 types of large birds to this group and distribute them among 6 sub-groups (Fig. 3). BB., on the other hand, includes 21 types distributed among 11 groups.

The AA./CC. organization of the water-seeking birds will be described first. As an aide to the reader, the six groups to be described below could be approximated in Western taxonomic terms as follows: 1. eiders; 2. loons; 3. alcids; 4. mergansers; 5. Oldsquaw; and 6. an unidentified species.

According to AA./CC., a first sub-group of water-seekers has as its focal species the mitiq, known to ornithologists as the Hudson Bay Eider (*S. m. sedentaria*). Two other members of this sub-group are described as nukarait of the Hudson Bay Eider. The term nukaraq (pl. nukarait) is constructed from nukaq, meaning "younger sibling" and -raq, meaning "that which is like". The literal meaning of

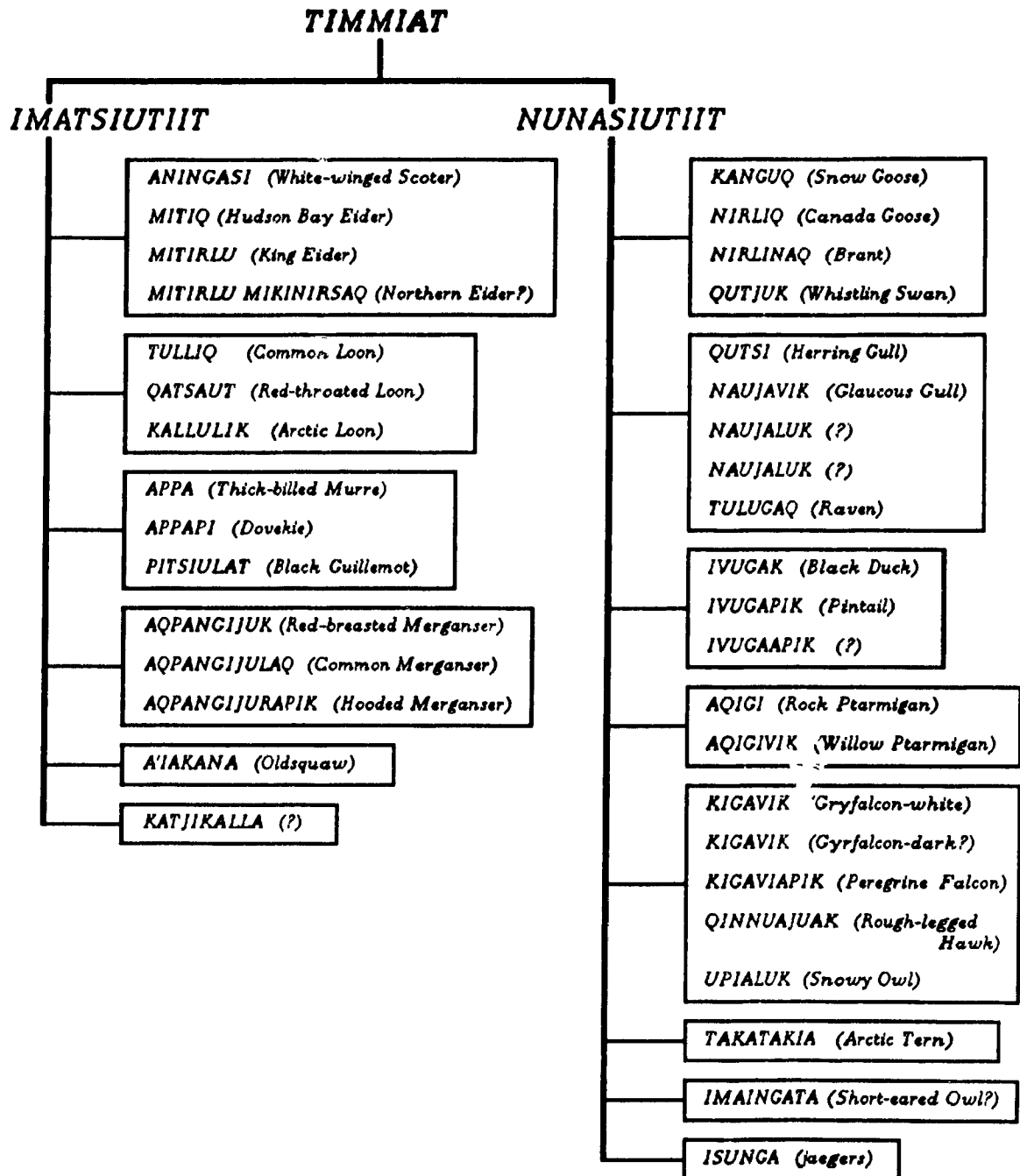


Figure 3. The classification of TIMMIAT, the large birds, by informants AA./CC.

nukarait in the above context is thus, "those who are like younger siblings" to the Hudson Bay Eider. These "sibling" species are named mitirlu, our King Eider (*S. spectabilis*), and mitirlu mikinirsag. The identity of the latter eider type is open to interpretation and is discussed in the following section 2.3. To this group of three eider "siblings", AA./CC. add a fourth bird type called aningasi which from a brief description appears to be the White-winged Scoter (*Melanitta deglandi*)⁹ of ornithologists.

A second sub-group described by AA./CC. is composed of three bird types: tulliq; gatsaut; and kallulik. These three species are grouped together because of a shared behavioural/morphological trait. They are all described as poor walkers on land due to the placement of their legs far back on their body. In scientific taxonomy, these three species are the Common Loon (*Gavia immer*), Red-throated Loon (*G. stellata*) and Arctic Loon (*G. arctica*) respectively. Ornithologists consider all three species to be members of the monogeneric family Gaviidae.

In a third sub-group, AA./CC. include three species: appa;

⁹ I believe this same bird bears the name pitsiulakpak in northern Quebec. The name (lit. the big guillemot) refers to the resemblance of the black and white plumage of the White-winged Scoter to that of the smaller Black Guillemot (*Cephus grylle*).

appapi; and pitsiulat. For ornithologists these species are the Thick-billed Murre (*Uria lomvia*), the Dovekie (*Plautus alle*) and the Black Guillemot (*Cepphus grylle*). In scientific taxonomy these three species are all members of the family Alcidae.

A fourth sub-group within the water-seeker timmiat comprises three species which ornithologists group together in the subfamily Merginae, the mergansers. The most common species, which breeds locally, is referred to simply as aqpangijuk. The suffix -tuinaq meaning "common" or "ordinary", may be added on occasion in order to distinguish this species from the others. Thus the aqpangijutuinaq is the Red-breasted Merganser (*Mergus serrator*) of scientific classification. For the other two members of the sub-group, AA./CC. again designate them nukarait, "like younger siblings". Those who are like the younger siblings of the Red-breasted Merganser are the aqpangijulaq or aqpangijuqakurta (lit. white merganser) which is our Common Merganser (*M. merganser*) and the aqpangijurapik (lit. little merganser) which is the Hooded Merganser (*Lophodytes cucullatus*).

Finally, each of the last two sub-groups have but a single species. The fifth sub-group is the a'iakana or Oldsquaw (*Clangula hyemalis*). Katjikalla, the only representative of

the sixth and final sub-group in AA./CC.'s classification of water-seeking timmiat has yet to be identified.

Before moving on to the classification of the land-seeking birds, we will examine briefly how the system of another Qikirtamiut eider, BB., differs from that previously described (Fig 4). Many of the differences as mentioned above, relate to the fact that BB. is more of a "splitter", preferring to separate bird types rather than group them. Thus, the three loon species which AA./CC. describe as a sub-group are separated into two sub-groups by BB. on the basis of diet and habitat. In his view, Red-throated and Arctic Loons are classed together because they share a diet of small marine organisms. The Common Loon, on the other hand, is set in a sub-group of its own because it is associated more with lakes and a fish diet. In spite of the separation into two groups, BB. obviously recognizes some level of similarity between the three species of loons because he lists them consecutively and contrasts the habits of one sub-group to those of the other.

BB. also splits the alcid group described by AA./CC. The Thick-billed Murre and the Black Guillemot are each unique representatives in their own sub-groups. BB., however, makes indirect reference to their similarity because he lists the two species consecutively. No mention is made by BB. of the

TIMMIAT

IMATSIUTIIT

NUNASIUTIIT

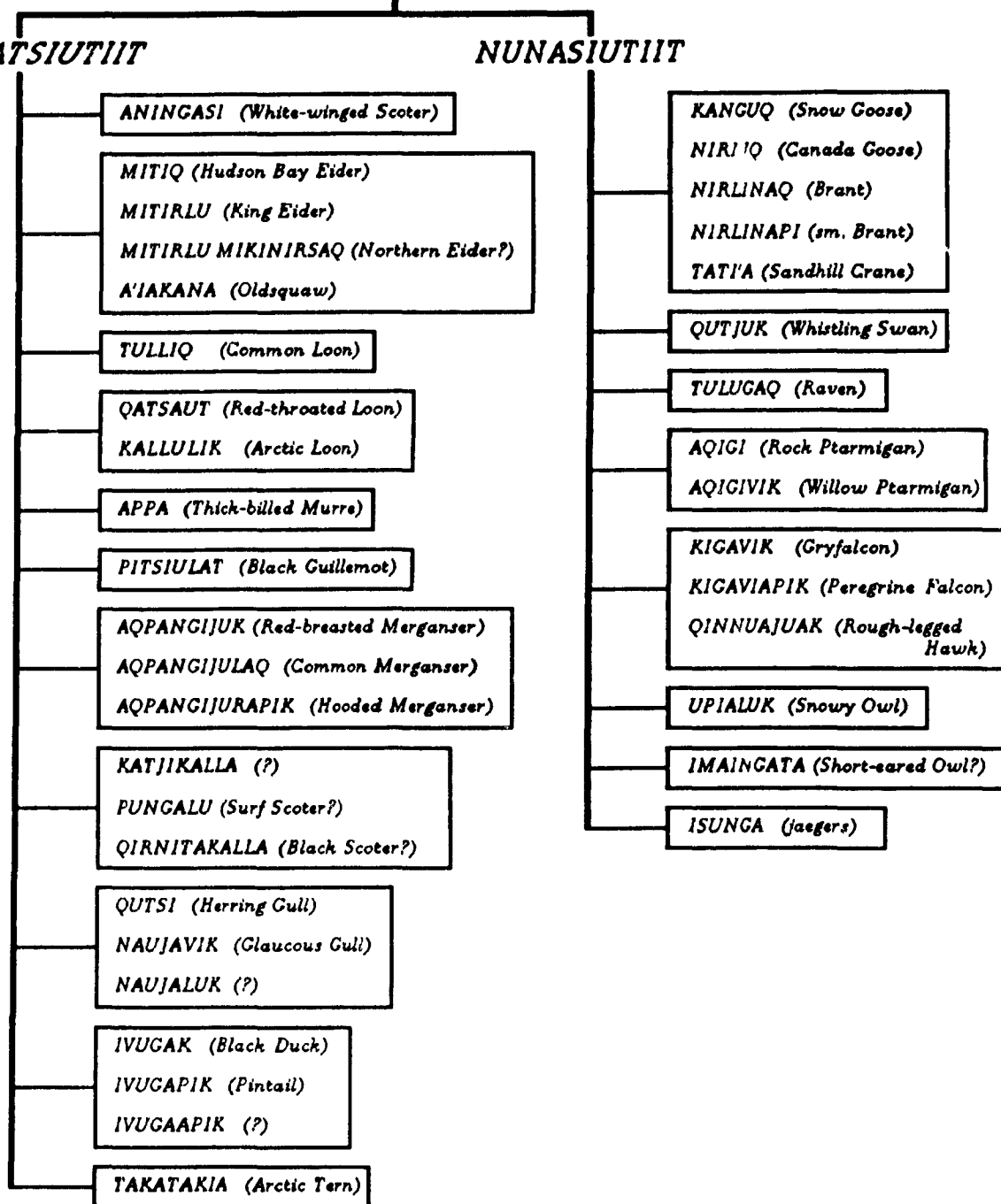


Figure 4. The classification of TIMMIAT, the large birds, by informant BB.

Dovekie, the third species in AA./CC.'s "alcid" sub-group.

Another difference between the classification presented by BB. and that of AA./CC. is not a split, but a switch. It involves the sub-group of eiders. Rather than associate the White-winged Scoter with the eiders and leave the Oldsquaw in a sub-group on its own, BB. integrates the Oldsquaw into the eider sub-group and places the White-winged Scoter on its own.¹⁰ According to BB., Oldsquaw are always with Hudson Bay Eiders. They nest together and feed on the same things. Ornithologists consider all of these species, that is eiders, scoters and Oldsquaw, to be members of the same sub-family Aythyinae.

To the sub-group containing the single unidentified species katjikalla, BB. adds two additional species not mentioned by AA./CC. These are pungalu and girnitakalla. The identification of these two species remains uncertain, but I believe the former to be the Surf Scoter (*M. perspicillata*) and the latter the Black Scoter (*Oidemia nigrum*). BB. grouped these three species because they are together when moulting their feathers.

¹⁰ Although NA classifies the White-winged Scoter apart from other species, he nonetheless mentions that they are often seen with girnitakalla (Black Scoter?) and pungalu (Surf Scoter?). The species is also associated with the walrus. White-winged Scoters and walrus are said to share the same food and to often be seen together.

Nunasiutiit: the land-seekers

Moving now from the classification of the water-seeking birds to the land-seekers, we note that AA./CC. include 22 bird types in the latter group, organized into 8 sub-groups (Fig. 3). The first of these sub-groups is comprised of four species as follows: kanguq or Snow Goose (*Chen caerulescens*); nirliq or Canada Goose (*Branta canadensis*); nirlinaq or Brant (*B. bernicla*); and qutjuk or Whistling Swan (*Olor columbianus*). Swan and Canada Goose are associated by AA./CC. because they feed together on land. Brant, on the other hand, is said to have lice and for this reason Canada Geese are said generally to avoid them. Only occasionally are they seen together. Nonetheless, the two species share a special relationship, for the Brant is considered to be the nukaraq ("like a younger sibling") of the Canada Goose.

Like Qikirtamiut, Western ornithologists recognize a close relationship between the four species of this sub-group, for they are considered to be members of two closely related sub-families: the swan is of the sub-family Cygninae and the others, of the sub-family Anserinae.

A second sub-group of land-seeking timmiat is composed of

five species. Four of these species are the gulls of scientific taxonomy. AA./CC. divide these gulls into two types: first, the naujak of which there are two types; and second, the naujaluk of which there are also two types. The naujak types are the gutsi (also referred to simply as naujak) which is the Herring Gull (*Larus argentatus*) and the naujavik (lit. the big gull) (Schneider n.d.: 136) which is the Glaucous Gull (*L. hyperboreus*). According to BB., these two species nest in different habitats, the Herring Gull preferring islands on saltwater and the Glaucous Gull preferring to nest on cliffs or islands on lakes. When not nesting, however, BB. notes that the Glaucous Gull is always near the ocean.

The two types of naujaluk bear the same name. Their identification in ornithological terms is uncertain. The Iceland Gull (*L. glaucoides*) is a possibility. The two naujaluk species are only present in the Belcher Island region in winter. Qikirtamiut say that they appear when the saltwater is really starting to freeze-up. The fifth and final member of their sub-group is the tulugaq or Raven (*Corvus corax*). AA./CC. associate the gulls with the Raven for reasons of diet. Both gulls and Ravens are said to eat anything, even garbage. Furthermore they share the habit of eating eggs.

Three types of land-seeking birds comprise a third sub-group. These include the ivugaq and its nukarait ("those like younger siblings"), the ivugapik and the ivugaapik. The first of these species is probably the Black Duck (*Anas rubripes*) and the second is the Pintail (*A. acuta*). The identity of the third type of ivugaq has yet to be determined.

The ptarmigans of ornithological classification comprise a fourth sub-group. The two species of this group are the aqigi or Rock Ptarmigan (*Lagopus mutus*) and the aqigivik or Willow Ptarmigan (*L. lagopus*). In earlier times, Qikirtamiut report that only one ptarmigan species occupied the Belcher Islands, the aqigi or Rock Ptarmigan.¹¹ Over the years, however, Willow Ptarmigan have immigrated from the mainland, and this species is now present the year around.

A fifth group of land-seeking birds consists of five species united by their identification as hunters of other animals. According to AA./CC., three of these bird types bear the same name: kigavik. The first kigavik described as white in colour, is the white phase Gyrfalcon (*Falco rusticolus*). The second is possibly the Gyrfalcon in dark phase. The third kigavik is described as smaller in size and is probably the Peregrine Falcon (*F. peregrinus*). Unlike

¹¹ An alternate Qikirtamiut name is nitsatug.

AA./CC., BB. distinguishes this last species by name as well as by description. He calls it kigaviapik (lit. the little falcon). Two other "hunters of animals" are the qinnuajuak or Rough-legged Hawk (*Buteo lagopus*) and the upialuk or Snowy Owl (*Nyctea scandiaca*).

The last three sub-groups of the land-seeking birds include but one representative each. These are: sub-group 6. takatakia, the Arctic Tern (*Sterna paradisaea*); sub-group 7. imaingata (species unidentified, but an incomplete description suggests the Short-eared Owl, *Asio flammeus*) and sub-group 8. isunga or jaegers (*Stercorarius* spp.).

Having completed our overview of the classification of land-seeking birds by AA./CC., we will now briefly examine differences between this system and that described by BB (Fig. 4). Again we note the latter's preference to separate out bird types that he considers to have less in common with the other sub-group members. Thus, BB. separates the Raven from the sub-group containing gulls, setting the former species on its own. He also separates the Snowy Owl from the falcons and Rough-legged Hawk. Finally, he separates the Whistling Swan from the sub-group of geese and Brant.

It is interesting to note that all of these "splits" coincide with Western scientific taxonomy, in that in each

case BB. separates out the member of the sub-group least related to the others by Western taxonomic criteria. The criteria used by BB., of course are not the same. In the case of the Whistling Swan, for example, BB. explains the separation from geese by the fact that the various goose species tend to fly together and even feed together, although they do not always select the same food items. The swans, however, remain apart and are therefore classified in a sub-group of their own. Note that this observation conflicts with those of AA./CC.

The criterion of association is used by BB. to add another species to the goose/Brant sub-group. BB. includes the tati'a or Sandhill Crane (*Grus canadensis*) because it is seen with geese and even sometimes nests with them.¹²

Finally, a difference between the classification system of AA./CC. and BB. which is more momentous than the splitting or lumping of sub-groups, pertains to the attribution of three sub-groups to water-seeking or land-seeking timmiat. As we have seen AA./CC. locate the three sub-groups of pond ducks, gulls and Arctic Tern within the land-seeking timmiat. BB. does not disagree with the organization of the sub-groups but

¹² Ornithologists have not recorded Sandhill Cranes nesting on the Belcher Islands, although they are known to nest in northern Ontario along the west side of James Bay (Godfrey 1979).

attributes all three sub-groups to the water-seeking timmiat. No specific explanation for this major disparity in timmiat taxonomic classification was obtained.

2.2.6 Qupanuat: The Small Birds

All of qupanuat or small birds are members of one of two avian orders: Passeriformes¹³, the passerines or songbirds; or Charadriiformes, from the families Charadriidae (plovers) or Scolopacidae (sandpipers).

The 18 recorded types of qupanuat are listed below with the scientific identifications where these are known: 1. sijagiatuinag (sandpiper spp.); 2. sijagialuk (sandpiper spp.); 3. quliquilia (Semipalmated Plover, *Charadrius semipalmatus*); 4. anaqtuvik (?); 5. tullivik (?); 6. tulliviujuk (?); 7. amauliqag (Snow Bunting, *Plectrophenax nivalis*); 8. qupanuaqpak (Horned Lark, *Eremophila alpestris*); 9. qupanuaq (?); 10. nasaulik (Lapland Longspur, *Calcarius lapponicus*); 11. qulualuk (?); 12. qullulak (?); 13. luviluvila (Semipalmated Sandpiper, *Ereunetes pusillus*); 14. igitajuk (?); 15. aiviqia (?); 16. sarvak (Red Phalarope, *Phalaropus fulicarius*); 17. mitsataq (?); 18. siutuu (?).

¹³ The only passerine bird not included in this category of uujajuit is the Raven which Qikirtamiut classify as a timmiat (large bird).

2.2.7 Qikirtamiut Taxonomy: Order, Hierarchy and Ecology

From our overview of Qikirtamiut classification of uumajuit ("animals"), we can draw three brief conclusions. First, the system is ordered. Each animal type has a unique and appropriate place in relation to other uumajuit, humans and the universe in general. This is not to say that the system is immutable nor that there is complete accord between individuals as to each animal's proper place. Quite to the contrary, we have seen in the category of timmiat that individuals may differ in several aspects of classification. Nonetheless, it is noteworthy that disparities occur at one level, that just above the individual species. The general structure of the system is not a subject of dispute. Furthermore, even where certain individuals split apart species that others prefer to lump together, the former recognize overtly or indirectly that the species that they separate are more closely related to each other than to other members of the larger group. In other words, the classification system has a consistent logic which all Qikirtamiut endorse. Like Western taxonomists who refer to themselves as "splitters" or "lumpers", individual Qikirtamiut may disagree as to the degree of relatedness which warrants a species' exclusion or inclusion in a group.

They do not dispute, however, the overall logic of the system itself. It is this shared logic which confers order upon the system.

Second, Qikirtamiut classification is hierarchical. In the category timmiat which was studied in greater depth, five levels of organization can be recognized. The highest level is that of uumajuit, a concept which is most closely but imperfectly rendered in English as "animals". As we have seen uumajuit is distinct from that domain which includes humans, dogs, and human lice. It is also distinct from the domain qupirquit which includes terrestrial invertebrates such as insects and worm-like invertebrates. Soil, rocks and plants (nunait) form another domain at this highest level of organization.

At a second level of organization within uumajuit, six major categories of "animal" life are recognized¹⁴: puijiit; igaluit; irgamiutait; pisutiit; timmiat; and qupanuat. The separation of timmiat into imatsiutiit (water-seekers) and nunasutiit (land-seekers) is an example of the third level of taxonomic organization. Within water-seeking timmiat, the fourth level of organization is evidenced by the grouping of bird types which are judged to be closely related eg. 3 types

¹⁴ There is some indication that Qikirtamiut may separate the six major categories of uumajuit into water dwellers versus land dwellers. If so, this would add another level of organization to the hierarchy.

of "loons" or 3 types of "mergansers" or 4 types of "eiders". Within these groups, one of the types is often provided particular prominence as the representative form of the group. The Hudson Bay Eider, for example, is deemed "representative" of the group "eiders" in that the King Eider and the Northern Eider are said to be related to it "like younger siblings" (nukarait). The fifth and final level of organization presented here is that of the specific animal type or "species". Classification below the specific level has not yet been discussed but will be addressed below with respect to the Hudson Bay Eider.

The final conclusion to be drawn about Qikirtamiut classification is that the organizing logic is not primarily morphological as in Western scientific taxonomy, but heavily ecological and behavioural. Western taxonomy is preoccupied with establishing evolutionary lines of descent and organizes species according to genetic relatedness. For the species which concern us here the principal Western criterion for determining relatedness is morphological resemblance.

For Qikirtamiut, ecology and behaviour, as well as morphology, provide the organizing principles. Major categories of uumajuit are conceptualized in behavioural terms: "those that rise to the surface" (puijiit); "those

that walk" (pisutiit); and "those that fly" (timmiat). The irgamiutait or marine benthic organisms are separated on the basis of those that are free moving and those that are not. The species that Western taxonomists refer to as "loons" are grouped together because they are poor walkers on land. The morphological features related to behaviour are recognized (their legs are far back on their body), but it is the behavioural trait that is highlighted as the organizing principle.

Ecological relationship also figures prominently. The irgamiutait are a most diverse assemblage of species by Western taxonomic standards. Virtually all are united, however, by the common ecological principle of being members of the nearshore marine community. Habitat reappears frequently as the *raison d'etre* for grouping. Fish (igaluit) are separated into ocean-seekers and land-seekers, and large birds (timmiat) into water-seekers and land-seekers.

Associations between species provide another justification for grouping. Within the large birds, BB. groups three species of scoters (?) (katjikalla, pungalu, and qirnitakalla) because they flock together when they moult their feathers. He also places Oldsquaw with the Hudson Bay Eider because they nest together and share a common diet.

Thus, common diet also provides a logic for organization. AA./CC. group Snowy Owl, Rough-Legged Hawk and falcons because they are all hunters of other animals. The Raven is associated with gulls because the former, like the latter, is said to eat anything, even garbage. They also share the trait of feeding on eggs.

It is clear that Qikirtamiut classification is remote from the museological tradition of ordering collected specimens. Unlike Western taxonomy it does not seek its organizing principles solely among the physical traits of the organisms themselves. Instead it embraces the animal in all its dimensions excluding neither the intangible elements of behaviour nor the complexity of environmental relationship.

2.3 **Mitig** in Qikirtamiut Classification

Qikirtamiut classification of the natural world does not, of course, abruptly end at the level of the "species". Having examined in the previous section the ordering of "animals" as a whole, in this section we turn to classification at the most specific levels of organization. Our focus is upon the term mitig, a term which acquires subtly different meanings in different contexts.

In section 2.3.1, we examine how the term mitig or more

precisely the term mitiit (pl.) is used in a manner roughly equivalent to our term "eiders". It is thus a generic which includes a number of different eider types. Our discussion highlights the efforts made by Qikirtamiut to describe and account for a rather mysterious type of mitiq.

In section 2.3.2, mitiq as a specific reference to the Hudson Bay Eider is explored. Qikirtamiut knowledge of intraspecific variations in body size, diet and distribution are discussed. Finally, in section 2.3.3, Qikirtamiut use of the term mitiq as a reference to the female eider introduces the subject of sex and age categories. We therefore examine Qikirtamiut classification of Hudson Bay Eiders according to categories of age and sex.

2.3.1 Mitiit as "Eiders"

During interviews focusing on the Hudson Bay Eider, Inuit were asked, "How many types of mitiit do you know?". The response elicited by this question suggests that mitiq is a generic term which embraces a group of two or more closely related "species". This group might be termed by an ornithologist, "eiders". In all interviews, two eider types were always included, mitiq, the Hudson Bay Eider and mitiqluk, the King Eider. Several individuals from Sanikiluaq

and one from Kuujjuarapik, however, added a third type of mitiq whose identity, as we shall see below, remains somewhat open to speculation.

DD. of Sanikiluaq, spoke of a third type of mitiq which he knew as mitigluiuak. Mitigluiuak much resembles the Hudson Bay Eider in appearance, and although not as small as the King Eider, it is slightly but nonetheless noticeably smaller than the Hudson Bay Eider. In comparison with the Hudson Bay Eider, mitigluiuak maintains its head in a more erect position and its neck is thinner. Its plumage is browner in colour. Interestingly, DD. has never seen a male of this "species". He has only seen females and mitiaraviniq, eider fledglings. As they only appear in the Belcher Islands region after eider eggs have hatched and when the juveniles can fly, and as they disappear before the ice freezes, DD. believes that the mitigluiuak does not "live" in the Belcher Islands. His suggestion is that they come from the North, possibly from the Inukjuak region, as he has heard that the eiders near Inukjuak are smaller.

DD.'s very precise observations and his own reflections, strongly suggest that his mitigluiuak is the Common Eider subspecies which ornithologists refer to as the Northern Eider, *S. m. borealis*. The *borealis* subspecies is indeed smaller than *sedentaria*, the Hudson Bay Eider. Furthermore,

and also in accordance with DD.'s observations, *borealis* are browner than *sedentaria* females and young. Palmer (1976: 33-34) describes the fall plumage of the adult female *borealis* as "rich, reddish brown overall". Female and young *sedentaria*, on the other hand, are described as "pale, toward gray-buff". The southern limit of the breeding range of the Northern Eider is generally designated by ornithologists as northern Hudson Bay, including Chesterfield Inlet, Mansel, Coates and Southampton Islands and Cape Wolstenholme (Abraham and Finney 1986; Palmer 1976). The actual range limits, however, remain undetermined (Abraham and Ankney 1986). DD.'s observations confirm that *borealis* does not nest as far south as the Belchers, but female and young *borealis* nonetheless stray into southern Hudson Bay in late summer and fall, leaving again before freeze-up.

Other hunters' descriptions of a third eider type correspond with DD.'s description of mitigluujak. They refer to this rather mysterious "species" by a variety of names. EE. of Kuujjuarapik described a third type of mitiq which he calls mitikallak, the "small, plump mitiq". Once again, he reports that this mitiq is intermediate in size between the Hudson Bay Eider and the King Eider. In appearance it closely resembles the former, but has a shorter neck and darker coloration. Although mitikallak mix with the Hudson Bay Eider, according to EE., they do not mate with them. Few

in numbers, they are only seen in the fall.

FF. of Sanikiluaq referred to a third eider type which he called mitiqluapik. Unlike the previous two observers, however, he describes these eiders as very small, smaller than the King Eider. On the other hand, he concurs in reporting that they are the least numerous of all the eider types and that he has only seen female mitiqluapik.

GG. of Sanikiluaq, described three types of mitiit: the Hudson Bay Eider; the King Eider and a third type for which he had no name. Once again, the third type is described as small and dark-colored. He groups these mitiit together because Qikirtamiut eat the flesh of all three, raw as well as cooked.

Further observations of this nature come from a joint interview, in which BB. and CC. describe a third type of mitiq which closely resembled the Hudson Bay Eider except that it is smaller in size. They know no special name for this eider type, referring to it simply as mitiq. Its smaller size is evident in flight, as well as in the hand. It is generally the females that are seen, although BB. has on rare occasion seen small adult males. In an attempt to account for this third type of mitiq, BB. speculated that

perhaps they were in fact unusually small and young Hudson Bay Eider females.

DD.'s explanation, however, corroborated by the independent observations of four hunters from Sanikiluaq and another from Kuujjuarapik, and consistent with Western scientific information on subspecific differences between the Northern and Hudson Bay Eiders, seems entirely plausible. This smaller and darker seasonal visitor to the Belcher Islands may indeed be the Northern Eider.

Although DD.'s speculation about the identity of mitiglujak, the mysterious third member of the eider group, cannot be confirmed without further data, this brief reconnaissance along the limits of Qikirtamiut knowledge and experience offers a most profound set of insights. It unveils an incredible perceptiveness and curiosity about subtle anomalies in their natural environment. These mysterious "eiders" appear in the Belcher region for only a very brief period in the late summer and fall. Only slightly smaller and somewhat darker than the thousands of Hudson Bay Eiders that are perennially present in the region, one would expect any pragmatic subsistence hunter, with presumably more pressing concerns on his mind, to hardly give them a second thought. After all, are they not, for all intents and purposes, just some more eider-type food ?

Clearly, Inuit think differently. Their curiosity is piqued. They make careful mental note of when they arrive and when they depart. They notice differences in morphology (smaller body size, something unusual about the neck, darker coloration) and differences in behaviour (the head is held more erect). The sex and age of the mysterious eiders are remembered and the degree to which it mixes with Hudson Bay Eiders observed.

Given the relatively small numbers of this eider seen and the brevity of its visit, such information can hardly be passed off as functional or pragmatic. Neither is it mere anecdote, a casual and somewhat haphazard accumulation of rather amusing bits of information. Quite to the contrary, these hunters who have undoubtedly accumulated their observations piecemeal over an extensive period of time and some of whom have even felt it necessary to assign a name to this unknown animal, clearly exhibit a directed and determined pursuit of knowledge for its own sake. As Lévi-Strauss has astutely pointed out, for the Qikirtamiut as for ourselves, "the universe is an object of thought at least as much as it is a means of satisfying needs" (Lévi-Strauss 1966: 3)

2.3.2 Mitimmarik: The true mitig

While the term mitig may refer to assemblages of eider types as we have discussed above, it is also applied specifically to the Hudson Bay Eider, that is to say the *sedentaria* subspecies of the Common Eider (*S. m. sedentaria*). In order to make clear reference to the Hudson Bay Eider in a situation where confusion with other "eiders" (i.e. mitig) might arise, the Qikirtamiut may use any one of the following names: 1. mitimmarik, the true or complete mitig in reference to its role as representative of the multi-species group "eiders"; 2. mitituinnag, the common or ordinary mitig in reference to its great local abundance; and 3. mitivik, the big mitig, in reference to its larger size.

On the basis of variation in distribution, habitat, behaviour and/or physiology, some Sanikiluaq hunters distinguish between different forms of mitimmarik. Western taxonomists refer to this as classification at the subspecific level.¹⁵ HH. recognizes northern and southern wintering "populations" of the Belcher Island mitimmarik. His differentiation between the two groups is based upon observations of eider movements along the floe edges of the Belcher Islands archipelago. The northern group frequents

¹⁵ Note that according to the Western taxonomic system, we were already dealing with subspecific classification when discussing Qikirtamiut analyses of Hudson Bay versus Northern Eiders.

the northern ice edge and the western edge north of the southwest end of Kugong Island (Fig. 12). The southern group ranges along the southern and western ice edges, northwards to the area southwest of Flaherty Island. During the winter, the eiders of each group move back and forth along their respective stretches of ice edge or to and from the edge and polynyas in the landfast ice. Their ranges do not overlap.

HH. speculates that the numbers of northern and southern eiders are more or less equal, the southern ones being perhaps somewhat fatter. From his experience the northern eiders are more "ice-edgers", spending more time out at the sea ice edge and making less use of areas of open water within the landfast ice.

Another hunter, AA., distinguished between two forms of Hudson Bay Eider on the basis of winter habitat, behaviour and physiology. The first group which he referred to as "traveller eiders" are incessantly moving. They frequent the ice edge in winter. These "travellers" feed in deep waters and are therefore obliged to consume 'seal food', quliligag (probably capelin, *Mallotus villosus*). As a direct consequence of their diet, the "traveller" eiders have small, soft gizzards.

His second group are Hudson Bay Eiders which are non-

travellers or sedentary. They frequent permanent areas of open water within the bounds of the landfast ice which are kept open by strong tidal currents. Here they dive and feed on benthic fauna such as mussels (*Mytilus edulis*), sea urchins (probably *Strongylocentrotus droebachiensis*) and sea cucumbers (unidentified species). Due to their diet of hard-shelled or tough foods, they have large gizzards. According to AA., the traveller eiders are many times more numerous than the sedentary ones.

2.3.3 Mitiq as "female eider": gender and ontogeny

The term mitiq can also be specifically applied to the female Hudson Bay Eider. It contrasts with amaulik (pl. amauliit), which refers to the drake. It is more common, however, to employ the terms arnaviag (root arnag = woman) for the female eider, and amaulik to designate the male.¹⁶

Gender differentiation begins with the egg of the Hudson Bay Eider. Elongate eggs are called amaulitsaq or more rarely angutiviatsaq (lit. future male), indicating that they will produce male ducklings. More rounded eggs are referred to as arnaviatsaq (lit. future female), indicating that the duckling will be female. This is an old tradition.

¹⁶ Arnaviag and angutiviag (root angut = man) designate female and male birds in general.

Table 1. Nomenclature for Stages of Eider Egg Development

General Terms:

1. <u>mannik</u>	egg
2. <u>kauk</u>	egg white (becomes the bird's feathers)
3. <u>itsik</u> or <u>tingutsaq</u>	yolk; (becomes the bird's liver)
4. <u>arnaviatsaq</u>	roundish eggs (said to be female)
5. <u>angutiviatsaq</u> or <u>amaulitsaq</u>	elongate eggs (said to be male)

Stages of Egg Development:

1. <u>mannitsaq</u>	egg still in the female's body
2. <u>inutsurituk</u>	newly-laid egg
3. <u>imigatuk</u>	an egg just starting to develop - "it has something like water", referring to watery condition of the egg white
4. <u>inulik</u>	embryo is visible
5. <u>inulialuk</u>	embryo is large and developing feathers
6. <u>tukkariavituk</u>	small hole in the shell i.e. it is pipped
7. <u>tukkaatuk</u>	shell well-cracked and duckling emerging

Table 2. Nomenclature for stages of development of the Hudson Bay Eider.

Eider development stages:

1. <u>tukkagamik</u>	duckling just hatched, barely standing
2. <u>mitirag</u>	eider duckling
3. <u>sulutsataktuk</u>	developing flight feathers or <u>suluk</u>
4. <u>migusagaliqtuk</u> or <u>migusataktuk</u>	developing contour feathers or <u>miguq</u> in the area on the back
5. <u>unirutik</u>	developing feathers under the wing
6. <u>isaqiliqtuk</u>	flight feathers present but as yet unable to fly, begins to practice flight
7. <u>mitiraviniq</u>	young fledged eiders of either sex (lit. former ducklings)

Terms only applied to female eiders:

8. <u>ginnaluk</u>	female in summer, tail feathers notched
9. <u>arnaviatsaq</u>	female who will breed next year for the first time, tail feathers no onger notched (lit. future female)
10. <u>arnaviak</u>	female adult

Terms only applied to male eiders:

11. <u>amaulitsaq</u>	general term applied from the moment a young eider is distinguishable as a male, until adulthood (lit. future male)
a) <u>tuullisaujaq</u>	male, dark head and neck with first white feathers around base of neck ¹⁷
b) <u>angutiguluk</u>	male with white feathers appearing on back
c) <u>amaulitsaq</u>	like an adult male except the tips of elongate tertials are black, back of head brownish (lit. future male)
12. <u>amaulik</u>	male adult

¹⁷ "They look like tullig (Common Loon) in the face, they remind us about tullig with their black heads" (CC., Sanikiluaq).

Present-day elders explain that this is what their elders used to say.

Gender differentiation of ducklings is not possible at the time of hatching, but is possible by the fall. The plumage of male mitiravinig (juvenile) is darker and the bill longer than those of the female mitiravinig. AA. stated that the earliest stage at which gender distinction was possible was the unirutik stage, when the young eiders were growing feathers under their wings (Table 2). In the young male the under wing feathers are darker. At the next stage, when the young are isaqiliqtuk, the drake is evident because the feathers on the upper part of the head are darker than the females' brown coloration.

Nomenclatures for the development stages of eiders and their egg varied from the relatively simple to greatly detailed. Tables 1 and 2 present one hunter's detailed nomenclatures for stages of egg and eider development respectively.

2.4 Anecdotalism Refuted: the Inuit quest for objective knowledge

Having completed our survey of Qikirtamiut classification

of uumajuit ("animals") in general and having investigated their organization of eiders in particular, we now return to the questions raised at the opening of this chapter. Are wildlife professionals justified in dismissing traditional knowledge as a collection of anecdotes? Is traditional knowledge the haphazard and chaotic assemblage of chance observations that this critique implies? Are wildlife managers' knowledge and Inuit knowledge as alien to each other as the polar opposition of "scientific" to "anecdotal" encourages us to believe?

The data presented in this chapter, on Qikirtamiut classification paint a strikingly different portrait of traditional knowledge than that portrayed by wildlife professionals. Qikirtamiut knowledge of animal types is captured in a highly-ordered system of classification. This system has little in common with a haphazard collection of anecdotes. Qikirtamiut "animals" are ordered hierarchically from the highest and most inclusive level of uumajuit, down through as many as five levels of decreasing inclusivity to that of individual species. As we have also seen, Qikirtamiut continue this ordering below the species level. Groups of Hudson Bay Eiders are differentiated according to variations in distribution, behaviour and size. Hudson Bay Eiders are also separated into categories according to differences of age and sex. These data reveal that

Qikirtamiut traditional knowledge is more accurately characterized as refined, exacting and ordered than haphazard and anecdotal.

For anthropologists, the "discovery" of order and logic in Inuit classification may be banal, if not self-evident. Ethnoscience research into folk taxonomies has shown that all human societies without exception, order the chaos of their environment through classification and that these systems are consistent with an overriding, albeit culturally-specific, logic (eg. Sturtevant 1964; Berlin 1974; Brown 1979; Hunn 1982). But for wildlife professionals, who have little contact with the social science literature, the conclusions presented here move against the current of professional wisdom. In their view, the environmental knowledge of traditionally illiterate and "primitive" societies more plausibly verges on disorder rather than order and on illogic rather than logic. This presumption is inherent in the labelling of Native knowledge as anecdotal. It is these views, prevalent in the wildlife management profession, which this chapter confronts and refutes.

In addition to order, our examination of Qikirtamiut classification has revealed a directed and meticulous inquiry into the "essential" nature of organisms. This inquiry into

the "nature" of organisms considers not only morphological traits, but also traits of behaviour and ecology, which together allow the ordering of organisms according to a specific, cultural logic. The logic of Qikirtamiut classification is strikingly different from that of Western scientific taxonomy, which attempts to recapitulate phylogeny, evolutionary lines of descent. These disparate logics, of course, result in classifications which are in many respects strikingly different. This dissemblance in end-product, however, belies a number of striking similarities in intellectual process.

Thus like the "splitters" and "lumpers" of Western taxonomy, we find ourselves confronted by the dilemma of whether to emphasize similarity or difference. The appropriate path is determined by the context. And the pertinent context is provided by wildlife professionals who emphasize the distance between the knowledge and thought of scientists such as themselves and Native peoples.

In response, we conclude this chapter by drawing upon data presented herewithin to highlight parallels in the intellectual process of Qikirtamiut and Western scientists. The intent, of course, is not to convince readers that Qikirtamiut are in fact scientists, nor to convince them that scientists are in fact Qikirtamiut. The point to be made is

that in attempting to render the natural world intelligible, Western scientists and Qikirtamiut exhibit comparable intellectual application and ability. Their pursuit of objective knowledge is a fundamentally human preoccupation common to all human societies. No single culture has a monopoly on objective thought (Lévi-Strauss 1962).

Three noteworthy similarities between the process of classification by Qikirtamiut and scientists, will be briefly discussed: 1. the existence in both traditions of lumpers and splitters; 2. parallels between the nukarait concept and scientific concepts of type and sibling species; and 3. overlap in the organizing principles of Qikirtamiut and ecologists.

In our detailed investigation of Qikirtamiut classification of timmiat (large birds) an interesting phenomenon arose. The organization of timmiat proposed by two elders in a joint interview (AA./CC.) differed in several aspects from the organization by another elder (BB.). One consistent difference accounted for many of the disparities. AA./CC. tended to consistently lump species together into larger subgroups, whereas BB. tended to split species into smaller subgroups. Interestingly enough these tendencies parallel the perennial dispute in Western scientific taxonomy between taxonomists who tend to be "splitters" and those that tend to

be "lumpers" (Welty 1975: 10). The former emphasize differences between species and therefore tend to separate species into different supraspecific categories such as genera, tribes or families. Lumpers on the other hand emphasize similarities and therefore tend to cluster species together into the same genus, tribe or family.

The problem in scientific taxonomy is the same as that encountered by Qikirtamiut. A hierarchy of categories exists (i.e. species, genus, family, order, etc.) but there are no hard and fast rules for the inclusion or exclusion of members at any particular level. Species are relatively easy to deal with as there are generally (but not always) sharp morphological discontinuities between them. Similarly upper level categories which differentiate between groups on the basis of major morphological differences are easily recognizable. The major problem arises just above the species level where the description of subgenus, genus or subfamily, lacking any easily defined basis, remains completely arbitrary (Heywood 1967).

This is precisely the situation observed with the disparities between the classifications of BB. and AA./CC. Although we cannot be completely certain as some species remain unidentified, BB. and AA./CC. appear to concur

entirely at the specific level of bird types. They also concur at the upper levels as to the inclusion of animal types in each of the six major categories of uumajuit. Differences in classification arise in the formation of subgroups just above the "species" level. This is the conflict zone for splitters and lumpers in both Western scientific and Qikirtamiut traditions.

Noteworthy parallels with Western scientific thought are also evoked by the Qikirtamiut concept of nukarait¹⁸, a relationship between species which is "like that of an older sibling to a younger one". As may be recalled from our discussion of the classification of timmiat, Qikirtamiut use the term nukarait to describe the relationship between certain closely-related species. Thus the Common and Hooded Mergansers are said to be "like the younger siblings" (nukarait) of the Red-breasted Merganser. Similarly, those "like the younger siblings" of the Hudson Bay Eider are the King Eider and another eider type which we suspect to be the Northern Eider.

The Qikirtamiut concept of the nukarait relationship parallels two concepts in Western taxonomy: one, which relates to nomenclature (the system of scientific naming), is

¹⁸ The term nukarait is derived from the root nukaq meaning "younger sibling of the same sex" in human geneology and the suffix -raq (pl. -rait) meaning "that which is like".

the type concept; the other, which is taxonomic, is the sibling species.

To determine the nomenclature of biological organisms Western scientists endorse the type method. By this method a single species is selected as the type or representative of the genus. As such it confers its name upon the genus. Similarly, a single genus is selected as the type of the next higher level of taxonomic organization, the family. This typifying genus confers its name upon the family (Porter 1967). Thus the dog, *Canis familiaris* is the type species of the genus *Canis*. The genus contains several species which share the same generic name but differ in specific epithet (eg. *Canis lupus*, the wolf or *Canis latrans*, the coyote). The genus *Canis* is in turn the type for the family Canidae which embraces several genera (eg. *Vulpes*, the genus of the red fox and *Alopex*, the genus of the Arctic fox) (Banfield 1974).

The scientific tradition of the type method is paralleled by the nukarait concept in that Qikirtamiut select an animal as representative (the type species) of a group of closely related "species". Furthermore, the Inuktitut name of this "species" becomes the root term in the names of those "species" that Qikirtamiut designate as being of close relationship. Thus mitiq (Hudson Bay Eider) is the

representative type and its "younger siblings" (nukarait) are the mitirluk¹⁹ which is the King Eider and the mitiq mikinirgsaq²⁰ or mitigluujak²¹ which is thought to be the Northern Eider. Similarly, nirliq (Canada Goose), akpangijuk (Red-breasted Merganser) and iyugak (Black Duck) all give their names as the root term in the names of their "younger sibling" species.

It should be noted that these "younger sibling" species are recognized as species in their own right. The Common and Hooded Mergansers, for example, are not designated as "children" of the "elder" Red-breasted Merganser. Rather the nukarait denomination distinctly conceptualizes all three merganser species as sharing the same "parents", they are related as siblings. Thus the term nukarait provides a genealogical metaphor for a common origin.

The Qikirtamiut concept of nukarait, while not bearing precisely the same meaning, distinctly parallels in name and concept, the "sibling species" of Western taxonomy. In the scientific tradition, sibling species are "pairs or groups of closely-related species that are reproductively isolated but

¹⁹ In literal translation, "the bad mitiq" (Dorais 1977; Schneider n.d.).

²⁰ In literal translation, "little mitiq".

²¹ In literal translation, "that which is like a bad mitiq" (Dorais 1977).

are morphologically nearly identical" (Van Tyne and Berger 1971: 581). An ornithological example is provided by the North American *Empidonax* flycatchers which bear a baffling morphological resemblance to one another. In the field identification by song rather than by morphology is essential (Van Tyne and Berger 1971: 362). Both Qikirtamiut and population biologists have drawn upon the same geneological metaphor to indicate a close relationship between distinct animal types.

The final example illustrating comparable intellectual application on the part of Qikirtamiut and Western scientists involves the classification of animals according to ecological principles. As we have demonstrated in Section 2.2.7 above, ecological relations play a role of singular importance in Qikirtamiut classification. Nearshore marine organisms (irgamiutait) are grouped together in a major category which is defined by common habitat. The animals which scientists designate as mammals are segregated by Qikirtamiut into those of the land (pisutiit) and those of the sea (puijiit). The large birds (timmiat) are conceptually split between water-seekers and land-seekers, while fish (igaluit) are divided into ocean-seekers and lake-seekers.

In contrast, Western scientific taxonomy does not use ecological relationship as a principle of organization. Phylogenetic relationship is the unifying principle.²² As members of the scientific community, ecologists endorse and use this formal taxonomic system. This has not prevented them, however, from creating an informal, parallel system of classification which organizes species according to ecological principles.

Like Qikirtamiut, common habitat is often used as the basis for defining groups whose membership cuts across formal taxonomic lines. Ecologists identify "seabirds" and "sea mammals" as important groups for study. In northern waters the category "seabirds" recruits its varied membership from up to seven different families (Procellariidae, Hydrobatidae, Sulidae, Phalacrocoracidae, Laridae, Alcidae and Anatidae) representing four different orders of the Class Aves. Northern "sea mammals" are a similarly varied assemblage drawn from 11 families (Balaenidae, Eschrichtiidae, Balaenopteridae, Ziphiidae, Monodontidae, Physteridae, Delphinidae, Ursidae, Otariidae, Odobenidae and Phocidae) bridging three different orders of the Class Mammalia. Among invertebrates, ecologically important groups such as phytoplankton, zooplankton and benthos combine species, not

²² Ecological and behavioural information is nonetheless exploited by Western taxonomists to attempt to correct y establish phylogenetic relatedness.

only from numerous orders, but from a great number of phyla.²³ This reorganization of the formal taxonomic system along ecological lines is an important product of the development of ecological thought in Western science.

It is therefore interesting to note that although ecological classification is a relatively recent development in the Western scientific tradition, it has long been a fundamental organizing principle for the traditional Qikirtamiut system of classification. This system reveals the primacy of ecological thought in the Inuit view of the natural world.

This ecological perspective is deeply-rooted in a powerful and recurring theme in Inuit culture: the opposition of land and sea. Emerging from a dialectic between culture and environment, the land-sea dualism is reflected on an ideological plane in Inuit taboo and myth (Saladin d'Anglure 1978), and on a human ecological plane in traditional patterns of subsistence which alternatively exploit each ecological zone (Mauss 1979). It instills Inuit world-view with a profoundly ecological logic which resonates throughout their system of knowledge of their natural milieu. This ecological logic emerges in the classification of uumajuit as

²³ According to Barnes (1974: 4), "marine zooplankton includes representatives from virtually every group of animals, either as adults or as developmental stages".

a segregation of land mammals from sea mammals, of lake-seeking fish from ocean-seekers and of water-seeking birds from land-seekers. It is also apparent at finer levels of classification such as in the grouping of types of geese or the association of eiders and Oldsquaw on the basis of habitat.

Inuit ideology, which views humans as straddling the boundary between two spheres, that of the sea and that of the land, has an ecological foundation. In Western ideology, whose primordial segregation is between humans and Nature, this perspective is but a recent acquisition.

In conclusion, from our survey of Qikirtamiut classification, we find little support for the contentions frequently advanced by wildlife professionals, that Native knowledge is anecdotal, limited to the practical and non-ecological. Quite to the contrary, our research has revealed that traditional knowledge is organized into a highly-ordered system which adheres to a strong ecological logic. Furthermore, the data indicate that Qikirtamiut actively pursue an objective understanding of the natural world, not to fulfill narrow pragmatic goals, but for the intellectual pleasure of knowing. That this intellectual quest for knowledge is a universal trait shared by Qikirtamiut and

Western scientists alike, is indicated by parallels in conceptual thought which have emerged through our study of Qikirtamiut and scientific classification systems.

Chapter Three

Traditional Knowledge as merely Pragmatic: elusive limits to practical knowledge

A number of wildlife professionals harbour a rather dim view of the intellectual abilities of so-called "primitive" peoples. They overtly or inadvertently advocate a social evolutionist stance whereby Native hunters-gatherers are viewed as representatives of an early stage in human evolution. According to this view Native peoples in traditional times are akin to non-human animals in their ecological relations, buffeted about by the exigencies of a harsh and unforgiving environment.

These wildlife professionals, on the other hand, view their own role vis-a-vis Nature as the very antithesis of that of Native peoples. As representatives of a highly-civilized society, they are armed with a "sophisticated and scientific" perspective which is "not an endowment of mankind but a fruit of time and circumstance" (MacPherson 1981: 104). They exercise control over nature, manipulating wildlife populations in order that they comply with human needs.

According to this view, the physical and intellectual resources of hunter-gatherers in traditional times, are

monopolized by a single overriding concern: survival in a harsh environment. This preoccupation with bare subsistence, precluded the life of leisured intellectualism which wildlife professionals envision as a necessary precondition for cultivating a subtle understanding of the natural environment or elaborating a management perspective.

As the principle preoccupations of hunter-gatherers are represented as narrowly pragmatic, by extension, wildlife professionals have concluded that traditional Native thought is first and foremost "unabstract and practical" (Leopold and Darling 1953: 42; Lawrie cited in Kelsall 1968). Restricted to information which is merely pragmatic for survival, traditional knowledge is assumed to be too limited in scope to contribute to other intellectual domains such as wildlife management.

Is Qikirtamiut knowledge of the natural environment limited in scope to that information which serves practical ends? Or does it extend beyond the pragmatic to the accumulation of knowledge for its own sake? These questions provide the focus for the present chapter and Chapter 4 which follows.

In the present chapter, the wildlife professionals' claim that traditional knowledge is merely pragmatic is not itself drawn into question. Instead discussion focuses upon the

difficulty of determining the limits of that which is practical. In order to be able to distinguish that portion of knowledge of the natural environment which is pragmatic, from that portion which serves broader intellectual ends, a comprehensive understanding of subsistence use is required. If our appreciation of the breadth and complexity of Native resource use is limited, then by extension our appreciation of the breadth and subtlety of traditional knowledge is equally limited. Wildlife professionals fall victim to this shortcoming. Their apprehension of the multi-dimensional quantity which is Native subsistence is superficial and as a result they vastly underestimate the scope of traditional knowledge.

In this chapter, sections 3.1, 3.2 and 3.3 illustrate the complexity of resource use as it relates to the Hudson Bay Eider. According to the views expressed by wildlife professionals, Qikirtamiut should be expected to have a rather shallow knowledge of eiders for they are a resource of at best secondary importance to the subsistence economy.¹ As we shall see in section 3.1, however, the practical significance of eiders to Qikirtamiut is not revealed by a cursory understanding of subsistence harvest statistics.

¹ In Sanikiluaq, only 9.8% of total annual subsistence harvest by weight is derived from eiders (Donaldson 1983; 1984; J. Pattimore pers. comm.).

Defying their designation as "secondary" or "minor", small animals such as eiders, other waterfowl, ptarmigan and fish are in fact critical to the integrity of the subsistence economy. Accordingly a simplistic representation of subsistence whereby undue emphasis is placed upon large game animals to the exclusion of smaller species, leads to the expectation that Inuit knowledge is taxonomically restricted.

Furthermore, eiders cannot be viewed as a one-dimensional resource. For Qikirtamiut, eiders (and all animals for that matter) are not merely sources of meat. The complexity of eider use as food and of eider use as material for clothing are dimensions which few wildlife professionals are in a position to appreciate. These dimensions are explored in sections 3.2 and 3.3, for they have a direct impact upon the content of Qikirtamiut knowledge. This exploration provides the necessary foundation for our discussion of Qikirtamiut knowledge of eider anatomy, the central theme of Chapter 4.

3.1 Eiders and Qikirtamiut subsistence: the vital role of "secondary" resources.

Wildlife professionals contend that the content of traditional knowledge is limited to practical concerns pertinent to Native subsistence. As has been pointed out above, however, even if this contention is accepted at face

value, it is nonetheless evident that as long as wildlife professionals underevaluate the complexity of subsistence, they necessarily underestimate the sophistication of traditional knowledge.

One such misjudgement of subsistence practice has led some wildlife professionals to contend that traditional Inuit knowledge is restricted in its taxonomic breadth. They argue that while Inuit may be somewhat knowledgeable about large animal species (eg. seals, walrus, whales and caribou) which constitute subsistence staples, their knowledge of smaller animals such as birds, fish and invertebrates is superficial. This argument is based upon the assumption that large marine and terrestrial mammals play the central role in the subsistence economy and that smaller animals represent incidental additions to the diet, providing little more than gastronomic variety.

This portrayal of large mammals as "primary" resources and the smaller animals as "secondary" or "minor" is borrowed from cultural and human ecologists who have placed inordinate emphasis upon big game harvesting and largely ignored the role of smaller species (Balikci pers. comm.). This simplified rendition of subsistence, however, obscures the significant contribution made by these so-called "secondary" species.

Admittedly, among virtually all Inuit groups, the annual food produced from marine mammals and caribou dwarfs that provided by these smaller animals. The latter's significance to the subsistence economy is not, however, measurable in terms of absolute volume. Their significance is a strategic one. It derives from their availability at critical seasons of the year when large game are not present or not accessible, as well as from their dependability as a back-up resource when primary resource harvests fail. These aspects of the harvesting of one such "secondary" resource, the Common Eider, will be explored below. The intention of the following discussion is to assert the vital importance of all species to the viability of subsistence, including those labelled as "secondary". As we shall see, Native hunters equipped with but an attenuated knowledge of their environment, restricted to the "primary" resource species, would not have survived.

3.1.1 Harvest Statistics for the Belcher Islands

Subsistence harvest studies conducted in the late 1970s and early 1980s², confirm that the annual Common Eider harvest

²Harvest studies were conducted in 12 of 14 Inuit communities in northern Quebec by the James Bay and Northern Quebec Harvesting Research Committee (JBNQHRC). These studies covered the period 1976 to 1980.

in Sanikiluaq, NWT, is far greater than that in any other Inuit community in the eastern Canadian Arctic. In the Belcher Islands, an estimated 5,680 Common Eiders were harvested per year during the period 1981 to 1984 (Donaldson 1983, 1984; J. Pattimore pers. comm.). The Sanikiluaq harvest is an order of magnitude larger than the average annual harvest of 663 Common Eiders per year in the 13 other Baffin Region communities (Reed and Erskine 1986). Following Sanikiluaq, the largest estimated harvests of eiders are those of Cape Dorset (3,470 eiders per year) and Pangnirtung (2,300 eiders per year).

The average estimated kill of Common Eiders in 12 northern Quebec communities is 844 per annum for the years 1979 and 1980. The largest harvests were taken along the eastern shore of Hudson Bay; Inukjuak hunters harvested an estimated 4,469 eiders per annum; followed by Kuujjuarapik with an estimated annual harvest of 1,401 eiders; and Akulivik, 986 eiders annually (JBNQHRC 1982).

Together these harvest statistics for the Northwest Territories and northern Quebec indicate that for the entire

The data for Common Eider harvests are for 1979 and 1980 only, as only during these years were duck harvests differentiated by species (JBNQHRC 1982). The Baffin Region Inuit Association (BRIA) conducted harvest studies in 14 NWT communities during the period 1981 to 1984 (Donaldson 1983; 1984; J. Pattimore pers. comm.).

eastern Canadian Arctic, the most intensive area of Common Eider harvesting is southeastern Hudson Bay, in particular, the communities of Sanikiluaq, NWT, and neighbouring Inukjuak and Kuujjuarapik, Quebec.

To this harvest of Common Eiders is added a substantial harvest of eider eggs. In the southeastern Hudson Bay region, an estimated 13 525 eggs are collected annually. Approximately half of this egg harvest is from the Quebec communities of the east Hudson Bay coast: Inukjuak collects an estimated 3,439 eggs annually; Akulivik, an estimated 2,082 eggs per year; and Kuujjuarapik, an estimated 1,604 eggs per year (JBNQHRC 1982). Sanikiluaq accounts for the balance of this harvest, gathering annually some 6 400 eggs (Reed 1986).³

What do these harvests represent in terms of kilograms of food ? Assuming that an average Hudson Bay Eider provides about 1.5 kg of edible product⁴ and that an average eider

³ The egg harvests for the Quebec communities may include a very small proportion of eggs of duck species other than Common Eiders. The egg harvest estimate for Sanikiluaq provided by Reed (1986) are for the year 1982 only and represent preliminary BRIA results.

⁴ Reed (1986) uses an estimate of 1.2 kg of edible meat on an adult female Northern Eider (*S. m. borealis*). A slightly higher estimate is employed here in recognition of the fact that Inuit consume not only the meat but also virtually all of the eider's internal organs. As well, the Hudson Bay subspecies, *sedentaria*, is considerably larger than *borealis*. Field weights of whole eiders recorded by Schmutz (1981) and by the author averaged greater than 2 kg per bird. The 1.5 kg estimate

egg weighs 0.1 kg,⁵ the Inuit of Sanikiluaq harvest annually more than 9 metric tons of edible product derived from eiders. Of this harvest, 0.6 metric tons are eider eggs and 8.5 tons are harvested as immature or adult birds.

This is an impressive quantity of food. But how significant are eider harvests relative to overall subsistence food production ? Calculations based upon the reported harvests of all species indicate that eiders and their eggs account for 9.8% of Sanikiluaq's total annual wildlife harvest by weight. Represented in this fashion, eider harvests appear to provide neither an insignificant nor an overly impressive contribution to Qikirtamiut diet. Annual totals, however, conceal accentuated seasonal variations in harvest composition. It is only by recognizing the influence of season on harvest that the economic importance of small game species, such as the Hudson Bay Eider, can be appreciated.

Fortunately, eider harvest information for the community of Sanikiluaq is available on a month by month basis. Data on the mean reported harvest for each month, calculated over the four year period of 1981 to 1984, reveals three important

is therefore considered to be a conservative one.

⁵ Based on a large sample of eggs weighed by the author on the Sleeper Islands, Hudson Bay in 1985.

periods of eider harvesting and two distinct lulls. The strongest peak is in the late fall, just prior to freeze-up, when more than half of the annual eider harvest is taken: 11% of the annual harvest in October; 25% in November; and 17% in December. A second important period begins immediately after freeze-up in late December, providing about 8% of the annual harvest in January and 6% in February. A burst of eider hunting also occurs in the spring just prior to and during the nesting phase. In June, 9% of the annual eider harvest is taken and in July, another 9.5%.

These periods of heightened eider harvest activity are separated by lulls during which time few eiders are harvested. Little eider hunting occurs during the periods March-April and August-September.

By acknowledging this marked seasonal pattern of eider harvesting we begin to unveil the vital role of eiders in the Qikirtamiut economy, a role not defined by brute volumes of usable product, but by availability at strategic points in time. Thus eiders are harvested during difficult seasons of the year when large game species are absent or inaccessible. The integrity of Inuit subsistence is therefore as dependent upon small resource species (birds, fish, invertebrates) as it is upon big resource species (sea mammals, caribou), for although big game provides the great majority of subsistence

production over the greater portion of the year, it is the small species which allow Inuit to tide over the "hungry seasons" when big game are not available. Small resource species can be viewed as resources which bind the subsistence cycle together. The role of eiders as a binding resource is considered in section 3.1.2 below.

Eiders, however, fill a second significant role in the Qikirtamiut subsistence economy, a role which resembles but remains distinct from that of a binding resource. In the Belcher Islands, eiders are present in substantial numbers during the entire year. It is thus a resource which is dependable in both space and time. As such it serves as a safety net, an insurance against unpredictable and unexpected failures in the harvests of primary resource species. The role of eiders as a back-up resource is discussed in section 3.1.3.

3.1.2 Eiders as Binding Resource

The usefullness of this bird is not small ...there are seasons of the year when in some areas there is scarcely any other food than these and other eiders ...

Fabricius 1793 cited in Holtved 1962: 126

Qikirtamiut describe the most difficult time of the year for subsistence as the periods of freeze-up and break-up of the sea ice. Their observations reflect the traditional and

continuing importance of sea mammals, in particular the ringed seal, to their diet and the practicalities of access to this resource. When the sea is frozen, its hard surface serves as a platform which provides access to seals at their breathing holes or along the ice edge. When the sea is open, Qikirtamiut used their kayaks and today use their canoes and speedboats to hunt seal on the open waters. The periods of transition from one to the other is problematic, not because the resource is present in lesser numbers, but because access is rendered difficult or impossible.

Traditionally, the fall was considered a "hungry season" (Freeman 1964). Beginning in late October and continuing through until late December, forceful and unpredictable prevailing northwesterly winds make open-water sealing, whether from kayak or outboard-powered craft, a most dangerous undertaking. In this period, seal harvests drop to their lowest levels (Donaldson 1983; 1984; J. Pattimore pers. comm.).

During the transition from open waters to frozen, when marine mammals cannot be hunted, the vital importance of the Hudson Bay Eider as a binding resource is strikingly apparent. Eider harvests provide an essential link between the open water seal harvests which decline in early fall and

the breathing hole hunts which only begin after freeze-up. They provide Qikirtamiut with country food during a difficult season, which in traditional times was often a time of hunger.

In November, eider hunting provides 41.5% of the month's total food production by weight. During this month, the edible weight of eider harvests exceeds that of any other single species, including ringed seal. In December, eider harvests provide 25.8% of the month's food production, second only to ringed seal. Eider harvests dominate the first half of December but are quickly overtaken by returns from breathing hole sealing when the sea surface freezes towards the end of the month.

The vital role of smaller animal species such as the Hudson Bay Eider, as a binding resource, bridging across periods when big game resources are scarce, has received limited attention by cultural ecologists. It is nonetheless, characteristic of virtually all Inuit groups. Fish species often play a key role (eg. Balikci 1964), but in certain areas, such as the Belcher Islands, this role is also filled by species of birds.

An example from elsewhere in the Arctic is provided by the Polar Eskimo of northwest Greenland (Gilberg 1974-75).

During the first half of the 19th century, when kayaks were unknown to the Polar Eskimo⁶, the summer open water season was a difficult period for Polar Eskimo subsistence. As they lacked any watercraft, they could not hunt sea mammals on the open sea. Instead they relied exclusively upon bird hunting. The entire summer was spent camped at the foot of Dovekie nest cliffs or on eider nest islands, where they subsisted on birds and eggs. These bird harvests would tide them over until freeze-up when they could resume marine mammal hunting on the sea ice platform.

Although the reintroduction of the kayak and other technology by Baffin Island Eskimo in the 1860s, radically transformed Polar Eskimo patterns of subsistence, bird colonies continued to serve as a binding resource for a segment of the population. During the summer, old people were often left at the foot of bird cliffs or on islands where they were able to fend for themselves with relative ease (Gilberg 1974-75).

The Inupiaq diary of Della Keats (Lucier and Van Stone 1987) provides another example of birds serving as a binding resource. In this case it is the spring net hunt of ptarmigan by the Noatak people of Alaska, which provides a

⁶ The kayak was reintroduced to the Polar Eskimo by a group of immigrant Inuit who trekked from north Baffin Island to northwest Greenland in the 1860s (Gilberg 1974-75).

critical link between stores of dried meat which were exhausted by spring and the renewal of the coastal sea mammal hunt.

Before they used to get to the coast they used to try to catch lots of ptarmigan which were around there in the spring time...Lots of birds were caught like this (in nets) for food. Not too much food to eat at this time of year except ptarmigans. They [Noatak people] as always out of dried seal and ugruk (bearded seal) meat by this time and sometimes out of oil before they get to the coast.

Lucier and Van Stone 1987: 161¹

In the same manner as the Polar Inuit who relied on bird cliffs and nest islands to survive the summer, or the Noatak Inupiat who relied on ptarmigan netting to survive the spring, Qikirtamiut depended upon the fall eider hunt to bridge a difficult season when few other resources were accessible.

3.1.3 Eiders as Back-up Resource

Seabirds were also of some importance, particularly for the winter economy. As it was desired to have something to fall back on should the winter seal catches fail. The winter settlements lying in the vicinity of the eating places of seabirds, were regarded as good ones.

Petersen 1965: 10/

¹ Inuit from Kangiqsualujjuaq, Nunavik, report that they survived on ptarmigan and fish when the late winter caribou migrations failed to arrive (Roué pers. comm.)

Once the sea in and around the Belcher Island archipelago has frozen, the Qikirtamiut begin hunting ringed seals at breathing holes and along the edge of the landfast ice. These harvests provide the major part of the winter subsistence diet. Hudson Bay Eiders are nevertheless harvested in significant numbers throughout these coldest, darkest and most stormy months. During this period, eiders provide a vital contribution to Qikirtamiut subsistence, but a contribution different in nature than that of the fall harvest. In the winter, eiders act as a back-up resource, available should primary resource harvests, in this case those of ringed seals, fail.

In the recent past, this interdependence between winter seal hunting and eider harvests was particularly strong in the southern Belcher Islands (Freeman 1967). In this region, eiders occur in massive numbers at polynyas, permanent open water areas within the bounds of the landfast ice. Qikirtamiut hunters explain that when seal hunting proved unproductive, they turned to the polynyas for they could be relied upon to provide harvests of eiders. Windstorms and blizzards, not uncommon events at this time of the year, often made breathing hole sealing difficult. As eider hunting was productive even in inclement weather this harvest constituted a form of insurance against hunger brought on by the vagaries of the marine mammal hunt.⁸

Petersen (1965) has made similar observations for the Inuit of Greenland, noting that winter settlements were preferably located not only where seals occurred in sufficient numbers, but also in the vicinity of stocks of birds or fish. In fact, those winter settlement locations which were used year after year rather than in rotation, were generally situated close to an area which permitted the hunting of eiders and murre throughout the winter.

While eiders served the role of back-up resource during the Belcher Island winter, a variety of species of fish are cast in this role at other seasons of the year. During the open water season both cod and sculpin served as emergency rations during hard times. One young Qikirtamiut commented that his mother has often emphasized that it is sculpins that have permitted them to survive. He himself recalls one occasion when they had run out of flour, sugar and tea and could not hunt seal due to high winds and rough water. They lived through these difficult days by eating boiled sculpins. Cod served the same function and many Qikirtamiut regard it as "famine food". In fact some individuals dislike the flesh of this fish because it evokes painful memories of difficult times (also cf. Freeman 1964).

⁸ In this regard, Freeman (1967) notes the importance of mussel beds, as well as eiders, at the polynyas.

In this section, the eider's role in the Qikirtamiut subsistence economy has been examined. As we have seen, the vital importance of this resource defies its categorization as "secondary". Evidence presented here obliges wildlife professionals to greatly expand their notion of pragmatic knowledge to encompass a variety of species which they had previously presumed to be little used and little known. To continue this exploration of the pragmatic limits to knowledge, we will examine the complexity of Qikirtamiut use of the eider in section 3.2 which follows. For the Qikirtamiut, the Common Eider is not merely a source of meat. Virtually all parts of the body are consumed and as such the eider constitutes a many-dimensioned item of food, as well as complex food for thought.

Furthermore, the skin of the eider up until the 1970s provided the Qikirtamiut with their principal material for winter clothing. Thus, practical knowledge of the Common Eider was augmented by this unusual usage. This aspect of eider use will be described in section 3.3 below. As we shall see in the following chapter, complexity of use translates into completeness of knowledge, explaining at least in part traditional knowledge's formidable scope. Failure to appreciate the subtle and varied manner in which Nature's resources were used by Native peoples severely

hampers the wildlife professional's ability to understand traditional ecological knowledge.

3.2 Gastronomic Variety from a Single Source: Eiders as Food

From an apparent paucity of food sources, Inuit create gastronomic diversity by utilizing as fully as possible the various parts of the animals that they harvest and by preparing foods in a variety of ways. Freeman (1988) records five basic techniques of meat preparation and consumption employed by Inuit. Meat may be consumed fresh-raw (mikikkuk), fresh-frozen (quaq), boiled (uujuq), dried (nikku) or in a partially fermented state (igunaq). As Roué (1985) notes, however, food preparation serves a double function. Not only does it diversify diet by creating a variety of products from a single source, but it may also serve to preserve foods for consumption at a later date. Preservation itself, contributes further to diet diversity because it permits a variety of differently prepared foods to be available for consumption at the same time (Roué 1985).

In the Belcher Islands, all of the eider is consumed except for the gall bladder or sungak.⁹ When removing the eider's

⁹ Fabricius (in Holtved 1962: 126) makes the following comments regarding the use of King Eiders by the Greenlanders. "They eat them with viscera and everything, removing only the gall and what is digested

internal organs, the gall bladder is carefully excised in order not to taint the meat with its bitter and disagreeable contents. The balance of the eider may be prepared and consumed in any of five different ways: fresh-raw; fresh-frozen; boiled; dried; or braised (paanasi). Four of these five techniques are among those listed above by Freeman (1985).

Most of the eider's internal organs including the heart, liver, intestines and gizzard are preferred fresh-raw, although they may also be eaten boiled. The oesophagus is generally eaten boiled. If meat is to be eaten fresh-frozen, Qikirtamiut emphasize the superior quality of meat frozen outdoors, rather than "artificially" as in a freezer. If meat is to be dried, it is usually the breast meat which is selected and it is dried raw, directly on the breastbone or sternum.

Eiders are braised on open driftwood fires (paanasi) in the late spring and early summer when mild weather and long sunny days encourages outdoor cooking. This method of preparing eiders for consumption is unusual because rather than being skinned, the eider carcass is prepared by plucking out the feathers as is done with geese. The plucked bird is then laid, whole or cut into sections, directly upon the fire.

in the intestines".

The skin which at this season is amply lined with fat serves to baste the meat. Having been turned a few times, the meat which is generally cooked on the outside and warm but raw inside is eaten with much relish.

Braising on an open fire (paanasi) is not mentioned by Freeman (1988) as a traditional method of food preparation among Inuit. In the Belcher Islands, only eiders were observed prepared in this manner and elders report that this method of preparation is a recent practice. The recent adoption of this preparation technique may be related to the previous indispensability of eider skins for clothing. Prior to the mid-1960s, eiders were rarely if ever plucked, their feathered skins being carefully guarded intact as material for coats, footwear, blankets, mattresses etc.

Qikirtamiut never eat eiders, or for that matter any species of bird, fermented. In the Belcher Islands, the igunaq technique was reserved for the preparation of seal, walrus and whale. Elsewhere in the North, however, the preparation and preservation of birds in a fermented state has been recorded. The Polar Inuit, for example, consider Dovekies fermented with seal oil in seal skin bags a great delicacy (Mary-Rousselière 1980). The now-extinct Inuit of Southampton Island in north Hudson Bay appear to have also

prepared birds in this manner. Captain Comer during his visit to the island around the turn of the century, mentions dome-like storage structures made of limestone slabs in which he discovered:

the bodies of skinned birds, suspended by the legs, pieces of walrus, carcasses of seal, bags of blubber and one leather sack full of king-ducks, uncased, and with all their feathers yet on, smelling most offensively.

Comer cited in Boas 1975 [1901-1907]: 60

Although no strict rules regulate the consumption of eiders today, there is nevertheless a sentiment that specific parts of the eider are most appropriately consumed by certain individuals. One informant mentioned that men tend to eat the legs and upper wings, while the main carcass of the bird, once the breast meat has been removed, is reserved for the women to pick over. The neck of the eider is also often eaten by the women, a practice described as gaqqulak in reference to the crunching sounds generated by the crushing of the vertebrae along with the meat. Another informant specified that when she was young, the cooked oesophagus was given to children and the cloaca, once dried on the eider skin, was reserved as a child's treat. The tough lining of the gizzard was set aside for the elderly. When times were hard and there was not much food, the fat lying among the coils of the intestine (matsa) was kept for the hunters. The fresh eider liver, on the other hand, in spite of its small size, was dutifully divided into morsels to be shared

among the people in the camp.

In the days when Qikirtamiut still relied upon bird skin clothing, the skin of the eider was systematically reserved for this purpose. The fat lining the skin, however, was often greatly appreciated by the men when they returned hungry from a day's hunting. One elderly woman recalled how the men returning in the evening would often chew the fat from the eider skins (a process referred to as angulag), thus helping the women prepare the skins to be used for clothing, while at the same time getting some food into their stomachs. Although the men might remove much of the fat in this manner, it was the women's task to complete the cleaning, ensuring that no oil remained to rot the skin.

In Greenland, the chewing of bird skins was considered a most delectable treat and even a privilege reserved for guests. Fabricius made the following observations in 1793 regarding the cleaning of King Eider skins in Greenland:

When most of the fat has been scraped off, the skin is hung up to dry more or less, the rest of the fat being gradually chewed off by the mouth, a form of titbit usually offered to the men, and indeed to visitors.

Fabricius in Holtved 1962: 126

Cranz writes the following on the dressing of bird skins in early 19th century Greenland:

After scraping off the fat with a muscle (sic) shell, they hand them (the bird skins) about by way of a collation to guests of respectability, to chew between meals.¹⁰
Cranz 1820: 154

In the Belcher Islands, the eider's oil gland is considered a delicacy by some individuals, undoubtedly due to its high fat content. It is sliced from the inner surface of the skin of the eider's rump and eaten raw. The fleshy frontal lobes of the eider's upper bill is also on occasion enjoyed as a pleasantly crunchy and mildly salty treat.¹¹

There exists a fascinating distinction between the "large birds" (timmiat) that Qikirtamiut may eat raw and those that are only eaten cooked. Hudson Bay Eider and Rock Ptarmigan, and according to another informant, also Oldsquaw and Black Guillemot, may be eaten raw. In contrast, Canada Goose and Snow Goose are said to be only eaten cooked. The only parts of geese excepted from this generalization and thus on occasion eaten uncooked, are the wings (more specifically the

¹⁰ Cranz goes on to write: "They are afterwards soaked in the urine tub, dried and eaten (Cranz 1820: 194). That the skins are eaten is undoubtedly an error on the part of Cranz or his translator. In Greenland, the treatment of skins in urine served to extract fats and partially tan the skins in preparation for the confection of clothing (Holtved 1962; Le Mouel 1973; Rosing 1986).

¹¹ With regard to the King Eider whose frontal lobes are very large, Fabricius (Holtved 1962: 126) remarks: "The gibbosity on the bill of the male bird is bitten off at once by the hunter and eaten raw as a titbit, it being credited with a sweet flavour".

meat on the radius and ulna i.e. the forearm)¹² and the intestines. No explanation for this distinction between bird species which may be eaten raw and those which must be cooked, was provided.¹³

It is tempting to speculate, however, that this local custom differentiates between species which are considered to be migratory (tikisut) and those perceived as year-round residents (Fleming 1989). Both Canada and Snow Geese are clearly migratory, departing for the South in the fall and returning in the spring. The Hudson Bay Eider, Rock Ptarmigan and Black Guillemot, on the other hand, are sedentary, remaining in the region all year around (Godfrey 1979). Although the migratory-sedentary status of the fourth "raw" species, the Oldsquaw, remains unclear to waterfowl biologists,¹⁴ it is likely that Qikirtamiut conceive of this

¹² When butchering birds, the wings are cut off at the elbow joint. For geese, as for eiders, the skin of the bird's forearm is stripped off towards the wrist joint and the meat around the radius and ulna is then consumed. These bones were then detached at the wrist leaving the outer wing or nuvuliga. The feathered outer wing often serves as a hand broom.

¹³ One woman pointed out, however, that she believed the Qikirtamiut to be unique in this regard. In her experience, neighbouring Quebec Inuit eat goose both raw and cooked.

¹⁴ Band recoveries indicate that at least part of the population of Oldsquaw breeding in western Hudson Bay winters in the Great Lakes. Furthermore radar displays suggest Oldsquaw use a migration corridor from James Bay to Lake Ontario (Allison cited in Bellerose 1980). Bellerose sets these and other observations by amateur and professional ornithologists in perspective, however, by commenting that although

species as sedentary. Hunters report seeing large numbers of Oldsquaw throughout the winter in open water areas in and about the Belcher Island archipelago.¹⁵ Thus the Qikirtamiut distinction between birds to be cooked and birds eaten raw seems to correspond with their perception of these species as migratory or sedentary. Without additional information, however, it is not possible to confirm that the latter criterion provides the basis for this gastronomic distinction.

In addition to meat, bones, skin and a variety of internal organs, birds offer additional diversity to the Inuit diet in the form of eggs. Eider eggs are differentiated according to stage of development (see classification in section 2.3.3 and Table 1). Eggs may be eaten fresh-raw, boiled, dried-boiled or beaten and cooked as a sort of omelet. When hard-boiled, freshly-laid eggs are generally preferred over those containing a well-developed embryo. Some elders, however, consume the boiled eider embryo with relish.

"many thousands" migrate South, "untold thousands remain at sea in the Far North" (Bellerose 1980: 390).

¹⁵ Observations made at a Belcher Island spring camp in 1987 by B. Fleming (1989), corroborate but do not confirm the migratory-sedentary hypothesis. Ptarmigan, observed consumed on four occasions, was always eaten raw. Canada Goose (35 observations), Snow Goose (4 observations) and merganser (1 observation) were always eaten cooked (boiled or braised).

In former times, large quantities of eider eggs were preserved by drying, a method of egg preparation and preservation to which we have found no previous reference in the scientific literature on Inuit subsistence. To dry eggs, they are first hard-boiled. The shell is then removed and the egg yolks separated from the whites. As the yolks are too fatty to be dried (they rot rather than dry), they are soon eaten. The egg whites are strung onto threads from which they are suspended to air-dry. Once dry they become hard, brittle and translucent. The dried egg whites are referred to either as qaggu, a reference to their crunchy texture, or kauk nikku, a term which juxtaposes the name for fresh or boiled egg white (kauk) with the generic term for dried food (nikku). Once they are dried, the egg whites are stored in pouches of seal skin.

One individual described the appearance and texture of dried egg whites as similar to that of glass. He found that those made from eggs containing a well-developed embryo were particularly tough and disagreeable to eat. Another individual described them, in spite of their hardness, as enjoyable to chew on when out on the land.

3.3 From the Skins of Birds: Eiders as Clothing

Not without reason do the Polar Eskimos say that as a

hunter a man is what his wife makes him, expressing by this truth that his clothing is of paramount importance to the efficiency of his hunting, both in time and space.

Birket-Smith 1928: 93

Wildlife professionals maintain that traditional knowledge is narrow in scope because it is merely pragmatic. But as we are in the process of discovering the "merely pragmatic" covers a lot more ground than a cursory understanding of subsistence suggests. As we have already noted, cultural ecologists have provided wildlife professionals with a distorted view of subsistence, having placed inordinate emphasis upon the harvesting of large mammals, to the detriment of harvests of small animals. A much greater variety of resources are essential for the long-term viability of subsistence than has been generally appreciated.

This is not the only distortion of subsistence, however, that wildlife professionals must grapple with in order to come to grips with a definition of the pragmatic. Cultural ecologists are also guilty of a preoccupation with food production, to the virtual exclusion of other non-comestible subsistence needs. Adherents of optimal foraging theory carry this blinkered vision of subsistence to its logical extreme by reducing the products of the hunt to mere calories of energy (Smith 1983, 1985).

Yet the objects of hunting, fishing and gathering are not only calories to be eaten but also raw materials to be converted into artifacts upon which survival depends. Kemp (1971) identifies three requirements for survival: food, shelter and clothing. Having one of the world's least hospitable climates, the arctic regions make particularly exacting demands upon human shelter and dress. A diverse, refined and versatile repertoire of skin clothing has always been an indispensable element of Inuit adaptation. In spite of their importance, cultural ecologists have largely ignored these facets of subsistence, narrowly focusing their attentions instead on the food quest.

Once again, if wildlife professionals are to gain a realistic appraisal of the limits of practical knowledge, then they must appreciate that subsistence comprises not only the quest for food but also for raw materials for dress, shelter, tools and transportation. In this section of the thesis, we consider the use of the skins of the Common Eider as materials for clothing. Usage of eider skins adds another dimension to the growing data set which is Qikirtamiut "practical" knowledge.

3.3.1 A Brief History of the Qikirtamiut Eider Skin Coat

We had no caribou skin, so we had to use eider skins and also gull skins. That's how we survived ... because of these clothing, we're alive today.

II. Sanikiluaq

Unlike the Eskimo archetype which seasonally exploits the marine environment for sea mammals and the terrestrial one for caribou, the Qikirtamiut of the Belcher Islands possess a singularly marine adaptation. With at best sporadic access to caribou since at least the turn of the century, the "people of the Islands" had to resort to substitutes for this terrestrial mammal, whose skins are universally considered to be the material *par excellence* for arctic winter clothing (eg. Hatt 1969; Birket-Smith 1929). Their marine milieu yielded a profusion of seabirds whose densely feathered skins provided light, warm and most serviceable garments to shelter them from the harsh winter climate. Numerous species were exploited, their usage tuned to the specific properties of their skins, but none surpassed the mitiq or Hudson Bay Eider in importance. These clothing, made from the skins of eiders, are called mitigavinnig or mitijak.

The skins of eiders and other birds, provided material to confect a wide variety of artifacts. From this original material, Qikirtamiut made baby's bonnets, pouches for the

newborn (ungillari or immati), the legging of their inner boot (kanak), the inner slipper worn over the inner boot (pinarak), the overshoe worn over the outerboot (itigaag), mattresses (qaak), blankets (qipik) and, for nursing dogs, a belly protector worn in winter to shelter the teats from abrasion or freezing when the female is running free or pulling the sled (mamautailitak).¹⁶ The major clothing items, however, were inner and outer coats made for men, women and children. Our discussion of eider skin use will therefore focus on the Qikirtamiut eider skin coat.

The very earliest accounts of Qikirtamiut dress date from the beginning of this century. In 1915, Renouf and Flaherty independently visited the Belcher Islands and made some observations on their inhabitants. In his published account of the expedition, Renouf (1921) refers in passing to Qikirtamiut seal and caribou skin clothing, but makes no mention of bird skins.¹⁷ He was nevertheless aware of their

¹⁶ All of these items were made from caribou skin in adjacent arctic Quebec. See Isserman (1988: 43) for a photo and brief description of a "Dog's stomach protector" from Kangirsuk, Nunavik, made from the skins of caribou rather than eiders.

¹⁷ His only reference to clothing is the following description of the spring attire of a group of Qikirtamiut women: "All were dressed in native clothing, sealskin trousers and long coats or kolitoos of the same skin. An odd one or two sported kolitoos of caribou skin with the hair outside, fancily fringed and decorated with white strips of caribou skins and tasseled with ivory ornaments" (Renouf 1921: 17). In this particular case, the absence of eider skins may be a function of season

usage for a man's eider skin parka which he collected during his April visit is presently part of the Museum of Civilizations collection in Ottawa.

Flaherty (1918), on the other hand, captivated by the drama of the Belcher Island caribou herd's demise¹⁸, underscores Qikirtamiut bird skin use and makes no mention at all of caribou skin clothing.¹⁹ According to Flaherty, winter dress was made from eider and "sea pigeon"²⁰ and summer dress of seal skin. His descriptions and photographs attest to the former's importance.

and possibly of the wearer's gender.

¹⁸ According to Qikirtamiut accounts collected by Flaherty, caribou were numerous on the Belcher Islands up until about 1880, when rain and a subsequent freeze glazed the Islands with ice. Deprived of their food the herds starved to death. Elton (1942), based upon an account by a Hudson's Bay manager at Great Whale River, reports the date of the extinctions as 1840-50.

¹⁹ Information collected from Qikirtamiut during the course of my own research, confirms reports by Balikci (1964), Guemple (1967) and Trudel (1971) of a regular trade between islanders and mainlanders. Qikirtamiut were able to obtain caribou skins, sinew and/or clothing in exchange for dogs, walrus tusk and/or ivory-shod sleds. Although becoming scarce on the Québec mainland by 1918, small numbers of caribou skins received in trade were probably, as reported by Renouf (1921), still available to Qikirtamiut.

²⁰ By "sea pigeon", I assume that Flaherty is referring to the Black Guillemot (*Cepphus grylle*), the only common alcid in the region. "Pigeon" is a common denomination for members of the alcid family, eg. the Pigeon Guillemot (*C. columba*), a close relative of the Black Guillemot. None of the Qikirtamiut with whom I spoke, however, made reference to clothing of guillemot skins.

Subsequent visitors to the region, confirm the continued predominance of bird skin attire. In 1938, Twomey (1939; 1942) and Douth (1939), zoologists from the Carnegie Museum in Pittsburgh, Pennsylvania, spent several months on the Belchers collecting zoological specimens. They observed that the winter dress consisted of inner and outer coats of eider skins and pants of seal skins. In summer, the eider skin coats would be replaced by ones of seal skin or canvas if these materials were available. If not, as was apparently often the case, Qikirtamiut had to make do with the inner eider skin coat which by autumn was usually torn and badly in need of replacement (Twomey 1939; 1942).

Desgoffe (1955), the first anthropologist to visit the Islands, describes the increasing presence of Euro-Canadian trade goods by the mid-1950s. According to his observations, store-bought clothing and fabrics were extensively used by Qikirtamiut for summer dress. Winter attire, however, was still exclusively made from eider and seal skins. For the period 1959 to 1961, Freeman (1967), who spent many months in the Belchers during this period, reports that eider skins are "still extensively used for clothing by the Islanders (ibid; 157). Guemple (1966), resident for 13 months in 1962-63, describes the Qikirtamiut as still wearing the traditional eider skin parka and seal skin pants in winter. He points

out, however, that some women have begun to use duffel coats.

The latter observation by Guemple proved a portent of rapid changes soon to come. During the decade that followed, the bird skin coats which were so integral to the Qikirtamiut winter wardrobe largely disappeared from the Islands. Elder Qikirtamiut with whom I spoke recall using eider skin coats up until about 1967-68. One woman made her husband a last eider skin coat in 1971-72, which her husband used for a number of years. To allow its continued use, she repeatedly patched this garment using eider skins and nylon cloth. It was still a functional garment when its pattern was recorded by the author in 1988, although fragile due to its age.

During the last two decades, eider skin parkas have on a few occasions been commissioned for museum collections. In the summers of 1970 and 1971, Pharand and Saladin d'Anglure of Université Laval, organized the confection of a woman's inner and outer coat, a man's inner and outer coat, and a child's coat. These artifacts are presently part of the Musée de la Civilisation collection in Ville de Québec.

In 1988-89, a study of the technological process of eider skin clothing production was conducted by the author. The data from this research forms the basis for this section of the thesis. The woman's inner coat that was produced by this

research is at the Musée de la Civilisation. In 1989, an eider skin coat was also produced for the local school where it is presently on exhibit. Another coat, commissioned for the Museum of Civilizations in Ottawa, was collected by Oakes. Most noteworthy, however, is an independent effort: a traditional eider skin coat made by a Qikirtamiut woman for her child (ca. 1988). Sadly, rumour has it that the child was teased at school for wearing such a "smelly" coat and refused to wear it again.²¹

The technological knowledge of the qualities, the use and the preparation of bird skins is still very much alive in the community. It rests, however, with the segment of the population which is middle-aged or older. Eider skins have been replaced by duffel, sheepskin and most recently, nylon shell with eider down fill. Qikirtamiut elders nevertheless still reflect nostalgically on the era, not so long ago, when animals provided them with clothing. As one woman lamented, "We were never cold wearing those skin clothing, but duffel...the wind just blows right through it".

²¹ Bird skins are still regularly used in the community for purposes other than clothing. An ivalugautik, a bag for sinew thread, made of Common Loon skin was observed on one occasion. Loon skin was also used to make insulating pouches for Thermos bottles carried by hunters into the field. Of the three pouches seen, one was of Arctic Loon skin and another of adult male Common Eider.

3.3.2 The Eider Skin Amausik: the technical process

Knowing that the skins of Common Eiders constituted the primary material for Qikirtamiut clothing and that their usage persisted until very recently, heighten our appreciation of the eider's practical significance to the Qikirtamiut. Without more precise information on how eider skins were actually exploited for clothing confection, however, our awareness of how this particular usage has influenced Qikirtamiut knowledge remains limited. To correct this shortcoming a brief résumé of the technical process of eider skin coat production is provided in this section. This more detailed consideration of eider skin use serves as a direct complement to Section 4.2 in the following chapter, which examines Qikirtamiut knowledge of the properties of the skins of birds.

The data for this section are from an eider skin coat reconstruction project organized by the author in 1988-89. The project permitted the detailed observation of all phases of the confection of a Qikirtamiut amausik, a women's inner coat equiped with a functional back pouch for carrying a child.²²

²² Qikirtamiut distinguish between two types of traditional women's coats: the amausik which has a functional child-carrying pouch; and the amautik which has a narrow pouch which cannot be used for carrying a child. The amautik is worn by young girls before child-bearing age and

In a report submitted to the Musée de la Civilisation in Québec (Nakashima 1989) the fabrication of the Qikirtamiut eider skin coat has been described as a *chaîne opératoire* (Leroi-Gourhan 1965). This analytical method, developed by Leroi-Gourhan (1965) and refined by Lemonnier (1976) and others (eg. Cresswell 1976), describes the technical process as a nested sequence of procedures. Strict attention is paid to the ordering of technical events and the distinction between optional and compulsory sequences. Only a condensed and simplified version of the operational sequence is presented in this thesis. The *chaîne opératoire*, which begins with the hunting of eiders and ends in the assembly of the woman's eider skin amaqusik can be divided into seven phases as follows :

Phase I	The eider hunt
Phase II	Skinning eiders for clothing
Phase III	Drying and cleaning the skins of fat
Phase IV	<u>si'ui</u> : cutting up the prepared skins
Phase V	<u>niukitug</u> : folding and sewing the leg skins
Phase VI	Piecing skins to form the coat's basic parts

older women who will no longer have any children. The amaqusik is only worn by women during their child-bearing years. This usage contrasts with other parts of the Arctic where the term amautik is applied to the woman's coat with a functional pouch. According to elder Qikirtamiut women amaqusik is the correct term but young Qikirtamiut women today only know the term amautik.

Phase VII The assembly of parts to form the amaqusik

As use of the eider skin is our major concern here, our description of the technical process will therefore commence with Phase II, the skinning of eiders for clothing.

The Skinning of Eiders for Clothing

If the feathered skins are to be used for clothing, their removal from the body is a delicate task. It demands a considerable knowledge of the bird's anatomy and the strengths and weaknesses of different parts of the skin. Few descriptions of bird-skinning techniques can be found in the ethnographic literature. Those that exist are brief and difficult to interpret. Turner, for example, provides the following brief description for the Ungava Inuit of the 1880s:

The skins of birds are removed in a peculiar manner. The wings are cut off at the body, and through the incision all the flesh and bones are taken out.

Turner 1979: 43

That the flesh and bones of any bird could be removed through the small holes created by severing the wings at the body seems at best unlikely. Perhaps the back skin between the wings bases was also removed with the wings, providing a

larger hole through which the body could be removed. Turner provides no further information.

A more precise account from 18th century Greenland describes a procedure strikingly similar to that of the Qikirtamiut:

The skin is peeled off whole in order to obtain it the larger for making clothing; a cut is made with an ulo around the bill and an opening is made in the back, when the skinning is carried out neatly with the fingers.

Fabricius in Holtved 1962: 126

Illustrations by Rosing (1986) of the West Greenlandic method of skinning King Eiders (*S. spectabilis*), clearly show the incisions around the bill and along the dorsal midline of the upper back. Only in the placement of the latter incision does the Greenlandic technique differ, ever so slightly, from that practiced today in the Belchers. As we shall see, however, this difference is a significant one for the Islanders. The gulusuk or back skin which they use for the man's hood or the woman's apron or tail, is split in two by the Greenlandic method and thus rendered useless by Qikirtamiut standards.

In the Belcher Islands, skinning procedures appear to be remarkably uniform.²³ The prescribed method restricts

²³ For their clothing, Qikirtamiut used the skins of several species of birds. These species are not skinned in the same manner for skinning

cutting of the skin, avoids tearing fragile portions of the membrane and minimizes soiling of the plumage with blood or fat.

Skinning is primarily a woman's task, although men may also participate. Skins to be used for clothing are removed from the eider's body soon after the kill, generally within a few hours of the arrival of the harvested eiders at the household.

Skinning begins with the removal of the appendages. Each outer wing is removed at the elbow joint by a combination of cutting with the ulu or knife and twisting and breaking the joint with one's hands. The foot and lower leg are detached at the tibio-tarsal joint in a similar fashion.

The first and only major cut is along the midline of the dorsal surface of the neck. It is through this hole that the eider's body is to be removed. With the eider's head held in one hand and the ulu or knife in the other, a slit made in the middle of the neck is extended posteriorly to the neck's

procedures are specifically adapted to anatomical form. Intraspecific variation, on the other hand, is a minor consideration and thus all eiders irrespective of age or sex are skinned in identical fashion. Furthermore skinning method is not influenced by the end-product envisaged. Thus eider skins which may ultimately be converted into coats, footwear, blankets, sleeping mats or any of a variety of other products are removed from the body in the manner described in the text.

base. This cut must be straight to reduce the likelihood of subsequent tearing. Furthermore it must only be large enough to barely permit the outward passage of the bird's carcass. A longer slit causes unnecessary soiling of the eider's plumage during the subsequent process of cleaning and drying.

The next stage in the skinning process involves freeing the eider's skin from the underlying muscle and bone by tearing through the connective tissues which join the skin to the body. For the neck and the body region, the woman works through the slit in the back of the eider's neck, using her fingers and then her balled fist to force the skin away from the carcass. Once this operation is completed, the skin remains loosely in position, covering the eider's body, but completely detached from the underlying muscle and bone of the lower neck and upper body.

Removing the skin from the eider's head is a more difficult task which requires considerable dexterous use of the ulu or knife. Once completed, the head and neck are manoeuvred out through the slit incised in the back of the eider's neck and the bill is firmly grasped in the woman's teeth. Placing her hands on each side of the eider's upper body, the breast is squeezed to decrease its diameter and facilitate its passage out through the narrow neck incision. By pulling the eider's

body via the bill held firmly in her teeth, and pushing the upper body skin down, the woman forces the eider's shoulders and upper body out through the hole cut in the back of the neck (Fig. 5). Once the eider's skin is removed from the upper body, it is carefully rolled inside out to protect the plumage. With much delicate use of the ulu the skin is then detached from the lower body and finally cut free from the carcass.

Drying and Cleaning the Skins of Fat

The skins of birds are first detached from the head and then drawn over the body. After scraping off the fat with a muscle (sic) shell, they hand them about by way of a collation to guests of respectability, to chew between meals.

Cranz 1820: 154

Cranz observed the use of mussel shells to scrape bird skins in Greenland ca.1765. Also referring to Greenlandic Inuit, Rosing (1986: 50) states that "the main fat is removed with an ulo (woman's knife)", followed by the use of "a large blue mussel shell". According to Turner (1979: 42), late 19th century Ungava Inuit removed the "grease" from bird skins by "scraping and chewing".

Figure 5. Pulling the eider skin off the carcass. Note how the chest of the bird is squeezed to facilitate its passage through the small slit cut in the skin of the eider's neck.



Figure 6. angulaktug: using teeth and mouth to remove the fat from the inner surface of a dried eider skin. The flat whiteness of the cleaned skin in the woman's mouth, contrasts with the glistening and darker breast and neck skin (towards the camera) which is still laden with fat.

Speck (1937) cites Turner and further specifies that a kiliútyk (orth. after Speck), a bowl-shaped scraper, is sometimes used. A photograph taken by Graburn in Lake Harbour, south Baffin Island in 1960, shows precisely such a scraper being used by an Inuk woman to clean the skin of an Arctic Loon (Brody 1987: 80).

Qikirtamiut today clearly specify, however, that they do not use any tools to remove the fat from bird skins.²⁴ The only essential requirement for fat removal is a strong set of teeth. Many of the most knowledgeable and experienced older woman could not demonstrate the cleaning technique because their front teeth had been removed and replaced with dentures. According to some, travelling dentists played a decisive but unwitting role in the demise of eider skin clothing. Several women attribute the end of their bird skin sewing days to the loss of their front teeth.²⁵

²⁴ One woman states that during the height of the moult when eider skins are peppered with growing feathers, a spoon could be used on the inner skin surface to scrape the fluids from the bases of the growing feather shafts. She specified, however, that only persons lacking teeth would resort to such a measure.

²⁵ Not everyone's teeth are suitable for cleaning skins. Sharp or uneven teeth are problematic because they are more likely to tear the inner skin surface or pull feathers out by their bases. Adolescents, for example, did not generally participate in the cleaning process because their teeth were considered to be too sharp.

The skins of eiders are lined with a layer of fat. The thickness of this fat layer varies considerably according to season and the age, sex and health of the bird. To prevent the skins from rotting, this fat must be completely removed. As indicated above, the Qikirtamiut cleaning procedure is distinguished from that documented in other regions by the absence of tool use and the sole reliance on angulaktuq, the "chewing" and sucking of fat from the skin. Furthermore, fat removal is completed in a single operation carried out after the skins are dried.²⁶ In contrast, Rosing (1986: 51) describes the Greenlandic method as a three-stage process involving: first, the scraping of the fresh skin with an ulu and then a mussel shell; second, the "gumming between the teeth" after a period of drying; and finally, a washing in the urine tub. The previously-mentioned photograph by Graburn (in Brody 1987: 80) which depicts the scraping of a fresh loon skin, and data from Turner (1979) and Speck (1937), suggests that at least the first two stages may also be characteristic of Inuit from Ungava and south Baffin.

The cleaning procedure of the Belcher Islands, however, proceeds in the following manner. The eider skin is dried outdoors, feathered-surface outwards and then skin-surface

²⁶ The skins of exceptionally fat eiders, however, must be roughly chewed clean while fresh, for a very thick fat layer will not dry properly and will rot the skin. Some individuals were said to be so efficient at extracting fat that the fresh skins that they cleaned did not need to be chewed again after drying.

outwards. A few days are required for this process. Once dry, the chewing out of the fat or angulaqtug begins. To angulaq-, one grasps a large portion of the dried eider skin in the mouth and softens it with a series of shallow, closely-spaced bites. This is repeated once or twice to ensure that the selected area of skin is rendered flexible. Once this is completed the skin is again taken into the mouth, but this time it is firmly clenched in one's teeth. Applying tension to the skin by pulling outwards with one's hands, the skin is gradually removed from the mouth while the teeth mash the skin's surface in a series of small but firm bites (Fig. 6). At the same time the mouth squeezes and sucks the skin surface. The mashing of the teeth releases the fat from between the bases of the feathers shafts. The extracted fat is then drawn into the mouth and either swallowed or after several mouthfuls, spit out into a receptacle reserved for that purpose. This mashing and sucking operation is repeated several times on the same patch of skin. When the taste of fat is eliminated, one proceeds to a new area of skin.

In this manner the skin is slowly and steadily cleared of its layers of fat. The cleaned skin is then once again turned feathers inward and suspended from a line outdoors for a final drying in sub-zero temperatures. Extended exposure

to freezing temperatures causes the skins to whiten, a most desirable quality. Exceptionally white skins were said to come from very fat birds whose skins were cleaned soon after they were killed and were left outdoors to freeze for a very long time.

si'ui and niukitug: Preparing Skins for Assembly

The eider skin which has been freed of fat and whitened by freezing must now be transformed from a three-dimensional pouch into two-dimensional forms amenable to sewing. This conversion is achieved by a clever configuration of skin cutting which, with a minimum of waste, produces two flat and roughly rectangular pieces of skin from each eider. The largest of these two pieces is primarily composed of the eider's breast and belly (timik). The smaller piece of skin from the eider's back is called the qulusuk.

Prior to cutting, the skin is rendered supple by a combination of kneading and stretching. These preparatory operations are important for they reduce the likelihood of the skin tearing during subsequent handling. The cutting procedures of the two women working on the project differed in the sequence and direction of cuts, but not in the final products produced (Fig. 7).

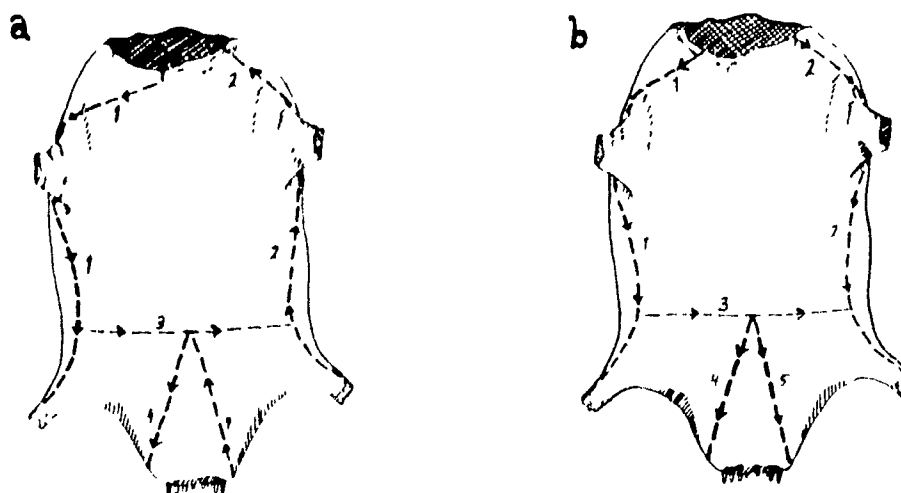


Figure 7. si'ui: cutting the prepared eider skins. Pattern, sequence (indicated by numbers) and direction of cuts used to transform the pouch-like eider skins into flat rectangular forms for sewing. The different techniques of two women are illustrated.



Figure 8. Assembling the amagusik. One woman (on left) holds up the body of the coat by the shoulders, the carrying pouch facing the camera. The other woman finishes sewing the hood.

The Qikirtamiut technique transforms an eiderskin not only from three dimensions to two, but also from an irregular form to a rectangular one. The key to these transformations is not obvious when one is confronted with the Common Eider itself, a stocky marine duck which is exceedingly broad in the chest but tapers sharply to the tail. The ingenious series of cuts described above, however, allows the dorsal skin of the eider's rump to be deflected ventrally so that it lies on each side of the eider's lower belly. In this fashion the narrowness of the eider's belly, relative to its breast, is compensated by the juxtaposition of the rump skin. Trimming renders the resultant form rectangular.

This manipulation of the skin, however, poses another problem. The skin of the leg region, buckles. To render the skin flat, an operation referred to as niukitug is carried out. The excess leg skin is carefully folded flat and a series of stitches is used to hold it in place.

Assembly of the Coat

The fabrication of a parka from prepared caribou or seal skins can be viewed as a two stage process. First, pieces which conform in shape and size to the requirements of the

pattern are cut from the prepared hides. Second, these parts are assembled and sewn together to form the coat. Bird skin parka fabrication differs from this process in one key aspect. As individual bird skins are considerably smaller than the parts required by the pattern, several skins must be pieced together to form a larger composite form which can then be cut to the required size and shape.

Thus, bird skin coat fabrication is a three stage process involving: first, the piecing together of bird skins into approximate forms; second, the shaping of these forms as required by the pattern; and third, the assembly of these composite parts to produce a coat.

This technical solution to the problem of making clothing from the skins of small animals is shared by the Inuit of Greenland (Hatt 1969; Holtved 1967), southwest Alaska (Hatt 1969) and the Belcher Islands. In the former two regions, due to the particularly small size of the birds and mammals used (eg. the diminutive Dovekie, *Plautus alle*, in Greenland and the "marmot" or Arctic ground squirrel, *Spermophilus parryii*, in southwest Alaska), the skins are first joined side-by-side into horizontal belts which are then vertically juxtaposed and sewn together to form a many-tiered piece (Hatt 1969; Holtved 1967). When piecing together the relatively large Common Eider skins, Qikirtamiut adhere to a

more complex formula which does not generally entail the sewing of skins into belts.²⁷

In stage one of the Qikirtamiut process, eider skins are pieced together to form the 8 major parts which, when assembled, will form the coat. These parts are 1) saa, the chest panel; 2) tunuk, the back panel; 3) allinik, the sides and back of the hood; 4) gallinik, the top of the hood; 5 and 6) aig, the sleeves (right and left); 7) kinig, the front apron; and 8) akuq, the tail flap. Each of these parts are flat, two-dimensional, composites of several skins.

The first six parts of the amagusik are composed entirely of the large breast/belly skins (timik) of the eiders. The chest panel requires seven such skins, arranged in two tiers. The back panel, which includes the pouch for the child, is considerably larger and more complex. Some eleven belly skins are required, ten of these being eider skins and one the skin of a Common Loon (Fig. 8).²⁸ The voluminous hood of

²⁷ The exception to this generalization, which supports the contention that skin size is an important factor, is the fabrication of the front apron and tail flap of the Qikirtamiut amagusik. These elements of the coat are made from the tiny qulusuk or eider back skins which are first sewn into vertical belts and then attached side-by-side.

²⁸ Loon skin is used to form the bottom of the child's pouch. Should the child urinate while in the pouch, this species' particularly waterproof plumage facilitates the tipping of the urine out onto the ground.

the amagusik is comprised of 13 eider skins, while the sleeves require two and one half skins each. In total, about 36 breast/belly skins are required to construct the 6 parts which constitute the coat's torso, hood and sleeves.

The front apron and tail flap, on the other hand, are made entirely from the thinly-feathered back skins of eiders. Fourteen of these small square or rectangular skin pieces are used to make the front apron and 23 are required for the tail flap.

In stage II, having pieced together skins to form these 8 major parts of the coat, each part is then shaped by cutting away superfluous skin with the ulu. In the third and final stage of assembly, the joining of these parts together provides the amagusik with its definitive three-dimensional form (Figs. 9 and 10).

3.3 Traditional Knowledge and the Intricacies of Subsistence

Wildlife professionals contend that traditional knowledge has little to contribute to contemporary wildlife management because its content is restricted to matters of practical importance to subsistence. In this first of two chapters addressing this issue, we have not questioned the validity of



Figure 9. The completed amagusik. The woman wears the traditional Qikirtamiut winter dress: eider skin coat with dog skin ruff; seal skin pants and boots; and dog foot skin mittens.

Figure 10. Back view of the amagusik showing the large pouch for the child and the traditional nappakuk-style tail flap, cut square along its lower edge.



the proposition itself. Instead we have demonstrated that in the Inuit case, a knowledge set restricted to matters of practical significance for subsistence is anything but limiting. Subsistence is complex and demanding. The knowledge of the environment required for its successful pursuit is neither narrow in intellectual scope nor in spirit. Wildlife professionals necessarily misjudge the breadth of traditional knowledge because their understanding of subsistence, in all its complexity, is but cursory.

Thus as we have seen, wildlife professionals contend that traditional knowledge is taxonomically restricted to those species of primary significance for subsistence. They believe that only the large sea and land mammals are of practical importance and therefore known. In contrast, our own data indicate that so-called "secondary" resources such as eiders, play vitally important and largely overlooked roles in Inuit subsistence. Secondary species serve as binding resources, bridging gaps in the subsistence cycle when primary species are not available or not accessible.

Furthermore, they act as back-up resources, available as a safety net should primary harvests fail. Accordingly, eiders are not a minor inflection in Qikirtamiut diet. They cannot be regarded as dispensable or as a source of mere gastronomic

variety. They are essential for the successful pursuit of subsistence and the hunter must know them and their habits intimately. Wildlife professionals expect Qikirtamiut knowledge of eiders to evidence a superficiality commensurate with their label "of secondary importance", but this expectation is not realized.

The complexity of subsistence is reflected not only in the great taxonomic diversity of species that need to be known for subsistence survival, but can also be recognized in the incredible diversity of subsistence products obtainable from each species. Thus the eider which has been taken as an example, represents in itself a multi-dimensional resource, providing not only meat but also an array of other edible products which may be prepared, consumed or preserved in a variety of ways. This exhaustive use of the eider as food demands a detailed and sophisticated anatomical and physiological knowledge which wildlife professionals neglect to take into account when they dismiss traditional knowledge as merely pragmatic.

Finally, we have indicated that wildlife professionals, like many cultural ecologists and ecological anthropologists before them, err in weighing the practical importance of wildlife only as food i.e. calories to be consumed. In reality, wildlife provide Native peoples not only with

comestibles but also with invaluable materials for the construction of tools, clothing, shelter and transport. Taking once more the example of the eider, we have shown that Qikirtamiut rely upon the use of the eider's skin for the confection of a variety of items of clothing and bedding. The demanding and ingenious technical process by which harvested eiders are converted into warm, form-fitting winter coats, has been examined in order to illustrate the complex practical knowledge of the eider which until very recently was indispensable for subsistence survival. Wildlife professionals have overlooked these aspects of wildlife use and in the process have overlooked yet another dimension of traditional ecological knowledge.

Our examination of the use of the eider as food and as clothing, sets the scene for a detailed survey of Inuit knowledge of eider anatomy. In the present chapter, we have demonstrated that "practical" knowledge required for subsistence is not, as wildlife professionals try to argue, "restricted" knowledge. In the following chapter, using Inuit anatomical knowledge as a basis for discussion, we contest the proposition of pragmatism itself, arguing that traditional knowledge extends beyond the practical to the intellectual pursuit of knowledge for its own sake.

Chapter Four

Beyond Pragmatism: Inuit Knowledge of Eider Anatomy

In this chapter we continue our assessment of whether traditional knowledge is limited to the pragmatic, by exploring Qikirtamiut knowledge of Hudson Bay Eider anatomy. Our discussion of anatomical knowledge is divided into two related parts. We begin with the presentation of a lexicon of anatomical terms in section 4.1.

Lexicons are of considerable interest because terms or linguistic labels identify features of the environment which are cognitively salient to members of a culture group. They highlight entities which a society delimits and recognizes as significant amidst the infinite diversity of their surroundings. As a result, the study of naming systems is one approach by which differences between world-views may be apprehended. Lexicons further serve to identify the bounds of a cultural group's cognitive universe, as well as illustrating the refinement of knowledge within a given domain. In the context of our present discussion, it is the refinement of Qikirtamiut knowledge of the Common Eider which we attempt to demonstrate below. The lexicon is divided into four parts, according to whether the terms apply to features of external anatomy, internal anatomy, the eider egg or eider

skin.

While the rich lexicon of Qikirtamiut anatomical terms is indeed indicative of considerable intellectual application, the resolution of such an approach remains relatively low. On the one hand, certain elements of the environment may not bear a linguistic label even though they may be cognitively salient (Berlin, Breedlove and Raven 1974). On the other, names do not in themselves provide access to the wealth of knowledge which rests behind labelled categories. Knowing that Inuit distinguish between the various internal organs of the eider tells us nothing about what they might consider to be their significance to the eider or for that matter, their significance to Inuit. Thus linguistic labels provide access to a minimum horizon of knowledge, convincing in their concreteness and topical breadth, yet mute as to the knowledge implied by their existence.

To indicate to the reader the wealth of knowledge which lies behind these labelled categories, in section 4.2, we explore the many dimensions of Qikirtamiut knowledge of a single anatomical feature, the mitigaviniq or eider skin. Our discussion will consider knowledge of eider skin quality as it relates to age and sex, body part and season, as well as how the qualities of skins vary between bird species.

Our analysis of Qikirtamiut knowledge of the anatomy of the Hudson Bay Eider calls into question the views of wildlife professionals on traditional ecological knowledge. Specifically, the contention that traditional knowledge is narrowly pragmatic finds little empirical support. In the concluding section of this chapter, section 4.3, we look beyond pragmatism to seek out the intellectual foundations upon which Inuit knowledge rests.

4.1 Eider Topography: an anatomical lexicon

The lexicon of anatomical terms to be presented here is not exhaustive. It was clear during the interview process that many other terms exist and that these could have been elicited if time and resources were allocated to this task. Furthermore, there exist not only names for additional anatomical features, but also in some cases alternate names for the same features. Only a portion of this complex linguistic array of knowledge has been documented.

The more than 50 collected terms which are applied to the Hudson Bay Eider have been subdivided into four categories: 1. terms pertaining to features of the external anatomy; 2. those pertaining to internal anatomy; 3. terms applied to eggs; and 4. special terms for parts of the cased eider skin (i.e. the skin once removed from the carcass).¹

¹ These categories have been chosen largely for the convenience of

Mitig is the Inuktitut name for the Hudson Bay Eider. Once killed, however, the eider is referred to as a mitiviniq (lit. former eider or that which was an eider). This name is applied to the eider carcass intact or with the skin removed. In contradistinction, the eider skin or mitigag, once removed from the carcass becomes the mitigaviniq (lit. former eider skin).²

4.1.1 Terms for Features of the External Anatomy

To commence our survey of Inuktitut terms for external anatomical features, we begin with the head region of the Hudson Bay Eider (Fig. 11). As in the English language the same term, niaguk, applies to the heads of both eiders and humans. Several features in the head region are identified by name. Two terms from different individuals were recorded for the "crown" (Godfrey 1979; Petersen 1980), an area which Inuit delimit by indicating that it corresponds with the

presentation and are not knowingly based upon an Inuktitut logic. Nevertheless it was clear from the interviews that a distinction exists between terms pertaining to the anatomy of the eider body (categories 1 and 2) and that of eider eggs (category 3). It was also evident that in spite of a certain sharing of terms with body features, a discrete terminology exists for the parts of the cased eider skin (category 4), a terminology which has undoubtedly sprung from the intensive traditional use of bird skins for Qikirtamiut clothing.

² The term mitigaviniq has a second usage. Any item of clothing made from eider skin may be called a mitigaviniq. Alternatively, items of eider skin clothing may be referred to as mitijak.

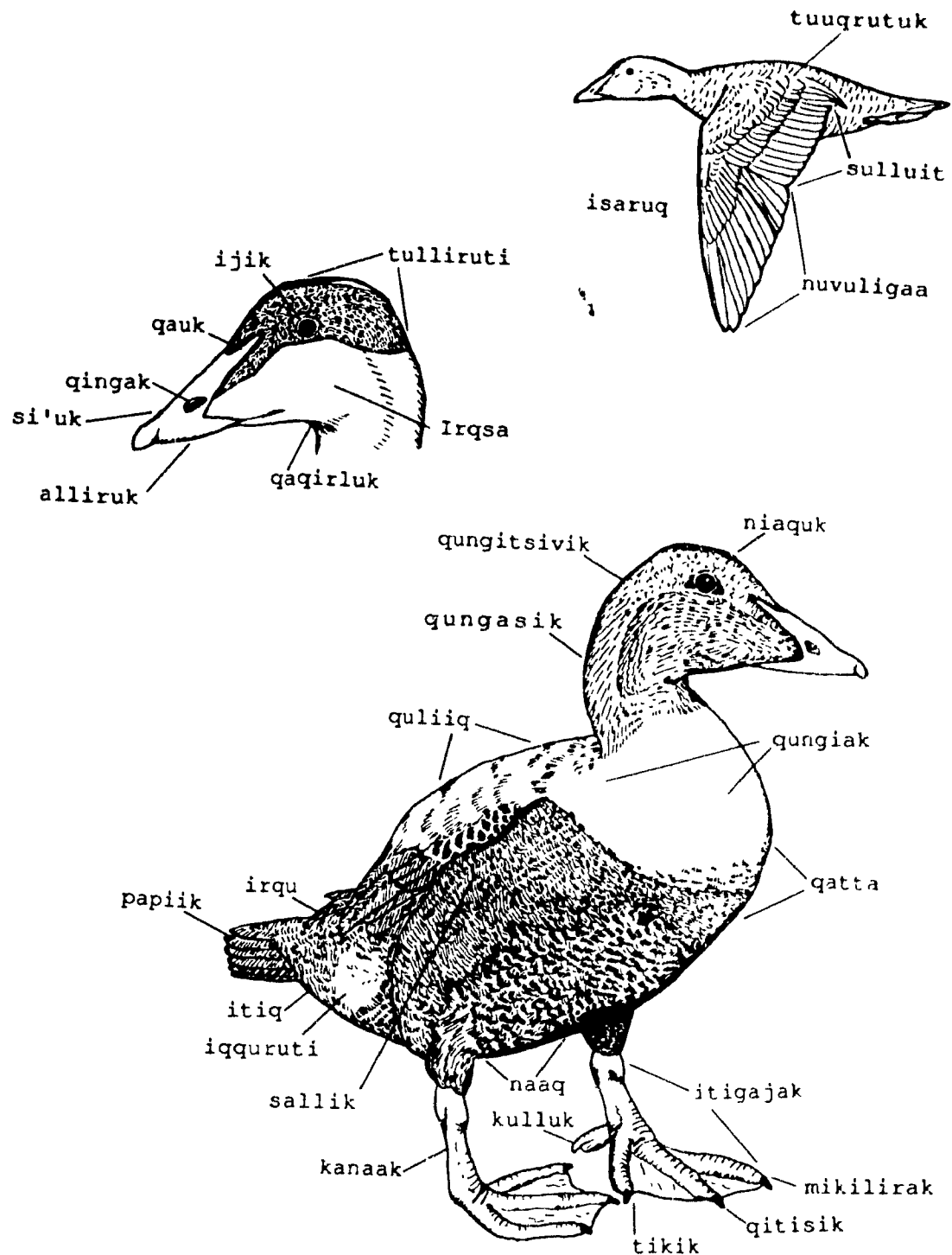


Figure 11. Qikirtamiut terminology for external anatomical features of the Hudson Bay Eider.

black-feathered region on the top of the head of the adult male eider. The recorded terms for the crown are katji and tulliruti.

The dictionary of Inuktitut terms which Lucien Schneider compiled in the early 1950s, provides different but obviously related definitions for these same terms. According to Schneider's informants, katjiq in the Quebec dialect refers either to a tuft of hair or the last spiral of snow blocks constituting the roof of the snow house. Tulliguti, on the other hand, are ribbons or decorations used to hold chignons, the braided hair coiled over each ear (Schneider 1985). The conceptual parallels between human hair, hair ornaments, the apex of the snowhouse and among the Qikirtamiut, the crown of the Hudson Bay Eider head are readily apparent.

Irgsa is the area corresponding to the white feathered patches on the side of the adult male eider's head. Ornithologists speak of the bird's "cheeks" (Godfrey 1979) or in reference to the feathers covering the cheeks, the "auriculars" (Petersen 1980). In this case, unlike in English, the cheeks of birds and humans go by different Inuktitut names, human cheeks being referred to as uluag. The underside of the head, just posterior to the base of the bill is the qagirluk.³ This area does not extend down onto

³ This term is rendered qakirluk in Schneider (1985) for the

the neck and corresponds with the area which Godfrey (1979) labels as the duck's "chin" and "throat".

Several labels apply to the "bill". No equivalent to the English term which refers collectively to both upper and lower mandibles seems to exist. Instead the term alliruk is the lower mandible and the si'uk generally refers to the upper mandible. One informant, however, defined si'uk as the portions of both upper and lower mandibles lying distal to the eider's nostrils.

On the upper mandible, proximal to the nostrils, is the gauk⁴ or "frontal lobes" of the bill (Palmer 1976). The lobes of the drake of the Hudson Bay Eider subspecies (*S. m. sedentaria*) are broad and somewhat fleshy, unlike those of the Northern Eider subspecies (*S. m. borealis*). In the Belcher Islands, the eider's gauk is sometimes trimmed from the freshly caught drake and eaten raw, a pleasantly crunchy and mildly salty treat. On the drakes of the closely-related King Eider (*S. spectabilis*) these lobes are greatly expanded and Qikirtamiut may, in addition to the term gauk, refer to this area as the qingakkallak, *lit.* short, plump nose. Similarly, Ungava Bay Inuit refer to the King Eider as qingalik, meaning "it has a nose".

corresponding portion of the human head.

⁴ On humans, gauk is the forehead.

The nasal openings or "nostrils" (Godfrey 1979) on the eider's bill are the qingak and the fine dentition along the edge of the eider's bill are the kigutik.⁵ Oilak is the "palate", the roof of the eider's mouth, a word which is linked symbolically to the entrance of the snow house and the vault of the heavens (Schneider 1985). Ugak is the eider "tongue", the identical term being applied to the corresponding part of human anatomy.⁶ The opening of the "ear" (Godfrey 1979) which is concealed by the auricular feathers, is called the siutik.

In addition to a term for the "eye", ijik, Qikirtamiut add a perceptive detail. They name the "nictitans or nictating membrane", the taalutak. This "third eyelid" (Welty 1975: 79) lies just within the two outer eyelids. It is drawn across the eye from the inner to the outer corner. In the Quebec dialect, taalutak is a curtain, blind or any article of a similar nature which is used to conceal or provide shade (Dorais 1983; Schneider 1985). One informant suggested that the eider's taalutak was closed when sleeping and flying. The latter suggestion may have been spurred by the observation that the nictitans of loons, auks and diving ducks (eiders included) has a clear lens-shaped centre. According to Wells (cited in Welty 1975: 80) this unusual

⁵ According to Schneider (1985) kiguti is applied to the teeth of humans, animals and steel traps.

⁶ Rendered uqaq by Schneider (1985).

adaptation serves the birds as a contact lens, accommodating for the higher refractive index of water as opposed to air, and thus improving their underwater vision.

Moving from the head to the body region, we record the term gungasik for the eider "neck". The point at which the skull joins the neck vertebrae bears a special name, the gungitsivik. This point is of particular importance when skinning eiders to make clothing. It is at the gungitsivik that one begins the short slit in the skin of the back of the eider's neck to form the small opening through which the entire carcass of the bird is deftly withdrawn.

Qikirtamiut divide the body of the eider into six major zones, each bearing a distinctive linguistic label. The area around the base of the neck is the gungiak, a collective term which refers ventrally to the ornithologist's "chest" and dorsally to their "cape" (LeMaster 1988), "upper back" (Bellrose 1976) or the mid-"mantle" (Godfrey 1979). Proceeding ventrally from the gungiak, is first the gatta or "breast" and second the naaq or "belly".

The eider's "back" is the guliig. According to Schneider (1985), the term guliig is applicable only to the backs of humans and perhaps apes. He reserves the term gulusuk for the backs and spines of birds. In the Belcher Islands, gulusuk is used to describe the back area of the cased eider

skin. One informant also used gulusuk to designate the back region of the skinned carcass. Ouliig, however, was the appropriate term for the back of the eider when whole.

Among ornithologists there is some confusion regarding the terminology for the lateral surfaces of the bodies of birds. Bellrose (1976) and Godfrey (1979) differentiate between the lateral area beneath the bird's wing which they label as the "side", and the lateral region posterior to the point of insertion of the leg, termed the "flank". Other authors only use the term "flank" and in contradiction with the previous authors they apply it first and foremost to the area beneath the wing (Cramp 1977; Farrand 1983; Gooders and Boyer 1986).

Qikirtamiut terminology for this region of the body most closely corresponds with that of Godfrey and Bellrose, as it distinguishes two lateral areas on the eider's body. The iqquruti is the "flank". Informants describe it as corresponding to the distinctive white patch on the adult male eider which lies laterally and immediately anterior to the base of the tail. The term is most likely derived from irquq which refers to the "back-end of long, oblong objects" (Schneider 1985: 96).

The Qikirtamiut term sallik corresponds most closely with the "side" of Godfrey and Bellrose, but differs in that it

refers strictly to the down-covered area of skin located immediately below the wing. Upcurved contour feathers from the edges of the duck's breast and belly, conceal the sallik from view on the living specimen. A pocket is formed between the downy sallik area of the eider's body and the overlying contour feathers. It is into this side pocket that ducks slip the folded wing when at rest. The term "side" as employed by Godfrey and Bellrose is thus more general than the Qikirtamiut term sallik. It encompasses not only the sallik, but also the overlying contour feathers.

Finally the eider "tail" is the papiik. Associated with it is the irqu or "oil gland" whose opening is located on the rump, just dorsal and anterior to the tail base. Ventral to the tail base is the itig or "cloacal opening".

Inuktitut terminology for animal tails provide an excellent demonstration of how linguistic labels offer insights into Inuit cognitive structuring of the natural world. In northern Quebec dialect, the term papik is applied to the tails of birds, papirug to those of fish and pamiak are those of land mammals. Sea mammal tails are referred to as pamialluk, if the animal has webbed feet (seals, walrus; i.e. Phocidae or Odobenidae), but sarpik if it is a whale (Dorais 1977; Schneider 1985). This linguistic classification of animal tails compares favourably with the major divisions of

the traditional Inuktitut taxonomy of uumajuit (animals).⁷

Turning now to the appendages, Qikircamiut refer to the eider's "leg" including the "foot" as the itigajak. According to Schneider (1985) this term is specific to the feet of birds. Human feet are itigait. Several parts of the itigajak have their own names. The "tarsus", which extends from the bird's foot to the "knee" (actually the anatomical equivalent of our heel), is the kanaak. The eider's hind "toe" is the kulluk, the same term being used for the human thumb. Of the front toes, the innermost of the three digits is the tikik, the mid-digit is the qitisik and the outer digit, the mikilirak. These same three terms are respectively the index, middle and ring fingers of the human hand.

Several terms are applied to the eider's wing. The "wing" as a unit is the isaruq. The outer portion which corresponds with the eider's "hand" and which bears the primary flight

⁷ We have collected some information from the Belcher Islands which suggests that names for animal skins may also be largely consistent with Inuktitut taxonomic categories. The skins of birds and land mammals are referred to as the amig. Fish skins are amigak. Sea mammal skins are qisiq. These information still remain to be confirmed. Notes in Schneider (1985:310) provide some support for this suggestion. For the region of Kangiqsujuaq, northern Quebec, he defines qisik as "skin in general (men and animals)" but excepts caribou skin as amig and fish skin as amirag. For west Hudson's Bay, however, he defines qisiq specifically as sea mammal skin. According to Dorais (1977), qisiq in northern Quebec dialect is sea mammal skin.

feathers, is the nuvuligaa. Disjointed at the wrist, the nuvuligaa of geese and ducks often serve as efficient hand brooms. The inner portion of the wing which ornithologists recognize as bearing the secondary feathers, is the sulluit. At the base of the wing, just ventral to where it joins the body, are a cluster of feathers called the urngiliti, the ornithologist's "axillaries". Dorsal to the wing base are the tuugrutuk, the ornithologist's "scapular feathers".

It is appropriate to introduce here, several terms labeling types of feathers. Suluk, which is the singular of the above term sulluit, identifies any of the bird's larger flight feathers: the primaries, the secondaries, tertials and rectrices (tail feathers). In opposition we record the word mirquq which are the numerous small contour feathers of the body.

Beneath the contour feathers is the eider's down or guniguk. The same term is applied to down on the body of the bird and down deposited by the female eider in her nest. A special term is used to designate particularly pale-coloured down which is sometimes seen in eider nests. This whiter down known as pimmarit is believed to be that of old females.

Feathers in the process of growth are given their own linguistic label. These feathers are recognized by their distinctive blue-coloured bases, the calanus or feather quill

gorged with the nourishing blood-rich pulp necessary for feather development. These growing feathers are the mamaak.

4.1.2 The Eider's Internal Anatomy

The presentation of anatomical terms for the skinned eider carcass is divided into two sections: first, terms relating to bones (saunik) and muscle (nigil); and second, terms for body organs.

Beginning with the eider carcass, Qikirtamiut provide differing combinations of terms for the "sternum" or "keel" and the muscles of the breast which find insertion upon it. One informant labeled the sternum the gataak and the breast meat the allaak. These terms and their usage corresponds with definitions recorded by Schneider (1985). A second informant employed the term gingagta for the sternum and reserved gattaa for the breast muscle. Finally a third individual described the gattaak as the ensemble of breast bone (sternum) and muscles.

The "furcula", popularly referred to in English as the wishbone, is the gutlu. The related term gutuuja is the "pectoral girdle", including not only the furcula but also two other paired bones, the stout "coracoid" below and the elongate "scapula" above. The bones of the chest cavity

(i.e. the rib cage and the anterior portion of the spine) is the kapiigru.

The "pelvic girdle" (including the pelvis and the posterior backbone) is the kutsi. The tail vertebrae which terminate in the "pygostyle", are the pamialluk, taking back the term applied to the tails of seals and walruses.⁸

Moving forward on the eider's body, we encounter the gungasi, the ensemble of neck vertebrae and attached muscle, as well as the tuu'gujaa which are the fine forking "hyoid bones" which lie within the bird's tongue.

The leg bone and muscle may be referred to collectively as niug, but specific terms also exist for the "tarsus" bone which, as already mentioned above, is the kanaa. Whether guttura is the "tibia-fibula" (the bone of the drumstick) or the "femur" (the bone of the thigh) must be verified as my notes on this term are unclear.⁹ The term nugsa was recorded for the "humerus" or upper arm bone. Nugsara is the "ulna", the larger of the two forearm bones.

Many terms were collected for the eider's internal organs. The "brain" is garitak. The "oesophagus" of the eider bears

⁸ Could this be due to the physical resemblance of a bird's tail, once stripped of feather and skin, to the bob tail of a seal ?

⁹ qurturaq is the femur or thigh according to Schneider (1985).

the same name as that of gulls, i'iaak. Carefully dried and sliced into fine strands, the i'iaak of gulls was traditionally one of the principal sources of thread. The eider's oesophagus leads down to the extensible "crop" or puvigata, a term derived from puvirpaa, meaning to inflate or blow up (Schneider 1985). The crops of ptarmigan known as puviaq, are often transformed into amusing toys for children by inflating them with their contents, often willow buds, intact. As such they serve as both balloon and translucent rattle.

From the crop, food is transferred to the aqiaruk or "gizzard", the muscular stomach. Qikirtamiut describe the aqiaruk as the substitute for the eider's lack of teeth, noting that the stones and other hard gritty material serve to grind up food. Their intimate understanding of the relationship between eider diet and gizzard size has already been described in section 2.3.2. The "intestines" are the inalua.

The "lungs" or puvak share the same root with the crop, puvigata, because they inflate. The eider's voice box or "syrinx" is the tuqsuk. Tinguk or i'itaqqu is the "liver" and tagtu the "kidneys". Matsu was described as the fat lying between the coils of the intestine, but it may in fact be the pancreas. The sunga which we believe to be the "gall

bladder", is described as the only internal part of the eider which is not eaten.

The "heart" is the ummatik and the translucent pouch in which the heart lies is the ummasia.¹⁰ Qaluviak are the "aorta".¹¹

4.1.3 Terms for the Eider Egg

Mannik is the "egg". Several Inuktitut terms apply to the egg and its parts. These terms are not specific to the eggs of the Hudson Bay Eider, but apply to bird eggs in general. The "shell" of the egg is said to resemble bone, and is thus conferred the name saunaq, which literally means having the quality of bone (i.e. sauniq). Within the egg is the "yolk" which bears two names which may be used interchangeably: itsik and tingutsaq. Inuit state that the yolk will become the bird's liver, a belief which is perhaps founded upon the observation that the yolk is absorbed into the abdomen as the chick's development in the shell progresses. Accordingly the yolk is the tingutsaq, lit. the future or potential (-tsaq)

¹⁰ Schneider (1985: 282) provides the following definition for galluvialaq: "membrane that surrounds heart (cartilage?), whitish tough membrane full of liquid in seals and the great bearded seals also. (?) (sic) Any other visceral membrane". In Sanikiluaq, we have seen an ummasia or heart pouch of a walrus which had been transformed into a large, sturdy and very serviceable bag. The membrane on the finished product is opaque, yellowish-white and extremely supple.

¹¹ Schneider (1985) also defines galuvialaq (not to be confused with his term galluvialaq) as aorta.

liver (tinguk).

The egg white or "albumen" also bears two names, in this case applied in different contexts. The first is kauk which is used when the albumen is fresh or cooked. The kauk is said to become the bird's feathers.

The older people used to say things straight. As we kids used to have stomach aches from eating too many eggs, the elders used to say, "It's from eating too many feathers", since the white part is going to be feathers
AA., Sanikiluaq

In Inuktitut, the same term kauk is applied to both egg white and walrus skin. One hunter explained this odd juxtaposition of meanings as an association between the toughness of walrus skin and the toughness of egg whites when they are boiled and dried. Dried egg albumen was notoriously tough to chew on and according to Qikirtamiut, those prepared from eggs with a fetus in an advanced stage of development were the worst.

I know why they call it kauk. When a bird is forming, the white part usually turns really hard when dried and that's why it's called kauk, because it's really like walrus skin when it's dry.

AA., Sanikiluaq

This brings us to the second term for the egg white, qagquk which is applied when it is boiled and then dried. Once again, this term has a dual application which links marine

mammals to birds, and in particular the eider as the eggs of this species are the only ones harvested in large enough quantities to warrant preservation by drying.

Dorais (1973) defines qagquk as cooked and dried viscera. Schneider (1985), who renders the term as qagguq, defines the term as viscera (excluding the lungs) cooked and left to dry in the sun. My informant explained that qagquk was the dried liver of seal and walrus and the dried whites of eider eggs. The shared name is likely linked to the brittle and crunchy texture of the final product. The root qaggu-, for example, is also employed to describe the manner in which one eats the eider's neck. As meat and bones are consumed together, the latter being crushed between one's teeth, the whole operation is referred to as qagqulak.

The "embryo" of the egg is the inuk, the same term as that used for a human. In this context however it is likely applied in the sense of owner, master or inhabitant of the egg.

4.1.4 Terms for Parts of the Eider Skin

Perhaps because of the importance of the eider skin or mitigaviniq for clothing, the Qikirtamiut have developed a special set of terms which apply to parts of the eider skin.

Some of these terms are shared, being also applied to features of the eider's internal and external anatomy. The majority, however, are exclusively applied to the cased eider skin.

The cased eider skin is composed of four major parts, the delimitation of which is linked to the manner in which the skin is cut up and used in clothing fabrication. If we visualize the eider skin as a feathered oblong pouch, then the four major divisions can be described as the eider's anterior, the gungiak, which is the chest and upper back; the eider's posterior, the upatik or nuluk which is the area surrounding the tail (the rump and hind belly); the timik or breast and belly; and the gulusuk which is the eider's back.

Between the ventral timik and the dorsal gulusuk are the downy feathered sallik or wing pockets, one on each side of the body. The ventral midline of the breast/belly, between the two ventral feather tracts is given a special name, the qitiruti, a term derived from qitiq meaning middle (Schneider 1985).

The area near the base of each wing bears a special name isarugavvik which literally means the place where there was a wing. On the rump the dorsal region just anterior to the tail is a small triangular region of feathered skin called the galusuiqsini. When cutting up an eider skin, this small

named portion of the rump is cut free with the tail and discarded.

4.2 Bird Skin as Object of Thought

The Qikirtamiut have developed a sophisticated corpus of knowledge about the skins of birds. This knowledge finds its origins in their long history of bird skin use for clothing, a practice of vital importance until at least the mid-1960s when imported fabrics became prevalent. Their appraisal of skins takes into account a wide variety of factors: the bird species; its age; its sex; and the season in which the bird was harvested. Qikirtamiut also differentiate between the feathered skin from different areas of the bird's body. These features combine to confer upon the skin specific properties which in turn influence the manner in which the Qikirtamiut utilize skins to produce clothing. The properties to which Qikirtamiut pay particular attention are the skin's durability, suppleness, attractiveness, insulative capacity versus wind, cold and water, and the ease with which it is processed.

The physical properties of bird skins interact in a complex manner. No single skin is optimal in all categories simultaneously. Durability and flexibility, for example, are for the most part mutually exclusive as both are largely a

function of skin thickness. Skins which are relatively thick offer greater strength, but this strength is gained at the expense of suppleness. Qikirtamiut women, using their extensive knowledge of the properties of specific skins and working always within the constraints of what skins are available, seek out a compromise which is best suited to the task at hand.

4.2.1 Skin Qualities Determined by Eider Age and Sex

According to Qikirtamiut, the preferred allocation of skins is as follows: adult male eider skins for men's coats; adult female eider skins for women's coats; and eider fledglings (i.e. young of the year) for the coats of children. This normative statement reveals a symbolic symmetry between gender and age in eiders and humans. The practical realities of skin allocation are in general more complicated, as Qikirtamiut must juggle aesthetic and physical considerations while working within the constraints imposed by skin supply.

Among the eiders, the skin of the full adult male is described as the thickest and the toughest. For this reason its use is reserved first and foremost for the hunter's parka. The hunter, as the most active family member, requires clothing which protects him from long periods of exposure to adverse weather conditions, as well as resisting

tearing or bursting when subjected to the oftentimes strenuous and brusque movements of the hunt.

Physical properties of the skins, however, are not by any means the only consideration. The adult male eider (amaulik) is considered to be wily and difficult to kill. A man who wears coats entirely made of amaulik skins is a hard-working and capable hunter. Adult male skins thus serve as a symbol of male status, and as a result, when amaulik skins are in short supply they are reserved for the hunter's outer coat.

The outer coat is drawn over the inner coat, also made of eider skins, and is worn feathered surface outward. When a hunter is on the land in winter, it is the feathered surface of the outer parka which is visible to those around him. An outer parka whose body and sleeves are entirely composed of the distinctive black ventral plumage of the adult male eider thus serves as an unmistakable testimony of the man's prowess as a hunter.

For these reasons, the skins of amaulik are highly prized and jealously guarded. As one woman qualified while expounding upon the Inuit virtue of sharing:

I survived by giving and receiving bird skins ...but
amaulik skins, you kept for yourself.

JJ., Sanikiluaq

To collect enough adult male eider skins for an entire outer coat (about 17 skins for the coat's body and sleeves) is not always a simple task, however, and the hunter at times has to be satisfied with a coat of mixed skin types.

Even though we wanted that kind of parka (only of amaulik skins), as we were not that successful at hunting, we would get parkas of amaulik mixed with other types of skin.

BB., Sanikiluaq

One Qikirtamiut hunter, whose son is today one of the community's elders, gained a certain renown for defying these dress norms. He systematically chose to wear coats made from the skins of young eiders, mitiraviniq, a material he is said to have preferred for its softness and flexibility.

Although admirable to possess an inner as well as an outer coat of adult male eider skins, these skins types are often wanting and in their absence adult female eider skins must suffice. As the inner coat is worn feathers inward and skin surface outward, the identifying plumage is generally hidden from view. Aesthetic considerations other than skin age and sex therefore become paramount. A very white and unblemished inner skin surface, for example is considered a most desirable quality. Exceptionally white skins are said to come from very fat eiders whose skins were cleaned of fat soon after being killed. Furthermore, these skins were

subjected to an extended period of "frost-drying" (Speck 1937: 348),¹² a process whereby the cleaned skins are hung outdoors to freeze. The longer they are exposed to subzero temperatures, the whiter they are reported to become.¹³ Thus the whitest eider skins, which bear witness to the hunter's fortune (having captured fat eider ducks) and the woman's meticulous attentions, are carefully selected for the most visible part of the coat, the savvik or breast panel (Nakashima 1989).

In contrast with the sturdy and stiff skins of the adult male, the skins of the juvenile eiders or mitiraviniq are soft, supple and delicate. Mitiraviniq skins are destined for the parkas of children, one informant suggested, those children aged between two and ten years of age. Qikirtamiut women specified that it was important that a child's coat not be too stiff as this would hamper movement and be uncomfortable to the child.

Juvenile eider skins are a pale buff brown. They appear uniformly coloured at a distance but upon close inspection a very fine barring of the feathers can be detected throughout the plumage. The two children's parkas from the Belcher

¹² Speck (1937) documents the use of freeze-drying by Labrador Inuit to whiten sealskins and by Naskapi-Montagnais Indians to whiten caribou.

¹³ Note that Qikirtamiut relate length of time exposed to freezing temperatures to skin whiteness. In reference to sealskin, the Naujamiut of West Greenland claim the colder the temperature, the whiter the skin (LeMouel 1973).

Islands that we have had the opportunity to examine, were both made entirely from the skins of eider juveniles.¹⁴

Juvenile eider skins are recognized as having another quality in addition to suppleness. Their plumage is less bulky than that of adult birds, the feathers lying flatter, closer to the skin surface. The less bulky character of the juvenile eider plumage contributes, perhaps, to the flexibility of the child's coat made from this material. Whether or not this is the case, Qikirtamiut women attribute the almost exclusive use of mitiravinig skins on the front half of the hood of the man's coat, to the reduced bulk of the plumage. Typically a single skin is used for this purpose. It is sliced longitudinally, along the ventral midline,¹⁵ and the halves are positioned on each side of the hood such that the cut edge forms the hood's leading edge. Is the less bulky juvenile plumage favoured because it is less likely to hamper lateral vision? Does the supple quality of the skin allow it to better conform to the contour of the face, more effectively cutting out chilling winds?

¹⁴ The first was collected by M. Freeman in 1961 and is presently at the Museum of Civilization in Hull (no. IV-B-762). The second, at the Musée des Civilisations in Québec, was collected by B. Saladin d'Anglure. It is probably also from the Belchers although the museum dossier is inconsistent, reporting it at times as a collection from the Belchers and at times as a collection from Puvirnituk, Nunavik (Québec). The collection date is also variously reported as 1970 and 1971 (no. 72-24).

¹⁵ As we have seen in the previous section, the skin's ventral midline along which the skin is sliced, bears a special name, the qitiruti.

No explanation for this use was put forth other than the plumage's bulk. It is clear from all informants, however, that barring a shortage of this skin type (an unlikely event as juvenile eiders are generally the easiest to come by) mitiraviniq was always used on the sides of the hunter's hood. For this particular part of the parka it was the material *par excellence*.

Between the extremes of the adult male eider and the juvenile are ranged the skins of the other eiders, whose qualities of strength and flexibility are intermediate between these extremes. One Qikirtamiut woman with whom we had the occasion to discuss the finer points of eider coat fabrication, specified a sequence of skin choice which accurately represents the relative qualities of all eider skin types. The shoulder of the coat is subject to particular stress as it must bear the coat's weight.

Consequently strength and resistance to tearing is the quality sought. For this component, she stated a preference first and foremost for the skins of the amaulik, the adult male eider, the most durable of eider skins. Lacking this skin type, she would then select tullisaujaq, the immature male eider skin. If these were in their turn not available, she would then utilize the skins of aknaviak, the adult female eider. If all of these other skins were in short

supply she would, as a last resort, use the skins of the aknaviatsaq or immature female eider, which are the least strong of these skin types.

For the women's parka, the amaqusik, Qikirtamiut women stated a preference for the skins of adult female eiders. Not always available in sufficient quantities, these skins are often replaced with those of juveniles or immature females. The latter skins are preferred for the lower section of the sleeve as their greater flexibility and lesser bulk facilitates their being rolled inward and thus out of the way, when women have a particularly messy task to perform such as skinning or butchering. If additional adult male eider skins remain after confection of the hunter's coats, a rather exceptional circumstance, some women stated a preference for their use for areas of the women's coat which are subjected to particular stress: over the shoulders; across the upper chest and back; and to form the baby-carrying pouch.

It might seem odd to consider qualities of eider skins for winter parka confection and to discuss relative durability, suppleness, plumage bulk, but not relative warmth. When we asked Qikirtamiut about this apparent oversight, they explained that all eider skins are equally warm, so long as they are not torn or punctured. These comments provide an immediate explanation for their preoccupation with the

strength and durability of eider skins.

4.2.2 Skin Properties Specific to Body Part

...from the back of seabirds they made their thin light underwear, from the belly the warm winter clothes, and from the neck their beautiful Sunday best, and on these, the feathers are usually turned outwards.

Cranz [1765] in Hatt 1969[1914]: 9

It is now clear that in the Qikirtamiut view, the skins of the Hudson Bay Eider are not a single, uniform resource. The skins of eiders of different age and sex do not possess the same properties and these differences are recognized and exploited to advantage. But exploring further, it is apparent that they not only distinguish between the skins of various eider types, but also discriminate between the parts of the same eider skin, each part having its own particular application. To illustrate, we will consider the distinct properties of three different areas of an eider's skin and describe their usages. These areas, described in the anatomical lexicon of eider skin parts appearing above, are: the timik which comprises the eider's ventral surfaces as well as, due to some clever cutting and manipulating, a portion of the dorsal rump; the qulusuk, the eider's upper back; and the sallik, the wing pocket areas of the eider's sides.

The timik constitutes the major portion of the skin. Up

until now, when discussing eider skin use, we have been referring to the use of this large and thickly feathered portion of the eider's skin. The timik is the warmest part of the eider's skin, undoubtedly due to the fact that the eider spends the greater part of its existence afloat in frigid seas, relying largely upon this ventral cushion of feather and down to remain warm, dry and afloat. The Qikirtamiut use the large timik portion of the eider skin to confect the front, back, sides and sleeves of their winter coats, as well as the entire hood for women and children and the front portion of the hood for the men.

In sharp contrast, the gulusuk or back skin is much more sparsely feathered and relatively small. It is also relatively thin and fragile as any taxidermist who has prepared bird skins is apt to know. For these reasons these small portions of skin, trimmed into square or rectangular forms, are reserved for two usages, the sides and back of the hunter's hood and the apron and tail of the woman's coat (Nakashima 1989).

The gulusuk offers the advantage of being extremely supple facilitating, in the case of the hunter's coat, the movement of the head when hooded as well as the dropping back of the hood onto the shoulders. In the case of the tails of the woman's coat, its flexibility allows freer movement of the

legs. It is not clear, however, whether these are the primary considerations for the use of the qulusuk for these parts of the traditional wardrobe. Aesthetics are also an important factor.

For the man's hood, the back skins of the adult male eider are preferred. The adult male's qulusuk skins bear striking pattern of deep black and white feathers. Cut for sewing, the qulusuk sports a black triangle on a white background. To form the sides and back of the man's hood (recall that the front portion of the hood is made of a juvenile eider's timik or belly skin, split in two and placed one half on each side of the face), these back skins are sewn one above the other into three vertical strips which are then attached side by side. As the qulusuk skins are all oriented with feathers pointing downwards, the finished product bears the aesthetically pleasing appearance of three ascending rows of deep black triangles set on a pure white background.

Eider back skins are not the preferred material for the woman's coat apron and tail. Dog skin are warmer and more durable. The qulusuk skins are used only if the latter are not available. In order to observe the techniques involved, however, we requested that qulusuk skins be used to make the front apron and rear tail flaps of a coat commissioned for the Musée des Civilisations (Nakashima 1989). This artifact

is the only eider skin coat existing that illustrates this particular usage of the eider's back skins.

On the sides of ducks, below the wing, is located an area of skin which sports none of the quilled contour feathers but only soft down. Along the lower margin of this unusual down-covered area of skin are contour feathers which are oriented dorsally, extending upwards over this vulnerable portion of the eider's body, concealing it from view and forming a pocket. At rest, the bird's folded wing slips neatly into this side pocket, the lateral contour feathers riding up over the wing to conceal all of the wing but the tips of the primary feathers which project posteriorly.

It is the down covered skin of the inner surface of this wing pocket which Qikirtamiut refer to as the sallik. The sallik skin is reserved for a special task, it is ideally suited to patching holes or tears in eider skins. A hole is patched by sewing a small square of eider skin over the opening. The patch is oriented such that its own feathered surface is applied to the unfeathered side of the skin being repaired. The sallik skin is perfect for this task because its feathered surface is free of contour feathers whose stiff vanes would prevent a tight, wind-proof seal. Its soft downy feathers, on the other hand, do not interfere with the stitch and prevent the patched areas from becoming cold spots on the

coat's surface.

The lack of contour feathers made the sallik skin excellent for patching but poor for warmth. For this reason these lateral areas of downy skin are trimmed from the sides of the thicker and warmer breast and belly skin. When skins are plentiful, only a very narrow band of sallik skin is left along each side of the belly skins (timik) as the absence of contour feathers in this area facilitates the sewing of one skin to its neighbour. Such coats with sallik skin essentially removed are particularly warm and bear a special name, sallikituq, *lit.* it is without sallik. But when skins are few, the extra breadth provided by the wing pocket areas mean that a coat can be made from fewer skins. To economize, more of the sallik skin area is left on the sides of each breast-belly skin resulting in cold spots and a more chilly coat.

In closing, it is worthwhile to note that even the tiny and finely-feathered skins of the eider's head and neck have a use suited to their small size and frailty. Qikirtamiut sew them together with fine stitches to form warm and exceptionally delicate bonnets for newborn babies. Several Qikirtamiut women spoke with great admiration of a woman, the mother of a present-day community elder, who made an amagusik, women's parka, entirely from the head and neck skins of eiders. This feat won her considerable renown and

it is further said of her that all that she made was done with exceptional finesse. The head and neck skins of the eider are remarkably soft and velvety and as no Belcher Island coats of such unusual and meticulous design have been preserved we can only imagine how exquisite a work of art it must have been. Hatt (1969) citing Khvostov and Davydov (1810), mentions a large Kodiak Island (Alaska) coat made exclusively of "the extremely beautiful, velvety neck portion" of the *Pelecanus urile*.¹⁶ For this masterpiece, 140 neck skins were required.

4.2.3 Eider Skin Quality and Season

Superimposed upon the transformation of skin quality with eider age and differences attributable to the bird's sex, Qikirtamiut recognize that skin quality also changes through the cycle of the seasons. These seasonal variations in skin quality have an important influence upon their use of eider skins.

Seasonal change is intimately tied to the cycle of plumage moult and renewal in the Hudson Bay Eider. A brief summary of this process, as understood by Western ornithologists, is

¹⁶ We have not been able to identify this bird species. No members of the present day genus *Pelecanus* (pelicans) occur in the south Alaska region, suggesting that Hatt's usage of the genus name is obsolete. Perhaps it is a member of the Order Procellariiformes, eg. the shearwaters and petrels.

presented below to facilitate the discussion of Qikirtamiut knowledge of seasonal changes in skin quality.

As members of the subfamily Anatinae, all ducks bear two distinct body plumages and undergo two feather moults each year.¹⁷ In most species the male breeding plumage (also termed nuptial or alternate) is conspicuous and brightly-coloured while the non-breeding plumage (also termed eclipse or basic) is drab. As its name implies the showy breeding plumage is worn during courtship and pair formation. The cryptic eclipse plumage coincides with the simultaneous moult of the flight feathers which renders the bird flightless and more vulnerable to predation.¹⁸

The breeding plumage of the Common Eider drake is the striking white of cheeks, neck, breast and mantle, and the contrasting deep black of head cap, belly and lower back. The hind neck feathers bear hues of green and the white breast feathers a cast of peach or rose. In sharp contrast the full eclipse plumage is a uniform, dusky brown-black throughout with occasional flecks of white on breast and back (Bellrose 1980; Palmer 1976).

¹⁷ The whistling or tree ducks (Tribe Dendrocygini) are excepted, for as members of the subfamily Anserinae they exhibit a single plumage and moult per annum, as do geese and swans (Bellrose 1980).

¹⁸ Unlike the body plumage, the flight feathers of the wing and tail are renewed but once a year during the post-breeding moult.

Female ducks bear two plumages per year, but unlike the males, both breeding and non-breeding plumages are discrete. In the female Common Eider the non-breeding plumage is somewhat more muted than the breeding plumage, generally lacking the latter's rich tones of chestnut or russet (Palmer 1976).

The transition from one plumage to another, the shedding of one set of feathers and their replacement, is termed the moult. Adult male Common Eiders begin the moult into their eclipse plumage in mid-summer, just after the egg-laying period. The body feathers are the first to be replaced followed by the tail and then the wing. The simultaneous wing moult which renders the drake flightless occurs in late summer (ca. August) (Palmer 1976). The moult into the drake breeding plumage follows soon after, beginning at the end of the summer and extending well into the fall.

There is a marked asymmetry between the length of time that each plumage is retained. Drakes are primarily in breeding plumage for some eight months and largely in eclipse for only two months, with periods of rapid transition (the moults) of roughly one month's duration between (Palmer 1976). The moult schedule of the female Common Eider is reported by Cramp (1977) as similar to that of the drakes but occurring about one month later.

These observations of ornithologists, largely based upon the Common Eider subspecies *S.m.dresseri* (Bellrose 1980; Palmer 1976) and *S.m. mollissima* (Cramp 1977), coincide in general terms with Belcher Island hunter observations of the Hudson Bay subspecies, *S.m. sedentaria*. Hunters report that the drakes leave the nest colonies to moult about mid-July and that many are flightless by the end of that month.¹⁹ Soon after the eclipse plumage is acquired the moult back into the breeding plumage begins. The capacity of flight is restored by mid to late October. Hunters report a somewhat delayed schedule for female eiders due to the incubation of the eggs and the brooding of the ducklings. Their flightless period is said to begin in August and end in late October.

With these information we may now turn to the discussion of seasonal variations in Hudson Bay Eider skin quality. In Inuktitut, six rather than four seasons are recognized. These are: 1. uking or "winter", corresponding approximately with the period from late December to early March; 2. upingasag or "almost spring", from about mid-March to the end of April; 3. upingak or "spring", approximately May-June; 4. aujag or "summer", July and August; 5. ukiatsag or "potential fall", about September to October; and 6. ukiaq or "fall",

¹⁹ In the previous section the Inuktitut term isak was introduced, designating waterfowl (and perhaps other birds such as loons) rendered flightless by the synchronous moult of the flight feathers.

November to mid-December.

The term aujalik (from aujaq "summer" and -lik "the presence of") refers to animals which are in their summer pelage or plumage. In the case of eiders, aujalik are individuals which are moulting, either into their eclipse plumage or back into the breeding plumage. Moulting eiders bear feathers in various stages of loss and replacement. Qikirtamiut women consider aujalik skins to be by far the worst skins for clothing.

Growing feathers, known to Inuit as mamaak, have a calamus or quill engorged with a nourishing, blood-rich pulp (Welty 1975). These mamaak feathers are a problem for clothing confection. If they are left on the skin, they have the tendency to fall out once the skin is cleaned and dried, leaving small but troublesome holes through which the bitter cold winds of winter easily penetrate. If they are but few, they can be plucked out before the skin is cleaned and dried without significantly disturbing the skin's integrity. If they are many, however, the skins are useless for clothing.

Aujalik or summer eider skins are peppered with growing mamaak feathers, and thus not usable for coats. Qikirtamiut nevertheless conserve them for use as sleeping mats or blankets²⁰ or as overshoes (itigag) worn over the foot of the

²⁰ The skins of Canada Geese harvested when isak, flightless due to the

kamik or skin boot.

While aujalik eider skins are the worst, the best skins are those from ukialik, eiders in late fall plumage. These birds, harvested in the latter half of November and in December, bear the completely renewed breeding plumage. Their feathers are described as fresh and therefore soft and warm. This was the material *par excellence* for the hunter's coats.

Eiders harvested prior to November, during ukiatsaq or early fall, are in less than prime condition due to the persistence of a scattering of contour feathers still in the process of growing in. By late October and early November the annoying presence of mamaak feathers is reduced to a score or so along the sides of the breast. These are plucked out with relative ease, without diminishing the skin's air tightness.

Winter parkas are generally made in the fall. If an insufficient number of late fall eider skins, ukialik, are available, Qikirtamiut women then resort to the use of skins saved from the early spring of that year. Upingasalik eiders, those in the plumage of early spring, have skins with less bulky plumage, the feathers lying closer. They are less warm than the skins of late fall and are ideal for use in or moult, were reserved for this same purpose.

around the snowhouse. If needed, they are used for the inner parka.

The skins of winter caught eiders, ukiulik, are also used for making parkas, but they are considered inferior to the previous skins in several respects. One women described the winter skins as warmer than those of fall, but this advantage was said to be undermined by their lesser resistance to tearing. Another women restricted their use to the outer coat. In her experience, winter skins are unsuitable for the inner coat because they drip cold and oily water from the side belly feathers.

She could not explain the cause of this unpleasant condition but considering the first women's comments we might speculate that as the winter skin tears more easily, its membrane is thinner, providing less insulation. Perhaps one result would be the condensation of humidity from the wearer's body, on cold spots along the inner surface of the coat. The coldest areas would be the sallik, the sparsely-feathered, wing pockets which are located along the sides of the eider's belly feathers. Accordingly, water would tend to condense and drip from these areas, just as the woman has described.

4.2.4 Species-specific Qualities of Bird Skins

The Hudson Bay Eider is not the only bird species whose skins supply the Qikirtamiut with materials for clothing. While the eider is by far the most common source of skins, many other species are also exploited. Perhaps the most extensively utilized after the eider, are the skins of the Oldsquaw duck (*Clangula hyemalis*), a diminutive seaduck, and the skins of various species of gulls (*Larus* spp.). Due to their relatively smaller size and greater frailty, these skins are primarily used for clothing small children under about ten years of age. Fall-harvested gull skins are praised as warmer than eider skins but convenient only for child's wear due to their poor resistance to tearing.

Snowy Owl (*Nyctea scandiaca*) skins were also mentioned as an additional skin resource. One woman recalled wearing owl parkas as a child and remembers them as very warm, even warmer than gull skin. A Qikirtamiut hunter described owl skins as tough. Durable coats are made from this material, but as the wing pocket areas are said to be very sparsely feathered, an owl coat has numerous cold spots. He observed that only the "poor" Inuit wore them.

The contradiction between these two testimonies may perhaps be resolved by a detail of parka construction. As discussed

above (section 4.2.2), the sallik or wing pocket areas of a bird skin may be largely trimmed away during coat confection, eliminating them as cold spots. A sallikitug parka, as these coats were termed, made of owl skins would consequently be warm despite the sparsely feathered condition of the owl's wing pockets. Such sallikitug parkas, however, required a greater number of skins. As Snowy Owl skins are difficult to come by in any numbers, it is perhaps relatively easy to produce a sallikitug, and thus warm, child's parka, but difficult to do the same for an adult coat. "Poor" hunters with insufficient skins had to resign themselves to wearing owl parkas with the chilly sallik areas still in place.

The skin of the tullik or Common Loon (*Gavia immer*) is prized for a very different quality, its water-repellency. For this reason a single loon skin is used for the bottom of the child-carrying pouch of the woman's parka. When a woman carries a child in the pouch she is generally very alert to the child's needs and can swiftly slip him or her out to urinate. Nevertheless accidents do sometimes occur. If the child urinates in the pouch, the extremely water repellent plumage of the loon skin allows the mother to easily pour out the urine onto the ground by deftly pushing the pouch away from her back and tipping it forward. Other bird skins are not as accommodating. The urine penetrates among the feathers, wetting the skin and eventually causing the

feathers to fall out. Lacking a loon skin, an adult male eider skin can be used but it provides a poor substitute.

The skins of other bird species are also used but much less frequently than the fore-mentioned. One woman described a parka made for her as a child whose back was of two gutjuk or swan (*Olor colombianus*) skins and the sides of the hood, the skin of a Red-throated Loon (*G. stellata*). Moulting Canada Goose skins served as sleeping mats or blankets and the tiny skins of the Black Guillemot (*Cephus grylle*) were used for patching.

4.3 Beyond Pragmatism: the intellectual pursuit which is traditional knowledge

Having provided the reader with some idea of the scope and the subtlety of Qikirtamiut knowledge of Common Eider anatomy, it is appropriate to address ourselves one last time to the questions posed early in Chapter 3. Is traditional knowledge of the natural environment restricted in scope to matters of practical importance to subsistence? Or does it range beyond the bounds of the pragmatic, driven by intellectual curiosity rather than mere economic need?

Wildlife professionals have used the argument that traditional knowledge is merely pragmatic, to discount its applicability in contemporary wildlife management. They also

maintain that this practical perspective of Native peoples, precludes the development of a philosophy of wildlife conservation or management (Leopold and Darling 1953; MacPherson 1981). Yet the results of our survey of Qikirtamiut anatomical knowledge of a species generally dismissed as "secondary" or "minor" in its importance to the subsistence economy, are at odds with this proposition. In spite of the fact that our information is as yet incomplete in that numerous additional terms need be added to the lexicon and in that information about but a single anatomical feature has been examined in detail, it is clear that Qikirtamiut knowledge is neither superficial nor scant. Comprehensive in its scope and refined in its subtle detail, Qikirtamiut knowledge of the Common Eider far surpasses the meagre expectations of wildlife professionals.

But as indicated in Chapter 3, this conclusion does not necessarily bring us closer to answering the questions posed. Wildlife professionals may have misjudged the limits of practical knowledge but their contention that traditional knowledge is merely pragmatic may nevertheless hold. Thus, having been enlightened to the complexities of subsistence, having accepted that "secondary" resources such as the Common Eider do indeed fill a vital subsistence role and that eider use is many-faceted, they can now embrace the wealth of anatomical data presented in this chapter and include it as

"pragmatic". But what are the limits of "pragmatic" ?

Nelson (1969), for example who has studied Alaskan Eskimo adaptation to the sea ice environment, includes within the folds of pragmatic knowledge, "facts relating to rare or unusual occurrences":

...the Eskimo hunter is knowledgeable about every aspect of the environment which he exploits. This body of knowledge goes far beyond that which is essential for success in basic travel and subsistence activities, to include a large number of facts relating to rare or unusual occurrences, such as emergency conditions. Each Eskimo hunter is faced with an "emergency situation" of one sort or another during almost every season of every year, and he must draw upon their specialized factual background in order to make the correct responses.

Nelson 1969: 374

While emergency situations demanding knowledge of the physical environment may be the first to spring to mind (eg. blizzards, rough water, dangerous ice, etc.), Nelson's comments also apply to the biological environment. He describes several types of birds (eg. gulls, terns, jaegers), not otherwise sought after by hunters, as "excellent source(s) of food for emergency situations" (Nelson 1969: 167). Knowledge relating to the location, attraction and capture of these birds would, therefore, according to Nelson, qualify as pragmatic. Obviously, the practical importance of such obscure knowledge is only very rarely apparent to the

outside observer. As we can see a definition of "pragmatic" is not only elusive but also elastic.

To push our futile quest to its extreme, we might consider Qikirtamiut classification of the small birds (qupanuat) discussed in Chapter 2. Admittedly there exist some species, in particular some shorebirds that are on rare occasion eaten. But the majority serve no recognizable, practical purpose. Yet Qikirtamiut identify 18 different small bird types including individual names for all of the locally-breeding songbirds. Remark, two elders did specify that as children they "worked on" all of these small birds, stalking and harvesting them in play, as seriously as they would larger game later in their lives. While the observation and hunting of songbirds is certainly important for the training and development of the fledgling hunter (Laughlin 1968), it is also apparent that we have pushed the definition of "pragmatic" beyond the point where it is meaningful. If we cling to the contention that traditional knowledge is pragmatic, then the proposition verges on the tautological. By one tortured logic or another, all knowledge can be construed as serving some useful purpose. In the final analysis, the conception of traditional knowledge as limited to the mere pragmatic is absurd.

Lévi-Strauss (1966: 3) has astutely observed that for

"primitive" societies as much as for our own, "the universe is an object of thought at least as much as a means of satisfying needs". The verity of this statement for the Qikirtamiut is as evident in the detailed and precise naming of anatomical features of the Hudson Bay Eider, or of members of the class qupanuat (small birds), as it is in the exacting observation and carefully-weighed analysis which led hunter DD. to believe that the mysterious mitigluujak eiders are wanderers from the northern parts of adjacent Nunavik (cf. section 2.3.1).

Wildlife professionals are not the first to have erred in the belief that the knowledge of their own society is balanced and complete, whereas that of traditional societies is restricted to matters of economic importance. As Levi-Strauss (1966: 3) has observed, "Every civilization tends to overestimate the objective orientation of its thought and this tendency is never absent". It is this universal tendency towards ethnocentrism, rather than a "scientific" analysis of Inuit knowledge, which has led wildlife professionals to falsely conclude that traditional ecological knowledge is limited to the pragmatic.

Chapter 5

An Inherently Ecological Logic: Inuit Knowledge of Eiders and Environment

Of the natural sciences, ecology is arguably the most abstract. It has no material subject but must be understood second-hand, through the media of animals, plants, soil, air, water, etc. For ecology is the study of neither the organism nor its environment as such, but of the relationship between the two (Shepard 1969). In the intellectual tradition of Western science, ecology is a newcomer. Admittedly elements of ecological thought can be traced back to the 1700s (Worster 1977), but as a scientific discipline, ecology barely predates the turn of the century.¹ Its vertiginous ascent to contemporary prominence only began in the late 1960s, less than 30 years ago.

Thus, wildlife scientists view ecology as "a relatively new science" (Theberge 1981: 283), sophisticated in its broad thematic scope and the intangibility of its objects of study. Even in their own discipline, wildlife scientists have been criticized for not yet replacing traditional research

¹ Although Ernst Haeckel coined the term "Oekologie" in the late 1860s, several decades passed before biologists recognized the discipline and label (Worster 1977).

concerns with an approach which is more fully ecological (Wagner 1989). From this viewpoint, it seems only reasonable to conclude that an ecological perspective lies well beyond the intellectual grasp of the "extremely unabstrakt, practical philosophy" of northern hunter-gatherers (Leopold and Darling 1953: 42). While the Western intellectual experience appears to support these contentions, our objective in this chapter is to demonstrate that empirical evidence indicates otherwise.

Our examination of the Inuit system of "animal" classification in Chapter 2 has already provided some indication that an ecological perspective forms an integral part of the Inuit world-view. As may be recalled, the symbolic opposition of land to sea divides the Inuit world into two great "habitats", and this opposition has profound repercussions upon the conceptual ordering of their biological milieu. Mammals are divided between those of the land and those of the sea. Fish are classified in one group if they are lake dwellers or anadromous, but in a separate group if they are marine. The large birds are either water-seekers or land-seekers. It seems clear that Inuktitut taxonomy strongly reinforces a conception of animals as associated with a particular natural milieu. But does an ecological perspective reach beyond animal categories which are well-established in tradition, to encompass contemporary

Inuit thought and conception of the natural world?

This chapter provides a response to this inquiry. Its subject is Inuit knowledge of the Hudson Bay Eider in its environment. Unlike previous chapters which have placed much emphasis upon Inuktitut terms as linguistic indicators of knowledge content and organization, this chapter relies primarily upon the analysis of descriptive accounts provided by Inuit. These accounts reveal that ecological thought, in the sense of an intellectual perspective whereby the natural world is conceived as a system of relations between organisms (including humans) and their environment, is well-established.

Before beginning the presentation and analysis of Inuit data, two brief clarifications need to be made concerning our approach. First, in its focus upon the ecological relations of a single species, the Hudson Bay Eider, our research has adopted what ecologists describe as an autecological approach. This is opposed to the synecological approach of systems ecology. The choice of the former is purely methodological, in that it was deemed necessary to focus upon a single species in order to reduce to a manageable size the volume of Inuit knowledge to be compiled and interpreted. The choice does not reflect a greater or lesser propensity of

Inuit to think in autecological or synecological terms, nor even that they make such a distinction.

Second, it is important to once more briefly clarify the distinction between the more empirical focus of the present research and the more ideological focus of other related and complementary analyses. As mentioned in Chapter 1, knowledge of the natural milieu is a complex and voluminous entity stretching from the highly symbolic or ideological at one extreme to the empirical at the other.

With regards to traditional knowledge of the natural world, several authors have selected the ideological dimensions of this knowledge set as their primary object of analysis. Feit (1973; 1986), for example, describes the "ethno-ecosystem" of the Waswanipi Cree, as a system of personal relations between human and non-human animals. This ideological point of view whereby non-human "persons" are conferred respect and are capable of reprisals should appropriate respect not be forthcoming, has also been described for the Yupik Eskimo of Alaska (Fienup-Riordon 1990). While these ideological perspectives on traditional knowledge provide significant insights into the Native world-view, they nonetheless represent only part of the complex corpus of information which is traditional knowledge of the natural milieu. As specified in Chapter 1, our primary interest lies at the

opposite extreme, embedded in the empirical dimensions of what Inuit know about their natural environment.

The presentation of Inuit ecological knowledge of the Hudson Bay Eider is divided into seven sections, the first six of which are organized as a temporal sequence from fall through winter to the following summer. The fall provides an apt starting point, for it is in this season that the eiders return to the coasts of the major islands and the mainland, after passing several weeks largely out of sight and out of sound in scattered remote locations where they moult their feathers. In contrast, from the fall period through to the following summer, eiders are highly visible members of the marine coastal environment until they once again retreat to their remote moulting areas to renew their plumage.

Thus in section 5.1, we focus upon Inuit accounts of Hudson Bay Eider activities in autumn, from the time they return from moulting areas until ice forms over the greater part of the ocean surface. In section 5.2, aspects of the winter ecology of Hudson Bay Eiders are examined. Section 5.3 deals with the period when eiders disperse from the wintering grounds, migrate to nesting areas and engage in courtship activities. The nesting period is discussed in section 5.4. Finally in section 5.5, we examine the activities of eiders in summer, when the adult females are occupied with raising

their broods and male eiders are going through their annual moult. Inuit ecological knowledge relating to the eider as predator and as prey, has no specific temporal focus, and is therefore dealt with separately in section 5.7.

Due to our reliance upon Inuit accounts of their ecological knowledge, as opposed to a focus upon Inuktitut terms, the following text is richly illustrated with direct citations from informants. The intent is to provide the reader with a text which remains faithful to the information received. All of the information in the following pages are from Inuit of southeastern Hudson Bay. Where other data are brought in to complement the Inuktitut data set, these sources are clearly indicated to avoid any confusion about data source. While the scientific literature on the Hudson Bay Eider is very limited, those biological data that are pertinent to the discussion are included. To avoid confusion, however, they are offset from the Inuktitut text as footnotes.

5.1 The Ecology of Hudson Bay Eiders in Autumn

When they're moulting they are where there are lots of waves and in autumn they come to the 'mainland' where there's more shelter.

KK., Sanikiluaq

In early autumn or ukiatsaq (a season approximately

corresponding with our months of September and October), the first Hudson Bay Eiders complete the moult of their flight feathers and regain the ability to fly. They leave the remote, offshore moulting areas to return to the shores of the larger islands and the mainland. During the summer moulting period the eiders have been very secretive and elusive, frequenting areas distant from the habitual hunting sites and travel routes of Inuit. Having been little seen and little hunted during this season, their arrival in the nearshore areas in the fall is viewed by Inuit as a "return" and a precursor to the important fall eider hunt which will soon be their major preoccupation. As one hunter expressed it, in the fall "they come to us to be eaten".

But the eider hunt does not begin immediately. The first arrivals are observed but not hunted. The timing of their arrival is associated with another biological event: the arrival of the first flocks of Snow Geese heading southward on migration.

when the Snow Geese are flying a little, then the Hudson Bay Eiders fly a little too.

CC., Sanikiluaq

According to Inuit, Hudson Bay Eider males, females and juveniles do not begin to fly at the same time. The adult drakes (amaulik) are the first to complete their moult, and

are first seen in the nearshore areas of the main islands and the mainland around late September or early October. The subadult males (amaulitsaq) and females (aknaviatsaq) regain the capacity of flight about the same time or slightly after the adult males. The adult females (aknaviak) with their fledglings (mitiaravinig) join the flocks of drakes and subadults somewhat later. Inuit associate the latter's arrival in the nearshore areas with the first snow falls (i.e. approximately late October/early November).² Hudson Bay Eiders of all ages and of either sex, mix together at this time and they will remain together until they split up again in the spring.

At this time (early December) all the mitiit are mixed and it's only in spring that they will split up.

LL., Sanikiluaq

The only exception to this generalization, occurs near hunting sites along the Nunavik (northern Quebec) mainland shore and is apparently a response to hunting. Near Kuujjuarapik, adult eiders tend to fly farther offshore than the young eiders. MM. from Kuujjuarapik who has hunted both

² On November 15, 1988, I accompanied hunters on an eider hunt in Eskimo Harbour, Belcher Islands. The ground was covered with a light layer of snow at that date. Several juveniles with notched tail feathers were harvested. Note that the approximate dates presented here correct those in Nakashima (1988) where the dates of first snowfalls were erroneously approximated as late November-early December.

along the Nunavik shore and in the Belcher Islands indicates that eiders at the latter location behave somewhat differently. In the Belcher Islands, the adults fly near the shore and mix with the young birds. They nevertheless remain alert to the presence of people.

(Near Kuujjuarapik)...The adults are usually farther down (offshore) since they're more alert than the younger ones. They're farther down, although some are near the shore ... In Sanikiluaq where the water's salty...the adults are nearer to the shore if they don't see people...they're mixed with the others if people aren't near...

MM., Kuujjuarapik

Hunters attribute this difference in behaviour of adults and young to the greater experience and intelligence of the former. In this regard, the eider drakes are conferred particular respect.

The adults don't go as near to the hunting areas as the younger ones. I think the amauliit (drakes) know which are the hunting areas.

NN. Sanikiluaq

Inuit describe wind direction and force as important determinants of eider activity and location on any particular day. Once the eider hunt begins in earnest in late fall or ukiaq (November-December), hunters pay close attention to wind conditions. When winds are strong, eiders collect together and fly actively along exposed windward shores.

Animals don't fly against the wind. So the mitiit get into larger numbers that way.

LL. Sanikiluaq

Stiff, onshore winds (sammiturtug) serve the hunter in several ways. First, they press the flocks of flying eiders close to the shore and within reach of the hunter's shotgun. Second, they insure that downed eiders drift shoreward, into the hunter's grasp. Aware of the relationship between wind condition and eider behaviour, Inuit on any particular day, observe the winds and choose their hunting locations according to their knowledge of where eiders will be flying.

Certain locations such as narrow straits between two bodies of water are reputed to be frequented by eiders, no matter what the wind direction. One such favourable hunting location is kataapik, a narrow passage in the northwest corner of Eskimo Harbour in the Belcher Islands. Another is Ridge Passage in the southeastern corner of Omarolluk Sound, Belcher Islands (Fig. 12).

Inuit also describe a diurnal cycle in eider activity which interacts with the effects of the wind. Thus a burst of flight activity is noted early in the morning, starting at first light and continuing until just after sunrise. A second, less pronounced flurry of flights characterizes the hours just before dark. The eider's crepuscular flight

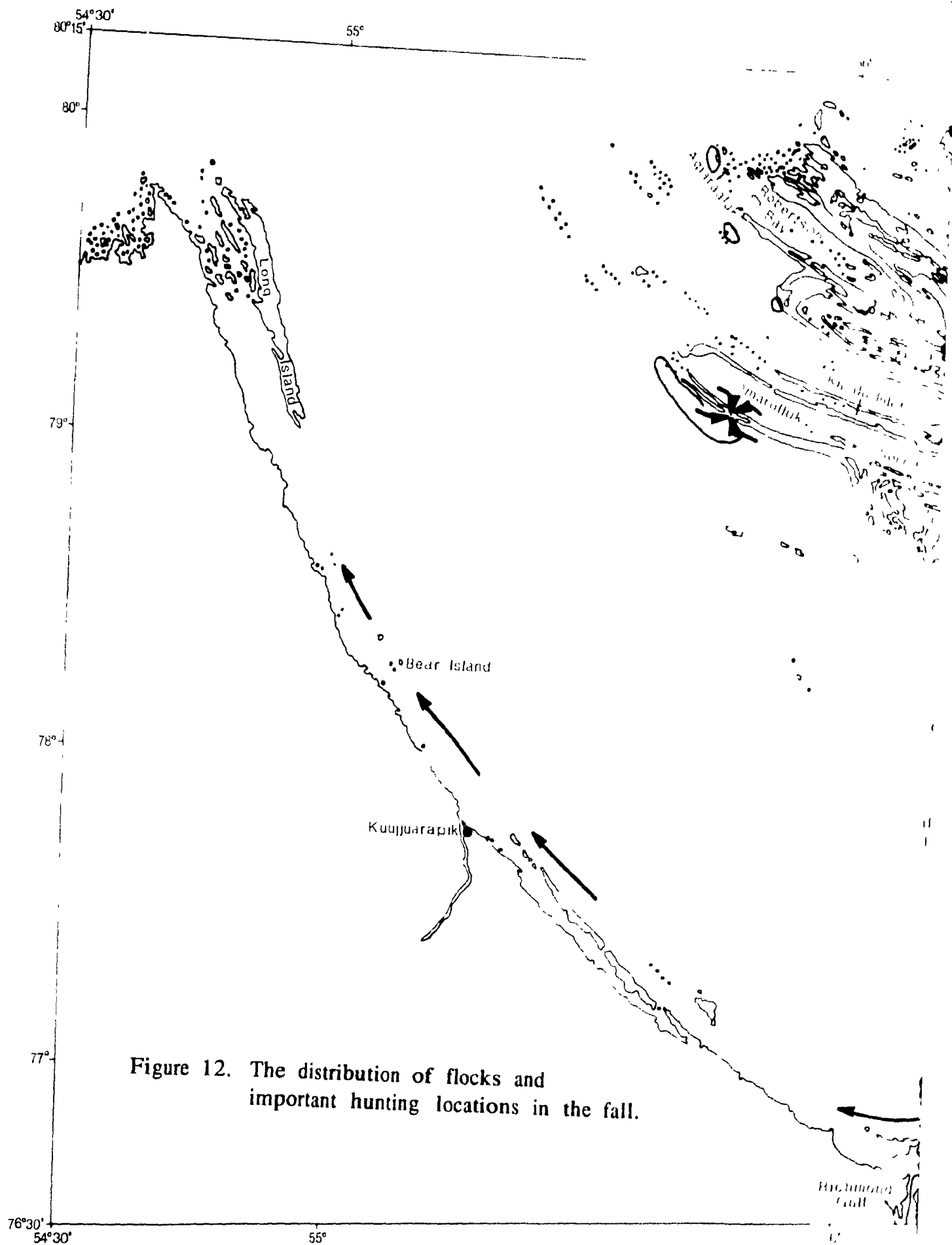
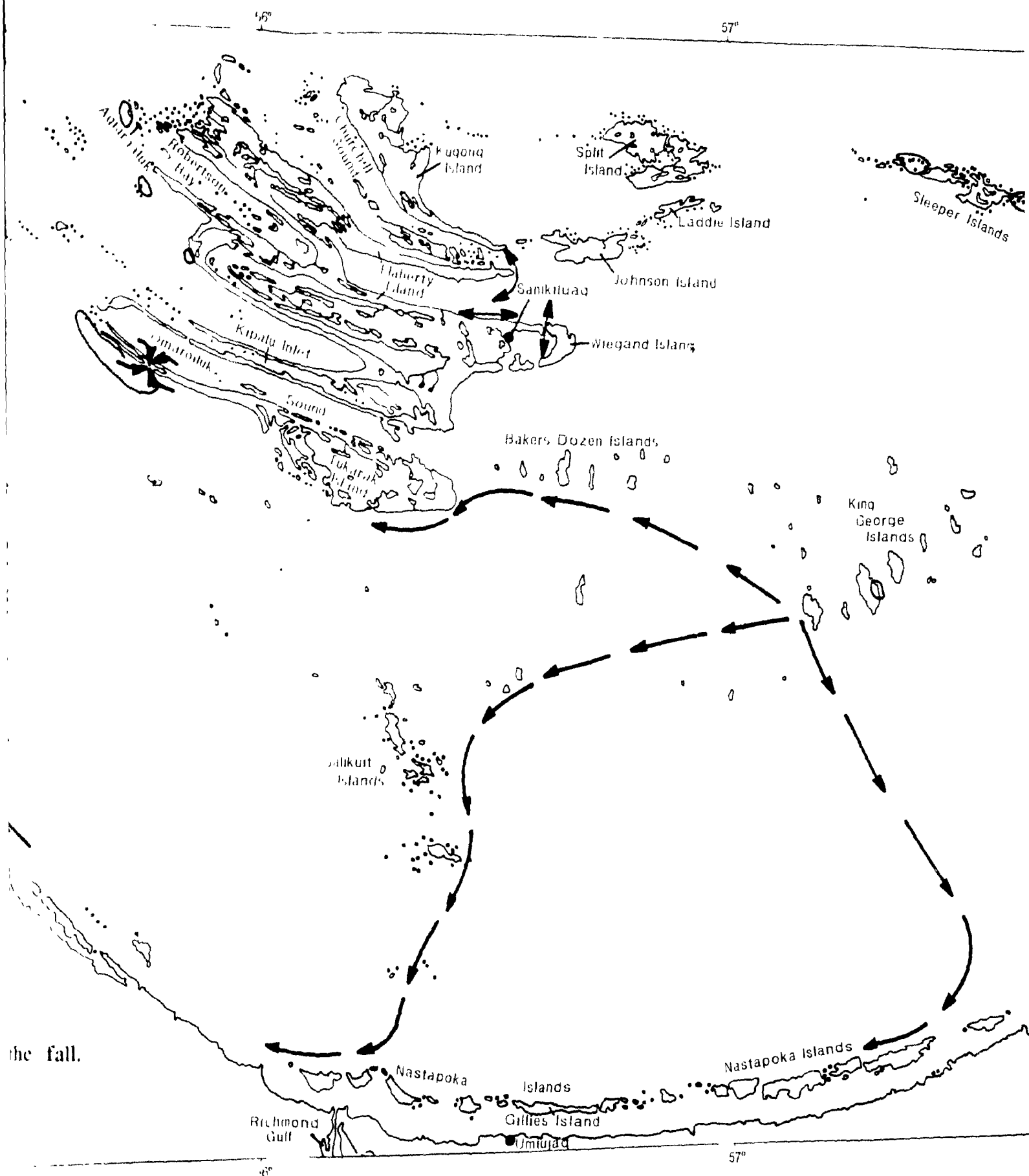


Figure 12. The distribution of flocks and important hunting locations in the fall.



the fall.

58°

59

59°30'
80°15'

Scale
1,000,000

10 0 10 20 30 m.
10 0 10 20 30 40 50 x m.

80°

N

79°

LEGEND

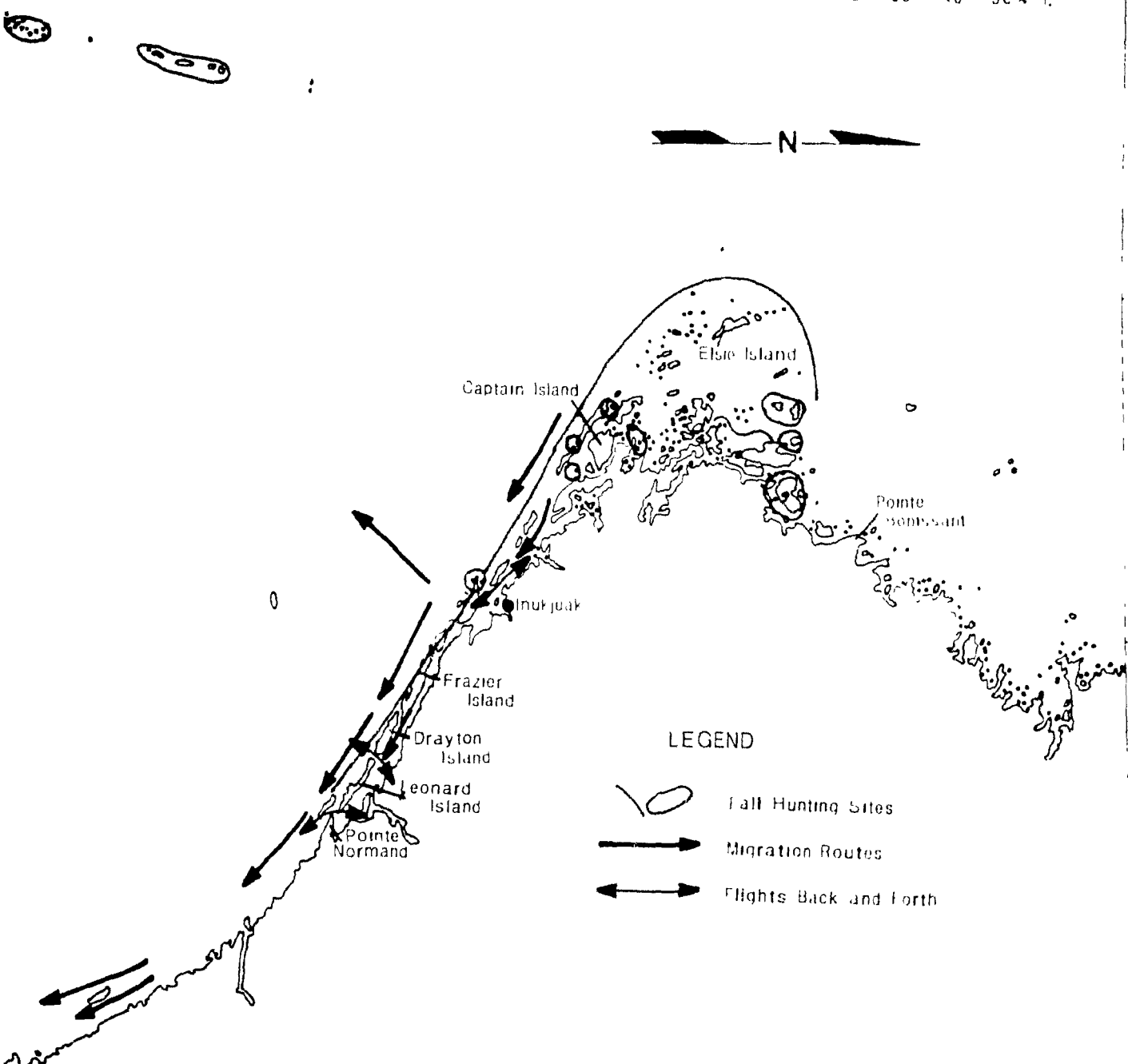
-  Fall Hunting Sites
-  Migration Routes
-  Flights Back and Forth

77°

76°30'

59°

58°



activity is accentuated on days when the winds are strong.

In the Belcher Islands archipelago, Inuit do not observe any pronounced directional movement of eider flocks, other than local displacements in response to daily wind conditions. In contrast, Inuit along the Quebec shoreline observe a pronounced southbound migration along the coast beginning in November. Flocks of drakes may be the first to leave, but most of the migrants are in mixed flocks consisting of eiders of all ages and both sexes. Figure 12 shows the fall migration path described by hunters of Inukjuak and Kuujjuarapik.

Although the migration commences before coastal ice formation, the final departure of eiders from the Quebec nearshore area is linked to the timing of freeze-up. Flocks are observed to linger in the area right up until the last open water freezes.

It's easy to tell when the water is freezing up because they are flying all over ... looking for open water ... They follow the water and that's how they usually disappear. In the fall they're all around here, but as the water freezes they just follow it.

MM., Kuujjuarapik

5.2 The Winter Ecology of Hudson Bay Eiders

5.2.1 Ice formation and Eider Distribution

According to Inuit accounts, the pursuit of open water is a major preoccupation of the Hudson Bay Eider in winter. As their only source of food is marine, eiders cannot survive except for brief periods of time without access to the sea. The pattern of eider distribution is thus closely linked to the expansion or contraction of ice sheets and the coming or going of wind or tide-driven ice floes. Inevitably, when Inuit discuss the winter distribution of eiders, sooner or later they talk about ice.

Whereas eiders are widely distributed in the autumn, the formation of sea ice leads to a gradual restriction in their spatial occurrence. In the Belcher Islands, for example, eiders frequent the archipelago's intricate series of bays and sounds throughout the fall. As fall passes into winter (mid-December), these inner waterways freeze and eider flocks are forced to the archipelago's perimeter. At this point in time, the main Belcher Islands and the North Belcher Islands are joined together by a single continuous ice sheet. Particularly large numbers of eiders gather along the ice edge of the southeastern perimeter of the Belcher Island archipelago, an area sheltered from the prevailing

northwesterly winds. Occasionally the winds shift to the south or southeast, in which case the eider flocks are said to drift downwind across the islands to the leeward ice edge on the northwest side. When the winds revert to the northwest, the eiders return to the southeastern ice edge.

Inuit along the Quebec coast make similar observations for the long, narrow sounds of the Nastapoka and Hopewell Islands. Eiders frequent these sheltered waters until they are displaced by the formation of sea ice which eventually joins these island chains to the adjacent mainland.

As the sea continues to freeze, eiders are forced to abandon increasingly large areas of southeastern Hudson Bay. In January, an ice sheet develops which encompasses the Salikuit Islands and extends from the east shore of the Belcher archipelago to the adjacent Quebec mainland (Fig. 13). This ice bridge which excludes eiders from the middle reaches of the Hudson Bay arc, then expands southward and northward. PP. of Sanikiluaq has observed flocks of eiders moving southward along the eastern perimeters of the Belcher Islands. Displaced by the expanding ice sheet, these eiders are described by PP. as migrants, heading towards the major wintering areas off the southwestern edge of the Belcher Islands.

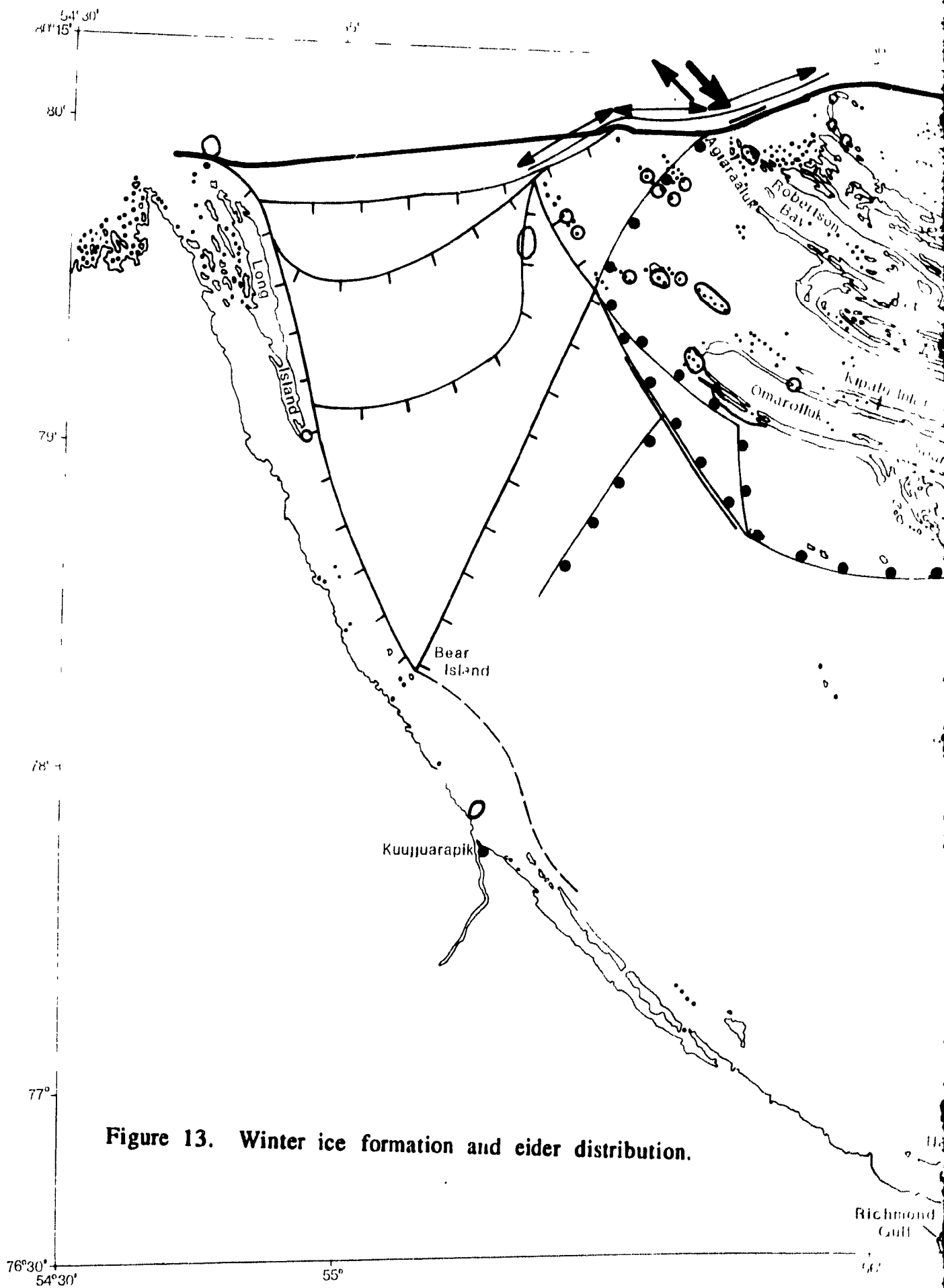
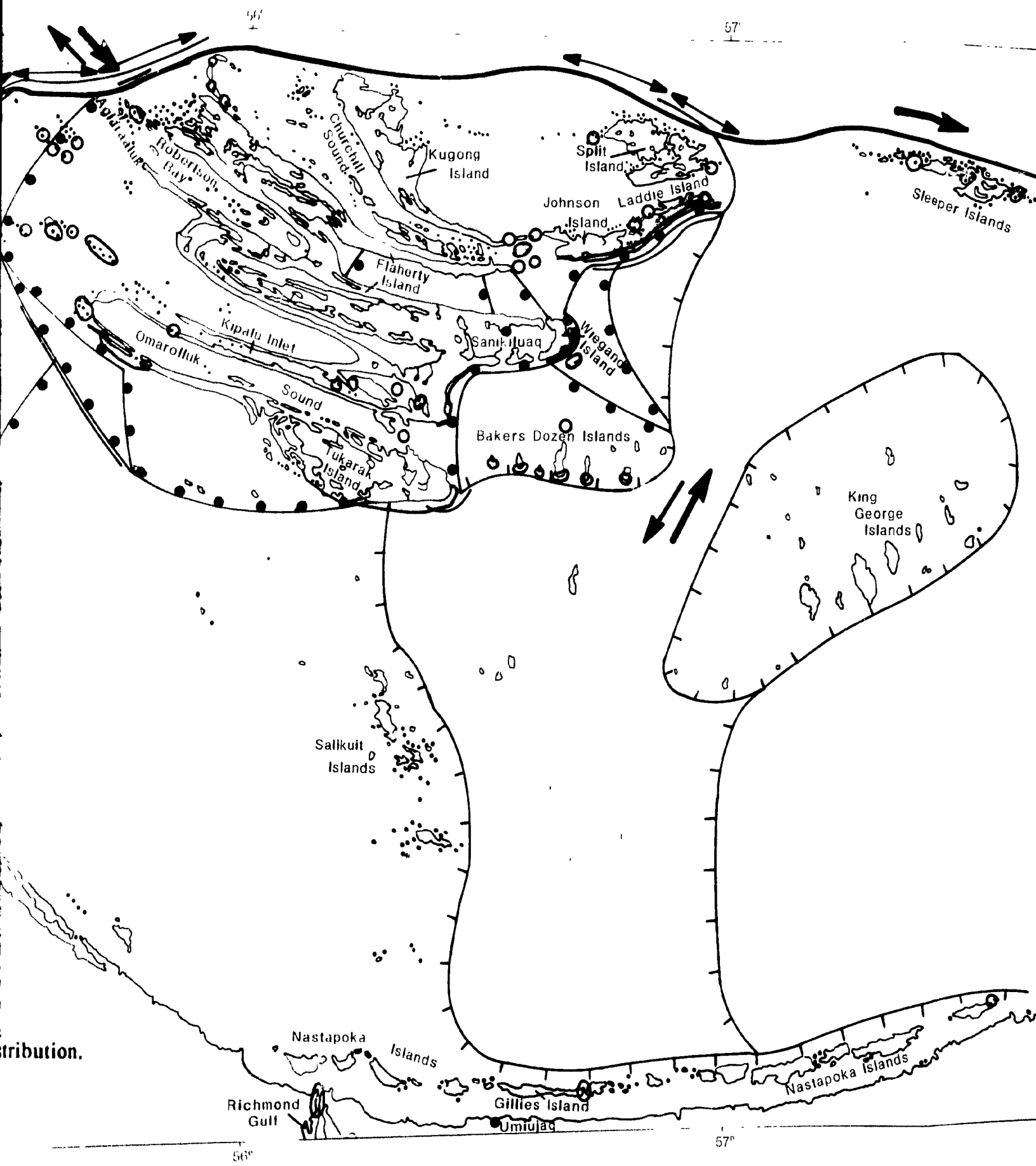
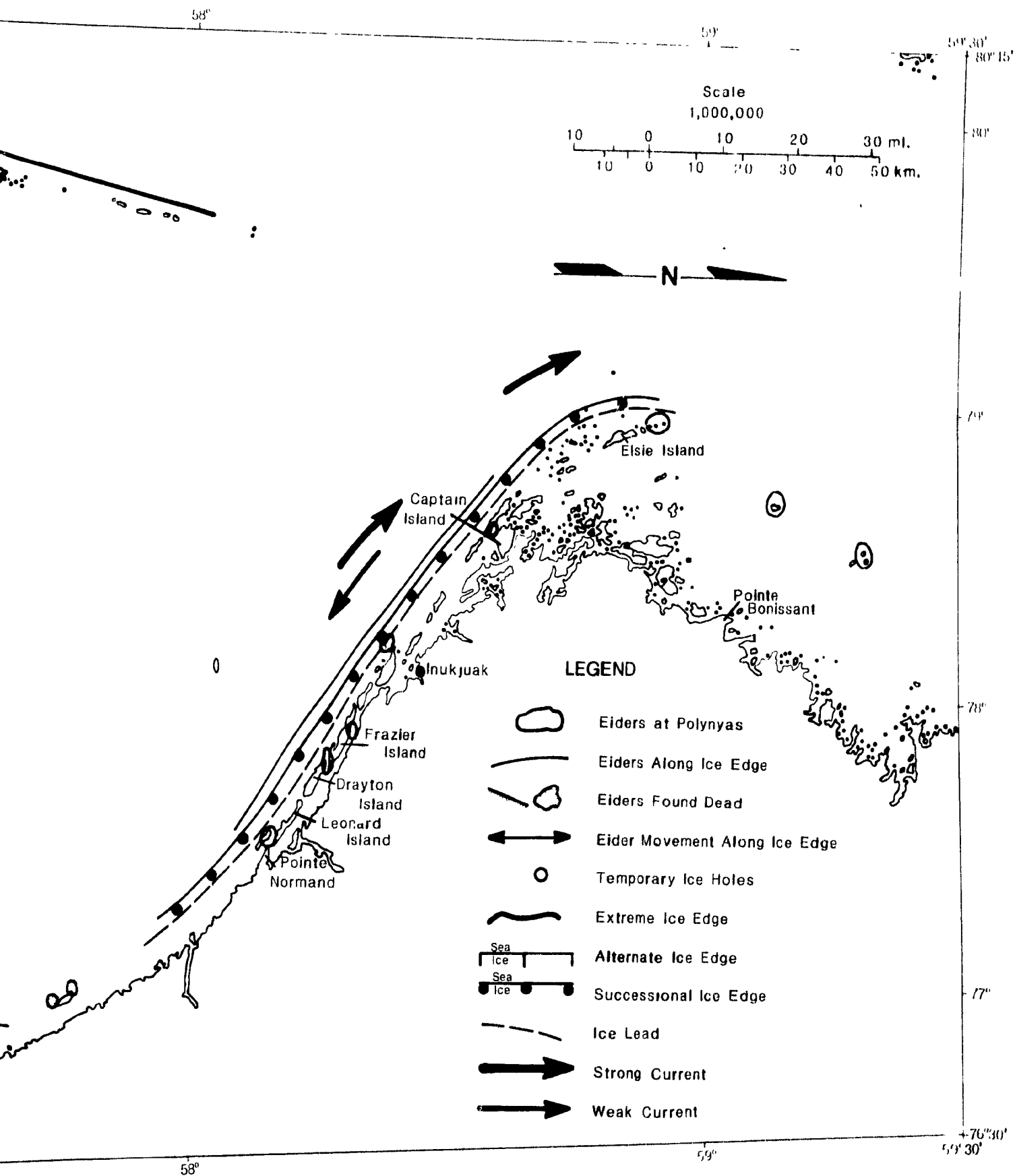


Figure 13. Winter ice formation and eider distribution.



tribution.



South of the Belcher Islands, the ocean surface freezes across to the Quebec mainland, creating an ice edge which runs roughly north-south from the south Belchers to the vicinity of Long Island, near the mouth of James Bay. The precise location of this ice edge is highly variable, a function of winter temperatures and the forces of wind and tide. Thus in the depths of a bitterly cold winter when tidal currents are weak and the weather calm, Inuit know that the ice edge will stretch northwards from the western extremity of Long Island. Virtually all of the southern and central portions of the Hudson Bay area will be frozen solid from the mainland to the western perimeter of the Belcher Islands.

In a mild winter, the ice edge south of the Belchers will retreat eastward to the eastern extremity of Long Island, and rough and unstable ice may continue as far east as Bear Island. This ice edge is frequented by numerous eiders, the greatest number occurring along the stretch of ice edge closest to the Belcher Islands.

In the northeastern portion of the Hudson Bay arc, the pattern of ice formation and eider occurrence is quite different. The ice in this area is characterized by Inuit as less stable due to powerful tidal currents. Unlike the

southern and eastern portions of the arc, the formation of a continuous ice sheet from the Belcher Islands to the mainland is an uncommon event in this northeastern sector. Nevertheless during very cold winters such extensive freezing may occur, joining the Sleeper and King George Islands to the adjacent coastlines of the Belcher Islands archipelago to the south and to the Quebec coastline to the northeast. This ice configuration rarely endures longer than one month.

The more common mid-winter ice configuration consists of masses of current-driven pack ice which shift back and forth between the landfast ice of the mainland shore and that encircling the major offshore archipelagos. As a result, in most winters, transient leads of open water occur throughout the area. Open water, however, is not in itself a sufficient condition for the occurrence of eiders. Few eiders, for example, winter in the vicinity of the King George Islands. Hunters who have sojourned in this small and remote archipelago report either no eiders at all or only a few along the east edge of the landfast ice and these disappear during the coldest winter weeks.

Along the northern and northeastern perimeters of the Belcher Islands, wintering eiders are more common. In mild years, this area never freezes and eiders remain throughout the winter. They are said to occur in particular abundance

northeast of Radar Island. It is not unusual, however, for the ocean surface to freeze a considerable distance offshore and to remain frozen for a period of several weeks. In these circumstances, locally occurring eiders are forced to move elsewhere. While most eiders abandon the area, some remain behind clustered together in shrinking areas of open water.

5.2.2. Nigajuk: eiders entrapped by the sea ice.

The Hudson Bay Eider endures the most extreme overwintering conditions of any of the Common Eider sub-species. That Inuit regularly encounter large groups of winter-killed eiders is one indication of the severe conditions encountered on ice-covered Hudson Bay.

Every few years, Inuit discover large numbers of dead eiders in the northeastern portion of the Belcher Islands. The locations of these groups of dead birds are very specific. They include the east shores of each of the Bakers Dozen Islands, the eastern shore of Tukarak Island, the northeastern shore of Wiegand Island and the northeastern coast of Flaherty Island between Gushie Point and Eskimo Harbour. Less frequently, dead eiders are also encountered along the east shores of Laddie and Johnson Islands. In the southeastern sector of the Belcher Islands, large numbers of

dead eiders have also been found southeast of Broomfield Island (Fig. 13).

The locations of these winter-killed eiders to the east, northeast, or southeast of land masses, is related to the local pattern of ice formation. Inuit explain that when the sea freezes in these regions, the very last areas of open water occur to the east of land. Whether this is a function of the prevailing northwesterly winds or tidal current patterns was not verified with Inuit. In any case, those eiders that have not already moved elsewhere, concentrate on these small areas of open water.

The vigorous activity of large numbers of eiders can keep these holes from freezing for a considerable length of time. But when tidal currents weaken, the wind calms and temperatures are extremely low, these openings soon shrink in area. The constant diving and rising of the birds, splashes water on the ice edge which rapidly freezes and gradually builds up an ice wall around the hole's perimeter.³ This wall eventually builds up to the point that the eiders, which must taxi to take flight, become trapped. Hunters describe how at this stage only the heads of the birds are visible

³ Observations by Freeman (1968: 276) on ice formation around holes kept open by entrapped belugas in Jones Sound, NWT, correspond with descriptions reported here for eiders. He writes: "The edges had been built up by spray and waves generated by movement of the whales in the opening".

above the encircling rim of ice. Inuit in the Belcher Islands refer to these trapped eiders by a special name: nigajuk.⁴

When they (eiders) are nigajuk and when there are lots, then they can't fly. They just stay there even when they are being approached by a person. You are even able to hear the sounds they are making when they are moving around ... from splashing they have made some kind of a wall.

When there's no (other) open water and you see a lot of heads sticking out, that's when they are nigajuk.

AA., Sanikiluaq

As the holes shrink further, the ice wall may continue to build up due to the spray generated by the eiders' frenzied activity. Eventually, a partial dome may be created over the hole.⁵ The high winds and drifting snow of blizzards were also described by Inuit as contributing to ice dome formation.

At this point, if the eiders in the hole are numerous, the area of the opening has shrunk so much that some eiders drown, unable to regain the surface upon diving due to the crush of bodies. If bitter cold temperatures continue, the hole may freeze completely, locking the bodies of the dead

⁴ Belcher Island Inuit also apply this same term to beluga whales trapped at isolated breathing holes by long stretches of unbroken ice. According to Schneider (1985), the term nigajuk refers to a snare for birds or mice.

⁵ Freeman (1968) describes similar doming over breathing holes frequented by trapped belugas in Jones Sound, NWT.

eiders into an icy grave.

There would be a small open water, and the eiders would stay there because it's the only water they know there is. So, they would stay there, depend on that small hole and they would dive under to eat from the bottom (of the sea). But there were too many eiders and it would be so cold that all the eiders would be sitting on that hole. As the others would have trouble going up to the surface, they would drown. And other times they would lose the hole and they would drown. The only time you can see those eiders is in the spring when the ice starts to melt. They're all piled up on top of each other, they froze to death like that.

KK., Sanikiluaq

As KK. describes, it is usually only in the spring that the melting ice yields up the previous winter's dead. Often Inuit are led to these natural caches of eider meat by Ravens and foxes which have been attracted to this easy source of food.

The great majority of these winter-killed eiders are juveniles (mitiaraviniq), experiencing their first winter. Inuit explain that these young and inexperienced birds do not know that they must abandon the eastern Belcher Island region and seek out the more dependable open water areas along the extreme outer edge of the offshore islands. Rarely, adult Hudson Bay Eiders may also be found dead, as well as the occasional Thick-billed Murre, Black Guillemot, or Oldsquaw.

These winter die-offs do not occur every year. Inuit find

these large groups of frozen eiders only every few years, when the winter is cold enough to freeze all of the open water in the eastern sector of the Belcher Islands.

The nigajuk (trapped eiders) are usually starved. A lot of ducks usually die since they can't get out of the ice ... It happens when the water freezes up. When there's open water throughout the winter, they never die. But when it freezes, they just die.

BB., Sanikiluaq

5.2.3 Eiders Wintering along the Outermost Lead.

Within the southeastern Hudson Bay region, the distribution of suitable over-wintering habitat for Hudson Bay Eiders is severely limited. As we have seen, the freezing of the sea between the Quebec mainland and the eastern and southern perimeters of the Belcher Islands completely excludes eiders from this area. To the northeast of the Belchers, in the vicinity of the King George Islands, a continuous ice cover may develop in very cold winters, but even in a normal year the area is ice-choked and even the few eiders that may be seen abandon the area during the coldest period. The eastern portion of the Belcher Islands archipelago is somewhat more hospitable in mild years, but the mortality of large groups of juvenile eiders every few years attests to the unreliability of this area for over-wintering.

Inuit observations indicate only two reliable over-

wintering habitats for Hudson Bay Eiders, the outermost lead (aulanik) and polynyas within the bounds of the landfast ice (ikirasak). In both of these areas, open water is, for the most part, continuously available throughout the entire winter due to the action of tidal currents and/or wind. The ecology of Hudson Bay Eiders over-wintering in each of these two habitats will be described below. We begin with those utilizing the outermost lead.

The continuous ice sheet which covers the great majority of the ocean surface within the Hudson Bay area stretches from the Quebec mainland eastward to the Belcher Islands and abruptly ends along the archipelago's western edge. Beyond this outermost edge of landfast ice are the open waters of central Hudson Bay. In winter, the surface of the Bay is covered with pack ice which according to the whims of tide and wind may shift back and forth, at times pressing up tight against the landfast ice edge and at other times retreating to expose a long lead of open water. This lead whose eastern perimeter is the landfast ice and whose western limit is defined by the pack ice covering the surface of Hudson Bay, is the focus of our interest. It will be referred to as the outermost lead.

While the position of the pack is continually changing, the

limit of the landfast ice in any given year is relatively stable. The outermost ice edge runs along the western perimeter of both the Belcher and North Belcher Islands. To the north, in a very cold year it continues uninterrupted along the western perimeter of the Sleeper Islands. Due to the strength of tidal currents, however, solid ice cover rarely persists between the Sleeper and North Belcher Islands, and in most years the ice edge is interrupted in this area by an ice-choked passage (Fig. 13).

To the south, the outermost ice edge extends to the area of Long Island, just east of the mouth of James Bay. The extent and location of the edge is further east in mild winters and further west, when it is very cold.

The great majority of Hudson Bay Eiders wintering in southeastern Hudson Bay, frequent the waters of this outermost lead. Eiders are said to occur all along its length. Inuit note, however, that stretches of ice edge far from land, where the water is deep, are usually devoid of birds.

Every edge that can be reached usually has eiders ... I've never seen empty open water because at least one or two are always there. As long as the land is near there's always eiders. But the areas far from land don't have any.

HH., Sanikiluaq

(They're) near the land and fewer on the main open water. Maybe they're usually trying to be where the water's not

too deep.

OO., Sanikiluaq

Inuit note particularly impressive concentrations in three general locations along the outermost lead: near the Sleeper Islands; near Split Island (North Belcher Islands); and southwest of Flaherty Island.

When QQ. and RR. of Inukjuak over-wintered on the Sleeper Islands, they recall seeing impressive numbers of Hudson Bay Eiders. The flocks were so immense, that QQ. commented upon how he once mistook a flock for a low cloud.

I wasn't thinking of eiders in the morning. I got out of my snowhouse and got ready to trap for fox. It was snowing, foggy and cloudy. I was thinking that a cloud was touching the ground, but they were eider ducks. Lots of them.

QQ., Inukjuak

SS. of Sanikiluaq, likened the wintering flocks that he observed near Split Island to a cloud of mosquitos.

At this time of the year, there are a lot of ducks along the edge, say, west of Split Island. They're like a cloud of mosquitos, they are so many.

SS., Sanikiluaq

HH. of Sanikiluaq recognizes that, in the winter, distinct northern and southern groups of Hudson Bay Eiders frequent the outermost lead. The two groups are roughly equivalent in

size. The northern eiders occupy the ice edge as far south as the southwest end of Kugong Island. The southern eiders use the ice edge south from approximately the middle of the mouth of Churchill Sound. HH. distinguishes between these two groups on a geographical basis. According to his observations, the northern and southern eiders restrict their range to their respective areas along the outermost lead.

Hunters often commented on the eiders' incessant movements. Their never-ending quest for areas of open water which appear and disappear in response to shifting wind, tide and bitterly cold temperatures, keeps them constantly on the move.

They are not always in one area. They are always moving around ... They travel looking for water, open water.

SS., Sanikiluaq

Hunters interpret the movements of the eider flocks as a response to the changing disposition of the ice.

...the same group doesn't stay in one area all the time because they go where there's water ... even though you can't reach the open water you can usually see it from here and you can usually see them (the eiders) flying away when (the lead) is closing.

HH., Sanikiluaq

These constant displacements contrast sharply with the sedentary habits of eiders which over-winter on polynyas. Cognizant of the distinctive behavioral patterns of the two

groups, AA. of Sanikiluaq distinguishes the eiders of the outer lead by referring to them by the name of "travellers".

In the evening, the Hudson Bay Eiders which frequent the outermost lead, gather at certain locations in order to pass the night grouped together on the edge of the landfast ice. These concentrated groups of eiders were excellent prey for the hunter because many could be harvested with but a few shots from a shotgun. The difficult task was to know where along this extensive ice edge the eiders would spend the night. To determine this, the hunters would locate the eiders along the lead during the daylight hours when the latter were still active. This was done by observing gulls, for gulls are often associated with eiders in the winter (see section 5.6.3).

We used to walk here to the edge. We couldn't go by dog team because the ice was too rough. Since we were able to see gulls and gulls are usually seen where the ducks are, we used to try to go to them. And we used to see a lot of ducks on the moving ice.

CC., Sanikiluaq

Having located a large flock of eiders, the hunters would then search the ice edge for the flock's habitual overnight resting site. Here they would hide and wait.

There's big water here and we used to come here. . . when it's getting darker. We'd check the edge and notice that they (the eiders) have been there. . . If the edge is hard all

over that means that they have been there and so we just waited for them.

AA., Sanikiluaq

The evening arrival of Hudson Bay Eiders at their resting site on the ice edge is surprisingly orderly. The first to arrive are the juveniles, born this past summer. They land in the water near the ice edge. The second group of eiders to arrive are the adult females, recognized by their distinct vocalizations. The arrival of the females, stirs juveniles to begin to move from the water up onto the ice edge. Finally the adult drakes arise, and this stimulates the females to follow the juveniles onto the ice edge, where they will eventually be joined by the drakes.

We went to the edge during the evening and there were lots of water and it was low tide. Pieces of ice came when there was still daylight and the eiders came shortly after. But those that came were all young ones from last summer ... and the females usually say "gaug" and when they did the young ones started landing on top of the ice so that the females could land here ... When the females said "gaug, gaug" the younger ones started flying and splashing a lot ... and those younger ones were on the way to the ice ... and so the drakes were heard and the females did the same thing and went on top of the ice because they didn't want to be in the way.

AA., Sanikiluaq

5.2.4. Eiders on Polynyas within the Landfast Ice.

The majority of Hudson Bay Eiders winter along the outermost ice edge. Small but significant numbers of eiders may nonetheless be encountered at specific locations with

the bounds of the landfast ice where strong currents maintain open water throughout the winter. These small polynyas or ikirasak occur at numerous locations in southeastern Hudson Bay, but they are not equally utilized by eiders.

In the nearshore zone of the Quebec mainland few such sites exist and almost all freeze-over for at least brief periods of time during cold winters. One such opening occurs east of the easternmost tip of Long Island. This hole does not remain open during extremely cold winters.

In the experience of Belcher Island Inuit, the eiders that winter on the polynyas differ in several respects from those over-wintering along the outermost lead. As mentioned above, Inuit recognize a difference in behaviour. The eiders of the outer lead are "travellers", incessantly on the move in search of open water along the ice edge. In contrast, the polynya eiders are sedentary, passing much or all of the winter within the restricted limits of the one of a few neighbouring ice holes that they frequent.

Inuit also note a difference in age. Most of the polynya eiders are said to be young. The adult birds are said to prefer the extensive open waters of the outermost lead, where strong currents and winds assure them access to the sea and

thus to food.

They (the polynyas) always have eiders but not that many and always the same group ... In mid-winter these open waters are used only by the younger ones. The adults don't stay in them.

HH., Sanikiluaq

I think there are a lot more young ones than adults. I think the adults are mostly staying where they are really safe, I guess.

TT., Sanikiluaq

Furthermore, physical condition also differs between the eiders of these two habitats, the polynya eiders being "poorer" (i.e. thinner) and the ice-edge eiders fat.

I would say the one that's already here (on the polynya), I think they stay here all the time. But most of the time they will be a lot poorer than the ... one coming from down there (the ice edge) you know, the one that's coming from down there, they'll be a lot fatter than those who stay around here.

TT., Sanikiluaq

Finally, AA. of Sanikiluaq identifies a difference in diet between the two eider groups. This diet difference, he relates to habitat. The lead eiders feed off the outer ice edge where the water is deep and access to the bottom difficult. According to AA., they must therefore rely upon "seal food", that is to say small fish such as capelin. The diet of the polynya eiders is very different. At their openings within the landfast ice, access to benthic organisms is simple, and as a result they eat blue mussels and sea

urchins. AA. not only links diet to habitat, but also anatomical condition to diet. Due to the tough exoskeletons of their benthic prey, the gizzards of the polynya eiders are large. Conversely the gizzards of the ice-edge eiders are soft "like seagulls", a result of their fish diet.

The only place where they (the ice-edge eiders) think there's water is where the open water is big and where there are guliligaq (probably capelin). Those that stay in small open waters (polynyas) eat those that are on the bottom of the sea, like uviluit (mussels) and miqulit (sea urchins). Those here usually have bigger stomachs (gizzards) since they eat something harder. Those that stay on the big open waters have a different size stomach, theirs are smaller. Those guliligaq are soft, so those ducks have stomachs like seagulls which are soft all over.

AA., Sanikiluaq

5.2.5 When Pack Ice Closes the Outer Lead.

Under certain conditions of wind and tide, the shifting mass of pack ice on central Hudson Bay is pressed forcefully up against the edge of the landfast ice. When this occurs, the lead of open water between the pack and landfast ice is closed. Hunters disagree as to whether wind or tidal current is the determining factor. Certainly tidal amplitude and cycle influence pack ice movement. Current directions off the western perimeter of the Belcher Islands follow a roughly northeast-southwest axis. The current to the northeast is described as strong, while that to the southwest is said to be weak. Under certain conditions the strong northeast

current brings the pack ice against the landfast ice edge, closing the open lead.

Most hunters, however, describe wind direction as the key factor controlling pack ice movement. South or southwest winds are said to close the outer lead. Hudson Bay Eiders respond in a most dramatic fashion to the disappearance of open water off the landfast ice edge. During the daylight hours, little change is evident as the eiders continue to frequent the ice edge, seeking out small cracks and holes in the ice pack by which they can gain access to the sea. At sunset, however, eiders which generally spend the night along the edge of the outermost lead, flock in massive numbers to the polynyas near Agiaraaluk, an island off the southwest corner of Flaherty Island (Fig. 13).

The evening arrival of these huge flocks of Hudson Bay Eiders is an impressive, almost eerie event. From their vantage point alongside the Agiaraaluk polynyas, hunters describe the unusual panoply of sights and sounds which forewarn them of the approach of thunderous flocks of eiders from the distant outer ice edge. When the flocks take wing, all one sees is a kind of "smoke" over the remote waters. If the sky is clear, the distant eider flocks will turn it red from their numbers. Initially, one hears a faint rumbling sound generated by their flight. But as they approach, when

they pass by the south edge of Churchill Sound, one begins to hear the vocalizations of these innumerable eiders, and "the world seems unusual from the noise".

When there's some kind of smoke over the water we used to listen because the only time it can do that is when the eiders are starting to fly. When that happens you can hear the rumbling noise and then you can hear the noise they make even before you can see them

AA., Sanikiluaq

They used to sound like thunder when they went to the place where they'll spend the night.

UU., Kuujjuarapik

I used to wait here at this open water (the Agiaraaluk polynya), waiting for the current to switch since there are no ducks when it's going that way ... When the currents are coming this way, the area was blocked by ice ... Even when the weather's really cold, we never used to bother using mittens when the ducks are coming ... I said that the sky was red. It used to be red because there were so many of them. I'm telling the truth.

And they were coming. And when the sky's clear you could see red sky, but still can't hear them. . . And when they reach Quatjuit (the south edge of the mouth of Churchill), then the world seems unusual from the noise they make. . . Then you just lay flat on your stomach, when they were coming in.

CC., Sanikiluaq

The eiders are so numerous that their flocks are said to block out the sun.

The eiders used to come here when the ice comes in and we used to see lots. Even if the sun is still high, they could block it and it can't be seen for quite a while ...

AA., Sanikiluaq

Their bodies completely covered the surface of the polynya and many are forced to sit on the ice edge. They are so tightly packed that if they are scared into flight, neighbouring birds collide and many break or twist their wings while struggling to take-off.

Inuit say that when the pack ice closes the outer lead, the eiders go to the polynyas at night because they are afraid of the moving ice along the landfast ice edge.

They go anywhere that there's open water to spend the night, even when they spend the day here (at the ice edge). Maybe it's because they try to think about the ice when they have to spend the night

UU., Kuujjuarapik

We used to say that they want to sleep without something to bother them, like where nothing's moving. It's really good when they go here (to the Agiaraaluk polynya) to spend the night ...

AA., Sanikiluaq

Early in the morning the eiders leave the polynyas to go back out to the edge of the landfast ice, leaving the resident polynya eiders behind. If the ice edge remains closed, and if the eiders are not disturbed by hunters, then the ice-edge eiders may stay at Agiaraaluk for a period of a few days.

The hunters know that the eiders use the Agiaraaluk polynyas in numbers only when the outer lead is closed.

Consequently they use their knowledge of wind direction and ice movement to decide when it is worthwhile to go to Agiaraaluk to hunt. If the winds were south or southwest, they knew that the eider hunt at the polynyas could be a good one. When the outer lead is blocked with pack ice, even if the eiders are scared away from the polynyas, they eventually come back.

If the wind isn't blowing from the south, but from the north or the east, the ice is quite far from the land. The only time it would come is if it's from the south and then we used to go to these islands (Agiaraaluk).

KK., Sanikiluaq

If the wind was coming from the south or southwest, they'd go hunting here. But if the wind was coming from the north or directly from the east, don't bother going. . . even if they (the eiders) are already in these (the Agiaraaluk polynyas), as soon as you reached the area here, they'll fly away and they are not coming back. But if the wind was coming from here (south or southwest) you could hear them turning. . back and forth and then they'd suddenly come back.

TT., Sanikiluaq

When the outer lead is closed, Hudson Bay Eiders are not only observed in greater numbers at the Agiaraaluk polynyas. They may be encountered almost anywhere.

We don't even want to be asked where (the eiders were) because we used to go shopping (trading to Kuujjuarapik) and we used to see a lot of ducks in Tasitjuit (lakes) and all over when the big ice floe is here.

BB., Sanikiluaq

In fact even when Inuit were far from the outer ice edge,

they knew that the outer lead was closed because they encountered eiders at locations distant from open water.

Since the people know the ducks, they know that there's no open water anymore because they can see ducks everywhere and they usually see frozen dead ducks.

BB., Sanikiluaq

The eiders fly everywhere in search of open water. They are so desperate that Inuit have observed eiders landing among their dogs, mistakenly believing that these dark spots on the ice were areas of open water. The error of course is fatal for the ducks.⁶

When it is mid-winter, they're not afraid and they used to land right next to the dogs, thinking that they're open water. Our dogs used to eat the ducks that landed next to them.

CC., Sanikiluaq

In addition to those eiders that occupy the polynyas when the outer lead is closed, large numbers of eiders simply spend the night on the landfast ice, remote from any open water.

Even when there's no water they spend the night on the ice.

BB., Sanikiluaq

⁶ Along the coast of Newfoundland, eider hunters spread black garbage bags on the ice surface to attract eiders who, believing these dark areas to be open water, become easy prey for the hunters' guns (I. Goudie pers. comm.).

There used to be lots of ducks (settled on the ice) and they used to be okay when they saw people and would fly away.

CC., Sanikiluaq

After a night on the ice, not all of these eiders flew away the next morning. In a cold weather, several hundred ducks would cluster together into living mounds in order to keep warm. Those individuals that landed first and formed the bottom of the pile, often were suffocated and crushed. When the flock flew away in the morning, hunters would find these dead individuals with their belly or breast feathers frozen into the ice. This death was not reserved for the younger or inexperienced. Hunters would find dead adult drakes and females as well as young.

5.3 Spring Dispersal and Courtship

5.3.1 Dispersal from the Wintering Grounds: the offshore situation

With the approach of spring, Sanikiluaq hunters notice a change in the behaviour and physical condition of the eiders frequenting the ice edge. As the bitter cold days of mid-winter are past, the ocean surface no longer freezes and eiders are not forced to continually move about seeking out areas of open water. Instead they remain at one location and

put on fat.

Since the ice isn't going to freeze more and the edge will be mainly in the same area, the eiders will be staying at the same place more and will be getting fatter now (early April).

HH., Sanikiluaq

As winter progresses into spring, snow and ice begin to melt, and eiders fly in all directions over the largely frozen landscape. To the hunters, the eiders appear to actively seek out the first areas of open water, for even before new holes appear in the landfast ice, they are seen flying everywhere. VV. remarked that unlike the summer, when eiders never fly over stretches of mainland, in the spring, this is a common sight.

Very few sites within the Belcher Islands archipelago remain ice-free all winter. As the weather becomes milder, however, new open water areas appear. The first holes are in those areas where current are strong. These were the last areas to freeze the previous winter. Eiders quickly occupy these new sites.

One of these areas of early open water is between Kugong and Johnson Islands, west of the present day community of Sanikiluaq. Open waters appear off the north tip of Howard Point and in the numerous passages between Johnson Island and Lillico Point. Eiders arrive at these sites as soon as

they are open. They are important spring hunting sites for Inuit seeking Hudson Bay Eider and Canada Goose. Soon after, several areas of open water appear among the islands at the north end of Churchill Sound (Fig.14). Eiders quickly shift from the former sites to these newly available ones.

As the melt continues, areas of open water are created along the shorelines as a result of spring run-off or the rising tide. Eiders also take advantage of these sites.

It usually looks as if they know where to go when it's melting. When the river is running on the shore they usually stay there or even when there's water on the shore from the high tide, they seem to know about it. This can be seen when you hunt when the snow is melting.

VV., Sanikiluaq

During this time, the eiders continue to frequent the areas in the landfast ice which were open all winter. Agiaraaluk, the most important over-wintering polynya in the Belcher Islands, is a major spring hunting area for Hudson Bay Eiders and Canada Geese. Large numbers of eiders also continue to frequent the edge of the landfast ice, following it shoreward as it gradually erodes during the lengthening days of spring.

By mid-May, in a typical year, the ice edge to the north, west and south of the Belcher Islands closely follows the outer contour of the archipelago (Fig.14). Within the

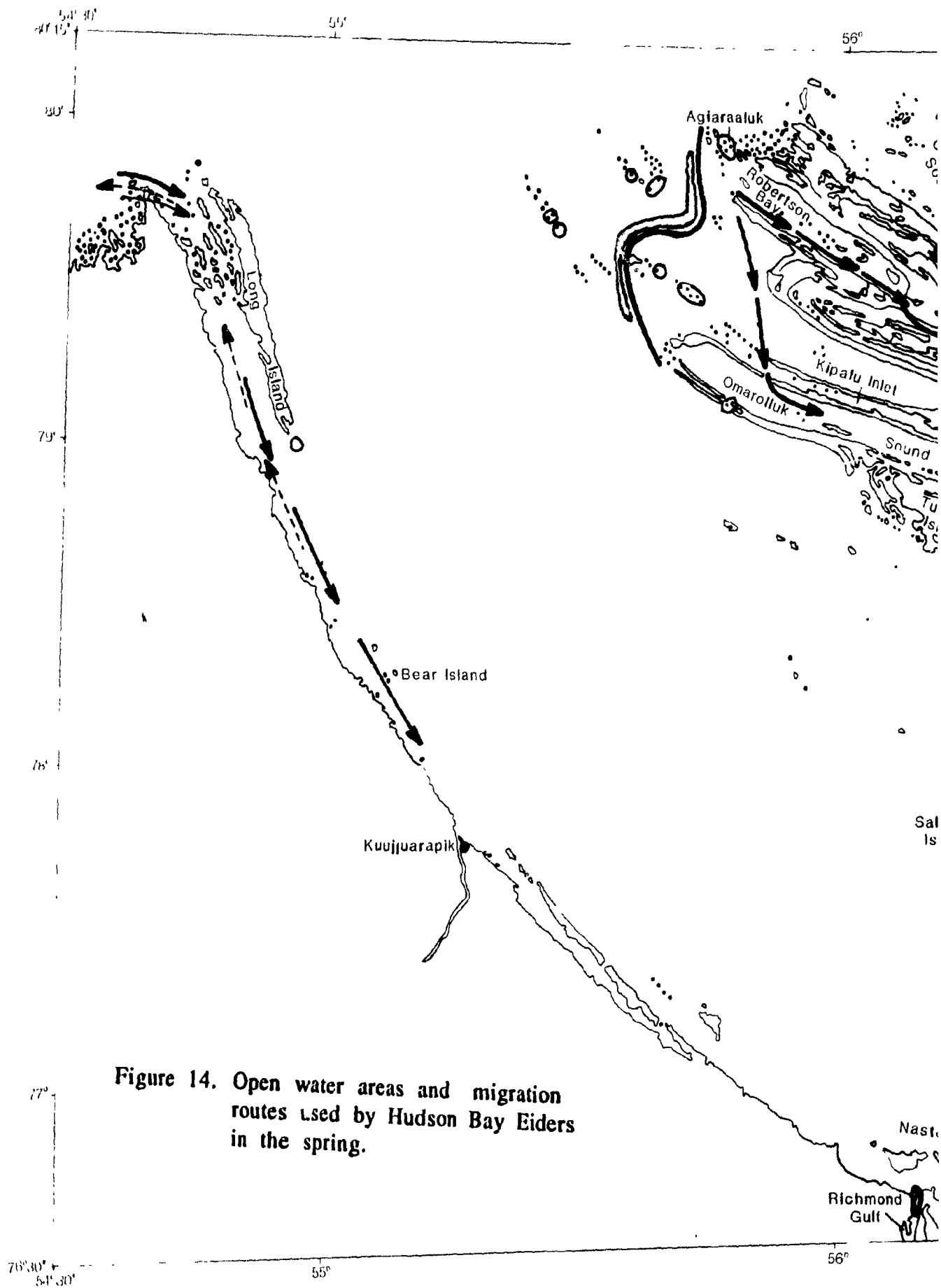
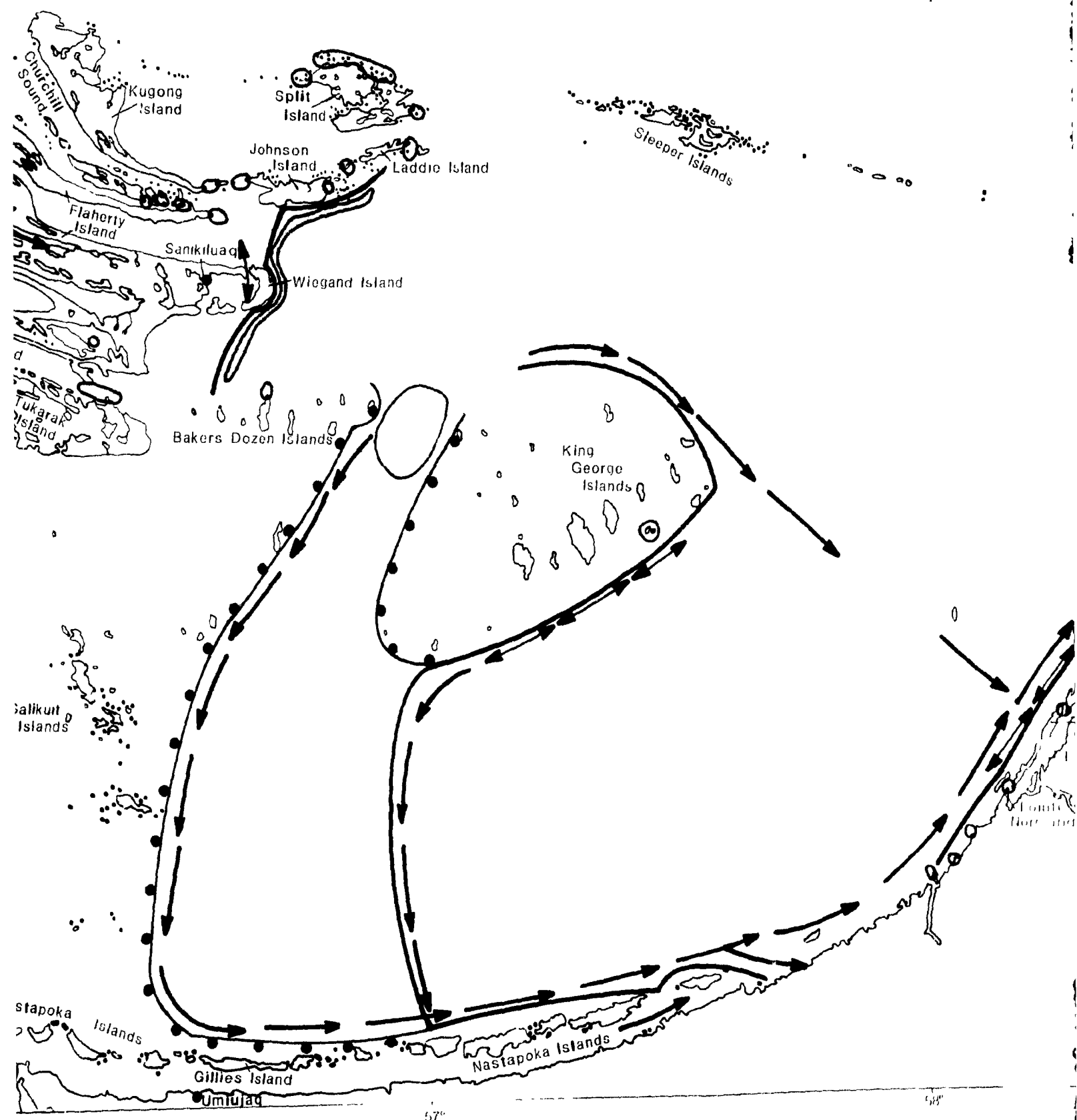
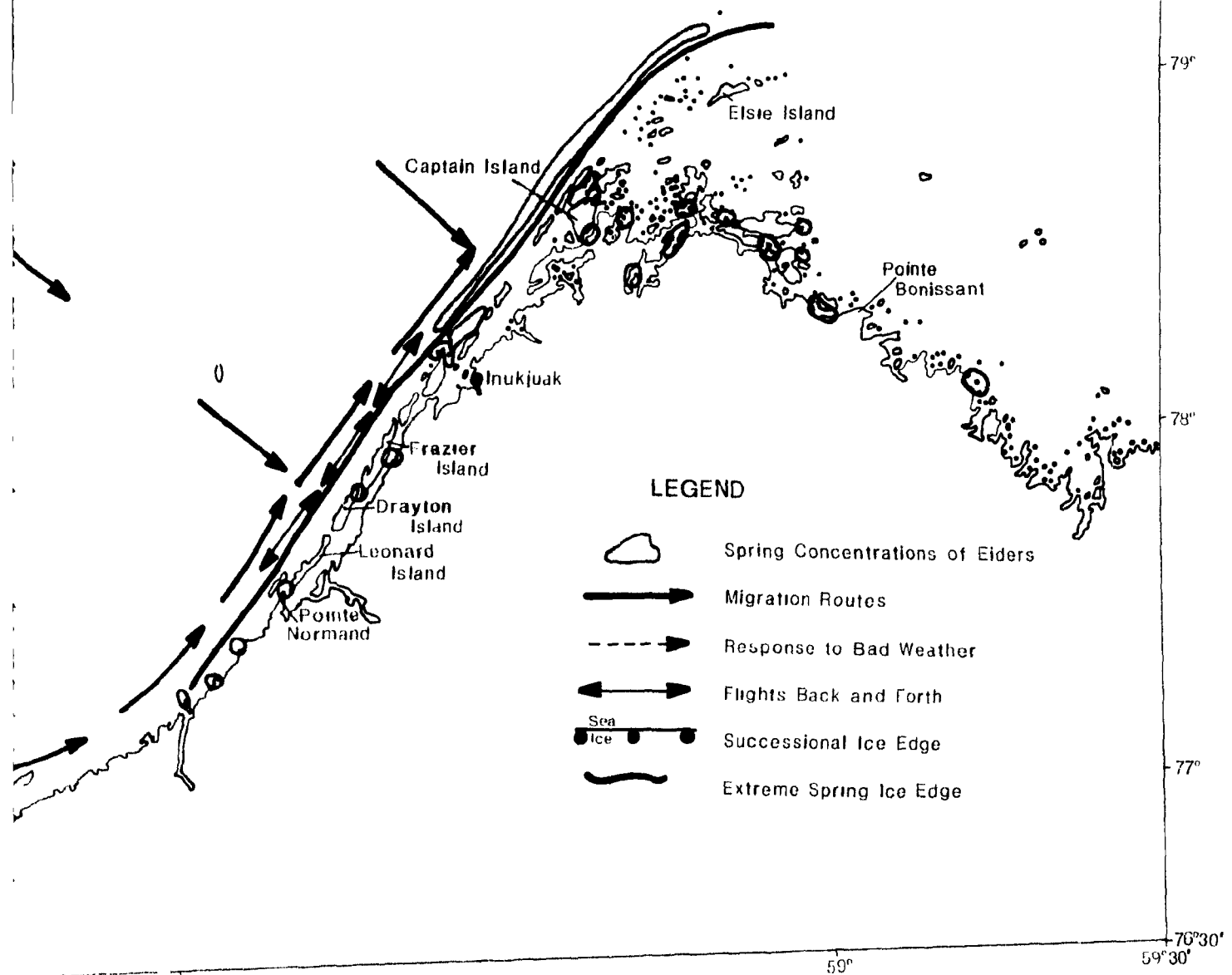
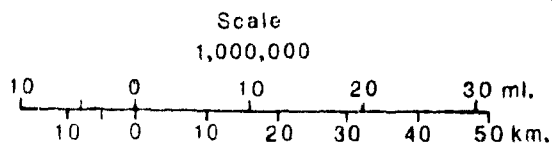


Figure 14. Open water areas and migration routes used by Hudson Bay Eiders in the spring.

57°

58°





archipelago, however, the long bays remain locked in ice. Eiders occur in large numbers along the southern and northern ice edges, off the west side of Split Island and in an extensive area of open water which develops at the mouth of Omarolluk Sound.

By early June there is still much ice in and around the archipelago, but it has been broken up and its movements are subject to the whims of wind and tide. At this time, Sanikiluaq Inuit encounter eiders almost everywhere along the coasts with noteworthy concentrations around their future nest islands.

5.3.2 Migration to the Nearshore Area of Nunavik

In the spring, PP. of Sanikiluaq has observed a northward movement of Hudson Bay Eiders within the Belcher Islands. He plotted two specific routes: first, northward up the length of Qasigialuk Lake; and second, through Ridge Passage and northward up Omarolluk Sound. He insisted, however, that these routes were only two examples of many. While PP. identified a northward trend, most Sanikiluaq hunters insisted on the eiders' tendency to fly everywhere and in all directions in the spring. In sharp contrast, hunters of the Quebec nearshore area observe strongly directional spring

movements along defined routes.

In March, the month of maximum extent of sea ice, the eastern Hudson Bay area is locked in ice from the coast to the outermost offshore islands. In April, however, the ice begins to break up north and east of the King George Islands. It shifts back and forth parallel to the coast according to the tide, and inshore and offshore according to the winds. At this time an ice edge may extend from the King George Islands, eastward to the Quebec mainland. This edge is soon eroded southward to the north edge of the Salikuit Islands (Fig.14).

When the ice first breaks between the Hopewell and the King George Islands, the shifting areas of open water created offshore are almost immediately occupied by Hudson Bay Eiders. They may arrive as early as late March, but in most years, the first arrivals are in April. Only at the end of April does the eider migration begin in earnest.

Incoming flocks of Hudson Bay Eiders follow the ice edge eastward along the north edge of the Bakers Dozen and Salikuit archipelagos and then northwards along the outer edge of the Nastapoka and Hopewell Islands. Flocks of eiders are also believed to migrate directly from the far offshore islands to the Hopewell Islands. Many are believed to arrive

directly from the Sleeper Islands. While others follow the west edge of the ice which remains fast to the King George Islands and then fly northwards to the Hopewell Islands.

In the Inukjuak region in April the edge of the landfast ice runs outside of the Hopewell and Elsie Islands. Upon arriving, eiders fly back and forth along this edge, waiting for areas of open water to appear further inshore. WW. described three areas along the coast south of the Hopewell Islands which usually opened up before the end of April (Fig.14). Many early spring migrants are attracted to these areas. Along the Hopewell Island chain the first areas opened by the currents are: 1. between the highest point of Frazer Island and the mainland; 2. between Frazer and Drayton Islands; and 3. between Bartlett Island and Pointe Normand. If the winter has not been extremely cold, the first of these may remain open all winter and the latter two are open by early May.

Similarly, along the coast east of Elsie Island, numerous areas among the nearshore islands are known to be open by early May. As soon as these holes appear in the landfast ice, they are occupied by eiders.

Eiders continue to frequent the Hopewell Island chain

throughout the month of May, waiting for the ice to break up among the nest islands further to the north. Soon after the beginning of June, they abandon the Hopewell Island area and move northwards to begin nesting in the vicinity of Commodore Island and beyond.

Inuit from Kuujjuarapik explained that the Salikuit Island chain impedes ice break up and allows a broad ice bridge to persist late into the spring between the Belcher Islands and the Manitounuk and south Nastapoka Islands. As a result, eiders are not immediately accessible near Kuujjuarapik in the spring. Hunters wishing to harvest eiders must either go north of Richmond Gulf or south to Long Island. As the ice between Kuujjuarapik and the Belchers eventually erodes away and as shore leads open up, Kuujjuarapik people observe an influx of eiders from both the north and the south.

EE. spoke in detail about the spring movements of eiders south of Kuujjuarapik. Eiders fly northwards along this section of coastline in the spring. At Pointe Louis XIV, eiders short-cut across a narrow neck of land from George Bay to the southwest end of Long Island Sound. They occupy holes opened by tidal currents between the islands within the Sound. Eiders will fly northwards along the coast as shore leads open up, although winds which push the drifting pack ice against the shore and bad weather, can force them to

temporarily return southward. At these times, EE. has seen eiders sheltering in areas of open water on the leeward side of nearshore islands or retreating southward past Pointe Louis XIV. Even before conditions improve, however, the eiders press northwards again. It is said that they can foresee when the weather will clear and the shore leads will reopen.

5.3.3 Pairing and Spring Flock Composition

They just go with the weather, that's how they start to pair up. They don't bother each other during winter, although they can be mixed together when they're flying. I don't think they even look at each other until the weather gets warm.

AA., Sanikiluaq

The Hudson Bay Eiders fatten up before they begin pairing. Courtship, however, soon burns away the drakes' reserves.

The only time they pair up is after they're fat, they stay in the open waters first (off the ice edge).

LL., Sanikiluaq

The arnaviak (females) are usually fat and the amauliit (drakes) are fat, too, but they grow thin from chasing the females.

BB., Sanikiluaq

By the time the eiders begin prospecting for early holes in the landfast ice of the Belcher Islands, or migrating along the Quebec coastline, the adults are flying in pairs.

In the Belcher Islands region, young non-breeding eiders accompany the paired adults on their early reconnaissance flights over the still frozen sea ice. They can also be seen with the adults on the first areas of water that become accessible within the landfast ice. The young tend to remain in these larger areas of open water, however, seldom following the adults to small open water sites such as those created by freshwater run off or the rising tide. Along the Quebec coast, Inukjuak and Kuujjuarapik Inuit provide similar observations. Young non-breeding eiders arrive with or very soon after the paired adults.

5.4 The Nesting Period

5.4.1 Factors influencing Nest Initiation and Location

As the landfast ice continues to melt, the breeding pairs make an effort to establish themselves on open water as close as possible to the islands where they intend to nest. They do not nest immediately but await the further break up of the ice.

I think they nest only when there's no ice near the shore...The ones on the south (Belchers) nest before the mitiit in the northern part (of the Belchers). The south melts faster. That's the way it is, they wait for it to melt to nest...

VV., Sanikiluaq

The south Belchers used to melt first ... (the North) used to be behind and we used to hear that there were ducklings here (in the South) but here (in the North) they were just starting to lay eggs.

AA., Sanikiluaq

The break-up of ice around individual nest islands is an important determinant of nest initiation dates. Hunters explained that the ice provides a bridge from the mainland or adjacent large islands which allows Arctic fox and red fox access to eider nests. For this reason, eiders do not lay eggs until the island shores are free of ice.

It's because they're smart. If they have eggs when there's still ice, the fox is going to get the eggs. That's the way they (the people) used to say it. They (the eiders) have to wait for the ice to melt before they can lay eggs.

AA., Sanikiluaq

Ice break-up not only influences the local date of nest initiation, it also affects the density of local nest colonies.

They usually looked like they keep an eye on the first place that melts so that they can lay their eggs there... There used to be the most eggs on the island which melted first. I know that, since that was the way it was when I used to go out hunting.

AA., Sanikiluaq

While islands that are ice-free early in the season attract eiders, islands that remain bound in ice are avoided. BB. of Sanikiluaq explained that, even in the absence of fox, a

normally good nest island would have few nests if the ice around its shores broke up late. The actual presence or absence of fox has a direct influence on the location of eider nest colonies. XX. of Inukjuak illustrated this relationship in speaking about Qikirtaaruq, an isolated island with two small adjacent islets, about 35 km offshore and south of Inukjuak. Qikirtaaruq is a fairly large island (approx. 150 ha). When there are no fox it is covered with nesting eiders. He described the drakes when onshore as looking like snow. When fox are on Qikirtaaruq, however, few eiders nest there. Instead, breeding pairs crowd onto the two adjacent islets, placing their nests so close together that often the down rim of one nest touches its neighbour (Fig. 15).

Throughout southeastern Hudson Bay, Inuit identified fox as an important influence on the local distribution of Hudson Bay Eider nest colonies. Their influence is not only restricted to the current nest season but could also affect nest island selection in the following year or years.

Some foxes get trapped on an island where ducks lay their eggs. If that was to happen, then the foxes eat the ducks' eggs. So the eiders know that there was a fox that ate their eggs. So they don't go back to that island the following year because they didn't get any of their young...

SS., Sanikiluaq

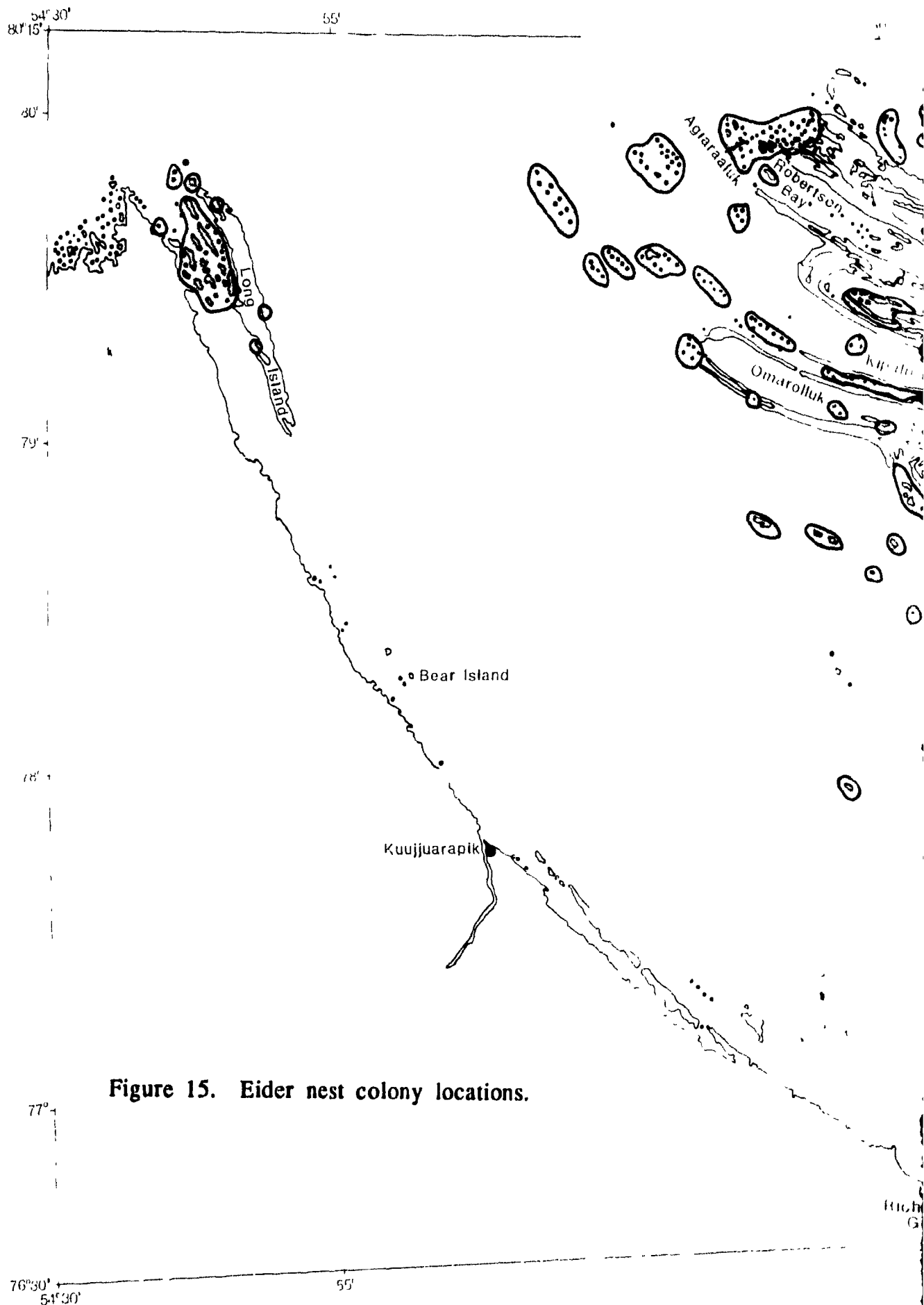


Figure 15. Eider nest colony locations.

56°

57°



58°

59°

59° 30'

80° 15'

Scale
1,000,00010 0 10 20 30 ml.
10 0 10 20 30 40 50 km.

N

Elsie Island
Captain IslandPointe
Bonissant

Inukjuak

Frazier
IslandDrayton
IslandLeonard
IslandPointe
Normand

LEGEND



Nesting Area



Nesting Area, If Fox Not Present

70°

78°

77°

76° 30'
59° 30'

58°

Subsistence harvesting (hunting/egg and down collection) and human-caused disturbance (outboard motor traffic) significantly influence eider colony location. Changes in patterns of land use were often used to explain changes in eider colony density or location. The establishment of permanent central settlements in lieu of scattered seasonal camps has had a significant influence.

In the Hopewell Island chain, for example, YY. used to go eider egg collecting by kayak on Bartlett Island and on the numerous small islands south of Leonard Island. Today, only a few scattered eider nests can be found in the Hopewell Islands due to their proximity to the community of Inukjuak and the resultant intensified harvesting and canoe traffic.

In contrast, in the northern Nastapoka Islands, Hudson Bay Eider colonies are said to have increased in size in recent times, again because of the establishment of Inukjuak. The north Nastapoka Islands region used to be an important spring sealing area. Numerous spring camps were located on the adjacent mainland. With the establishment of Inukjuak, spring use of the area around these camps has substantially declined. The decrease in the intensity of the area's use is believed to have allowed the increase in eider colony size.

Sanikiluaq hunters have similar observations. The nest islands at the north end of Churchill Sound and those between Kugong and Johnson Islands are said to have fewer and smaller eider colonies than when the informants were young. The proximity of the community of Sanikiluaq is the reason given. In the south Belcher Islands, in contrast, the number of nesting eiders is believed to have increased since the closing of South Camp, the community at the south end of central Flaherty Island.

5.5 Eiders in Summer

5.5.1 The Brood-rearing Period

The female lays on them (the ducklings) until they're dry... and when they're dry and if they can handle themselves, then the mother takes them to the water... and they look for food right away even though they're still quite small.

BB., Sanikiluaq

Initially the broods remain near the nest islands.

When they're still quite small they just stay along the shore of their nesting place. They look for kinguk (gammarids) near their nesting place when they're small.

VV., Sanikiluaq

CC. of Sanikiluaq explained that as the ducklings grow, the broods move from the nest islands to the coasts of the main islands presumably to seek more sheltered areas. When the

ducklings grow further, the broods move again.

They take them (the ducklings) to a current to practice, where there are lots of waves. Even though some stay on the islands, those in large groups are taken to a place where there's current and waves.

BB., Sanikiluaq

...these areas are where the strong currents are and I think the mother takes them there to practice, so I know that there are usually more in the current areas than the smoother ones.

ZZ., Sanikiluaq

Several broods will group to form a single flock of mothers and ducklings. The families, however, maintain their integrity and the ducklings follow their own mothers.

They're in a group so I think that they join those that they see since there's usually so many of them ... There's usually so many of them even though they have their own mother.

VV., Sanikiluaq

As a result of their wanderings the groups of ducklings and mothers become widely-dispersed (Fig.16). The complex archipelago southwest of Flaherty Island in the Belcher Islands and the area near Inukjuak, inshore from Elsie Island and north of Commodore Island, were identified as harbouring particularly large numbers of broods. Although densities might be somewhat greater in these areas, eider broods can be encountered anywhere among the nearshore and offshore islands.

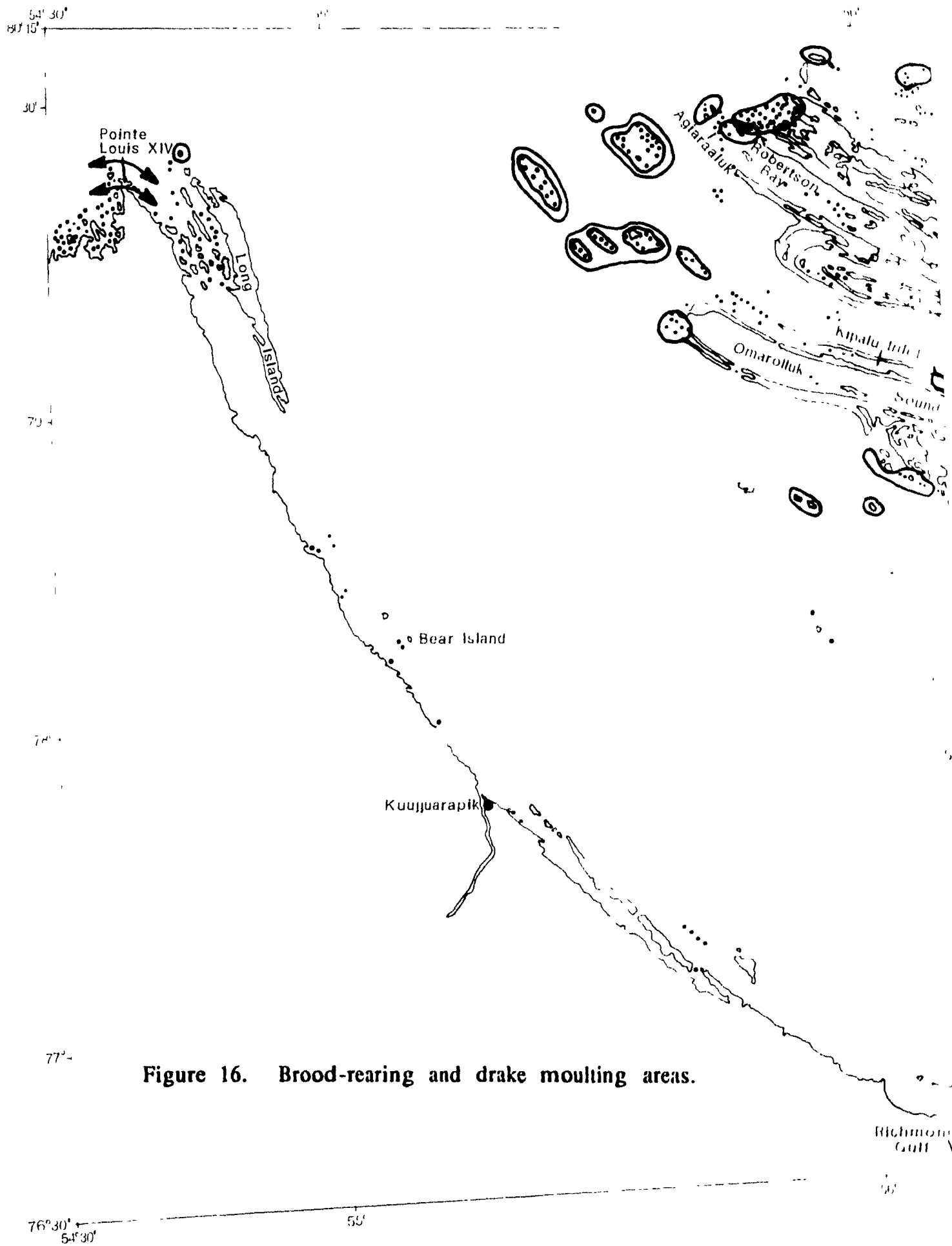
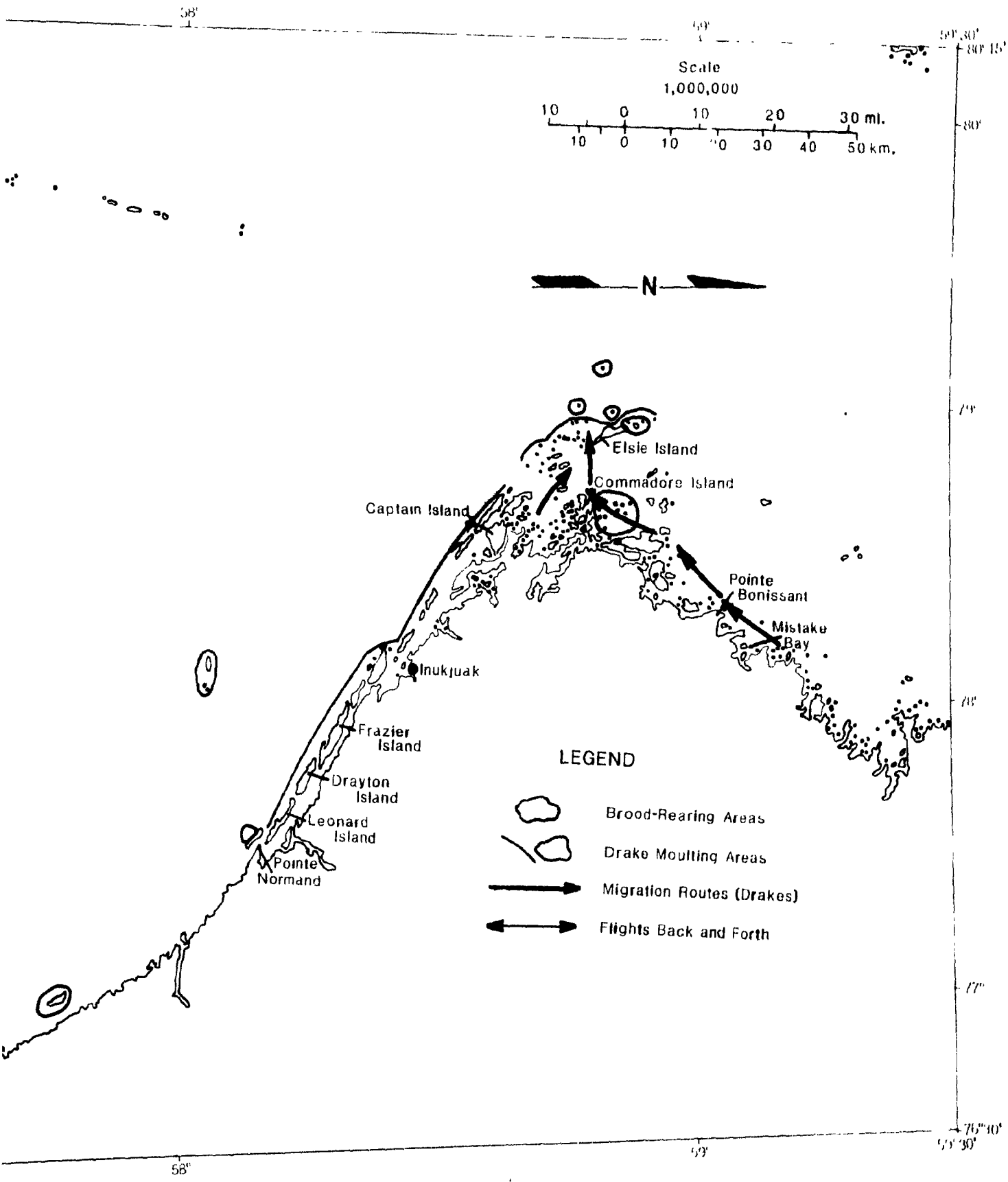


Figure 16. Brood-rearing and drake moulting areas.

57°



areas.



While the young of the year are developing, the adult females moult their flight feathers and are flightless for several weeks. The mothers fly again at the same time or slightly before their young fledge.

5.5.2 The Drake Moults

Soon after the eggs are laid and the female eider begins incubation, hunters note that the drake becomes less attentive of the female.

When the female is nesting, the males just sit by their side, go away when they feel like it, just go travel anywhere, anywhere they wish. They do whatever they want...

KK., Sanikiluaq

AB. and RR. of Inukjuak link the drake's departure to the behaviour of the female. The drake remains with the female as long as she does not stay in one place. Once the female settles down on the nest, the drake leaves. The pre-moulting drakes remain in the vicinity of the nest islands for a period of time before their final departure to the areas where they will moult their flight feathers.

The flocks of adult drakes are joined by the younger non-breeding eiders.

They feed and stay on the shore and usually join the other amauliit (drakes) when they're about to moult.

BB., Sanikiluaq

In these mixed flocks composed of one-year-olds, subadult males and adult males, hunters appreciate the presence of the younger eiders for they facilitate the hunting of the adult males. The young eiders being less fearful of humans, can be enticed to approach within shotgun range. The adult males, perhaps reticent to break from the group, follow the lead of the young birds, to their own demise.

...from my experience those amaulitsaq (subadult drakes) and mitiaraviniit (one year old eiders), when the females are laying, they're usually in a group with amauliit (adult males). Since the one-year-old aren't scared of people, the adults used to follow them right next to us. That was the only thing that made me happy about the one-year-olds, because the adult drakes just follow them.

CC., Sanikiluaq

As B5. commented, to explain CC.'s "happiness" about the one-year-old eiders:

... and the ones that he's happy about (the one-year-olds) won't be bothered, even though they're the ones that made them (the flock) come. He would only get the older ones (the adult drakes).

BB., Sanikiluaq

The drake departure from the nest islands is neither conspicuous nor synchronous. In most hunters' experience the majority of drakes leave during the latter part of the

incubation period, although some linger behind until the eggs begin to hatch. Hunters' comments suggest that the drakes in the more southerly part of Hudson Bay leave before mid-July, while in the Inukjuak area they leave close to the end of July.

For most of the southeastern Hudson Bay region a conspicuous moult migration is not observed. EE. of Kuujjuarapik has seen groups of pre-moulting males flying southward past Pointe Louis XIV. WW. of Inukjuak has witnessed large numbers of drakes, conspicuous due to their white plumage, migrating from the area of Mistake Bay southward along the coast. At Commodore Island the drakes fly westwards to their moulting areas along the west edge of Elsie Island and the islands immediately to the south. No other pronounced drake movements were reported, neither departing from nest areas, nor arriving to moulting areas.

As for the timing of the flightless period, AC. of Inukjuak specified that drakes arrive at the Elsie and Peckham Islands moulting area towards the end of July. By mid-August the moult begins, and soon after none of the drakes present can fly. For the Belcher Islands region, HH. observed that the drakes are usually flightless when the ducklings are in the sea (about the end of July).

For the flightless period, the drakes seem to seek out areas where they will not be disturbed by hunters. They tend to move to islands which are far offshore and show a preference for the more exposed outer shorelines.

...They go to the farthest islands to moult ... on the outside of the islands where the water's rough, that's where they go to moult after leaving the females.

KK., Sanikiluaq

They go where there are no people and lots of waves.

CC., Sanikiluaq

They're almost all over (the King George Islands area). There are lots of moulting eiders since there are no people down there... and there are ocean currents there. I wonder why they want to be where the sea's rough when they're moulting ?

VV., Sanikiluaq

According to the hunters we spoke to from Kuujjuarapik, drakes do not moult in the Kuujjuarapik region. Aside from the observation of a few scattered individuals in the Salikuit Islands by AD., it is clear that the breeding drakes of the southern Nastapoka Islands, the Manitounuk Islands and those nesting near Long island, migrate elsewhere to moult.

In the Inukjuak region, many moulting drakes are seen off the west edge of Elsie Island and west of the numerous small islands south of Elsie Island (Fig.16). The south-eastern coast of Nicholson Island and the various straits between

northern Nastapoka Islands are considered to be important drake moulting sites.

For the Belcher Islands, virtually all of the farther offshore islands, especially their outer edges, were identified as moulting sites (Fig.16). The west edge of Split Island and the southwest coast of Flaherty Island are also important moulting sites. Although the majority of drakes go to the far offshore islands for the moult, some remain among the main islands. Flightless drakes have been observed in Kipalu Inlet, Churchill Sound and Fairweather Harbour.

When flightless the drakes become very secretive, evasive and difficult to hunt.

... those drakes go to the place where there's no people. They don't want to see people when they're moulting.

VV., Sanikiluaq

The drakes seem to be the hardest to get when they're moulting. They're the hardest to get. I've worked on them... when they are alert only their head is on the surface when the water is calm. And they leave even before you can see them.

LL., Sanikiluaq

When moulting, the adult drakes are more clever than seals. You can't have enough time to shoot at a moulting drake.

XX., Inukjuak

During September and at least part of October, the moult

continues. Some hunters speculated that the drakes were flightless for about two months. When they regain their ability to fly they return to the mainland coast or, in the case of the Belcher Islands, the coasts of the main islands.

5.6 INTERSPECIFIC RELATIONSHIPS

5.6.1 Mitig as Predator

Uviluk, the blue mussel (*Mytilus edulis*) was universally identified as the key element in the diet of the Hudson Bay Eider. In the experience of some Inukjuak hunters, it was the only food eaten. Other hunters, however, had observed eiders eating other prey.

I used to think they were only eating mussels. (But then I found that) those kanajuit (sculpins), their tails used to be eaten by eider ducks... The only thing they didn't eat was the head of the sculpin... I never knew how they cut them because the eiders don't have teeth.

QQ., Inukjuak

For QQ., mussels were the eider's summer food and sculpin were only eaten in winter at ice holes where the mussel supply was depleted.

XX. of Inukjuak was also of the impression that eiders were only eating mussels. Only recently, he observed eiders

eating sea urchin (probably *Strongylocentrotus droebachiensis*) at the edge of the landfast ice, far offshore from the Hopewell Islands. He speculated that, although mussels were the preferred diet of eiders, they would resort to sea urchins when necessary, such as in deep water.

YY. of Inukjuak has found the remains of mussels and sea urchins in the gizzards of the eiders he has killed. In the spring, he noted that eiders seem to only defecate mussel shell fragments. In his experience, eiders primarily eat mussels in the spring and mainly sea urchins in the fall.

Sea cucumbers were mentioned as an important element of eider diet by both Sanikiluaq and Kuujjuarapik hunters. Mussels, urchins and sea cucumbers were the prey items most often mentioned for the Belcher Islands. Other food items include: ipitsaunik (probably the clam, *Macoma baltica*⁷), kukinuaq (unidentified cockle), kinguk (shrimp-like gammarid), kanajuk (unidentified sculpin), kanajuapik (unidentified sculpin), quliligag (probably capelin, *Mallotus villosus*), ammajak (probably sand lance, *Ammodytes* spp.) and giquak (a type of seaweed). The last was said to be eaten only if the eiders were very hungry.

⁷ Eiders examined by Freeman (1970) at nesting sites in Robertson Bay, Belcher Islands, were feeding on *Mytilus edulis* and *Macoma baltica*.

VV. considered an eider's summer diet to be primarily composed of mussels, sea cucumbers and gammarids. In summer, the eiders have access to many different prey items and although they eat a variety of foods, they restrict their diet through preference.

I don't think they bother anything but uviluk (mussels) in summer, but I think they'd eat anything that's available when the place that they're at doesn't have uviluk at hand... they can eat anything in winter, but in summer they have a special diet.

AA., Sanikiluaq

VV. explains further that access to food in winter is restricted by the presence of the landfast ice. In this season, the prime food items are capelin (quliligag) and sculpins (kanajuk and kanajuapik).

When they are staying out on the edge, in deep water, they can't go to the bottom because it's too deep. So they eat what the seals eat, the little fish quliligag (capelin).

SS., Sanikiluaq

When they have been feeding on the big open water their stomachs are really small. Those "travellers" (ice-edge eiders) seem to only eat seal food...

AA., Sanikiluaq

In contrast, on the edges of the polynyas within the landfast ice, hunters find the remains of sea urchins and sea cucumbers which eiders have brought to the surface.

5.6.2 Mitiq as Prey

Arctic and red foxes, Raven, gulls (*Larus* spp.) and jaegers (*Stercorarius* spp.) prey upon eider eggs and ducklings. The significant influence of fox upon nest initiation and location has been discussed (section 5.4.1).

It used to be really upsetting when the island you're trying to gather eggs from had a fox in it. And the ravens are even worse, because they can hop around and try to remove the mitiq. When she does move he'll take an egg for sure.

AA., Sanikiluaq

Gulls and ravens are the ones that eat the most (eggs)... I know the ravens. Once the female is in a nest, the raven will jump up and down in front (of her) trying to scare the mitiq. When she flies then the raven will eat.

CC., Sanikiluaq

The ravens go to every island to look for eggs....(they) get the eggs for their young. They put it in their throat and when they reach the nest they vomit it to their young.

AC., Inukjuak

Lots of ducklings are eaten by gulls in the summer and I have seen more than once they just wait for the mitiaraks (ducklings) to go back to the surface before they snatch them.

ZZ., Sanikiluaq

Snowy Owls (*Nyctea scandiaca*), Gyrfalcons (*Falco rusticolus*), polar bears (*Ursus maritimus*) and fox prey upon adult and immature Hudson Bay Eiders. SS. of Sanikiluaq explained that the Snowy Owl only feeds on eiders when other prey, such as rodents, are not available. But when an owl is

hungry it has no difficulty capturing an eider.

The owl usually follows the mitiq along the (ice) edge... the way the owl gets the mitiq is that the owl is just sitting there, just waiting. When he is hungry and knows the mitiq is going his way, he goes way up in the air and just dives right down to the mitiit and gets one of them, hits it with his breast, because the breast of the owl is very hard. So they hit the mitiq while it's flying... and when it falls to the ice they just grab it and kill it that way.

SS., Sanikiluaq

Foxes take their share of eiders from along the ice edge at night.

When ducks go to sleep during the night, they bundle up together and they sit there (along the ice edge) and there are thousands of them... So the fox goes, creeps up on the whole bunch and just bites them during the night... In winter when there are a lot of ducks, you can see the tracks of foxes. There are a lot of tracks on the ice.

SS., Sanikiluaq

(the fox) are always near the edge because of the eiders. I've noticed that there aren't too many foxes in the mainland in midwinter. They're just on the floe edge because of the eiders and eating the polar bear's leftovers. In the spring they move back to the mainland.

HH., Sanikiluaq

In HH.'s experience, the "weaker" eiders are more likely to become the victims.

Since the animals are like people ... some can be poor. Those poor ones are the ones that are usually caught by the other animals.

HH., Sanikiluaq

But referring specifically to the Snowy Owl, SS. believed that owls will take any eider that ventures near enough, whether it be an adult or young, male or female.

5.6.3 Eider-gull Association in Winter

The ducks are their mothers, they (the gulls) can only survive through them. If they spend the winter alone, they wouldn't survive. They usually take the food the ducks are eating.

CC., Sanikiluaq

In winter, when hunters were trying to locate Hudson Bay Eiders along the sea ice edge, they would look for gulls.

Since we were able to see gulls, and gulls are usually seen where the ducks are, we used to try to go to them. And we used to see a lot of ducks on the moving ice.

CC., Sanikiluaq

The gulls would remain with the eiders in order to feed on prey that eiders brought up from below the ice.

The eiders usually put the food on top of the ice and the gulls usually eat with the eiders.

AA., Sanikiluaq

This association between gulls and eiders was variously interpreted as the gulls stealing from eiders, gulls eating food rejected by eiders or gulls helping the eiders.

Even if they (the gulls) don't take the food the eiders are trying to eat, they (the eiders) usually put the food aside if it's too big.

BB., Sanikiluaq

... the gulls help the mitiq. If the mitiq happens to lose or drop something, say in the water, the gulls will pick it up and take it back or give it to a mitiq....that's what I used to see when hunting.

AE., Sanikiluaq

5.7 Inuit Knowledge: Ecological Thought

(Native) hunters are extremely knowledgeable concerning animal behaviour and anatomy for a variety of reasons. Hunting is their profession and this requires such knowledge ... Their conversations often sound like a classroom discussion of ecology, of food chains, and trophic levels.

Laughlin 1968: 314

Data presented in this chapter on the relations between Hudson Bay Eider and environment indicate that Laughlin's observations on hunter knowledge of ecology, behaviour and anatomy, apply in full to the Inuit of southeastern Hudson Bay. As Laughlin points out, an ecological perspective is not just superficially present nor does it need to be deciphered out from "between the lines". Rather, it pervades the thought of the hunters and from their point of view, little can be said or thought about an animal without immediately setting it into the context of the environment in which it occurs.

Inuit, for example, do not consider changing seasonal patterns of eider distribution in isolation from the ecological processes responsible for generating these patterns. Thus, when discussing autumn distribution of eiders, they immediately focus upon wind velocity and direction which, as we have seen above, are important determinants of eider location during this season. As autumn merges into winter, Inuit describe eider spatial occurrence as a function of the pattern of sea ice formation. In winter, they identify the availability of open water and thus the eider's access to food, as the critical determinant of eider distribution. They recognize the influence of temperature, wind and tidal current on the spatial pattern of open water and ultimately on the pattern of eider location.

Similarly, eider selection of nesting locations is recognized as a response to the pattern of sea ice breakup. Eiders nest earlier where breakup occurs first, and later or not at all where breakup is late. While Inuit consider the pattern of ice breakup to be the proximate determinant of eider nest location, they recognize that the ultimate factor is fox predation. Eiders avoid nesting on islands joined to the mainland by an ice bridge in order to avoid predation of their nests by fox.

In addition to interpreting eider spatial occurrence as a

function of their bio-physical environment, Inuit also describe variation in eider behaviour as a response to habitat. Thus in winter, the eiders which frequent the outermost lead are distinguished from those which frequent polynyas in the landfast ice by the behavioral trait of being "travellers" rather than sedentary. Inuit recognize that the incessant "travelling" of the outer lead eiders is a response to the exigencies of the habitat they occupy. They must constantly seek out shifting areas of open water along the ice edge.

This example of Inuit knowledge of eider behavioral ecology also provides an interesting insight into the complexity of Inuit knowledge of their feeding ecology. As discussed in Section 5.2.3 above, "travellers" or ice-edge eiders differ in diet from the eiders which remain at the polynyas. The former eat "seal food" (i.e. fish) while the latter eat mussels and sea urchins. This difference in diet which is related to habitat has repercussions on eider anatomy. According to Inuit, ice-edge eiders have small, soft gizzards "like seagulls" whereas the gizzards of polynya eiders are large and strong. Snippets of knowledge, such as this, reveal the extent to which ecological thought permeates the Inuit way of thinking about their natural milieu.

Western scientists, cognizant of the recency of an ecological perspective in their own knowledge system, may be sceptical about its prevalence among "primitive" peoples. The data presented in this chapter, however, have made it clear that the conceptualization of nature as a system of relations between organisms and their bio-physical environment is a vigorous and vital component of Inuit world-view.

Chapter Six

The Content and Nature of Traditional Ecological Knowledge

6.1. The Last Elder and the Demise of Tradition: a recurrent myth about the end of knowledge

Rapid technological, economic and social change in the North has encouraged the propagation of a myth about Native knowledge which if not complete fiction, represents at least a serious distortion of reality. Most frequently encountered in social scientific circles but occasionally raised by members of the wildlife management profession, this myth calls attention to the presumed frailty of traditional knowledge. According to this view, Native elders of the present-day, represent the last bearers of "true" traditional knowledge. Their inevitable and imminent passing away means the absolute loss of a unique body of knowledge.

A particularly strong statement to this effect is provided by Nelson who conducted fieldwork among the North Alaskan Eskimo from 1964 to 1966. In a chapter dramatically titled, "The Death of Hunting", he writes:

It is obvious, therefore, that the native economy will die with the passing of the present adult generation. And along with it the fascinating and impressive body of

knowledge which has been developed over these hundreds of generations will be lost ... we must put forth a maximum effort to live with the people and learn from them whatever we still can, before it is lost forever in the icy graves of the old men.

Nelson 1969: 387

Nelson is not alone in his lament over the passing of the last elders. Earlier generations of observers have mourned the same event and later observers, up to the present-day, continue to do the same. Ironically, each generation of scientists finds its own group of "last" elders to fret over.

For a myth, such as that of the last generation of elders to recur so frequently and be so widely-held, suggests at least some basis in reality. It is true that individuals accumulate during their lifetimes a unique store of knowledge whose loss with their passing, is truly regrettable. It is also true that over the last century, the North has undergone a period of momentous change and the life experiences of each generation of elders, differ significantly from the generation prior and that following.

These observations, however, could just as appropriately be applied to Western society, and yet a great deal less clamour is raised about the passing of our own elders. Perhaps the true reason for the popularity of the "last elder" or the "dying of traditional knowledge" myth is best sought in our

own false visions of Native society. Two misconceptions can be addressed here. First, there is a tendency to view Native culture and society as largely ahistorical. Native cultures prior to contact with Europeans, are conceived of as "pristine" and "traditional", concepts which imply a static, unchanging situation. They are without history. Upon contact with Europeans the Western mind refuses to conceive of Native societies as changing or adapting, denying them the right to historical change. Instead, we speak of assimilation, acculturation and eventually decline and extinction. Throughout North America, Native peoples have repeatedly defied this interpretation of their post-contact experience, demonstrating their adaptability, ingenuity and resilience in the face of drastic forces of change.

In the North, some 25 years after Nelson predicted "The Death of Hunting", the Native subsistence economy continues to thrive in Northern Alaska, as well as throughout Arctic and subarctic North America. Traditional knowledge of the environment has not been lost to "the icy graves" of an earlier generation of elders, but is alive and well. Of course, the subsistence economy and traditional knowledge of today are not precisely the same as those 25 years previous. As is their right, they have been modified and adapted to suit the continually changing circumstances of the North.

The second misconception about Native society in general and about traditional knowledge in particular, pertains to the failure to recognize culture as a dynamic system which is shared and transmitted. Traditional knowledge is not created anew by each individual in society. Nor is it abruptly lost with the death of one or a group of elderly individuals. Knowledge, as part of culture, is not the sole possession of an individual. It is a system possessed by the extant members of a society. Individuals die, but the knowledge system continues on.

Each new generation of Native children begins at an early age to acquire elements of the traditional knowledge system from older and more experienced members of the society. With the acquisition of language, fundamental concepts relating to nature and facets of the traditional ecological world-view are conveyed to the child. The simple act of learning the names of animals and animal groups establishes a conceptual framework in which elements of the natural world are identified and associated according to an implicit but ever-present cultural logic.

Training of younger and less-experienced members of the society is a conscious and deliberate process (Laughlin 1968). All of the Sanikiluaq hunters with whom I discussed

the matter of learning, indicated to me one or a few key individuals (generally a father and/or uncle(s)) who were particularly instrumental in their education.

Hunter TT. described his first two years accompanying his father hunting, as a period when his father dedicated much time and effort, to the task of explaining to him many of the things he needed to know about the land. In subsequent years, TT. recalls his father testing his knowledge by frequently asking his opinion about matters relating to the weather or the hunt.

The acquisition of knowledge is a life-long process. In Native communities, the weather, the outcome of the hunt, the distribution of game, the condition of harvested animals etc. are incessant topics of conversation. In Sanikiluaq, experienced hunters explain how they regularly consult with elders to help interpret or explain phenomenon they have observed or experienced on the land but were unable to fully account for themselves. Elders regularly telephone the local radio to convey information to the community that they feel is important.

On the occasion of a walrus kill, for example, AE., a Sanikiluaq elder, called in to caution the community about the suspicious circumstances surrounding the animal's

1 killing. The walrus was unusually fat, solitary and had seal fat and skin in its stomach rather than clams. It reminded AE. of a walrus kill some 30 years previous, whose consumption caused the deaths of several individuals on Split Island in the North Belcher Islands. In spite of the warning a number of individuals in the community ate the walrus meat raw. As a result, several became sick, two very seriously, their condition being described to me as life-threatening.¹ Several individuals who got sick, recall this elder's warning and are today cautious about eating walrus that they have heard were found alone.

1 The point of the discussion is that traditional ecological knowledge is a dynamic part of contemporary Native communities. It is shared widely among community members and exists collectively, not reliant upon any single individual. Thus, although the passing away of an elder is indeed a grave loss, traditional knowledge continues to live on, born by the community in general and by "new" elders in particular who mature to fill the places of those who have passed away. The belief that traditional knowledge will be lost forever with the passing of this last generation of true Inuit, is truly a myth.

¹ From the symptoms described by an individual that was taken ill, the sickness was most likely caused by a particularly heavy infection of *Trichinella*.

1

6.2. Traditional Learning and the Verification of Knowledge: the stereotype of the unquestioning Native.

Inuit hunters rarely question observations related by others and do not always ascribe more importance to multiple than single observations...(These) characteristics are ... the antithesis of science.

Gunn, Arlooktoo and Koomayok 1988: 25

It has been maintained that Native peoples in general and Inuit in particular readily accept information from other persons without questioning its validity (Crowe 1974). This characteristic is often portrayed as contrasting sharply with the attitudes exhibited by Westerners in general (Nelson 1969) and scientists in particular (Gunn et al. 1988). This polar opposition of the attitudes of Inuit versus scientist, as naively unquestioning versus trained scepticism is at best misleading.

With regard to wildlife science, it should be noted that university students acquiring the fundamentals of biology from their "elders" receive with a minimum of questioning, a very specific world-view, a host of complex concepts and a flurry of facts. As we shall see in the following chapter, wildlife managers hold many beliefs and attitudes about wildlife and how they should be managed which have been learned by rote and have never been questioned. At best, one

might be able to make a case for the proposition that scientists are trained to be sceptical and question information, only so long as it falls within certain narrowly-defined bounds.

The contention that Inuit passively receive information without questioning, particularly if it comes from individuals older than themselves (Nelson 1969), correlates well with a vision of traditional knowledge as static and unchanging. Such a vision leaves no room for traditional knowledge to evolve and change. Accordingly its only fate, as we have argued above, can be erosion and eventually an "icy grave".

Discussions with Inuit in Sanikiluaq indicate that the process of acquiring knowledge about the natural environment is considerably more complex and dynamic than that portrayed in the citation by Gunn et al. (1988) above. True, the opinions of elders are conferred great respect. Young individuals are taught to be perceptive observers and not to query those more experienced than themselves. Careful observation is an integral part of the learning process and the knowledge thus obtained is applied with a great degree of respect and confidence and a minimum of questioning.

I learned by following my father. I learned by looking and doing, not by asking and talking. Inuit didn't ask

why. They didn't try to understand. They just observed and learned without quest ning.

HH., Sanikiluaq

HH's comments reflect the great value placed by Inuit upon learning through respectful observation. They apply, however, to a very specific context, that of an unexperienced young hunter. Taken out of context, they are easily misrepresented. Both Nelson (1969) and Gunn et al. (1988) gravely distort the Inuit experience of knowledge acquisition by generalizing from a specific context to conclude that "the Eskimo seldom doubts what he has been told by others" (Nelson 1969: 374)² or that Inuit attitudes represent "the antithesis of science" (Gunn et al. 1988). Data collected during the present research refute the idea that mature Inuit are passive, indiscriminating and uncritical receivers of information. The characterization of the unquestioning learner may be aptly applied to the young Inuk, just as it could be applied to students of Western science. The extension of this characterization to mature Inuit, however, is completely inappropriate.

Several arguments can be presented in support of this contention. First, personal experience is highly valued as a

² Nelson is fully aware of the particular importance of elders. To the above citation he adds, "especially if they are his elders". The point we wish to emphasize, however, is that it is nevertheless misleading to represent Inuit as seldom doubting.

pathway to knowledge and thus independent thought, interpretation and ingenuity is encouraged, not discouraged. HH., for example, commented that when he is out on the land with less experienced individuals and he sees them doing something incorrectly, he does not interfere so long as they do not put themselves into serious danger. He believes knowledge is better acquired by personal experience, rather than by being told.³

By their own doing they will get wiser. If they were talked to a lot, they will get less in them. If they have to get into more bad situations, they will get wiser. This I know.

HH., Sanikiluaq

Thus, first-hand knowledge is considered to be superior to that received through others. Inevitably, this creates the circumstances for doubt, whenever observations made by others conflict with one's own.

Second, Inuit evidence a general concern about the reliability of information. Accordingly they often accompany accounts of their own observations with qualifying comments such as "This I know"; "This I have experienced"; "I don't have all the knowledge yet, but I observed some"; or "I have

³ Nelson (1969: 380) records very similar attitudes among North Alaskan Inuit regarding the importance of learning from personal experience. Interestingly Nelson (ibid: 198) also notes that this belief about learning is also extended to their dogs. He observed that a female dog was allowed to 'fight' a bear that had been recently killed in order that it gain experience for a possible subsequent encounter.

just heard of it, I have not seen it". The following comments by HH. are indicative of the discretion used when receiving information from others.

It is true. I believe it because the person I heard from actually saw it. I don't believe it when someone just says 'maybe'. I don't really believe things that they haven't actually seen.

HH., Sanikiluaq

The value placed by Inuit upon direct observation either by themselves or a reliable observer, parallels the scientist's preoccupation with empirical knowledge.

Finally, in the course of interviews or discussions Inuit of all ages freely disputed information from other sources including other Inuit, which they felt to be of a dubious nature. As direct confrontation is regarded highly impolite, such disparities in opinion were only rarely discussed outright. Generally the individual holding a dissenting opinion would wait until the other person was absent, before "correcting" the "misinformation" that had been provided.

6.3 Traditional Ecological Knowledge: a summary of major findings.

The previous four chapters have focused upon the traditional ecological knowledge of the Inuit of southeastern

Hudson Bay. The knowledge of a single wildlife species, the Hudson Bay Eider, has been emphasized in order to provide a detailed and exhaustive assessment of at least one subset of their universe of knowledge. To conclude this segment of the thesis which has focused exclusively upon traditional knowledge, we present a brief summary of our major findings. In the following two chapters, we move from the realm of traditional knowledge into the realm of wildlife management and consider the implications of our research results for the continuing evolution of northern wildlife management institutions.

Traditional Ecological Knowledge is comprehensive in its scope

The comprehensive nature of Inuit traditional knowledge has been revealed in a number of different ways by our research. It is evident in the breadth of the taxonomic system which names and orders species, not only of importance to subsistence, but also of little or no economic value such as raptors, song birds, lemmings, sticklebacks, as well as numerous small invertebrate organisms. This research has also unveiled the wealth of specific information lying behind only one of these labelled taxa, that of the Hudson Bay Eider. Even if we admit that the same depth of information is not likely to exist for every one of the other known

species, it is clear that in this thesis we only managed to scratch the surface of this vast universe of information which is Inuit traditional ecological knowledge. In our analysis of Inuit knowledge of the eider itself, our documentation of the multitude of anatomical terms for internal and external elements of the eider's body, are also illustrative of the comprehensive treatment which characterizes Inuit observation of their natural milieu. Similarly, our survey of an Inuit ecology of eiders, easily encompassed all seasons of the year, all life stage of the eider and observations pertinent to a multitude of biological fields of study including ethology, population biology, life history, and evolutionary ecology.

Traditional Knowledge is subtle and refined

The subtlety and refinement of Inuit ecological knowledge is illustrated by the concept of nukarait or "younger sibling". As the reader may recall from Chapter 2, Inuit reserve the term "nukaraq" for groups of species of particularly close taxonomic relationships. Paralleling Western taxonomic concepts such as the type species and sibling species, the Inuit concept of nukarait is tangible evidence of the sophistication and refinement of traditional classification. Further evidence of the subtlety of Inuit

knowledge has been provided in Chapter 4, where we have documented a mind-boggling sensitivity to minute variations in the qualities of the skins of birds. Inuit women distinguish between the properties of the skins of eiders of different age and sex. Similarly their finely-honed talent for observation has allowed Inuit to detect variation in eider gizzard size, and to link gizzard size to diet and diet to habitat. It is evident from observations such as these that Inuit knowledge of Nature is highly refined.

Traditional Knowledge is ordered

Our research results demonstrate that Inuit knowledge is ordered according to a consistent, culturally-specific logic. This order has been most evident in our examination of the Inuit taxonomy of uumajuit. This hierarchically-structured system captures their knowledge of the biological diversity of their natural environment. Up to five distinct levels of classification are recognized, from the most general, uumajuit or "animals", to the most specific, the individual species. Below the species level, the Inuit classification of eiders according to age and sex, provides a further example of the great degree to which traditional knowledge is ordered and structured, conferring order and structure upon the infinite diversity which is Nature.

But order is not only evident in the systems of classification of biological organisms which Inuit possess. Order is also evident in our survey of Inuit knowledge of eider ecology. For Inuit view Nature as a system of relationships. Their observations of natural events are not accumulated as random, isolated anecdotes, but linked together into a conceptual system which recognizes patterns and processes in their natural milieu.

Thus, eider use of a given island for nesting is recognized to be a function of the pattern of ice break-up: if the ice around the island breaks up early, nesting occurs; if the ice breaks up late, nesting is delayed or may not occur at all. Inuit not only link observations of eider nest distribution to ice break-up pattern, but also draw into the relationship the island's accessibility to fox. They recognize that it is the presence or absence of this most efficient nest predator which is the ultimate factor, determining the nature of these ecological linkages.

In this case an ecological logic, associates and orders three observations, each of a rather different nature: observations of eiders nesting; of ice break-up; and of fox distribution. This ecological logic appears throughout our survey of Inuit knowledge of the natural milieu. Their

observations of eider movements, their appearance or disappearance from an area, their diet, their physiological condition, etc. are invariably linked to one or a number of environmental factors. This logic confers order upon traditional knowledge.

Traditional knowledge is knowledge for its own sake.

Traditional knowledge defies definition in functionalist terms. Its scope is too broad, its details too subtle and its content too diverse. From our survey of Inuit knowledge it is evident that traditional knowing extends beyond the limits of the pragmatic into the realm of knowledge for its own sake. The universe is indeed an object of thought (Lévi-Strauss 1966) and Inuit, like individuals in all human societies, actively pursue the incessant quest for greater understanding. Thus, as in the example of the mysterious mitiqluujak eider, discussed in section 2.3.1, Inuit actively seek information, compile observations and consider alternative explanations. All of this energy is dedicated to the pursuit of greater understanding of a slightly smaller, slightly darker eider whose numbers are dwarfed by the huge local eider population and whose presence in southern Hudson Bay is transitory, not lasting more than a few months. This dedication to knowledge for no other reason except to know is characteristic of traditional knowledge.

Traditional Knowledge is ecological

The fundamental importance of ecological thought has been a recurrent theme throughout the four chapters on Inuit traditional knowledge. Whether one considers taxonomic system, eider anatomy, seasonal distribution or any of the multitude of other topics that this research has broached, ecological considerations continually work their fundamental contribution to Inuit thought. Taking the taxonomic system, as an example, the reader may recall how ecological habitat provides the first and most pervasive criterion for organizing the natural world. The segregation of land from sea is a fundamental tenet of Inuit world-view and this division by habitat continually reappears at all levels of the hierarchical system by which "animals" are ordered. In chapter 5, which has focused upon knowledge of eider ecology, the primacy of ecological thought among Inuit is repeatedly demonstrated. Linkages between organisms and environment are repeatedly sought, for it is the ability to "read", interpret and predict natural events which renders successful subsistence possible. Thus Inuit have provided us with a profoundly ecological vision of the world of the Hudson Bay Eiders. They have highlighted for us linkages between the distributions of eiders and ice, between eider habitat and diet, between nest location and access to fox, between eider

age and mortality, etc. The natural world viewed through the eyes of Inuit is a world of associations and interconnections which bind human and non-human animals to environment.

Chapter Seven
Wildlife Manager Ethnocentrism
and the Image of Native Hunters as Improvident

The first six chapters of this thesis have focused upon the traditional ecological knowledge of the Inuit of southeastern Hudson Bay. The primary objective has been to examine the content and nature of Native knowledge of the environment and in so doing, call into question a number of preconceptions about traditional knowledge which some wildlife management professionals consider as conventional wisdom. These data have shown, that although these preconceived notions are conferred credibility by their circulation in a scientific milieu, they have little empirical basis.

Traditional knowledge is not anecdotal, narrowly pragmatic, unabstract, non-ecological, unverified nor in the process of disappearing. It is an ordered system of knowledge which extends beyond the practical to the purely intellectual and which is permeated with an abstract, ecological logic. The verification of information through empiricism is a vitally important process and as a shared system which is passed from generation to generation, traditional knowledge evolves but is not about to die.

Beyond the narrow issue of whether the preconceptions about

traditional ecological knowledge held by some members of the management profession conform to empirical reality, the research results have demonstrated that Inuit are indeed profoundly knowledgeable about their natural milieu. In the case of the Hudson Bay Eider, Inuit knowledge far outstrips the available scientific data which are by comparison meagre and narrow in scope. It is readily apparent that biologists would have to invest exorbitant amounts of money and person-hours to establish a data set remotely comparable to that already extant in contemporary Inuit communities.

Inevitably the discussion of traditional knowledge leads to the issue of wildlife management. If it is true that Native peoples possess a profound knowledge of their natural environment and that this knowledge includes an ecological understanding of natural patterns and processes, then why have they been so unsuccessful in establishing a significant presence in wildlife management institutions in the North? Why is it that even in co-management institutions which are held up as models of progress, Native knowledge continues to be largely ignored (Cizek 1990; Usher pers. comm.)?

Answers to these questions are best sought in an analysis of the institution of wildlife management itself. In particular, an investigation of the attitudes, values and beliefs of wildlife management professionals may provide

valuable insights into factors influencing Native participation in northern wildlife management (Usher 1982; 1986). The ideology of wildlife managers as it concerns the human-nature relationship in general and the relationship between Native peoples and wildlife populations, in particular, is the subject of the present chapter.

Members of the wildlife management profession, directly or indirectly, control the direction and rate of change of wildlife management institutions in the North. Since the 1970s, when state attempts to unilaterally impose wildlife regulations on northern Native communities met with bitter resistance, there has been a cautious transition towards increasing Native input into the wildlife management process.

In spite of these changes, the state still maintains ultimate control over the management process, and while Native peoples pressure for greater control over wildlife resources which they view as their own, state representatives are generally in the position of defending the status quo, limiting the degree to which new and innovative management arrangements depart from present-day norms.

Given the influential role played by members of the wildlife management profession, it is vitally important to examine their attitudes and beliefs about Native wildlife use

and Native ability to conserve and manage wildlife populations. Clearly the views held by wildlife professionals have a significant impact upon their willingness to accept and advocate an increasingly significant role in wildlife management for Native peoples. But wildlife manager conceptions about Native-wildlife relations cannot be analyzed before first establishing a firm comprehension of who are, in ideological terms, the members of the wildlife management profession.

Accordingly, section 7.1 begins by deciphering some fundamental elements of the wildlife professional's ideological universe: their beliefs, values and attitudes towards Nature in general and towards wildlife in particular. Our intent is to reveal some of the unquestioned and decidedly cultural assumptions which render management practice "logical" to the minds of wildlife managers. Western concepts of Nature and of human-environment relations are to be examined. These conceptions inform the reality of wildlife professionals and largely determine their attitudes and judgements about what constitutes "correct" or "appropriate" decisions and actions vis-a-vis wildlife.

Having established the ideological framework within which wildlife professionals analyze their world, in section 7.2 the focus shifts to wildlife manager representations of the relationship between Native peoples and wildlife. In

previous chapters, a number of wildlife manager misconceptions about traditional ecological knowledge have been examined and refuted. In this section, arguments are examined which have been advanced by wildlife professionals in support of their conviction that Native peoples have never managed the wildlife resources upon which they subsist. Evidence set forth in support of their views is assessed and in the concluding section of the chapter, the extent to which ideology as opposed to empiricism has influenced their conceptions of the Native-wildlife relationship, is examined.

7.1 Attitudes, Values and Beliefs of Members of the Wildlife Management Profession

In this section dealing with wildlife manager ideology, two related precepts of the Western wildlife profession are to be examined. The first, that of control over Nature, provides the wildlife management profession with its *raison d'être*. The second, the optimization of Nature's production, has precipitated substantial change in wildlife manager values and attitudes towards the natural environment. Our assessment of these key elements of the profession's ideological framework reveal the extent to which cultural values underlie what wildlife professionals consider to be the "mere common sense" of Western management objectives and strategies.

Once an understanding of the profession's system of values and beliefs has been established, their influence upon wildlife manager views of Native hunting are then to be considered.

7.1.1 The Control of Nature

The wildlife manager's ideological commitment to the control of Nature reaches far back in the history of Western civilization. In order to control Nature it must first be externalized, objectified and reified. White (1967) traces the roots of this alienation of humanity from the natural environment to early Judeo-Christian belief. Christianity and Judaism sharply segregate humans from the natural world. In the Christian origin myth, for example, only Man is created in God's image and provided with an immortal soul. The Christian God creates Nature to serve humanity and grants them dominion over all creation.

And God said: let us create man in our image, after our likeness and let them have dominion over the fish of the sea, and over the fowl of the air, and over the cattle, and over all the earth, and over every creeping thing that creepeth upon the earth.

Genesis 1: 26

And God blessed them, and God said unto them, Be fruitful and multiply, and replenish the earth, and subdue it.

Genesis 1: 28

White denounces Christianity as "the most anthropocentric religion the world has ever known" (White 1967: 1205)¹ and attributes the current global ecological crisis to Christian attitudes and values which, in spite of the decline in power and influence of the Church during the last century, remain a deeply-entrenched fixture of modern-day Western society.

In the evolving legacy of Western dominion over Nature, wildlife management represents a particularly powerful expression of the belief that Nature should be controlled for human benefit. The singular importance of control and manipulation in the wildlife management tradition can be explored in several ways. One insightful approach is provided by examining the etymology of the terms "manage" and "management" and the historical events leading to the application of these terms to wildlife.

The conjunction of the words "management" and "wildlife" is recent. The root verb "manage", however, enriches this contemporary expression with the ghosts of connotations accumulated during more than 400 years of use in the English language. The Oxford English Dictionary identifies two major influences on the sense-development of the root verb

¹ A number of authors have taken exception with White's views. Dubos (1976) for example notes that severe environmental degradation in ancient and contemporary times is of widespread occurrence, and is not by any means restricted to cultures of a Judeo-Christian or even Occidental tradition.

"manage", one Italian and the other French.

At its origin, the English term was an adaptation of the Italian *maneggiare*, meaning to handle, train or direct horses. The Italian word was in turn derived from the Latin, *manus* meaning "hand". The earliest recorded usage of "manage" in the English language is dated 1561: "to manege wyth reason, especially rough horses" (Hoby 1561 cited in Oxford 1989: 292). The Oxford also cites the following text by Daniel dated 1645: "Manage the lustie Steed? Or see the Eager Hounds pursue the prey?".

The initial application of the term to the horse, an animal which if not wild, is considered to be spirited or self-willed and the explicit sense of controlling or causing "to submit to one's rule", immediately suggests a strong link between this earliest object of management and that which concerns us here, the management of wildlife. But in actual fact this link is not direct and the sense-development of the term follows a long and convoluted path before its application to wildlife.

Thus the application of the term "manage", at a very early date, was extended to the handling of arms, a usage which bore the connotation of control in order to make it (the weapon) serve one's will. The sense of bending to one's will that which resists, encouraged the word's use in other

contexts as illustrated by the following phrase of Marlowe and Nashe (1594): "And full three Sommers likewise shall he waste In managing those fierce barbarian mindes". The verb also came into frequent early usage in the contexts of war and business, where it denotes the control of the course of affairs by one's own actions. Its application in the context of business, finance and administration can be traced to the late 16th century.

While the Italian roots of the term emphasize skillful control of that which is self-willed or difficult to master, the sense-development of "manage" was profoundly influenced in the late 17th and early 18th century by the French verb *ménager*, meaning "to use carefully, to husband, to spare" (Oxford 1989). The English word consequently acquired a connotation of husbandry or shepherding which modified its original emphasis upon skillful or deft control. Extension of the term to agricultural or pastoral contexts such as the cultivation of land or the tending of herds or flocks may be attributed to this modification in meaning.

As we have seen, the English verb "manage" has a rich and diverse usage. In contrast, the noun "management", perhaps due to the strong influence of the French *ménager* has a more restricted application. In fact many of the earliest contexts of use such as those relating to the handling of

horses, arms and the direction of war are lost. "Management" has been primarily applied in two contexts, that of business or commercial enterprise and that of agriculture and animal husbandry. The Oxford Dictionary (1989: 293) provides the following definition of management: "the application of skill or care in the manipulation, use, treatment or control (of things or persons) or in the conduct (of an enterprise, operation, etc.)". Both the Italian and French roots are acknowledged in this definition, the former denoted by the application of skill and the latter by the application of care. Note also the continued and central importance of control and manipulation

Business use of the term has added new elements of meaning. As early as 1739, management has been used to designate "that group of employees which administers or controls an industry in contra-distinction to the labour force" (Oxford 1989: 294). This alienation of those who manage from those who are (or that which is) managed has implications as important for the management of wildlife, as that of business. Furthermore, business and also perhaps agricultural uses of the term, have introduced the notions of maximization of profit, efficiency or production, notions which have also been transferred to wildlife management.

To quickly summarize then, the word "management" throughout

its history of several centuries of use in the English language has always carried with it the clear connotation of human manipulation or control. This control may be calculating or caring, but from its deepest roots to the present day *manus*, the human hand, has always been present.

What then are the circumstances of the conjunction of wild life and "management"? For up until this point in the discussion objects to be managed have always been located well within the sphere of human affairs: first the horse, then arms, war, cultivated plants, domesticated animals and business. What historical shift in Western perspective allowed that which was once considered wild to be managed? After all, "wild" is derived from the early Teutonic and Norse root meaning self-willed or uncontrollable (Nash 1982). To address this question, a brief history of North American attitudes towards wildlife and wildlife conservation must first be indulged in.²

A brief history of Western attitudes toward Nature

The first European colonists arriving in North America had little reason to concern themselves with controlling or managing the supply of wildlife. Relative to the densely-

² European attitudes and practices have had an important influence and interested readers are referred to the writings of Leopold (1933a), Worster (1977), Foster (1978), Nash (1982) and McCandless (1985).

populated countries which they had left behind, the "New World" offered a seemingly inexhaustible abundance of land, forest and animal life. Commercial exploitation of fisheries and fur provided the initial basis for economic prosperity and early colonists were hardly aware that these activities were the first of a series of devastating inroads into the continent's natural wealth (Kerr 1988).

Subsequent waves of settlers occupied the arable lands along the Atlantic seaboard, clearing forests and displacing Native peoples and wildlife. For these settlers, Nature was hostile and feared. Wilderness, Indians and wildlife had to be conquered and subdued in order to allow "civilization" to advance (Nash 1982).

a Canadian settler hates a tree, regards it as his natural enemy, as something to be destroyed, eradicated, annihilated by all and any means.

Jameson cited in Foster 1978: 9

This "frontier mentality" continued to thrive as European colonizers pushed westward across the continent. But in the East, an increasing population and the development of urban populations engendered the first hints of a change in attitude towards Nature. As early as 1718, a closure on deer hunting was instated in Massachusetts (Leopold 1933a). Ruffed Grouse benefited from a closed season in Upper Canada from 1762 (Foster 1978). In 1794, Nova Scotia passed legislation to protect grouse and Black Duck (Lewis 1972).

These were early and largely isolated attempts at controlling hunting. Over the ensuing decades, protective wildlife legislation accumulated piecemeal, with limited public interest and support. In Canada, the British North America Act of 1867 ignored wildlife, lumping them under the generic, "matters of private and local nature" (Kerr 1988: 2306).

By the 1880s and 90s, however, significant changes had taken place across the North American continent. Railways traversed both Canada and the United States from coast to coast. The plains buffalo, whose population numbered in the millions a mere two decades earlier, was now virtually exterminated by market hunting. Habitat destruction and commercial hunting also spelled the demise of the Passenger Pigeon, a species once so numerous that Audubon (cited in Verney 1979: 106) felt compelled to write, "The passenger pigeon needs no protection... no ordinary destruction can lessen them...". But by the 1890s, of a population once estimated in the billions, only a few scattered sightings were recorded. In 1900 the last wild representative of their kind was killed in Ohio (Wilcove 1989).

The wholesale slaughter of wildlife added momentum to a fledgling nature conservation movement of which the buffalo became a powerful symbol. Nonetheless, wildlife was not a central issue (McCandless 1985). At the turn of the century,

the primary conservation concern was the rapid depletion of forested lands (Nash 1982).

At this point, we take back the threads of our etymological consideration of "management" and intertwine them with the history of wildlife conservation. For at the end of the 19th Century, advocates of a utilitarian or "wise use" vision of Nature, appropriated the term "conservation" for their cause and linked it irrevocably to the concept of "management".

The Preservationist - Conservationist Debate

In the United States in the latter half of the 19th century, the relationship of human society to Nature became a subject of bitter debate. Two very different points of view struggled to win the hearts and minds of the American public. John Muir, the self-made wilderness prophet who spoke for the virtues of wild Nature and against the tide of Judeo-Christian anthropocentrism, sought a kinship between humans and all of "God's creatures". Muir's mission was the preservation of wilderness. His ideas about Nature can be traced back via Thoreau to the European Romanticists of the 18th century, the primitivism of Rousseau and Byron (Nash 1982).

The spokesman for his opponents was Gifford Pinchot, soon

to be Chief Forester of the U.S. Forest Service. Pinchot was also influenced by European thought, but of a decidedly different nature. Returning from graduate studies in Europe where timberland was considered a crop to be managed for sustained yield, Pinchot set himself to promoting a narrowly utilitarian vision of forest use for economic development.

The bitter struggle that ensued rent the growing conservation movement in two. Wise-use advocates succeeded in appropriating the term "conservation" for their cause. Muir and his followers took up the banner of "preservation". In the end, Pinchot and his colleagues prevailed. The Forest *Management* Act, passed in 1897, designated timber production as a primary purpose of forest reserves and also opened them to mining and grazing. Thus at the turn of the century, the concept of "conservation" was given new meaning as "wise-use" and management became the tool by which conservation was to be achieved. As we shall see, once society had accepted the concept of managing forests, the concept of wildlife management was but a short step away.

During the first decades of the 20th century in both Canada and the United States, however, wildlife concerns continued to be translated into protectionism. The Migratory Birds Treaty signed by the two countries in 1916 represented the first attempt at coordinating wildlife protection on an international scale (Kerr 1988). In 1919, two Canadian

government bodies, the Commission of Conservation (formed in 1909) and the Advisory Board on Wild Life Protection (formed in 1916) organized the first National Conference on Game and Wild Life Conservation (Commission of Conservation 1919). At the 1919 Conference, Hewitt explained how Canada's small population size allowed it to trail behind its southern neighbour in wildlife affairs and to take lessons from the U.S. experience :

The manner in which the wild life over most of the United States has suffered through lack of adequate protection has furnished an object lesson that Canadians have not been slow to learn; and, while wanton destruction and excessive and unwise killing has taken place throughout Canada, our comparatively small population has not depleted our wild life so well favoured in haunts by Nature...

Hewitt 1919: 8

Thus it was south of the border that Leopold first breathed life into the profession that was to become wildlife management. His influential text, "Game Management", published in 1933, is considered by many to represent the veritable starting point of the modern wildlife management tradition in the United States (Bailey 1984), as well as in Canada (Hochbaum 1981 [1944]; Nikiforuk 1988).

Leopold's designation of wild game as fitting objects of management was directly inspired by the "cropping arts" of agriculture and forestry.

Like the other agricultural arts, game management

produces a crop by controlling the environmental factors which hold down the natural increase, or productivity, of the seed stock.

Leopold 1933a: 3

He rejects preservationism and whole-heartedly endorses Pinchot's vision of "conservation" by planned manipulation :

Both scientists and sportsmen now see that effective (game) conservation requires...a deliberate and purposeful manipulation of the environment-the same kind of manipulation as is employed in forestry.

Leopold 1933a: 21

The expression "wildlife management" came into common usage shortly after the publication of Leopold's "Game Management". Up until 1935, conservationists had viewed game species as the primary focus of their concerns. "Non-game wild life", as Leopold (1933a: 403) denotes them, are given only fleeting consideration in his text. The game manager's interests soon broadened, however, (at least in principle, if not in practice) to include all "wild life" forms so that in 1936, the annual professional forum changed its title from the American Game Conference to the North American Wildlife Conference (the latter now including Canada and Mexico in addition to the United States) (Kennedy 1985).

Reflecting upon the management of wild-life as the control of life which is "uncontrollable", leads us back to the question posed earlier: What conceptual shift in North

American perspective allowed wildlife to be managed? Management is the exercise of manipulation and control, the subjugation to one's will. Like wild horses, wild Nature had first to be broken before it could be "managed". In the late 19th Century, the disappearance of the western frontier, the loss of forested lands to the plow, the slaughter and extinction (or near-extinction) of wildlife species whose numbers were once thought to be inexhaustible, the establishment of an urban population ... all these factors contributed to Nature's "domestication".

Once conservationists and preservationists alike could agree that the fate of wilderness lay in *manus*, the human hand, only then could the concept of "management", first of forests, then game animals and finally, wildlife, come into being. The contradiction between the act of management (control/manipulation) and its object (wild or self-willed life) was resolved, not by an alteration in the sense of management, but by a change in the conception of Nature.

Wildlife Management as the Control of Nature

In the opening passage of the Preface to "Game Management", Leopold, the father of wildlife management, makes explicit the new vision of Nature which fostered the emergence of the management profession.

We of the industrial age boast of our control over

nature - plant or animal, star or atom, wind or river -
there is no force in earth or sky which we will not
shortly harness to build 'the good life' for ourselves.

Leopold 1933a: vii

For Leopold, Western society possesses both technological
might and moral right to exercise its dominion over the
natural world. His only lament is the ends to which this
control is being directed.

Is all this glut of power to be used, for only bread and
butter ends ? Man cannot live by bread and Fords alone.
Are we too poor in purse and spirit to apply some of it
to keep the land pleasant to see, and good to live in?

Leopold 1933a: vii

Leopold campaigns for the conservation of wild game and
offers management as a novel and efficient means to achieve
this end.

The central importance of the ideology of control in the
Western wildlife management tradition is revealed by our
discussion of etymology and history. It is also evident in
the writings of the profession's originators and contemporary
practitioners. For Leopold, the concepts of dominance and
control over nature are central to his vision of wildlife
management. In "Game Management", the word "control" figures
prominently in five of ten chapter headings on management
technique: Control of Hunting; Predator Control; Control of
Food and Water; Control of Cover; and Control of Disease

(Leopold 1933a: xiv-xv). In his article on "The Conservation Ethic", Leopold refers to management as "the idea of controlled wild culture" (Leopold 1933b: 641). For Leopold this control is to be provided by the advance of Western science and technology.

Control comes from the coordination of science and use. This book attempts to explore the possibilities of such coordination in a single limited field - the conservation of game by management.

Leopold 1933b: vii

Contemporary wildlife management has forsaken little of Leopold's preoccupation with the control of nature. Bailey, for example, describes wildlife management in much the same terms as Leopold.

Wildlife management consists of controlling the number, distribution and quality of wild animals, either directly - as by manipulating hunting seasons - or indirectly - as by manipulating wildlife habitat.

Bailey 1984: 307

The same strident tones resound in Calef's writings on the management of caribou in the Northwest Territories.

If we want to start the caribou herds of the Northwest Territories on the road to recovery now, wolves must be controlled. Even when the caribou herds build up to large populations, wolves will have to be controlled continually to hold their numbers below the ratio of one wolf for a hundred caribou. Otherwise, human hunting will start another decline.

Calef 1981: 167

Wildlife managers from Leopold's time to today, abide by

the assumption that Nature should be dominated, controlled and manipulated in order to benefit humankind. The "natural" course of events, that is to say if humans did not intervene, is not to be trusted.

If nature is allowed to take its course, the prey herds will probably decline to a very low number before wolf population drops, but it will eventually drop. The net result would be fewer prey - and fewer wolves - for a longer period than if wildlife managers are allowed to intervene.

Grenewalt cited in Kennedy 1985: 574

In professing their perceived prowess at manipulating Nature, wildlife managers remain true to the Judeo-Christian legacy and fulfill God's ordinance to subdue and exploit all of creation for human benefit.

7.1.2 The Business of Nature: maximizing wildlife production

Application of the term management to the strikingly different contexts of business and wildlife is not merely a fortuitous occurrence. As our historical survey has revealed, the conservation movement in North America has been deeply divided from its earliest days: Pinchot's conservationists advocating utilitarianism or wise (i.e. economical) use of resources and Muir's preservationists arguing for "pristine" wilderness. Wildlife management was conceived in the Pinchot tradition of conservation, a tradition which Pinchot himself expressed in the following

succinct terms: "forestry for us is a business proposition" (cited in Foster 1978:35).

Wildlife management as a business proposition

In Canada, in 1910, Sifton, the chairman of the recently established Commission of Conservation expressed a similar view: "Conservation means the utilization of our resources in a proper and economical way". (cited in Foster 1978:41). More explicitly, Haskell, vice-president of the American Game Protective and Propagation Association, explained in 1937 that "conservation consists in consuming only the excess, of keeping the principal intact and enjoying the interest" (Haskell cited in Gottesman 1983:84). Leopold himself, described and in fact conceived of game management in terms of managing financial affairs.

If the (game) crop is to be removed by hunting, its measurement is to be accomplished, as in finance, by comparing the interest with the capital...The unit of productivity, where the increase is removed, is the ratio or per cent which can be removed yearly without diminishing the capital....Often, of course, only a part of the crop is removed as kill, the rest being left as capital accretion.

Leopold 1933a: 171

Contemporary wildlife professionals view wildlife conservation through management in very much the same capitalistic terms. MacPherson (1981: 106) declares that "a prudent future-oriented outlook that has parallels in

agriculture (preserving the breeding stock) and capitalism (living off the interest)" is fundamental to wildlife management.

Ducks Unlimited, the North American waterfowl conservation giant that has invested millions of hunter dollars into the creation of artificial wetlands, promoted its projects until the 1970s, as "duck factories", a revealing metaphor identifying waterfowl as consumer product (Nikiforuk 1988: 38). Hochbaum, whose studies and writings have done much to promote waterfowl management in Canada (cf. Hochbaum 1981 [1944]) bitterly criticizes Duck Unlimited for "indirectly contributing to hunting abuses by fostering a consumer ethic among wildfowl hunters" (Nikiforuk 1988: 40). Other authors, however, level this same critique at the wildlife management profession as a whole. Disillusioned by wildlife management's obsession with "the delivery of wildlife to the consumer", Livingston laments the profession's entrenched economic motives.

Practitioners of wildlife 'management' are almost entirely concerned with the uninterrupted production and mass packaging of commercially-important species.

Livingston 1981: 26

The rapport between wildlife management and capitalist thought goes well beyond the sometimes colourful metaphors of its practitioners. The profession's terminology and core concepts demonstrate an indisputable kinship with Western

society's dominant market mentality. The term "resource" as in "natural resource" or "renewable resource" is a case in point. By definition, a resource has inherent utility to humankind. Resource infers, or for that matter requires, human use (Livingston 1981). First forests, then game animals and finally wildlife, each was in turn added to the nation's inventory of natural resources. Once designated as resource, "wild life" became a candidate for wise management in the national interest.

Yield and productivity are other terms which reflect a capitalist ethic of production. Leopold (1933a) speaks of enhancing yields of game species by manipulating the productivity of the breeding stock. Productivity in turn is viewed as "something taken away from 'other enemies' of game - a transfer of mortality from natural enemies to human hunters" (Leopold 1933a:23). But nothing illuminates the motivating values of wildlife management so effectively as the doctrine of maximum sustained yield (MSY) and its successor optimum sustained yield (OSY).

The Concept of Maximum Sustained Yield (MSY)

Wildlife management for MSY came into its own in North America in the decades following the Second World War (Larkin 1977). Prior to this epoch, the management objective was a modest affair: harvest for sustainable yields which would more or less maintain the wildlife population at status quo (Walters 1986). Leopold (1933a: 3) described his target as

"sustained annual crops of wild game". Management for MSY, however, is a much more ambitious endeavour.

According to MSY theory, a relationship exists between the size of a breeding group or stock of animals and the size of the sustainable harvest from this stock. If the stock is small, sustainable harvest will be low due to the necessarily low production from a small number of breeders. An excessively large stock, on the other hand, is believed to provide a diminished sustainable harvest as competitive interactions between individuals prevents them from realizing full reproductive potential. Therefore at some intermediate population size, a maximum sustainable harvest or yield is produced. If MSY is the management objective then the population must be maintained at this particular intermediate size.

It is the concept of maximization which bares the capitalist soul of contemporary wildlife management. Rather than managing a wildlife population with an eye merely to ensure sustainability, MSY theory dictates a precise management objective which would ensure maximum benefit to human society. With maximum profit as the goal, underexploiting of a resource suddenly becomes as deadly a sin as overexploitation. Either way there is "waste" involved :

You only need to have as much effort as is necessary to catch this magic amount, so to use more is wasteful of effort; to use less is wasteful of food. Basically it was a puritanical philosophy in which the supreme powers

were pretty harsh on people who enjoyed themselves rather than doing precisely the Right Thing.

Larkin 1977: 1

This do the "Right Thing" philosophy of maintaining wildlife populations in their most productive state, prompted McTaggart-Cowan (1955:176) in a survey of "Wildlife Conservation in Canada" to conclude that although wildlife stocks "are in good condition ... only a few species are realizing their full potential". He identified the "failure to adequately crop many capacity stocks (of big game)" as one important reason for their being smaller (and) less productive than he believed desirable (McTaggart-Cowan 1955: 175).

But as Caughley (1979) has pointed out there is nothing natural about having stocks reach their "full potential". This objective is entirely human and decidedly cultural. That maximization of wildlife production should become the "conservation" objective of a society which is profoundly capitalistic, is no coincidence. According to Caughley, ungulate populations which are left undisturbed by humans attain a stable and natural equilibrium with the plant biomass of their range. This equilibrium point, Caughley refers to as "ecological carrying capacity".

Wildlife professionals such as McTaggart-Cowan, however,

view such ranges as overpopulated even though they may be in a stable equilibrium state. Adherents to the MSY doctrine maintain that "natural" population size is that which provides a maximum sustainable yield. Ironically this state of affairs is not stable but must be maintained by depressing population size by artificial means such as hunting or culling. Caughley (1979) refers to this artificial MSY equilibrium as "economic carrying capacity", revealing the fundamental objective of this management goal.

The myth that an ungulate population at ecological carrying capacity is overpopulated, an "unnatural" and undesirable condition, continues to be perpetuated in the wildlife management profession (cf. McNab 1985). Bailey (1984), for example, commits this error in his textbook, "Principles of Wildlife Management". He illustrates the role of management in the conservation process by providing a case study of the Michigan white-tailed deer. After an initial explosion of the deer population in the 1920s and a consequent depletion of available browse, the population was in the process of establishing a new equilibrium with its habitat. As a result, cases of deer starvation were observed and fawn production was low. Rather than recognize this condition as part of a natural ecological process, Bailey speaks of "the ugliness of malnutrition", "the barrenness of the deer yards" and "an unproductive, sickly herd" (Bailey 1984:17). At the same time, he conveys to the reader, his sentiments about

what the wildlife manager considers to be the desirable state of affairs. His usage of the expression "balanced" invokes a sense of natural order (eg. the balance of nature) which implies that the manager's task is merely to set Nature back on track.

Malnourished deer produce comparatively few fawns... Reducing deer numbers to levels *balanced* with supplies of good forage can result in increased rates of reproduction. This increase could support larger annual harvests (emphasis added).

Bailey 1984: 18

Rather than indicating that the Michigan deer population was following a growth pattern typical of ungulates: an eruption, crash and the convergence to equilibrium (Caughley 1979), Bailey presents the wildlife manager as a kind of ecological folk hero who, abhorred by nature's cruel excesses, restores a natural balance between the deer and its habitat. Bailey does not point out that an equilibrium would be attained without manager interference, nor that his point of "balance" (Caughley's economic carrying capacity) is an arbitrary one founded upon a capitalistic ethic of maximizing the deer population's yield.

The MSY concept has been criticized for being too simplistic. It ignores the ecological interactions between target species and other community members and promotes the reduction of genetic diversity by over-exploiting less

productive sub-populations (or less-productive species in multi-species fisheries) (Larkin 1977). It has also been judged too risky, for the MSY point is thought to be close to a "cliff edge" where slightly higher harvests could quickly drive the population to extinction (Walters 1986). Wildlife managers today promote optimum sustainable yield (OSY), an ill-defined concept whose objective is less ambitious. In spite of this step back from the brink, OSY, like MSY, insists that a single best management objective exists (now called optimal instead of maximal). The OSY doctrine, no less than that of MSY, is a product of a capitalistic vision of wildlife which requires that productivity be maximized/optimized.

As wildlife management, from its earliest days, is inspired by the management of financial affairs (breeding stock as capital; harvestable surplus as interest) (Leopold 1933a; MacPherson 1981), it is no surprise that wildlife managers seek to maximize wildlife yield and embrace the sister concepts of MSY/OSY. Wildlife managers have sought not only to dominate Nature but, in accordance with North American society's allegiance to economic efficiency, their ambition is the manipulation of Nature for maximal wildlife output for human benefit.

7.2 Native Hunting from the Wildlife Manager's Viewpoint

Many people are under the impression that the primitive Indian was a dedicated conservationist. Nothing could be further from the truth.

Parker 1972: 72

A number of wildlife professionals have argued against the existence of Native forms of wildlife conservation or management. In their arguments, they distinguish between two epochs, defined by the presence or absence of modern firearms. For the pre-firearm period, two arguments are raised. The *predator-prey argument* maintains that Native populations had no need for management as their numbers were kept in close check by cyclic declines in the populations of their prey. The *primitive technology argument* proposes that limitations of Native hunting technology precluded the over-exploitation of wildlife and therefore removed the motivation to evolve a management ethic.

Once armed with modern weapons, it is argued that Native hunters provide substantial proof of the absence of a conservation/management philosophy. They kill excessively, cause or threaten to cause declines in wildlife populations, waste the products of their kills and shoot wildly when hunting. These representations of Native-wildlife relations are to be examined in this section of the thesis.

7.2.1 Stringent Controls on Human Populations: the predator-prey argument

It has been argued that Native populations in pre-contact North America were strictly ecologically controlled. Mechanisms of population regulation were entirely external. Distinctions between human and non-human populations were insignificant.

These features of the North - unreliability and low production and diversity - may together act to control human populations depending on local resources. Thus by their very instability, arctic prey populations could perhaps have kept predator populations - including human ones - within stringent bounds.

MacPherson 1981: 104

Subject to such a rigid regime, Western wildlife managers contend that wildlife management could not have been developed by Native groups. Life was a constant struggle for survival and harvesting opportunities could not be passed by. Conservation was a luxury that no Native hunter could contemplate.

The primary control agent, maintaining this "sustainable balance between populations of predators and yields of prey" (MacPherson 1981: 104) is described as periodic starvation (Calef 1981; Theberge 1981). Simple predator-prey models are used to represent the fate of Native hunter-gatherers.

A simple predator-prey model might fit the relationship between Inuit hunters and the population size of the ringed seal in a particular locality, the ringed seal being a resource (food and fuel) for which substitutes did not exist. In such a model the Inuit would not be effective enough as hunters to exterminate the seal, and the numbers of seal then would determine the size of the human population.

MacPherson 1981:104

This tendency to equate Native peoples with non-human predators can be traced back to the early days of the study of animal population dynamics. Charles Elton in his seminal work on animal population cycles entitled "Voles, Mice and Lemmings" (Elton 1942), speculates that populations of Indians and caribou in Ungava undergo the same cyclic fluctuations as those generated under laboratory conditions by the interactions of two species of mites (one a predator and the other its prey).

In the system formed by the Indians and the caribou there have been fluctuations and ultimate limits of this sort. For hundreds of years the Indian population must have starved at intervals, giving the deer opportunities to increase, then killing deer heavily until another failure to cross their erratic tracks caused more Indians to starve.

Elton 1942: 385

This point of view is reiterated today by other wildlife professionals.

Periodic starvation or emigration were part of the way of life of northern hunting peoples... In this way human hunters were no different from other predators whose distribution and abundance depend on their prey. If they overexploited the caribou in their region, they in

turn declined, allowing the herd time to recover.

Calef 1981: 163

In summary, a number of wildlife professionals envision Native peoples as the victims of a harsh and unforgiving environment. Hunter-gatherers exercised no control over their relationship with Nature. Life was a continual struggle against difficult odds. Like any other animal predator, human population size was a strict function of yields of prey. When prey populations were overexploited and declined, human populations followed suit. Having accepted this construction of reality, wildlife professionals dismiss any suggestion that pre-contact hunter-gatherers managed their game. If anything it was Nature that "managed" the human populations of traditional times.

7.2.2 The Technology Argument : Primitive arms and limited kills

Many people are under the impression that the primitive Indian was a dedicated conservationist. Nothing could be further from the truth. The primitive Indian was limited to weapons which would not allow him to kill much more than he actually required.

Parker 1972: 72

One of the principal arguments against the existence of a Native system of management is the primitiveness of traditional hunting technology. According to Parker (cited above), a Canadian Wildlife Service biologist, Native peoples

in pre-contact times did not exercise any meaningful, self-imposed limits on their hunting. Rather, the single most important limiting factor was external to their control. Wildlife harvests by Native peoples knew only the limits imposed by their "primitive" and presumably inefficient weaponry. Stated otherwise, Parker maintains that despite the Native's incessant efforts to kill more, their inadequate technological means inadvertently spared wildlife populations from extinction.

These views are seconded by other members of the profession. MacPherson expresses his agreement in the following terms:

There seems no evidence, then, that wildlife was purposefully managed by Amerindian populations in northern Canada at the time of contact. Instead we may conjecture that the impact of hunting on wildlife stocks was limited by the low technological level of the hunters and the fact that their populations were small and insecure.

MacPherson 1981: 104

Theberge concurs. In his view, Native North Americans were never conservationists. Although overkills of wildlife occurred in earlier times, they never became "excessive" and therefore threatening for wildlife, until the introduction of modern firearms (Theberge 1981). An earlier version of these same views is provided by Leopold and Darling. Their reflections upon wildlife use by the Eskimos of Alaska

include the following insight:

The bow and arrow stage of culture was conserving because of its limitations; the rifle has removed these limitations, but there has been no development of philosophy to offset the technological advance.

Leopold and Darling 1953: 43

The limited technology argument is based upon the following line of logic. Due to the inefficiency of their "primitive" hunting technology, Native peoples in pre-contact North America could not kill excessive numbers of wildlife. Unable to overharvest (and thus threaten) the resources upon which they depended, Native peoples did not require, and therefore did not develop, a philosophy of wildlife conservation or management.

This straight-forward logic is founded upon a single assumption: that traditional hunting technology was the critical factor limiting the harvests of Native peoples. No evidence, however, is presented to support this view. The authors equate "primitiveness" with inefficiency and leave their readers to seek out their own proofs.

Yet hunter-gatherer societies world-wide have developed sophisticated complexes of hunting tools and strategies whose diversity and ingenuity defy their dismissal as "primitive". The Inuit, in particular, are renowned for the complexity and efficiency of their hunting gear, each of many implements having been adapted to a highly specialized task. The

toggling head harpoon which permitted the successful exploitation of large marine mammals including the great whales, is but one example of the efficacy and ingenuity of the Inuit technological tradition. This innovative weapon has found no substitute and today it is still an indispensable element of the hunter's outfit through the Arctic.

Townsend (1983) cautions against the use of facile arguments based upon the presumption of technological inferiority/superiority. Her comparative study of the efficiencies of firearms and Native arms defies conventional wisdom. She demonstrates that in Alaska the killing efficiencies of the native bow/arrow and dart/throwing board complexes were comparable with Western technology until the first repeating rifles were invented in the mid or late 19th century. From a survey of a number of independant sources, Townsend concludes that arrows can wound or kill at ranges of 75 to 100 yards and were accurate up to 67 yards. Stefansson (cited in Jenness 1923: 145-46) reports that the bows of the Copper Eskimo have an effective range for killing caribou of 75 to 90 yards. Penetrating power was so great that "at thirty or forty yards members of our party have repeatedly seen an arrow pass through the thorax or abdomen of an adult caribou and fly several yards beyond" (ibid). As for rapidity of fire, archers, who were well capable of shooting

with accuracy 20 arrows per minute, easily outpaced the 19th century gunman who could muster but three shots per minute from his muzzle-loading musket (Townsend 1983).

The point is not to deny the efficiency of Western hunting technology, in particular the extended killing power and speed of the repeating rifle which, as evidenced by its rapid adoption was fully recognized by Native peoples. Rather it is to caution against careless assumptions arising from the dualistic opposition of Native and Western technologies as primitive versus modern and low level versus advanced.

Similarly, there is little evidence to support the wildlife manager's contention that traditional technology was in itself conserving as it did not allow Native peoples to overexploit. In fact, certain pre-contact harvesting techniques were extremely productive, providing ample opportunity for excessive harvesting. It is well-documented, for example, that Native peoples throughout the Arctic and Subarctic harvested large numbers of caribou during their seasonal migrations with relative facility and this in spite of the "primitiveness" of their arms. Ambushing the migrating herds at traditional crossing places where they could be easily overtaken and speared by hunters in kayaks or boats, driving herds between two converging lines of stone cairns near the apex of which hid archers or spearmen or by

any of a number of other traditional techniques, the caribou were not difficult prey.

Both Parker (1972) and Kelsall (1968) contradict the hypothesis of limited technology, citing a number of references which document kills of great numbers of caribou with only traditional implements and techniques. Kelsall in particular goes to great lengths to explain how easily caribou can be killed with no more than a bow and arrow or hand-held spear.

The author several times proved to his own satisfaction that it is possible for even a novice to decoy or trick caribou into range of a hand-held spear...Such simple expedients as slowly waving the arms, a handkerchief, or a rifle during a direct and open approach, or bobbing up and down from the waist, will hold a caribou until a hunter is within a stone's throw, and sometimes attract them to closer range.

Kelsall 1968: 216

He concludes that "there seems little doubt that under most conditions the caribou are among the most easily killed of game animals".

A similar point can be made for the harvesting of fish. Inuit stone weirs, for example, are efficient devices serving to produce substantial stores of Arctic char during the latter's upstream or downstream migrations. According to Rasmussen's observations in 1923, every Netsilik family present at the Amitsoq stone weir was able to cache between

600 and 1200 kg. of char in a period of just 14 days (Rasmussen 1976 [1931]: 65-66). Forty years later, Balikci documented that Netsilik fishermen using modern Western technology (i.e. fish nets) could match but not exceed this rate of char production (Balikci 1964: 58).

Leroi-Gourhan (1945) has exposed the fallacy of considering technology as materials and tools but not knowledge and technique. Given the materials at their disposal Native peoples devised refined and sophisticated tools which they applied to the harvesting task with efficient and ingenious techniques. If the thrust of their spear or the flight of their arrow lacked the force or reach of a bullet, Native technologies compensated using their knowledge that a caribou in water is slower than a hunter in a kayak and that a coordinated hunt using beaters and stone cairns brings the herds within easy range. Knowledge and technique provided for efficient and productive hunts in pre-contact North America.

Finally, dismissal of Native technology as "primitive" belies the fact that Native peoples had at their disposal and used with considerable finesse, a tool whose constructive and destructive potential for the environment places it in a category of its own. This tool is fire. The use of controlled burning by the Indians of the northern Alberta boreal forest has been extensively documented by Lewis

(1982). These subarctic peoples used fire for a wide variety of purposes including the creation and maintenance of meadows to attract wood buffalo and moose, the enhancement of riverine habitats for fur-bearers and the improvement of shoreline areas to facilitate waterfowl nesting and feeding.

7.2.3 The Technology Argument's Corollary: Western technology and overkills

As the corollary to the argument of "low technological level" (MacPherson 1981) and insignificant kills, many wildlife professionals contend that Native hunters armed with modern firearms kill excessive numbers of wildlife. Rather than being portrayed as predators swept along in a dynamic balance with their prey, Native hunters armed with rifles became wildlife slaughterers. The transformation is both sudden and unequivocal.

In the past the going and coming of the caribou determined the survival of human hunters in the North. Today it is the human hunters who control the destiny of the caribou.

Calef 1981: 164

Native peoples armed with rifles may control the destiny of wildlife, but who will control Native peoples? According to Calef, they cannot control themselves. He represents Native peoples as subserviant to innate hunting instincts which remain beyond their control and which drive them to kill

incessantly and abundantly.

Among the native peoples the age-old hunting instincts have not died... Because the modern technological society has come to the North so suddenly, the instincts evolved over thousands of years have not had time to adjust.

Calef 1981: 166

Leopold and Darling offer a somewhat different interpretation, attributing wildlife slaughters to the Eskimo's lack of "a developed point of view".

In respect to utilization of wild animals Eskimos are no more provident than the Indians, and given the opportunity they frequently kill more than they really need. It does not appear to us that the Eskimo has any understanding or regard for the idea of conservation... His extremely unabstrax philosophy, and ability to live in the present have not fitted him in his own culture to indulge in reflection on the dynamics of animal populations or to consider questions of conservation from a developed point of view.

Leopold and Darling 1953: 42

Whether attributed to unadjusted instincts or unabstrax philosophy the essence of the argument is the same. Dovetailing neatly with their conviction that the "low technological level" of pre-contact Native peoples rendered them "environmentally benign" and precluded the development of Native forms of management, wildlife professionals pronounce inevitable and self-evident the outcome of the introduction of firearms. Released from the bonds imposed by their primitive technology and uninhibited by "developed" ideals of wildlife conservation and management, Native

hunters reveled in the "excessive and unnecessary slaughter" of wildlife.

Many authors (Elton 1942; Kelsall 1968; Calef 1981; MacPherson 1981) have accused Native peoples of overkilling caribou and thus causing serious declines in their populations. Elton, for example, tries to link the turn of the century crash of the Ungava caribou herds to the acquisition of firearms by northern Quebec Indians and Inuit. Although he concludes that "the acquisition of firearms by natives...must have played a dominant part" (Elton 1942: 384) he is hard-pressed to explain the anomolous observation that the western Ungava herd begins its decline in the 1880s and 1890s, prior to the introduction of modern firearms. Furthermore, his central hypothesis that Indian and caribou populations cycle due to their dynamic predator-prey interactions, seriously detracts from the role of Western technology in the process.

If it is true, as Elton speculates, that Indians and caribou have cycled together during hundreds of years and that the cycle is driven in part by Indian harvests forcing down caribou numbers, then it must also be true that large kills were effected by Indians regardless of the technological means at hand. The presence or absence of repeating rifles is of little consequence. Note that Calef

(1981) also places himself in the same contradictory position, advocating hunter-generated cycles in caribou populations while at the same time suggesting that declines observed or feared in contemporary populations have but a single cause: the introduction of modern technology.

Calef's fears of the impacts of the introduction of mechanized transport are also at odds with recent events in northern Quebec. In total disrespect for the wildlife manager's hypotheses, the Ungava herds which began their turn of the century decline prior to the use of rifles, have erupted in the 1960s and 1970s in synchrony with the introduction and rapid proliferation of snowmobiles, outboards and other mechanized means of transport, the widespread use of increasingly sophisticated arms and an era of unprecedented growth of the Native population.

Still more ironic are the events of the mid-1980s. Confronted with a now huge caribou herd of over 600,000 animals, the Quebec Ministère de Loisir, Chasse et Pêche desperately sought means to control herd size by massively increasing the human kill through a proposed program of commercialization (Harvey 1985). Their alarm over the situation was fueled by their conviction that the herd would crash due, not to Native overkill, but to the overexploitation of the range. The long-standing tradition

of blaming wildlife population declines on Native overkill was no longer tenable. Yet few have sought to question in the light of the Quebec experience, the long and bitter legacy of wildlife manager denunciations of Native hunters as wildlife slaughterers.

7.2.4 Natives as reckless and irresponsible hunters

Early examples of excessive and unnecessary slaughter of caribou are legion, and modern-day counterparts can be found for most.

Kelsall 1968:216

With these words Kelsall, a Canadian Wildlife Service biologist, opens a prolonged and bitter diatribe against Native hunting practice entitled "The Abuse of Caribou by Man". In his critique, Kelsall accuses Native hunters of the following practices which he categorically dismisses as "excessive", "unnecessary" and yet typical examples of Native improvidence: the selective killing of pregnant females in order to eat the fetus; the incomplete use of carcasses, in particular the removal of only the skin and tongue; the complete abandonment of other carcasses; the failure to pursue wounded animals; inappropriate storage techniques; and the use of caribou as dog food (Kelsall 1968).

Accusations directed at Native hunters reach beyond the outcome of the hunt and the use or lack of use of the harvest. Kelsall for example stresses the irrational and

uncontrolled behaviour of the hunters.

When faced with large numbers of caribou and plentiful ammunition, natives frequently seem to go berserk and fire blindly into the animals until ammunition or caribou are gone.

Kelsall 1968: 221

His words echo in almost identical terms the sentiments expressed 15 years earlier by Leopold and Darling regarding Eskimo hunters in Alaska.

If a group of caribou is trapped on a point in the Arctic Ocean, the Eskimo will go on shooting, often very wildly, until all the animals are dead or the ammunition is exhausted.

Leopold and Darling 1953: 43

Kelsall also cites the testimony of MacFarlane who, in reference to his experiences at Fort Andersen in the 1860s, expresses himself in the following strong terms.

The northern Indians were accustomed...to slaughter thousands of reindeer annually, chiefly for skins and tongues, and too often from the sheer love of killing.

MacFarlane cited in Kelsall 1968: 217

This citation highlights the continuity between Kelsall's critique of Natives as irrational and undisciplined hunters and that of an earlier era when authors felt less compelled to mince their words. Kelsall and other wildlife professionals would perhaps agree, if not with the precise wording, at least with the spirit of Baker's contribution to the first National Conference on the Conservation of Game

which took place in Ottawa in 1919. Dr. Baker speaks as the Chairman of the British Columbia Game Conservation Board.

We have more difficulty with Indians than with anybody else. In the northern country, Atlin and Cassiar, we have experienced a great deal of trouble with the Indians in the slaughtering of moose... In the Chilcotin country...they have slaughtered the Rocky Mountain sheep... They kill them just for the love of killing ... it is a well-known fact that the Indian on the Pacific coast and through the valley of the Fraser kills the animals simply for the love of killing...

Baker cited in Commission of Conservation 1919: 30

In summary, wildlife professionals believe that modern firearms have freed Native peoples from the checks and balances provided by Nature. As Native peoples never required and therefore never elaborated their own system of wildlife management, they are incapable of controlling this newly-gained destructive ability. For wildlife populations the harvests are devastating and Western wildlife managers must intercede to curb these excesses and restore the "natural order".

Westerners, from the early explorers to today's biologists, have a rather limited understanding and appreciation of the dimensions of Native subsistence. Throughout the circumpolar North harvesting of a large number of caribou/reindeer during their seasonal migrations has until recently been an essential element of survival for aboriginal peoples (Burch 1972; Ingold 1980). As hunts on this scale fall well outside

the experience of Westerner observers we should not be surprised at their use of strong terms, such as "vast slaughter", "great destruction" or "orgies of killing" and descriptions of lakes or rivers "red with blood". Such commentaries are as impressive as the scene of the hunt that they attempted to capture in words. They should not, however, be accepted by the reader as evidence that the harvest was unnecessary, excessive or motivated by the "sheer love of killing".

Second, the concept of waste put forth by Kelsall and other authors is ethnocentric. Their obsession is the productive use of caribou meat. All concepts of waste are related to how caribou meat is or is not utilized. The corollary of this Western standard of usefulness is that exploitation of all other parts of the caribou is secondary or even irrelevant. Thus unused meat warrants denunciation as abuse while the use or disuse of the hide, stomach (including its contents), heart, liver, kidneys etc. is neither appreciated nor condemned. The concept of "waste" is derived from a comparison with what Laurie (cited in Kelsall 1968: 211) has termed "the civilized utilization of domestic meat". The "uncivilized" Native hunter might disagree.

One significant outcome of this ethnocentric standard of productive use derives from the Westerner's total lack of

appreciation for the singular importance of caribou hide to Subarctic and Arctic peoples. Until recently reindeer/caribou skin was the winter clothing material par excellence for virtually all Northern cultures (Hatt 1969). Its significance to successful survival in subarctic and arctic zones cannot be exaggerated.

Although today it has been largely but not completely replaced by Western materials, in Kelsall's time in areas where caribou were readily available, Inuit and to a lesser extent Indians still depended heavily upon caribou skins for clothing and bedding. In order to be useful for clothing, caribou skins must be harvested during a narrow window of time between late summer and early fall. Skins harvested too early lack a sufficient growth of fur and do not insulate against the winter cold. Skins harvested too late are stiff and shed their fur.

When caribou skins are in their prime, however, the weather is still too warm for the easy preservation of the meat. Large numbers of caribou must be slaughtered each year as much of the family's caribou skin wardrobe must be renewed. Given their ethnocentric preoccupation with the use of caribou meat, these circumstances of Native subsistence inevitably lead to a great hue and cry from the wildlife management community.

Virtually all of Kelsall's "legion" of denunciations [i.e. the observations of Hearne (1795); Pike (1892); MacFarlane (1905); Lawrie (1948); Robertson (1955); Thomas (1960); McCauley (1960); and Douglas (1960), all cited in Kelsall (1968)] pertain to this late summer-fall hunt whose primary motive is the acquisition of caribou skins for clothing. None of these authors, except Lawrie, evidence the least appreciation of the importance of this hunt for Native survival. The hunters have little choice in the matter, the skins must be acquired. Where more precise information is available it is evident that hunters do not waste hides for virtually all are meticulously taken for use (88 % in the case observed by Thompson (1960) cited in Kelsall 1968: 217). For Kelsall to conclude that this late summer-fall hunt represents a "needless slaughter of caribou primarily for hides" flies in the face of the basic material requirements of the northern Native peoples of his day.

A further point on the wildlife manager's concept of "waste" relates to the difficulties of preserving the meat produced by the late summer-fall hunt. At this season it is too warm for the meat to be frozen and too damp for the meat to be dried. Kelsall is well aware of these complications and in concurring with Douglas (cited in Kelsall 1968) writes the following :

Douglas also considered that preserving meat from all the animals taken was beyond the capabilities of the Eskimos, and in this he was doubtless correct. Unless the weather is unusually sunny, meat is apt to become fly-blown or putrid at that season before it can be properly dried. In addition the Eskimo had nothing from which to make extensive drying racks.

Kelsall 1968: 218

Nevertheless, such assertions do not inhibit Kelsall from providing completely inconsistent commentaries on the following page of his text. Sympathizing with Robertson's distressed account of the caribou "slaughter" ("apparently for hides only") perpetrated by the Duck Lake Indians, Kelsall cannot resist claiming that "if properly handled" the meat from the numerous "fine, fat caribou" could have fed the group through the winter. Instead, Kelsall observes "the people were starving and requesting relief supplies by air within 4 months" (Kelsall 1968: 219). But what does Kelsall have in mind for the "proper handling" of the caribou meat? He has already noted that Robertson's "slaughter" occurred in September, much too early a date to successfully cache the meat without it rotting. He is aware of the practical obstacles to its conservation. How can he justify this illogical critique?

Also possessed by the puritanical ideal of productive use, Lawrie (1948; cited in Kelsall 1969: 219-220) exhibits an equal illogic and inconsistency. He observed four Inuit spear 20 caribou. As the camp was some distance away only

tongues and marrow bones were taken for immediate use, the balance of the carcasses being set in a pile for later use as dog food. Lawrie pressed the Inuit to dry some of the meat, but his efforts were to no avail. He was more successful at urging the Inuit to stake out the hides, but these efforts were ruined by a subsequent five-day rain. Lawrie is quick to condemn the Inuit for not complying with his remonstrations to dry some of the meat. His acrid comments on the fate of the cache are an indication of his bitter disapproval:

In the fall the water rose and the whole (cache), long since putrid, was frozen in.

Lawrie cited in Kelsall 1968: 220

Yet how could Lawrie overlook the fact that the five-day rain that ruined the hides would have rendered futile any attempt to dry the meat. We can only speculate what the Inuit might have thought about his unrealistic notions about the "proper handling" of caribou meat and hides during a season too warm to freeze and too wet to dry.

We can appreciate that due to the late summer-fall conditions of temperature and weather "waste", in an abstract sense of the term, may often occur. It is irresponsible in the utmost, however, to translate such observations of "waste" into accusations of abuse. Native hunters had little alternative but to harvest substantial numbers of caribou

when their hides were at their prime. They had severely limited capacity to preserve the meat thus produced. "Waste" may have occurred but the hunt was nonetheless justified, necessary and neither irresponsible nor abusive.

Finally, it must be noted that much of this meat that is presumed "wasted" serves as dog food. Kelsall and the other authors that he cites do not appear to give much credence to this claim. Yet Turner observed this practice among the Ungava Inuit in the 1880s during a period when caribou were extremely abundant in the region. This abundance did not, as Kelsall might claim, contribute to an increase in careless hunting and waste.

The deer which are first slain, when the hunting season arrives, and the weather is still so warm that the flies and decomposition ruin the meat, are reserved for supplies of dog food.

Turner 1979 [1894]: 88

As noted above, Inuit hunters also attempt to assure Lawrie that the caribou meat left behind will serve as dog food. But Lawrie remains unconvinced. Certainly one of the obstacles of comprehension is the fact that both Kelsall and Lawrie, in any case, consider the use of caribou for dog food to be wasteful and abusive.

To these human needs may be added those of the dogs -

for they feed their teams on meat the year round. This is general abuse in certain parts of the North...

Lawrie cited in Kelsall 1968: 211

7.3 Wildlife Manager Ethnocentrism: creating images of the Native hunter

We refuse to accept the basic fact of cultural diversity, we prefer to expel from culture and into nature all that does not conform to the norms under which we exist.

Lévi-Strauss 1973: 14

In this chapter the writings of wildlife management professionals about Native hunting and Native wildlife management have been surveyed. Relatively few individuals have committed their views to paper but those that have are of a single opinion: Native peoples have never managed the wildlife resources upon which they subsisted. The evidence provided in support of their views, however, has been found to be severely wanting. Assumptions that they have made about such things as the conditions of traditional subsistence, the efficiency of traditional hunting technology or the role of Native hunting in wildlife population declines undermine the integrity of their conclusions. In short, their case against the existence of Native wildlife management remains unsubstantiated.

To explain their nonetheless adamant and united position, we have sought to understand the values and beliefs of the

wildlife management profession. Are representations of Native hunting provided by wildlife professionals best understood as a reflection of their own system of values and beliefs? Our analysis of wildlife management concepts on the one hand and their arguments against Native management on the other, appear to support this conclusion.

Wildlife managers views are suffused with a strong ethnocentrism. In his essay entitled "Race and Culture", Lévi-Strauss (1973) reflects upon the nature of ethnocentrism. He describes it as a most ancient of attitudes, one with deep psychological roots. Rather than perceiving cultural diversity for what it is, a natural phenomenon, all that is foreign to our own ways is instead rejected, despised and degraded.

In Antiquity, everything that was not a part of Greek (and later Greco-Roman) culture was lumped together under the name barbarian; Western civilization later applied the term savage in the same fashion. Behind these epithets, we find concealed the same judgement: it is probable that etymologically the word barbarian refers to the confusion and inarticulation of the song of birds, in opposition to the signifying power of human speech; and savage, which means "of the forest", also evokes a kind of animal existence, in opposition to human culture. In both cases, we refuse to accept the basic fact of cultural diversity; we prefer to expell from culture and into nature, all that does not conform to the norms under which we exist (author's translation).

Lévi-Strauss 1973: 14

Thus to civilization wildlife managers oppose the savage;

to advanced technology they oppose primitive implements; and to "wise-use" management, uncontrolled hunting instincts. But lest we naively delude ourselves into believing that this trait, at least, can be declared the unique domain of the "civilized", Lévi-Strauss points out that quite to the contrary of our expectations, ethnocentrism is "precisely the most striking and distinctive trait of the savages themselves".

Humanity ceases at the frontiers of the tribe, of the linguistic group, and sometimes even of the village ; to such a point that a large number of so called primitive populations call themselves by a name which means "humans"...implying in this manner that the other tribes, groups or villages do not share in the virtues - or even the nature - of humans...

Lévi-Strauss 1973: 15

Such is the case, for example, of the Inuit whose self-denomination literally means "the people" (Schneider 1985).

Are wildlife manager representations of Native resource use largely constructions stemming from a naive ethnocentrism? Lévi-Strauss provides us with a valuable insight from linguistics. He has demonstrated that terms do not exist in isolation, but in relationship with other terms. This relationship which confers meaning is one of opposition.

Similarly we must recognize that the wildlife manager's view of native resource use cannot be understood in

isolation. As we have shown, it does not emerge spontaneously from impartial facts and mathematical logic. Rather it is best understood as a product of a system of values and beliefs shared by members of the profession. It is constructed in opposition to the Western wildlife manager's concepts of appropriate human-environment relationship. Western humanity is set on the side of culture and Native peoples expelled into Nature. The dualistic opposition of Western manager and Native hunter is played out in many different forms.

Wildlife professionals represent Native society as one with non-human animal society and diametrically opposed to Western civilization. Living a hand-to-mouth existence, the "small and insecure" Native populations (MacPherson 1981: 104) had no time to develop culture let alone a conservation ethic. Their philosophy is unabstractive (Leopold and Darling 1953), they are driven by instincts (Calef 1981), they can neither perceive over-exploitation nor do anything about it (Tneberge 1981) and their outlook is locked in the desperate needs of the present (Leopold and Darling 1953; MacPherson 1981).

This is not the portrait of a society of wildlife managers. These impoverished hunters do not sway Nature's course. How foolish to suggest that Native hunters had any knowledge of "wildlife management for sustained yield which is today a sophisticated scientific activity" (MacPherson 1981: 104).

1 Aptly summarizing the Western wildlife manager's viewpoint, MacPherson declares in value-laden terms: "It (wildlife management) is a craft rooted in privilege, not in poverty".

With the acquisition of modern firearms by Native peoples, the doctrine of non-control is given new meaning. Native peoples are portrayed as gaining control over Nature (Calef 1981) but lacking control over themselves. They engage in the random slaughter of wildlife. They kill for "the sheer love of killing" (MacFarlane cited in Kelsall 1968: 217; Baker cited in Commission of Conservation 1919: 30). Their hunts are "orgies of killing" (Banfield 1956: 7). They become "wildly excited" (Lawrie cited in Kelsall 1968: 212), "go berserk and fire blindly" (Kelsall 1968: 221), "shooting...wildly" until their ammunition is exhausted or all the animals dead or gone (Leopold and Darling 1953: 43).

1 To preserve the biopolar relationship of wildlife manager and Native hunter, the Native stereotype is revised. Whereas Native peoples once lacked the technology to exercise the least control over their environment, they now lack the self-discipline to exercise the least control over themselves. For wildlife managers control and manipulation of Nature is the essence of their profession. In Manichean fashion, they deftly portray Native peoples as their polar extreme. Content with their stereotypes of non-control, they close the

perimeter of their circular logic and pronounce with authority on the absence of traditional wildlife management.

Chapter Eight

A Future for Native Wildlife Management?

In the previous chapter, we have examined wildlife manager conceptions about the relationship between Native peoples and wildlife in both traditional and recent times. As we have seen, a number of wildlife management professionals contend that northern wildlife populations were never managed by Native peoples. Instead, they argue that prior to contact, Native peoples were restrained by their "primitive" technology and that their population size was regulated by famine or other catastrophic events. With the acquisition of Western arms, post-contact Natives are represented as reckless hunters who kill wildlife abundantly and wastefully without the slightest notion of conservation to restrain them. Our analysis of these arguments against the existence of a Native wildlife management system suggests that these views have a stronger basis in wildlife manager ideology than in empirical fact.

While the case against Native management has proven transparent, the fundamental question still remains: Did Native peoples manage the wildlife upon which they subsisted? In section 8.1 below, Inuit ideology, knowledge and subsistence practice are examined and it is argued that in

traditional times and until quite recently, Inuit actively managed the wildlife populations that they harvested.

The North, however, has changed dramatically over the last few decades. Most notably conversion to Christianity, acquisition of modern technology (rifles, snowmobiles, outboards etc.), sedentarization and centralization have had momentous impacts upon the relationship of Inuit to their natural environment, disrupting traditional ideology and subsistence practice. Section 8.2 considers whether despite these changes an Inuit system of wildlife management still exists today.

Finally, the chapter concludes with an assessment of the institution of co-management, and considers whether it can accommodate the aspirations of Native peoples.

8.1 The Case for a Traditional Inuit Management of Wildlife

Did Native peoples manage wildlife prior to contact with Europeans? This question has been the subject of much debate. The wildlife management professional's case against Native management has been examined and found wanting. Here, the case will be argued for the existence of a traditional management system among Inuit.

The discussion of Inuit management is divided into two sections. It begins with a discussion of Inuit ideology as it relates to the exploitation of animals. In the second section, subsistence practices which contribute to the pursuit of management are discussed.

8.1.1 The Ideology of Traditional Inuit Management

The initial premise upon which all Western wildlife manager attitudes, values and beliefs are founded, is that humans reign in dominion over Nature. As a consequence throughout the history of wildlife management, the predominant preoccupation of wildlife managers has been the control and manipulation of Nature in order to extract maximal benefits for human society.

The Inuit ideological universe on the other hand is founded upon an entirely different interpretation of the relationship between humans, animals and other elements of the natural world. Rather than magnifying the distance between humans and their environment, in the traditional Inuit world-view the division is blurred. Humans and animals are of close relationship. They share a number of important traits. Both possess souls, both are intelligent, perceptive and sensate

beings and both act of their own volition. For the Inuit, animals are, as Fienup-Riordan (1990) has aptly phrased it, "non-human persons". Reinforcing this vision of unity and equality between human and non-human persons are innumerable myths and legends in which humans and animals communicate with each other, humans visit the world of animals, animals transform into humans and humans into animals, and humans and animals intermarry, cohabit and have offspring (eg. Boas 1964 [1888]; Rasmussen 1976 [1929]; Soby 1969/70).

For Inuit, the recognition that the animals which they kill and depend upon for food are persons much like themselves, bears certain grave consequences. As Ivaluardjuk, an Aivilingmiut, explained to Rasmussen in the 1920's, "the greatest peril of life lies in the fact that human food consists entirely of souls" (Rasmussen 1976 [1929]: 56). The peril to which Ivaluardjuk refers stems from the Inuit belief that animals cannot be captured against their will. They must give themselves to the hunter. So long as the hunter treats the animals he captures with due respect, observing all of the rules that custom requires of him, then the souls of the animals will depart contented, ultimately to return to be recaptured by the hunter again at a later time.

The belief is held that a seal is possessed by a perishable body and an immortal soul. As a result one may catch a seal many times if only one wins its soul over. One eats the body and if all kinds of taboo are

carefully observed and the religious precepts of one's forefathers followed, the soul of the same seal, merely in a new incarnation, will always come to the same man and allow itself to be caught.

Rasmussen 1976 [1931]: 165

It is said that animals do not fear death and if a hunter has conscientiously fulfilled all taboos, the animals will even come to meet the hunter (Boas 1975 [1901-07]: 120; Rasmussen 1976 [1929]: 58).

The conception of animal souls as constantly recycling and of the animal's body being constantly renewed is materially manifested in some Inuit groups by returning to the sea that part of the animal's body which is believed to be the seat of the soul. In western Alaska, for example, the Yupik Eskimo believe that the seal's soul rests in the urinary bladder. Accordingly, all the bladders of the seals caught during the summer were carefully preserved. In December, a hole was cut in the ice and as part of the bladder ceremony the bladders were returned to the ocean in order that the souls of the seals could reclothe themselves and return to the hunters the following year (Soby 1969/70; Fienup-Riordan 1990). Among the Netsilik, where the dwelling place of the soul was believed to be the seal's skull, it was the latter part of the body which was preserved intact. When a family moved camp the skulls were set in a line with their noses pointing towards the new camp location, indicating to the seals' souls

the direction they should follow (Rasmussen 1976 [1931]: 34). In East Greenland, the hunters returned the skulls of the seals to the sea (Soby 1969/70).

While animals could be infinitely renewed, the continuity of this relationship between hunter and animals was rendered vulnerable by the exigencies of the souls for meticulous observance of taboo. Thus it was the hunter's conduct that determined whether or not continued access could be gained to the animals he needed for survival. If the souls of these non-human persons did not receive the respect that was their due, they avoided the hunter, refused to be taken, with dire consequences for the hunter and those who depended upon him for their food.

Avoidance of the hunter was not the only possibility. In some cases, if the soul of the animal was not conferred proper respect, it was no longer able to reclothe itself in meat, skin and bones. These animals were lost forever from the finite pool of infinitely renewable souls (Fienup-Riordan 1990).

In summary, according to the Inuit world-view, animal souls are a finite and thus limited resource which may be infinitely renewed so long as all taboos are observed. Human

action therefore plays a critical role in insuring the continued renewal of the resource. Inappropriate conduct results in loss of access to animals because the offended souls avoid the offending hunter or because mistreated souls are not renewed in body and are forever lost from the finite pool of souls. Codes exist which dictate those actions which are appropriate and those which are inappropriate.

The Inuit-wildlife relationship is a vulnerable one, based upon mutual respect and need. Inuit must carefully manage this relationship with the animals that they harvest. They view themselves as "taking care" of the animals. In exchange the animals give themselves to the hunter. This management of finite animal souls has a direct impact upon the empirical experience of encountering and successfully harvesting wildlife. Accordingly, in order to begin to understand how these ideological considerations were translated into a traditional system of management, it is essential to consider traditional subsistence practice.

8.1.2 Subsistence Practice and the Traditional Management of Wildlife.

Our analysis of Inuit ecological knowledge provides us with a novel perspective on subsistence practice. Emerging from this research is a portrait of the Inuk as a social actor who

relies upon a profound knowledge about his/her natural milieu to make productive decisions about the pursuit of subsistence. Odd as it may seem, Inuit as cognizant, knowledgeable and free-willed individuals have been largely absent from the predominant approaches to the study of subsistence, those of cultural ecology, human ecology and ecological anthropology.

Ecological research has contributed immensely to our understanding of how Inuit have successfully survived in what is generally represented as one of the world's most hostile environments. Yet its broad-scale focus on adaptation has inadvertently obscured our vision of the Inuit whose day-to-day actions are the nuts and bolts of successful subsistence. The decisions that are made, the reasons for their choice, the alternatives that have been rejected, the information that has been considered, the contribution of knowledge and experience, the influence of social pressures, etc., are largely glossed over as part and parcel of an ambiguous quantity called "adaptation". Studies in cultural ecology and ecological anthropology do not consider the knowledge and motivation of individuals. They operate at a more general level of analysis, considering to what degree or in what manner the cumulative actions of numerous individuals reflect an adaptation to the natural milieu.

But behind these abstract adaptive mechanisms by which subsistence was successfully pursued in the Arctic are individuals who within the context of personal and cultural experience, made decisions and took actions whose outcome was, at least in the long-run, adaptive. In this sense, it is emphasized that Inuit as individuals acting within a specific socio-cultural context, managed their relationship with the natural environment. In other words, given that Inuit were adapted to their milieu and maintained a long-term and sustainable relationship with the wildlife they subsisted upon, and recognizing that Inuit as knowledgeable individuals played an active role in the maintenance of this relationship, it is argued that Inuit as actors within a sophisticated cultural system managed wildlife.

The mechanisms by which this management of wildlife was effected have been well-documented by cultural ecologists and will be only briefly outlined below. As part of a complex cultural system it should be noted that these practices fulfilled a number of ends concurrently. As our focus here is on the management of human-wildlife relations, however, only this latter aspect will be emphasized.

Subsistence practices which contributed to an Inuit management of wildlife can be roughly subdivided according to

whether they were effected by managing land use, human population size, hunting practice or the use of the harvest. Management of land use included mechanisms such as population dispersal and nomadism. It is common knowledge that Inuit groups dispersed themselves and as a consequence their wildlife use, over a large region. As nomadic people, they regulated their local impact upon the environment by moving frequently. With the passage of the seasons, they moved from site to site, their displacements greatly influenced by their detailed knowledge of the seasonal concentrations of wildlife populations (Balikci 1964; Freeman 1984). The same seasonal round was not adhered to indefinitely. Inuit were sensitive to local reductions in wildlife numbers resulting from repeated use of specific sites, and they rotated their use of sensitive locations in accordance to this knowledge (Petersen 1965).

If you look at the land, it all seems the same, but some parts of it are rough, with rocks all around... But even on rocky land, if there is moss, that is where the caribou stay during warm seasons. That kind of land we used to occupy. We did not stay right on one spot, expecting the game would always come back there...

Evalak cited in Brody 1987: 88

While according to Inuit principle one had the right to hunt anywhere, in practice specific rights of access to land and resources were observed (Petersen 1965; Fienup-Riordan 1990). Finally, in response to large-scale changes in wildlife distribution, Inuit could also temporarily or

permanently shift their seasonal cycle of activities from one area to an adjacent one.

Management of human population size provided another important means to adjust the level of wildlife resource exploitation to wildlife population size. Inuit employed a number of mechanisms including a low birthrate and birth spacing to maintain a small family size. In certain regions of the Arctic, infanticide, primarily of infant girls, was practiced (Balikci 1968). Elderly persons who were no longer able to follow the group or to contribute to subsistence were also occasionally abandoned or helped to commit suicide when times were hard. Local population size or the composition of local groups could also be adjusted when necessary by means of adoption. A bilateral kinship system allowed for maximal flexibility in social relations, permitting displacements of individuals along both maternal and paternal lines of descent.

The practice of hunting could be managed by a number of different means. As previously mentioned in the discussion of ideology, customary laws or taboo did not tolerate waste. In this manner, harvests conformed to the greatest extent possible with perceived needs. With considerable knowledge of their prey and a detailed linguistic classification

system, Inuit were able to precisely identify and harvest the specific animal types they required. This practice also reduced waste. Where available, they also harvested a diversity of resources, reducing the pressure on any single species.

The male heads of extended families, individuals recognized as particularly experienced and knowledgeable, were conferred the responsibility of taking decisions pertaining to the nature, location, timing and coordination of the hunt (Damas 1963, 1988; Wenzel 1986).

Finally, management of wildlife was also effected through the managed use of harvests. Thus, harvested animals were efficiently and completely used, virtually all parts of the organism being consumed or having some useful function. Through the storage and preservation of the harvest, Inuit were able to control their degree of dependence upon different species and the timing of their harvest. For example, the commencement of breathing-hole sealing was influenced by the size of the autumn caches of caribou and/or fish. Sealing only began once the latter were depleted (Rasmussen 1976 [1931]). Sharing of the harvest was also an important practice, both for strengthening social ties, as well as allowing for the efficient redistribution of local surplus.

By combining an ideology of respect for their prey, with subsistence practices which provided for self-regulation, Inuit were able to successfully maintain a certain quality of life on the land, enduring occasional hardship, but in general managing their relationship with wildlife in a long-term sustainable manner.

As one might expect, this Inuit management system differs from our own Western system in a multitude of ways. But like Western wildlife management and as wildlife professionals have themselves recognized, the principle mechanism by which management is effected is through the control of people, the users of the resource (Bailey 1984). From our brief review of data from cultural ecological studies, it is evident that Inuit, in this regard, have successfully controlled their own population size, distribution and wildlife use in a manner conducive to the maintenance of wildlife populations. In this sense it is argued that Inuit in traditional times managed the wildlife resources upon which they subsisted.

8.2 An Inuit Management of Wildlife Today ?

We have argued above that Inuit, prior to European contact and throughout the contact-traditional period, managed

northern wildlife. As we have seen this system of management was an integral part of a way of life. Inuit ideology and subsistence practice were bound together into a intricate, cultural design by which the relationship of humans to environment was regulated.

This managed relationship continued throughout the first half of this century. Despite significant changes brought by the fur trade, Western technology and the activities of missionaries, Inuit remained for the most part subsistence-based, nomadic and autonomous (Damas 1988). Beginning in the 1960s, however, change of a much more disruptive nature shook Inuit society, precipitated by a number of events not the least important of which was a change in Canadian government policy. Prior to the 1960s, the North and along with it, its inhabitants, were largely ignored by the State. Government policy affecting the Inuit population was minimal and largely administered indirectly through traders, missionaries and occasionally the R.C.M.P.

About 1960, motivated by political, economic and humane concerns, government policy shifted dramatically to emphasize Inuit sedentarization, centralization and modernization. Concentrated into villages and provided with subsidized housing, medical services, compulsory education, mass media, welfare and a variety of other fundamental elements of

southern Canadian society, the circumstances of Inuit existence have transformed over a period of three decades from relative autonomy and self-sufficiency to considerable dependence.

How has the traditional Inuit system of management weathered these three decades of change? To what extent is it still functional today? As we have observed, traditional management was an integral part of an earlier nomadic and autonomous way of life. It is evident that fundamental change such as sedentarization, centralization and intensified contact with Christianity could not have left it unmarked. What its present status may be today is difficult to assess and we can provide no more than a partial answer based upon observations made in the Belcher Island community of Sanikiluaq. Our discussion will be divided into three subsets which contribute to the wildlife management process: knowledge, ideology; and subsistence practice.¹

¹ In the Belcher Islands centralization occurred in two phases. In 1960, the federal government built a school at South Camp, establishing a community near the south end of Flaherty Island, just east of Robertson Bay. In 1961 the Hudson's Bay trading post situated in the eastern part of the archipelago moved to the site of the present-day community of Sanikiluaq located at the archipelago's north end.

Qikirtamiut still harbour bitter memories of the events associated with centralization. AA., for example, did not wish to move into South Camp but felt he had no choice but to comply. He described his experience as follows:

We were told that they were getting us. We were told that nobody

Beginning with traditional ecological knowledge it is evident that little need be added to the several chapters of discussion which form the core of this thesis. Contemporary Inuit knowledge of wildlife ecology remains a powerful resource for local management. While it is impossible to compare the quality and quantity of ecological data available prior to sedentarization as opposed to today, it is at least strikingly evident that the information pool on local ecology which is available in the community is far superior to that possessed by Western scientists. Furthermore, the informed network of communication which is a dynamic part of contemporary community life provides a system by which wildlife condition, numbers, distribution, etc. can be monitored with unequaled efficiency. HF radios which communicate from camp-to-camp and camp-to-community, local community radio and the community phone network have served to enhance the vital exchange of information which is as

was supposed to be at camps anymore ... They told us we were to go to this place where there's a school.

If they were Inuit, we would have said, "No". But a qallunak (white person) came alone with an Inuk.

I was really hurt when they told us to move. AA., Sanikiluaq

Some 10 years later, the people of South Camp were forced to move again. In 1970, South Camp was closed, the school was relocated to Sanikiluaq, and all residents had to follow. More complete accounts of the history of contact are provided by Desgoffe (1955), Guemple (1966) and Freeman (1967; 1982).

valued and valuable today as it was in traditional times.

The current status of traditional ideology as it relates to traditional management is more difficult to ascertain. Qikirtamiut have been exposed to Christianity since as early as the mid-19th century, albeit on an erratic basis (Francis and Morantz 1983). Present-day elders emphasize that the principal motivation for annual trips across the sea ice to Great Whale River in the first half of this century was to go to church.² Nevertheless, despite increasing contact with Christianity certain elements of traditional ideology persisted, often in syncretistic form. Guemple (1966) reports that the last ritual spouse exchange known to have taken place on the Islands, occurred during the winter of 1940-41. He suggests that the ceremony was triggered by critically low resource levels and that its purpose was to promote fertility among animals in order to improve wildlife harvest. In other arctic communities, Damas (1988) reports the occurrence of spouse exchange, as well as vestiges of shamanism into the 1960s.

In Sanikiluaq today, the traditional conception of animals as non-human persons remains strong.³ First, hunters

² Trade at the Hudson's Bay post was obviously another important consideration.

³ The individuals I spoke to on this subject were between 39 and 45 years old.

emphasize that animals are given, not taken. When a hunter kills game, he gives vocal expression to this relationship by stating pititauvunga or aitutaujunga⁴ (lit. I have been given something). This belief has been passed to the present generation of active hunters by their elders, and reinforced by personal experience.

The older people have always said that you have to be given an animal to catch. That we get only what we are given, we have always heard this. I believe it, and I began to believe it even more since I have been hunting ... I believe the saying that you are given an animal to catch from my own experiences. Even if you see an animal and you think of the way you will catch it, you don't catch it if it's not provided for you.

HH., Sanikiluaq

When Qikirtamiut identify who gives the animals to the hunter, they say that it is the Creator or God. In Inuktitut, however, there is some ambiguity in the term employed for the giver of animals. Qikirtamiut refer to the giver as ikajuttik which translates simply as "the helper". While the term 'helper' evokes the term "helping spirits", the supernatural aides to the shaman, we have no indication that there is or has ever been in the Belcher Islands, a connection between the term ikajuttik and the shaman's helping spirits.

Associated with the concept that animals must be given to

⁴ According to one individual the former expression is older, and it is the latter which is in current use today.

the hunter, is the view that animals, like humans, are intelligent and have their own will.

We plan ahead and try to think clearly. Animals are like that, too. They think wisely and they keep track of what they see.

HH., Sanikiluaq

Furthermore, the belief that animals can hear the people's disrespectful words is also still well-established. Of animals, it is said tusarqisiaatuk (lit. they hear very well). Animals, if offended, can take revenge upon the hunter or his family. A woman elder speaking of the animals' ability to hear, wondered if this was still the case today. She reflected for a moment and then recalling an individual's long illness, reasserted her confidence in this belief.

Long ago, the women were heard by the animals. The women had to be careful (wise). . . I don't know if it's still like that today. I don't observe anymore. [after a pause] I still think it's like this. It was a long time that 'X' was sick.

AF., Sanikiluaq

Several individuals cited examples of persons who, having offended animals in one manner or another, suffered an extended bout of poor hunting. The examples cited were recent, having occurred within the last 30 years and involving persons in the community who are still alive today. In several cases, the hunter or his wife expressed undue confidence that they could harvest an animal. The outcome of

this disrespect was to be unable to obtain the animal mentioned, in some cases for a considerable length of time. Serious illness was associated with such disrespect on one occasion.

One event that occurred around 1960 involved hunter AG. Being short of food, AG wished to cook some sealskin that his wife had set aside for her mother. He is said to have offended the animals by reassuring his wife that he would easily be able to get another seal to replace the sealskin. An entire winter and summer is said to have passed before he caught another seal.

Boastful behaviour is also said to have negative consequences for the hunt. Husbands or their wives, who boast about the success of their hunting or who mock other hunters who have been less successful will soon have difficulty getting animals.

If a hunter boasts he can catch animals, he would be unable to catch any animals for quite awhile. That has been known and I believe it.

HH., Sanikiluaq

Hunters must also share the products of the hunt.

And I've heard from way back, if there are many hunters they're supposed to share it, even if it's only one

seal. Try to give every hunter a piece. I try to do that.

HH., Sanikiluaq

Animal products that are sold for cash, however, pose a problem. Stuck between the cash economy and the traditional one, one hunter, reputed to be the community's best polar bear hunter, has resolved the situation as follows:

Take for example a bear. You don't just cut up the bear skin these days. Although I don't know (from personal experience), back then it would be used for clothing and other things. When they were caught, the skin would be divided. But now you don't divide it anymore. You get money from it and we live on money now. So when I sell it, even if I shot the bear, I share the money with the hunters who were with me.

I'm not saying that I do right all the time, but I'm talking about what I know.

HH., Sanikiluaq.

Sharing, however, did not refer only to food, but also to knowledge. Hunters must talk about the animals and share their observations with others or they would risk to not be given any more animals.

Another important custom which has persisted from earlier times, is that the hunter must not waste.

Another thing which is doing what is right and it is always done, is when you catch an animal, not to leave anything that can be eaten. That has always been done while I was growing up and is done even today.

If I killed animals senselessly and did not make any use of them, then even if I searched, I may not be given any.

HH., Sanikiluaq

Finally, animals can be offended if local traditions are not observed. An example of such an offense is said to have occurred a few years ago, when a hunter caught a polar bear. According to custom, all women have the right to participate in the scraping of the skin. The hunter, however, is said to have turned one away saying that there were already too many working on the skin. His failure to kill another bear since that time, is attributed to this break with tradition.

As we can see, important elements of the traditional world-view remain strongly fixed in the minds of the active hunting population. Animals continue to be conceived as non-human persons and the act of hunting is still today a social pact between humans and animals. Hunters continue to be given animals so long as they show proper respect. If hunters are boastful, if they presume that they will be successful, if they waste, then the animals are offended. As a result, the offending hunters will no longer be able to obtain game. His pact with the animals has been temporarily broken.

While only a cursory investigation of contemporary Qikirtamiut world-view has thus far been carried out, it is

already apparent from these preliminary results that traditional management ideology has remained surprisingly strong.

Whereas traditional knowledge and ideology have to a great degree eluded disruption, this could not be the case for the traditional practice of management. Some of the key mechanisms by which Inuit prior to the 1960s were able to maintain a balance between human and wildlife populations were shattered by the events of the 1960s. Most notably government policy largely destroyed the Inuit capacity to disperse or to move elsewhere in response to changing densities and distributions of wildlife. Sedentarized and centralized, the Inuit management system could no longer operate as it once did.

Given the contemporary Northern context, are Inuit realistically capable of managing wildlife today? To a certain degree (and perhaps to a greater degree than we are aware) Inuit continue to manage wildlife. They manage in the sense that they have maintained their own cultural hunting ethic. Inuit do not kill animals spuriously. They hunt selectively and judiciously. They continue to make full use of the animals that they kill, avoiding the wastage associated with southern hunting. Needless waste continues to be strongly criticized in the communities. In addition,

the persistence of networks of sharing helps to ensure complete and efficient local resource use. Exceptions to these generalizations have occurred but they run against the grain of behaviour considered acceptable by the community at large.

Inuit also manage in that they continue to disperse their camp locations as widely as is practical given the limitations of living at central locations and their dependence upon expensive means of transportation. Their resistance to further centralization, the fissioning of a number of Arctic communities and the strong interest in the establishment of remote, semi-permanent camps are indicative of their continual recognition that dispersion of the human population is an essential requirement for a balance between humans and wildlife. They also continue to recognize the rights of families to particular camp locations, a recognition founded in a traditional territorial organization of land use.

In addition, Inuit world-view is more sound ecologically than our own. Their recognition of a fundamental equality between humans and animals is a key ideological requirement for establishing a long-term, sustainable balance between humans and environment. Ironically, wildlife professionals

continue to advocate the "education" of Inuit in alienated Western thought (eg. Sterling 1990), while progressive thinkers in our own society have recognized that wildlife management is top heavy with its own contradictions (eg. Edwards 1989; Wagner 1989) and that a viable program of wildlife conservation requires a major ideological shift towards a world-view akin to that of Inuit (Livingston 1981; Evernden 1985).

Finally, as mentioned previously, it is evident that Inuit possess a collective knowledge of local ecology which in the majority of cases far surpasses that available to wildlife scientists. They also constitute themselves, an efficient and inexpensive information system whereby local wildlife populations are monitored on a continual basis, all the year round.

Given on the one hand the dubious record of Western wildlife management and severe deficiencies in scientific knowledge of Northern regions, and on the other hand, the persistence of elements of an Inuit tradition of management, an ideology of respect for wildlife and a profound knowledge of northern ecology, it seems not unreasonable to suggest that Inuit should be quickly provided greater autonomy and control over northern wildlife management. The persistence of a colonialistic situation where decisions about local

resource use are imposed upon Inuit from afar, only serves to further undermine the local potential for a sound self-management of wildlife resources. As in the case of the Alaskan Eskimo Whaling Commission (Freeman 1989) there is no reason why Inuit could not utilize scientific techniques or bring in outside expertise where they believe it appropriate. However, if a culturally appropriate system of wildlife management is to be created, it seems to be necessary that decision-making powers remain completely in Inuit hands. Any other formula contributes towards a continued, rapid erosion of that which was once a viable, and vigorous ecological relationship between Inuit as managers and wildlife as their equals.

8.3 Is Co-management a Solution ?

In conclusion, it seems unlikely that co-management can offer a permanent solution to the problems associated with the management of wildlife in the North. As Cizek (1990) points out and Usher (pers. comm.) confirms, even the most lauded example of progressive co-management, the Beverly-Kaminuriak Caribou Management Board, has not been able to bridge the ideological gap between Western and Native knowledge and management. State biologists in particular, stubbornly resist incursions by Native participants into the sacred realms of caribou research and management practice.

Ideologically, these domains remain exclusively scientific. Traditional knowledge is reduced to being fed piecemeal into an institution which remains Western in form and function. In a very real sense, co-management as Feit (1986) warns, has become a vehicle by which the self-management aspirations of Native peoples have been co-opted.

The inability to bridge the cultural gap, the exclusion of traditional knowledge and traditional management practice, the adherence to bureaucratic procedures and structures and the continued predominance of Western management ideology and methods has led to the demise of some co-management arrangements (such as that between the Department of Fisheries and Oceans Canada and Anguvigaq, an organization representing the Inuit hunters of Nunavik) and continues to plague virtually all others (eg. the Yukon-Kuskokwin Delta Goose Management Plan (Osherenko 1988; Fienup-Riordan 1990); the Pacific Walrus co-management regime (Langdon 1990)).

There is but one possible exception to this tendency for co-management to be distorted into co-optation. And it is an interesting one to consider. This is the co-management agreement on bowhead whales between the Alaska Eskimo Whaling Commission (AEWC) and the National Oceanic and Atmospheric Administration. Freeman (1989: 149) has described the

agreement as "a successful model for local user-state co-management arrangements". While a lengthy treatment of this regime is beyond the scope of this chapter (cf. Freeman 1985; 1989), certain aspects pertinent to this discussion are worth highlighting. The predominant and enterprising role played by the AEWC, a body established to represent the local whaling communities, is of particular interest. Of key importance is Freeman's observation that the AEWC's initial intent was the self-regulation of the bowhead whale hunt.

Furthermore, the AEWC at its own initiative organized a sophisticated scientific research program to confirm, give international credibility to, and eventually expand upon the traditional ecological knowledge of local Eskimo whalers. The scientific research confirmed several important elements of traditional knowledge: that bowheads migrate not only along the floe edge as scientists believed, but also at great distance from the land-fast ice; that contrary to scientific thought, the migration continues even once the leads are closed by the formation of new ice; and that unknown to scientists, bowheads feed during their migration (Freeman 1989).

Having taken it upon themselves to regulate their own hunting of bowheads and having initiated scientific research to confirm and enrich their own traditional knowledge of the

species, the whaling communities of North Alaska were fundamentally self-managing bowhead populations. This self-management continues under the terms of the co-management agreement, for it is the AEWC which retains management responsibility for the whale hunt.

While many factors have contributed to the process, a key element in the success of the bowhead co-management agreement may very well be that it has evolved from a functioning Native self-management regime. In other words, rather than beginning as a bureaucratic arrangement which establishes from the outset a heavy-handed Western ideology and structure, successful co-management may only arise where Native groups take the initiative (and are supported in their initiative), setting traditional knowledge and ideology at the core of the management process and drawing freely upon scientific expertise as they themselves deem appropriate.

Our investigation of the traditional ecological knowledge of the Inuit of southeastern Hudson Bay has demonstrated that contemporary Native peoples are the bearers of a vast and intimate corpus of information about their natural milieu. As knowledgeable actors, we have shown that Inuit were managers, maintaining a balanced relationship between themselves and the wildlife upon which they subsisted. Today, less than 30 years after this traditional management

system suffered major disruption by the sedentarization and centralization of the Inuit population, significant elements of traditional ideology and management practice remain intact. These traditions in combination with a profound knowledge of northern ecology provide Inuit with a solid cultural basis for establishing novel regimes of wildlife management and conservation, adapted to contemporary settings. Following the example set by the Alaskan Whaling communities, and alert to the deficiencies of the majority of co-management efforts, it seems to be clear that management which sustains cultural identity along with wildlife, is first and foremost self-management.

Bibliography

- Abraham, K.F. and G.H. Finney, 1986. Eiders of the eastern Canadian Arctic, Pp.55-73. In: Reed, Austin (ed.). *Eider ducks in Canada*. Can. Wildl. Ser. Report Ser. No. 47.
- Bailey, James A. 1984. *Principles of Wildlife Management*. New York: John Wiley & Sons.
- Balikci, Asen. 1964. *Development of Basic Socio-economic Units in Two Eskimo Communities*. Nat. Mus. Canada. Bull. no. 202. Anthropological Ser. no. 69. Ottawa.
- _____. 1968. The Netsilik Eskimo: Adaptive processes. Pp.78-82. In: Lee, Richard B. and Irven Devore (eds.) *Man the Hunter*. Chicago: Aldine Publishing Co.
- Banfield, A.W.F. 1974. *Les Mammifères du Canada*. Québec: Presses de l'Université Laval.
- Barnes, Robert D. 1974. *Invertebrate Zoology*. Third Ed. Toronto: W.B. Saunders Co.
- Bellrose, Frank C. 1980. *Ducks, Geese and Swans of North America*. Third Ed. Harrisburg. Pa.: Stackpole Books.
- Berkes, Fikret. 1989. Co-Management and the James Bay Agreement. Pp. 189-208. In: Pinkerton, Evelyn (ed.). *Co-operative Management of Local Fisheries*. Vancouver: UBC Press.
- Berlin, Brent. 1974. Folk Systematics in Relation to Biological Classification and Nomenclature. *Ann. Rev. Ecol. Syst.* 4: 259-271.
- Berlin, Brent, Dennis E. Breedlove and Peter H. Raven. 1974. *Principles of Tzeltal Plant Classification: An Introduction to the Botanical Ethnography of a Mayan-*

Speaking People of Highland Chiapas. New York: Academic Press.

Birket-Smith, Kaj. 1928. The Greenlanders of the Present Day. Pp. 1-208. In: Vahl, M., G.C. Andrup, L. Boké and Ad.S. Jensen (eds.). *Greenland*. Vol. II. Copenhagen: Reitzel.

_____. 1976 [1929]. *The Caribou Eskimos - Material and Social Life and their Cultural Position. I. Descriptive Part. II. Analytical Part*. Report of the Fifth Thule Expedition 1921-24. Vol 5. no. 1-2. New York: AMS Press.

Boas, Franz. 1964 [1888]. *The Central Eskimo*. Lincoln/London: University of Nebraska Press.

_____. 1975 [1901-1907]. *The Eskimo of Baffin Land and Hudson Bay*. Bull. Am. Mus. Nat. Hist. 15. New York: AMS Press.

Brody, Hugh. 1976. Land Occupancy: Inuit Perceptions. Pp 185-242. In : Freeman, Milton M.R. *Inuit Land Use and Occupancy Project*. Vol. 1. Ottawa: Minister of Indian and Northern Affairs.

_____. 1987. *Living Arctic: Hunters of the Canadian North*. Toronto: Douglas and McIntyre.

Brown, Cecil H. 1979. Folk Zoological Life-Forms: Their Universality and Growth. In: *Am. Anthropol.* 81: 791-811.

Burch, Ernest S. 1972. The Caribou/Wild Reindeer as a Human Resource. *Am. Antiquity* 37: 339 - 68.

Caughley, Graeme. 1979. What is this thing called carrying capacity. Pp. 2 - 8. In: Boyce, Mark S. and Hayden-Wing, L.D. (eds). *North American Elk: Ecology, Behaviour and Management*. Laramie: U. Wyoming.

Cizek, Petr. 1990. *The Beverly-Kaminuriak Caribou Management Board. A Case Study of Aboriginal Participation in Resource Management*. Ottawa: CARC.

- Commission of Conservation. 1919. *National Conference on Conservation of Game, Fur-bearing Animals and other Wild Life. February 18 and 19, 1919.* Ottawa: J: de La Broquerie Tache.
- Cramp, Stanley. 1977. *Handbook of the Birds of Europe the Middle East and North Africa. The Birds of the Western Palearctic.* Vol. 1. Oxford: University Press.
- Cranz, David. 1820. *The History of Greenland.* Vols. 1 and 2. London: Longman, Hurst, Rees, Orme and Brown.
- Cresswell, Robert. 1976. *Éléments d'Ethnologie: Six Approches.* Paris: Librairie Armand Colin..
- Crowe, Keith J. 1974. *A History of the Original Peoples of Northern Canada.* Montreal/Kingston: McGill-Queen's University Press.
- CSEB (The Canadian Society of Environmental Biologists). 1982. 1982 Annual Meeting: Interest Continues. *Newsletter/Bulletin* 39(4): 3-4.
- Damas, David. 1963. *Igluligmiut kinship and local groupings: a structural approach.* National Museum of Canada. Bulletin No. 196.
- _____. 1988. The Contact-Traditional Horizon of the Central Arctic: Reassessment of a Concept and Reexamination of an Era. *Arctic Anthropology* 25: 101-138.
- Dasmann, R.F. 1981. *Wildlife Biology.* Second ed. New York: John Wiley and Sons, Inc.
- Desgoffe, Claude. 1955. Contact Culturel: Le cas des Esquimaux des Iles Belchers. *Anthropologica* 1: 45-71.
- Donaldson, Judy. 1983. Wildlife Harvest Statistics for the Baffin Region, N.W.T.. *BRIA Technical Report* nos. 1.

- _____. 1984. Wildlife Harvest Statistics for the Baffin Region, N.W.T.. *BRIA Technical Report no. 2*.
- Dorais, Louis-Jacques. 1983. *Uqausigusiqtat: An Analytical Lexicon of Modern Inuktitut in Quebec - Labrador*. Quebec. Les Presses de l'Université Laval.
- _____. 1977. *Inuit Kupaimmiut Uqausingit: The Language of the Northern Quebec Inuit*. Québec: Association Inuksiutiit Katimajit., Inc.
- Doubleday, Nancy. 1989. Co-Management Provisions of the Inuvialuit Final Agreement. Pp. 209-221. In: Pinkerton, Evelyn (ed.). *Co-operative Management of Local Fisheries*. Vancouver: UBC Press.
- Doutt, J. Kenneth. 1939. The expedition to Hudson Bay *Carnegie Magazine* 12(Jan. 1939): 227-36.
- Drolet, Charles A., Austin Reed, Mimi Breton and F. Berkes. 1987. Sharing Wildlife Management Responsibilities with Native Groups: Case Histories in Northern Quebec. *Trans. 52nd N.A. Wildl. and Nat. Res. Conf.* Pp. 389-498.
- Edwards, Thomas C. Jr. 1989. The Wildlife Society and the Society for Conservation Biology: strange but unwilling bedfellows. *Wild. Soc. Bull.* 17: 340-343.
- Elton, Charles. 1942. *Voles, Mice and Lemmings: Problems in population dynamics*. Oxford: Clarendon Press.
- Evernden, Neil. 1985. *The Natural Alien - Humankind and Environment*. Toronto: University of Toronto Press.
- Farrand, John Jr. 1983. *The Audubon Society Master Guide to Birding*. Vol. 1. New York: Alfred A. Knopf.
- Feit, H.A. 1973. The Ethno-Ecology of the Waswanipi Cree - or How Hunters can Manage their Resources. Pp. 115-125. In: Cox, Bruce. *Cultural Ecology: Readings on the*

Canadian Indians and Eskimos. Toronto: McClelland and Stewart Ltd.

_____. 1986. James Bay Cree Indian Management and Moral Considerations of Fur-Bearers. Pp. 49-65. In: Alberta Society of Professional Biologists. *Native People and Renewable Resource Management.* 1986 Symposium. Edmonton, Alberta.

_____. 1988. Self-management and State-management: Forms of Knowing and Managing Northern Wildlife. Pp. 72-91. In: Freeman, Milton M.R. and Ludwig N. Carbyn. 1988. *Traditional Knowledge and Renewable Resource Management in Northern Regions.* Edmonton, Alta.: Boreal Institute for Northern Studies.

Fienup-Riordan, Ann. 1990. *Eskimo Essays.* New Brunswick/London: Rutgers University Press.

Flaherty, Robert J. 1918. The Belcher Islands of Hudson Bay: their discovery and exploration. *The Geographical Review* 5:433-458.

Fleming, Brian. 1989. *Working at leisure: Inuit subsistence in an era of animal protection.* M.A. Thesis. Edmonton: U. Alberta.

Foster, Janet. 1978. *Working for Wildlife: the beginning of preservation in Canada.* Toronto: U. Toronto Press.

Francis, Daniel and Toby Morantz. 1985. *Partners in Furs: A History of the Fur Trade in Eastern James Bay, 1600-1870.* Montreal/Kingston: McGill-Queen's University Press.

Freeman, Milton M.R. 1964. Observations on the kayak-complex, Belcher Island, N.W.T. *Nat. Mus. Canada Bull.* no. 194: 56-91.

_____. 1967. An ecological study of mobility and settlement patterns among the Belcher Island Inuit. *Arctic* 20: 154-175.

- _____. 1968. Winter observations on beluga (Delphinapterus leucas) in Jones Sound, N.W.T. *Can. Field-Nat.* 82: 216-286.
- _____. (ed.) 1976. *Inuit Land Use and Occupancy Project*. Ottawa: Minister of Indian and Northern Affairs.
- _____. 1982. An Ecological Perspective on Man-Environment Research in the Hudson and James Bay Region. In: *Naturaliste Can.* 109: 955-963.
- _____. 1988. Tradition and Change: problems and persistence in the Inuit diet. Pp. 150-169. In: de Garine, I and G.A.Harrison (eds.). *Coping with Uncertainty in Food Supply*. Oxford: Clarendon Press.
- _____. 1989. The Alaskan Eskimo Whaling Commission: Successful Co-Management under Extreme Conditions. Pp. 137-153. In: Pinkerton, Evelyn (ed.). *Co-operative Management of Local Fisheries*. Vancouver: UBC Press.
- Gavin, Thomas A. 1989. What's Wrong with the Questions We Ask in Wildlife Research? *Wild. Soc. Bull.* 17: 345-350.
- Gilberg, Rolf. 1974-75. Changes in the Life of the Polar Eskimos Resulting from a Canadian Immigration into the Thule District, North Greenland, in the 1860's. *Folk* 16-17: 159-170.
- Godfrey, W. Earl. 1979. *The Birds of Canada*. Ottawa: National Museum of Natural Sciences.
- Gooders, John and Trevor Boyer. 1986. *Ducks of Canada and the Northern Hemisphere*. New York: B. Mitchell.

- Gottesmann, Dan. 1983. Native Hunting and the Migratory Birds Convention Act: historical, political and ideological perspectives. *J. Canadian Studies* 18: 67 - 89.
- Guemple, D.L. 1966. *Kinship Reckoning Among the Belcher Island Eskimo*. Ph.D. thesis. Chicago: U. Chicago.
- _____. 1967. The pacalik kayak of the Belcher Islands. *Nat. Mus. Canada Bull.* No. 204: 124-190.
- Gunn, Anne, Goo Arlooktoo and David Kaomayok. 1988. The Contribution of the Ecological Knowledge of Inuit to Wildlife Management in the Northwest Territories. Pp. 22-30. In: Freeman, Milton M.R. and Ludwig N. Carbyn. 1988. *Traditional Knowledge and Renewable Resource Management in Northern Regions*. Edmonton, Alta.: Boreal Institute for Northern Studies.
- Harvey, Gilles. 1985. La Commercialisation de la Venaison des Caribous du Fleuve George. P. 95. In: Meredith, Thomas, C. and Maretel, Arthur M. (eds.). *Proceedings of the Second North American Caribou Workshop, Val Morin, Que.* 17-20 October, 1984. McGill Subarctic Research Paper no. 40. Montreal: McGill U.
- Hatt, Gudmund. 1969 [1914]. Arctic skin clothing in Eurasia and America: an ethnographic study. *Arctic Anthropology* 5(2): 3-132. (Originally: *Arktiske skinddragter i Eurasien og Amerika*, J.H. Schultz, Copenhagen, 1914).
- Hewitt, C. Gordon. 1919. The Need of Nation-wide Effort in Wild Life Conservation. Pp. 8 - 18. In: Commission of Conservation. *National Conference on Conservation of Game, Fur-bearing Animals and other Wild Life*. Ottawa: J. de LaBroquerie Tache.
- Heywood, V.H. 1967. *Plant Taxonomy*. London: Edward Arnold.
- Hochbaum, H. Albert. 1981 (1944). *The Canvasback on a Prairie Marsh*. Lincoln: U: Nebraska Press.

- Holtved, Erik (ed.). 1962. Otto Fabricius' ethnographical works. *Meddelelser om Grønland* 140(2).
- _____. 1967. Contributions to Polar Eskimo ethnography. *Meddelelser om Grønland* 182(2).
- Hunn, Eugene. 1982. The Utilitarian Factor in Folk Biological Classification. *Am. Anthropologist*. 84: 830-847.
- Ingold, Tim. 1980. *Hunters, Pastoralists and Ranchers: Reindeer economics and their transformations*. Cambridge: Cambridge U. Press.
- Issenman, Betty and Catherine Rankin. 1988. *Ivalu: Traditions of Inuit Clothing*. Montreal: McCord Museum.
- JBNQHRC (James Bay and Northern Quebec Harvesting Research Committee). 1982
- Jenness, Diamond. 1923. The Life of the Copper Eskimos. (Pp.3-278. In: *Report of the Canadian Arctic Expedition 1913-18. Vol. XII: The Copper Eskimos*. Ottawa: F.A. Acland.
- Jenness, Diamond. 1958. *The Indians of Canada*. Nat. Mus. Canada. Bull. no. 65. Anthropological Ser. no. 15.
- Johannes, R.E. 1981. *Words of the Lagoon: Fishing and Marine Lore in the Palau District of Micronesia*. Berkeley: U. Calif. Press.
- Kennedy, James J. 1985. Viewing Wildlife Managers as a Unique Professional Culture. *Wildlife Soc. Bull.* 13: 571-9.
- Kerr, Gordon R. 1988. Wildlife Conservation and Management. *The Canadian Encyclopedia*. Second ed. Vol V: 2306-07. Edmonton: Hurtig Publ.

- Kelsall, John P. 1968. *The Migratory Barren-ground Caribou of Canada*. Ottawa: DIAND-Can. Wildl. Ser.
- Kemp, Willian B. 1971. The Flow of Energy in a Hunting Society. *Scientific American* Vol. 225 (3): 105-115.
- Larkin, P.A. 1977. An Epitaph for the Concept of Maximum Sustained Yield. *Trans. Am. Fisheries Soc.* 106: 1-11.
- Laughlin, William S. 1968. Hunting: An Integrating Bio-Behavioural System and its Evolutionary Importance. PP. 304-334. In: Lee, Richard B. and Irven Devore (eds.) *Man the Hunter*. Chicago: Aldine Publishing Co.
- LeMaster, Richard. 1985. *The Great Gallery of Ducks*. Chicago: Contemporary Books Inc.
- Lemonnier, Pierre. 1976. La description des chaînes opératoires : Contribution à l'analyse des systèmes techniques. *Techniques et Culture* 1: 100-150.
- LeMouel, Jean-François. 1973. Préparation et utilisation des peaux de phoques chez les Eskimo Naujamiut. Pp. 173-192. In: *L'Homme, Hier et Aujourd'hui - recueil d'études en hommage a André Leroi-Gourhan*. Paris: Editions Cajas.
- Leopold, Aldo. 1933(a). *Game Management*. New York: Charles Scribner's Sons.
- Leopold, Aldo. 1933(b). The Conservation Ethic. *J. Forestry* 31: 634 - 43.
- Leopold, A. Starker and F. Fraser Darling. 1953. *Wildlife in Alaska: an ecological reconnaissance*. New York: Ronald Press Co.
- Leroi-Gourhan, André. 1945. *Milieu et Techniques*. Paris: Albin Michel.
- Leroi-Gourhan, André. 1965. *Le Geste et la Parole: La Mémoire et les Rythmes*. Paris: Éd. Albin Michel. 282 pp.

- Lévi-Strauss, Claude. 1962. *La Pensée Sauvage*. Paris: Plon
- _____ 1966. *The Savage Mind*. Chicago: University of Chicago Press.
- _____ 1973. Race et Histoire. Pp. 9-49. In: *Le Racisme devant la Science*. Paris: UNESCO/Gallimard.
- Lewis, Harrison F. 1972. Wildlife Conservation. *Encyclopedia Canadiana*. Vol. 10: 323-26. Toronto: Grolier of Canada.
- Lewis, Henry T. 1982. *A Time for Burning*. Boreal Institute for Northern Studies. Occasional Publication Number 11. Edmonton: Univ. Alberta.
- Livingston, John A. 1981. *The Fallacy of Wildlife Conservation*. Toronto: McClelland Stewart.
- Lucier, Charles V. and James W. VanStone. 1987. An Inupiaq Autobiography. *Etudes/Inuit/Studies* 11:149-172.
- MacPherson, A.H. 1981. Commentary: Wildlife Conservation and Canada's North. *Arctic* 34: 103-107.
- Martin, Calvin. 1978. *Keepers of the Game. Indian-Animal Relationships and the Fur Trade*. Berkeley: U. California Press.
- Mary-Rousselière, Guy. 1980. *Qitdlarssuaq - l'histoire d'une migration polaire*. Montréal: Les Presses de l'Université de Montréal.
- Mauss, Marcel. 1979. *Seasonal Variations of the Eskimo - A Study in Social Morphology*. London: Routledge and Kegan Paul.
- McAllister, Don E., Vianney Legendre and J.G. Hunter. 1987. *List of Inuktitut (Eskimo), French, English and scientific names of marine fishes of Arctic Canada*. Canadian

Manuscript Report of Fisheries and Aquatic Sciences No
1932. Ottawa.

McCandless, Robert G. 1985. *Yukon Wildlife: A social history*. Edmonton: U. Alta Press.

McNab, John. 1985. Carrying Capacity and related Slippery Shibboleths. *Wildl. Soc. Bull.* 13: 403 - 10.

McTaggart-Cowan, Ian. 1955. Wildlife Conservation in Canada. *J. Wildl. Management* 19: 161 - 76.

Meredith, Thomas C. 1983. Institutional Arrangements for the Management and Exploitation of the George River Caribou Herd: Remote or local control? *Etudes/Inuit/Studies* 7: 95-112.

Miller, Frank L. 1987. Management of Barren-ground Caribou (Rangifer tarandus groenlandicus) in Canada. Pp. 523 - 34. In: Wemmer, C.M. (ed.). *Biology and Management of the Cervidae*. Washington: Smithsonian Institute Press.

Muller-Wille, Ludger 1987. *Gazetteer of Inuit Place Names in Nunavik (Québec, Canada)*. Inukjuak: Avataq Cultural Institute.

Nakashima, D.J. 1988. Eider Ecology from Inuit Hunters. Pp.112-169. In: Nakashima, D.J. and D.J. Murray. *The Common Eider of eastern Hudson Bay: A survey of nest colonies and Inuit ecological knowledge*. Environmental Studies Revolving Funds Report no. 102. Ottawa.

_____. 1989. *From the Skins of Birds: a technological study of the Belcher Island eider skin coat*. Report prepared for the Musée de la Civilisation. Québec.

Nash, Roderick. 1982. *Wilderness and the American Mind*. Third ed. New Haven: Yale U. Press.

Nelson, Richard K. 1969. *Hunters of the Northern Ice*. Chicago: U. Chicago Press.

- Nikkiforuk, Andrew. 1988. Shooting Blind. *Harrowsmith* Vol XIII. No. 81: 34-41.
- Osherenko, Gail. 1988. *Sharing Power with Native Users: Co-Management Regimes for Arctic Wildlife*. CARC Policy Paper no. 5.
- Oxford English Dictionary*. 1989. Second ed. Oxford: Clarendon Press.
- Paine, Robert. 1977. *The White Arctic - Anthropological Essays on Tutelage and Ethnicity*. Toronto: U. Toronto Press.
- Palmer, R.A. 1976. *Handbook of North American Birds*. Vol. 3. New Haven: Yale U. Press.
- Parker, G.R. 1972. *Biology of the Kaminuriak Population of Barren-ground Caribou. Part 1: Total numbers, mortality, recruitment and seasonal distribution*. Can. Wildl. Serv. Report. Ser. no. 20. Ottawa.
- Petersen, Robert. 1965. Some Regulating Factors in the Hunting Life of Greenlanders. *Folk* 7: 107-124.
- Pinkerton, Evelyn (ed.). 1989. *Co-operative Management of Local Fisheries*. Vancouver: UBC Press.
- Porter, C.L. 1967. *Taxonomy of Flowering Plants*. San Francisco: W.H. Freeman and Co.
- Rasmussen, Knud. 1976 [1931]. *The Netsilik Eskimos. Social life and spiritual culture*. Report of the Fifth Thule Expedition 1921-24. Vol VIII no. 1-2. New York: AMS Press.
- Reed, Austin. 1986. Eiderdown Harvesting and other Uses of Common Eiders in Spring and Summer. Pp. 138-146. In: Reed, Austin (ed.). *Eider ducks in Canada*. Can. Wildl. Ser. Report Ser. No. 47.

- Renouf, Ernest. 1921. Salvage: being the story of the search for and reclamation of the lost schooner, "Fort Churchill", and incidently a few observations concerning the customs of the Belcher Islands Eskimos. *Beaver* Nov. 1921: 16-21.
- Romesburg, H. Charles. 1981. Wildlife Science: Gaining Reliable Knowledge. *J. Wildl. Manage.* 45:293-313.
- Roué, M. 1985. Techniques de conservation et rôle des réserves alimentaires dans les sociétés arctiques. *Les Techniques de Conservation des Grains à long terme*. 3 (fasc.1): 61-75 Paris: Editions de CNRS.
- Rosing, Jens. 1986. *The Sky Hangs Low*. Naomi Jackson Groves, transl. Penumbra Press.
- Saladin d'Anglure, Bernard. 1978. L'homme (angut), le fils (irniq) et la lumière (qau): ou le cercle de pouvoir masculin chez les Inuit de l'Arctique central. *Anthropologica* n.s. 20:101-144.
- Schneider, Lucien. 1985. *Ulinaisigutiit. An Inuktitut-English Dictionary of Northern Quebec, Labrador and Eastern Arctic Dialects*. Québec: Les Presses de l'Université Laval.
- _____. n.d. Dictionnaire des Infixes de l'Esquimaux de l'Ungava. Québec: Ministère des Richesses Naturelles.
- Schmutz, Josef K. 1981. *Coloniality of the Hudson Bay Eider Duck*. Ph.D. Thesis. Kingston: Queen's U.
- Sheperd, Paul. 1969. Ecology and Man - A Viewpoint. Pp. 1-10. In: Shepherd, Paul (ed.). *The Subversive Science: Essays toward an Ecology of Man*. Boston: Houghton Mifflin Co.
- Smith, Eric A. 1983. Anthropological applications of optimal foraging theory. *Current Anthropology* 24:625-51.

- Soby, Regitze Margrethe. 1969/70. The Eskimo Animal Cult. *Folk* 11-12: 43-78.
- Speck, Frank G. 1937. Analysis of Eskimo and Indian skin-dressing methods in Labrador. *Ethnos* 2: 345-353.
- Stirling, Ian. 1990. The Future of Wildlife Mangement in the N.W.T. *Arctic* 43: iii-iv.
- Sturtevant, William C. 1964. Studies in Ethnoscience. Special Issue of *Am. Anthropologist* 66: 99-131.
- Theberge, John B. 1981. Commentary: Conservation in the North - An Ecological Perspective. *Arctic* 34: 281-85.
- Townsend, John B. 1983. Firearms against Native Arms: A study in comparative efficiencies with an Alaskan example. *Arctic Anthropology* 20: 1-33.
- Trudel, François. 1971. *La Population de l'Archipel de Belcher: une culture insulaire ?* Thèse de Maîtrise. Québec: U. Laval.
- Tungavik Federation of Nunavut. 1990. *Agreement in Principle between the Inuit of the Nunavut Settlement area and her Majesty in Right of Canada*. Ottawa: TFN/Minister of Indian and Northern Affair.
- Turner, Lucien M. 1979 (1894). *Ethnology of the Ungava District, Hudson Bay Territory: Indians and Eskimos in the Quebec-Labrador Peninsula*. Quebec: Presses Comeditex.
- Twomey, Arthur C. 1939. The walrus hunt. *Carnegie Magazine* 12(March 1939): 291-96.
- _____. 1942. *Needle to the North: The story of an expedition to Ungava and the Belcher Islands*. Boston: Houghton Mifflin Co.
- Usher, Peter J. 1986. Devolution of Power in the Northwest Territories: Implications for Wildlife Management. Pp. 69-

80. In: Alberta Society of Professional Biologists. *Native People and Renewable Resource Management*. 1986 Symposium. Edmonton, Alberta.
- _____ 1982. Fair Game? *Nature Canada* 11: 4-11;35-43.
- Van Tyne, Josselyn, and Andrew J. Berger. 1971. *Fundamentals of Ornithology*. New York: Dover Publications, Inc.
- Verney, Peter. 1979. *Animals in Peril*. Provo, Utah: Brigham Young U. Press.
- Wagner, Frederic H. 1989. American Wildlife Management at the Crossroads. *Wild. Soc. Bull.* 17: 354-360.
- Walters, Carl. 1986. *Adaptive Management of Renewable Resources*. New York: MacMillan Publishing Co.
- Welty, Joel Carl. 1975. *The Life of Birds*. Second ed. Toronto: W.B. Saunders Co.
- Wenzel, George W. 1986. Resource Harvesting and the Social Structure of Native Communities. Pp. 10-22. In: Alberta Society of Professional Biologists. *Native People and Renewable Resource Management*. 1986 Symposium. Edmonton, Alberta.
- White, Lynn. Jr. 1967. The Historical Roots of our Ecologic Crisis. *Science* 155: 1203-1207.
- Wilcove, David. 1989. In Memory of Martha and her Kind. *Audubon* 91 (5): 52-55.
- Wilkinson, Paul F. 1976. Some Thoughts Towards a Policy for the Rational Use of Renewable Resources in the Canadian North. Pp. 72-85. In: Freeman, Milton M.R. (ed.) *Renewable Resources and the Economy of the North*. Ottawa: ACUNS.
- Winterhalder, Bruce. 1981. Foraging strategies in the boreal environment: An analysis of Cree hunting and

gathering. In: Winterhalder, Bruce and Eric A. Smith (eds.). *Hunter-gatherer Foraging Strategies*. Chicago: U. Chicago Press.

Worster, Donald. 1977. *Nature's Economy: a history of ecological ideas*. Cambridge: Cambridge U. Press.