Importance of Experiential Context for Understanding Indigenous Ecological Knowledge: The Algonquins of Barriere Lake, Quebec

Scot Nickels
Department of Geography,
McGill University, Montreal
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Abstract (English)

One of the more recent and alluring phrases used by development and resource management practitioners and theorists is "traditional ecological knowledge." Although there is a substantial amount of the literature on this subject, these studies have unfortunately an inadequate characterization of the way in which indigenous people view, order, internalize, and manipulate environmental information. This deficiency indicates a need to (a) improve our understanding and use of indigenous knowledge as an instrument for sustainable development and resource management and (b) revise some of our present conceptual, theoretical, and methodological understandings.

This dissertation examines these issues by investigating the ecological knowledge of the Barriere Lake Algonquins, living largely within Park La Verendrye in northwestern Quebec. The scope of this study concentrates on three aspects of this indigenous knowledge, namely, the (1) cyclicality within, the (2) utilization of, and the (3) terminology for the Algonquin forest environment. Theoretically, I draw to some extent on an approach taken from cognitive science called "connectionism" which helps integrate ecology and cognition. Within this theoretical framework I examine the experiences and understandings that different individuals and groups bring to common every-day situations involving environmental resources.

Three principles are put forward from the empirical findings of this thesis. First, indigenous knowledge formation is a contextual and experientially driven *process* rather than a static and timeless *content*. This process involves the natural-material and socio-cultural environment, expanding the typical cognitive unit of analysis beyond the individual person to include his or her entire natural and social surroundings. Second, this contextual and experientially driven process gives rise to heterogeneous, fluid, and contested knowledges. The knowledge-formation process goes beyond the mere generation and transmission of knowledge to how knowledge is articulated and used in particular everyday situations. Third, this process-approach has important implications

which, if ignored, will prevent researchers from developing an adequate understanding and appreciation of the contextual nature of IK because the research will fail to consider the everyday experiences which become internalized, shared, and later put to use. The process-approach has important practical, theoretical, and methodological implications for IK and its use in development, resource management, and resource conservation.

Abstract (French)

L'attrait actuel pour les connaissances traditionnelles parmi les praticiens et les théoriciens du développement et de la gestion des ressources, ne fait aucun doute. Bien que la littérature sur le sujet abonde, aucune caractérisation permet de décrire adéquatement la manière dont les autochtones voient, classifient, intègrent et utilisent les informations qui leur proviennent de leur environnement. Conséquemment, si les connaissances traditionnelles peuvent servir à soutenir le développement durable et la gestion des ressources, il importe de mieux comprendre et de mieux utiliser nos connaissances sur le sujet de même que de réviser notre compréhension conceptuelle, théorique et méthodologique.

La présente recherche aborde ces thèmes en examinant les connaissances traditionnelles des Algonquins du Lac Barrière, vivant principalement dans le Parc de la Vérendrie, au Nord Ouest du Québec. Le champ d'intérêt de cette étude se concentre sur trois aspects de la connaissance traditionnelle, soient la cyclicité, l'utilisation et la terminologie de l'environnement que constitue la forêt algonquine. L'approche théorique utilisée, le *connectionnisme*, est tirée de la science cognitive. Cette approche permet d'intégrer les aspects écologiques et cognitifs des connaissances traditionnelles. En utilisant comme trame de fond la théorie du *connectionnisme*, nous examinons l'expérience et la compréhension que différents individus et différents groupes ont des situations quotidiennes impliquant les ressources de leur environnement.

Trois principes fondamentaux résument les résultats empiriques de cette étude. Premièrement, le développement des connaissances des autochtones est un processus contextuel et *expérienciel* plutôt qu'un état statique et intemporel. Ce processus implique la matière naturelle et l'environnement socio-culturel, élargissant ainsi l'unité d'analyse cognitive qui typiquement se limite à l'individu, et en incluant, dans son ensemble, son milieu naturel et social. Deuxièmement, ce processus étant contextuel et *expérienciel*,

favorise l'émergence de connaissances hétérogènes, fluides et parfois divergentes. Le processus de développement de connaissances ne se limitent pas à une simple génération et transmission de connaissances car il inclut l'articulation et l'utilisation de ces connaissances dans des situations quotidiennes. Troisièmement, en ignorant ce processus et en ne tenant pas compte des expériences quotidiennes qui sont intégrées, partagées et plus tard mises à contribution, les chercheurs peuvent être amenés à développer une compréhension et une appréciation inadéquate de la nature contextuelle des connaissances traditionnelles. Les résultats de cette étude ont des implications importantes au niveau pratique, théorique et méthodologique ainsi qu'au niveau de l'utilisation des connaissances traditionnelles dans les domaines du développement, de la gestion des ressources et de la conservation des ressources.

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Abbreviations

ABL	Algonquins of Barriere Lake (***Mitcikanapikong Inik***)
ICC	Inuit Circumpolar Conference
IK	Indigenous Knowledge
INDM	Indigenous Knowledge and Development Monitor
IRMP	Integrated Resource Management Plan
TEK	Traditional Ecological Knowledge
WCED	World Council on Environment and Development

A note on orthography

Although many informal types of orthography exist within the community - influenced by various religious orders and familial ties - the orthography used in this thesis is based on a system developed by Jacob Wawatie, an Algonquin from Barriere Lake. It is also the orthography used by a long standing Barriere Lake researcher and anthropologist, Dr. Susan Roark-Calnek. Although I have tried to standardise my system of orthography with that of Dr. Roark-Calnek, differences may exist, mainly because of the way we hear various words, or because separate informants often have distinct pronunciations. Like Dr. Roark-Calnek, I have compared this system of orthography to that developed by Baraga for the Ojibwa (Baraga, 1878), Lemoine for Algonquins generally (Lemoine, 1909), McGregor for the Maniwaki Algonquins (McGregor, 1994), and that used by Dumont for the Lac Simon Algonquins (Dumont and Dumont, 1985). I am satisfied that this system works well and conforms to similar rules and conventions used by other Algonquin orthographies with only minor differences. Below are outlined the conventions used in the orthography of this study.

Pronunciation:

Fifteen consonants are used: b, c, d, g, h, j, k, m, n, s, t, w, and y.

c c = sh ex. ship, sheep

d dj = j ex. judge

dj as in "judge"

h h = sometimes silent

j as in "je" (in french)

l often pronounced as "n" ex. Basil= Basin

t pronounced as "ch", as in "church"

The vowels required are a, e, i, and o, with each being assigned two different sounds called long and short, differentiated by the use of a diacritic or accent mark " ^ ". They are enunciated approximately as follows:

a as in Butter, or nut

â as in Father, Fate, and Page. â = "aw" ex. paw

e whether long or short does not very enough to require the diacritic. This letter, however, is never mute and is enunciated as in "red" or "dread", whether at the beginning, middle or end of a word. Also pronounced as in "Pay", or "day".

i as in "bitter" "pig", "tigwagan"

î pronounced as "ee", as in "see", or "bleed"

o as in "good", or "hood"

ô yields a sound somewhere in between "loon" or "moon" and "moan".

CHAPTER ONE

Introduction

One of the more recent and alluring phrases used by development and resource management practitioners and theorists is traditional ecological or environmental knowledge. Aboriginal peoples themselves have been requesting that their extensive knowledge be incorporated into development planning, and some governments have been formally attempting to incorporate this "traditional knowledge" into policy deliberations. Indigenous knowledge (IK) is now seen to have application in many areas, including development planning, environmental assessment, agriculture, human and environmental health, resource management, and the local conservation of biological resources.

Even as one can acknowledge the positive contributions of IK theorists, who have tried to focus concern on indigenous and marginalized populations by highlighting their knowledge, a substantial amount of the literature has developed an inadequate characterization of the way in which indigenous people view, order, internalize, and manipulate environmental information. Insufficient attention has been paid in particular to the implications of the uneven distribution of knowledge within a population and how particular segments of society employ that knowledge in particular situations. Much IK literature ignores the performance of everyday cognitive tasks in particular empirical contexts in which knowledge is internalized, utilized, articulated and generated, by various segments of society, being content for the most part with abstract generalizations.

The result is a tendency for most ecological and cognitive work to describe one small part of a high consensus cultural activity or knowledge code which each individual is expected to share at the expense of a proliferating number of distributed knowledges. This has lead to a confusion between what is cultural knowledge and what is individual knowledge. Such a tendency makes cultural knowledge appear to be a static and unchanging system rather than a highly flexible and adaptive process. Therefore, "indigenous", "western", and "scientific" forms of knowledge have become totally separated from the possibility and richness of their historic interactions.

These problems indicate that the improvement of our understanding and use of IK as an instrument for sustainable development, resource management, and biological conservation requires a revision of some of our present conceptual, theoretical, and methodological understandings. If we want to improve our understanding of *how* and *why* indigenous knowledge can be different from that of other societies, then our interest is not so much in finding what makes up "indigenous" knowledge as an attempt to understand the way in which *knowledge* is conventionalized into *culture* (D'Andrade, 1995). Modernist positions on cultural theory have been criticized for treating culture as unified, uncontested, and unchanging. Postmodernist critiques -- because they are suspect of culture -- often go to the opposite extreme and describe culture as totally diverse, never accepted, and never the same. The problem is not so much determining which view of culture is correct but, rather, how can we explain the fact that both accounts exist.

In this thesis, I examine these issues by investigating the ecological knowledge of the Algonquins of Barriere Lake, living largely within Park La Verendrye in north western Quebec. My intention is not to produce a comprehensive ethnography of a people's thought and action in context. Knowledge is an immense realm touching all aspects of human existence and thought. It spans a broad range, including ideological and symbolic dimensions, as well as the empirical and objective domains. While touching to some degree on all of these aspects of knowledge, I will, nonetheless, keep to a narrow course and concentrate on knowledge that pertains to the relationship between humans and other parts of the natural environment. The main focus here is to investigate the Algonquin knowledge of their flora and fauna. Thus, the scope of my study concentrates on three aspects of this indigenous knowledge, namely, the cyclicality within, the utilization of, and the terminology for the Algonquin forest environment.

One area which holds much promise for addressing both theoretical and ethnological issues is cognitive science. This body of research is variously described as the attempt to bring cognitive psychology, neurophysiology, artificial intelligence, philosophy, linguistics, and anthropology together in order to understand knowledge. A small number of cognitive anthropologists[1] have incorporated contemporary concepts from the cognitive sciences. They have thus begun to use schema/connectionist frameworks to theorize how culture can be both partially shared and partially diverse, partially contested and partially accepted, partially changing and partially permanent. In

[1] For some examples see, (Bloch, 1992a, b; D'Andrade, 1992, 1995; Hutchins, 1988, 1995; Quinn and Strauss, 1989, Strauss and Quinn, 1996).

framing my analysis, I draw to some extent on aspects of the connectionist approach in order to integrate ecology and cognition. Within this theoretical framework I examine the experiences and understandings that different individuals and groups bring to common every-day situations involving environmental resources. This allows me to explain the way human knowledge and action are shaped through on-going interactions of individuals, their cultural process, and their environment. To a certain extent, therefore, this thesis explores how some of the recent critiques and insights of a cognitive theory of culture can illuminate how knowledges are constituted and work as cultural practice in every-day life.

I argue, that we can no longer view knowledge as completely shared and static understandings without fluid cultural boundaries, nor as completely individualized and inconsistent cultural processes. Instead, for thinking on IK to be effective in improving projects of development, resource management, and conservation, it must be grounded in the practical, everyday realities of cultural experience, context, and creativity. We must treat IK as a consequence of a practical engagement among humans and their environment which is reinforced by experience, shared but asymmetrically distributed, variably internalized, and embedded in a more encompassing cultural matrix. Here, culture is seen as a process which not only provides the contexts and constraints for individual learning and action but which is also constituted by the knowledge and activities of its participants. This view of IK, to varying degrees, opposes and complements total relativism and extreme structuralism. Such an outlook has important

practical, theoretical, and methodological implications for IK and its use in development, resource management, and resource conservation.

This dissertation is separated into seven chapters. The current chapter provides a brief introduction to the thesis. Chapter 2 serves as a literature review of research on indigenous knowledge. Chapter 3 summarizes the study area, the context under which this investigation was undertaken, and methodology used. The next three chapters present information obtained through the present research in order to support the investigator's position that a contextual approach is necessary for the study of indigenous knowledge. Chapter 4 examines the lifecycle of knowledge internalization; Chapter 5 examines the utilization of flora and fauna; and Chapter 6 examines the terminology used for flora and fauna. Chapter 7 attempts to pull the preceding chapters together into a coherent argument about the importance of a contextual approach to the study of indigenous knowledge.

CHAPTER TWO

Theoretical Context

The study of culturally specific knowledge, from which Indigenous Knowledge (IK) gains its roots, has been an element of academic inquiry since the turn of the 20th century. As a conceptualization of what indigenous people know about their environment and its ecological processes, IK has formed an important aspect of inquiry far longer than its formal usage has had intellectual currency (Wenzel, 1999). Indigenous knowledge is most commonly referred to in literature on arctic and sub-arctic development and resource management as traditional environmental or ecological knowledge (TEK). Contemporary usage of various formalized terms like IK and TEK are the result of a complex and changing history of use, meaning, approaches, ideologies, and methodologies. This chapter reviews these aspects as they relate to IK research, as well as introducing two important models for the architecture of cognition, both of which reveal the experiential, contextual and interactive nature of IK. This examination points towards the applicability of participant observation and the importance of taking a contextual approach to the study and understanding of IK as a research tool to improve development and resource management schemes. I begin by outlining the various usage and meanings of IK.

2.1 Utilization and Meaning of Indigenous Knowledge

An early precursor to today's formal use of IK, as pointed out by Brush (1993), was the use of *folk* or *ethno-* instead of *indigenous*. This employment was very common among earlier generations of cognitive anthropologists, and corresponded to the study of folk or ethnic cultures in other subfields and disciplines (ibid.). In order to analyse adequately how people interact with their environment, it was recognised that researchers had to pay attention to the way that the environment was apprehended and classified from the perspective of those being studied.

The first systematic investigations of knowledge began with a series of ethnoscientific studies on the terminologies that people of different cultures use to classify objects in their natural and social environments (Conklin, 1957, 1972; Diamond, 1966; Bulmer, 1970; Berlin, 1973; and Hunn, 1975). Such studies showed that most cultures recognise natural categories of plants and animals, and that folk cultures, like Western science, cognitively order the world. In their search for cultural universals, these researchers revealed an often close correspondence between scientific taxa and the classes of plants and animals established by folk cultures. The primary contrast implied here was between informal and Western scientific knowledge. The emphasis on "folk" knowledge reflected a broader interest in "popular culture," as opposed to "high culture" (Brush, 1993).

In the early 1980s the concept *folk knowledge* was gradually replaced by *knowledge system* as an object of study because it conveyed more strongly a sense of structure and

utility (Brush, 1993). Ethnoscientific studies began to be expanded upon through research on the ecological knowledge, beliefs, and management experience of a culture or group. This was because information obtained from such research was more effective for resource management purposes than knowledge limited to just resource use and classification (Prance, 1991). Listing and describing local use of resources is a necessary step to begin understanding a people's perception of and relations to their environment but it was nowhere near sufficient. Resource use, ecological knowledge, and management strategies, began to be seen as being all part of a larger body of social, cultural and individual knowledge which must be examined if a true understanding or appreciation of these factors was to be gained. There began an increasing desire to see this subtle ecological knowledge play an important role in conservation strategies and resource management. The shift from studying folk knowledge to studying knowledge systems was accompanied by adding *indigenous* as a key term, making it *indigenous knowledge system* (see Brokensha, et al., 1980, and Klee, 1980).

In most cognitive and ecological studies during the 1980s, the word *indigenous* was used interchangeably with *folk* and glossed as "*local*", "rural", or "*informal.*" The term "traditional" also began to emerge and was incorporated to demonstrate the ancient roots of much of this knowledge. Today there exists several formulations of the term (indigenous, traditional, local, rural) knowledge, and there are numerous views as to the appropriate use and application of each.

Some authors prefer to use the word "indigenous" to "traditional," arguing that the term "traditional knowledge" implies that knowledge is unchanging (Berkes, 1993). Using "indigenous knowledge" instead, has the benefit of avoiding the debate about tradition, while at the same time explicitly emphasizing its source (Johnson, 1992:4). Palsson and Chambers, see problems with the use of both "indigenous" and "traditional." Palsson argues that these terms have the tendency to "reproduce and reinforce the boundaries of the colonial world", and questions where such things as skills, expertise, and knowledge must be located and how old they must be in order to be classified as "indigenous" or "traditional" (Palsson, 1996:75). Chambers, argues that using these words suggest that knowledge originates from and is "naturally produced in an area", ignoring the fact that local forms of knowledge are continually being "added to, influenced by, and destroyed by knowledge from outside the area" (Chambers, 1983:82-3). He argues for the use of the term "rural people's knowledge", because it is all inclusive and does not exclude non-indigenous people living in rural areas. The drawback to this term is that it combines groups that may, in actuality, be very different.

The employment of "local knowledge" as a formal term implies the possibility of recognising the diversity of knowledge held by both local indigenous and non-indigenous peoples but it lacks the distinguishing cultural, if not political, aspects of IK. The use of "local knowledge" also has the drawback in that narrowing the focus on the "local" often fosters neglect of the implications that globalization has on localities (Cooke, 1991; Jackson, 1992).

The various contemporary formulations of the term IK are no longer restricted to academics and practitioners of development and resource management. Various combinations of these terms are beginning to be used by local indigenous groups to meet their needs. For example, the rhetorical use of "indigenous" and "traditional" by indigenous organizations and their advocates, politicises negotiation over development and resource management, linking them to issues of land claims, resource rights, and self-determination (e.g., ICC, 1993; 1994; IRMP, 1997). It is in this way that "indigenous" and "traditional," as indicated by Nuttall (1998:29), "are more culturally and politically potent terms than "local."

Certainly, as development practitioners, theorists, indigenous organisations, and advocates become more sensitive to notions of cultural and political absorption and resistance, and of the roles played by local and global forces in shaping cultural and biological landscapes, the usage of terms subsumed under the broad rubric of *indigenous knowledge* become more problematic. Already the term is used rather ambiguously, sometimes including the original "native" inhabitants of a region, sometimes including rural populations of minority groups, and sometimes even including local populations of majority groups. As Brush states, "[a]mbiguity about the term indigenous knowledge occurs because of its polysemy, as authors may have different intentions in and readers different understandings of its use" (1993:659). These various intentions and understandings can be determined as much by academic disciplinary boundaries -- descriptive historic particularism, ethnoscience, cultural ecology, cognitive anthropology, political ecology, and human ecology, as by sectoral actors and their approaches to the subject -- scientist,

development agent, facilitator, conservationist, political advocate, and capitalist.[2] To be sure, whatever formal terminology is used, the experience and context of interaction between the communicator and communicatee is highly important. As Nuttall has recently pointed out, "[i]ndigenous knowledge is the political expression of local knowledge and local knowledge can become 'indigenous' knowledge if people choose to see it as such" (Nuttall, 1998:30).

Looking at the evolution of use and meaning of IK by its practitioners in this way is revealing. It becomes clear that the various formulations of IK and the meanings they imply exist because they are contextual manifestations of particular every-day experiences and interactions among various stakeholders involved in development and resource management. Certainly, the accomplishments of IK theoretitions and practitioners have been affected by the every-day experience of working with rural - local - indigenous peoples. Less likely to be recognized is the degree to which the knowledge and activities of indigenous peoples and their organisations have been affected by changing conceptual, theoretical, and methodological understandings of IK research and policy. The development of the formal, theoretical practice of IK may have proceeded differently than its informal, "non-theoretical" social practice. But both have been actively implicated in constituting the social, and natural, history of the other. The same can be said to be true for

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[2] Brush (1993), divides IK research into these academic disciplinary boundaries, while participants of a recent International Symposium on Indigenous Knowledge and Sustainable Development (IKDM, 1993), arrange IK into more functional (sectoral) approaches. See also [Howes, 1980] and [Bell, 1979] on the subject of the various strands to the evolution of the indigenous knowledge perspective.

the numerous approaches to the study of IK and the methodologies that go along with them. This is the subject to which we now turn.

2.2 Approaches and Methodologies

I have shown that several formulations and meanings of IK have been produced over time in response to changing issues, purposes and perspectives. The major claim of indigenous (or traditional or rural or local) knowledge is that effective development and resource management benefits from some understanding of local knowledge and practices (Sillitoe, 1998:223). Effective development and management of natural resources can only come about if development and environmental managers take note of the knowledge and management strategies of local people and encourage their participation at every stage in the formulation of projects and policies.

Yet, it was not long ago that development theorists largely saw folk traditions and indigenous knowledge as simplistic, if not, outmoded and an obstacle to development. They assumed that "traditional" and "modern" knowledge were incompatible and the path toward development or "modernisation" lay in replacing the former with the later. Western science was equated with that which was "modern" and its abilities to problem solve with new technologies was seen as a revolutionary solution to the problem of underdevelopment.

Over time, however, evidence began to emerge that rather than improving the underdevelopment situation, Western science and the imposition of its knowledge on rural

localities was actually contributing to its deterioration. Not only was indigenous and local knowledge ignored and dismissed, but defining the nature and problem of development by reference to the knowledge system of Western science was actually leading to the "growth of ignorance" (Hobart, 1993).

In reaction to the top-down aspects of the Modernist movement, development and resource management began to underscore the promise IK holds for a more bottom-up and participatory approach in these areas. Many current authors see IK as specific cultural knowledge that offers an alternative perspective and a body of local wisdom and practical experience that competes with - and in many cases outperforms - the models offered by "western science" (Johnson, 1992; Knudtson and Suzuki, 1992). A considerable amount of this literature has been devoted to emphasising the "vulnerability of local knowledge and how the loss of such vast repositories of traditional knowledge and skills for sustainably managing very complex ecological systems would deprive the rest of humanity of our ability to manage resources, or perhaps even survive, into the future" (see WCED, 1987, 114-115). Highlighted here is often a rather romantic view of primitive peoples living in complete harmony with nature, a view which has been refuted by many authors.[3] Still, no matter which side of this divide one stands, most practitioners see IK as offering an alternative to strictly scientific and technological approaches to development and environmental management.

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[3] See for example [Callicott, 1982, 1990; Brightman, 1987; Burch, 1994; Ellen, 1986; Martin, 1978; Nelson, 1982; Palsson, 1996; Tanner, 1979].

As progressive as this attempt to focus concern on indigenous and marginalized populations by accenting their knowledge is, there has been a tendency in much IK literature to systematise, generalise and codify local knowledge by simplifying the complexities of the local practitioners' history of experience. A simplistic and idealised image of a culture or community, however, prevents all stakeholders involved in development and resource management from understanding the diversity and wealth of knowledge within localities.

A substantial amount of literature has been devoted to critiquing Western science as it relates to IK (Freeman, 1989; 1992; Feit, 1988; Gadgil et.al., 1991). Most of these writings tend to deal with specific events, case studies, or incidents of resource management and expose the limitations of scientific knowledge and the utility of gathering knowledge from a local perspective. An extension of this type of research, and one of the major ways in which IK has entered the literature as a point of discussion, is with regard to its differentness from Western scientific knowledge and practice (e.g., Berkes, 1988, 1993; DeWalt, 1994; Colorado, 1998; Freeman, 1979, 1985, 1989; Banuri and Apffel-Marglin, 1993; Lalonde, 1993; Stevenson, 1996; Wolfe, et al. 1991). Most of these authors use a "systems of knowledge" framework to locate and outline the distinguishing characteristics that separate these two forms of knowledge. They are mostly concerned with outlining what they see are the inherent points of epistemological and methodological conflict between IK and science. Such literature tends to develop a generalized list of characteristics that separate the two knowledge systems with the hope that this will somehow lead to new ways of integrating IK with science.

Most of these authors openly state their opposition to the modernist perspective that indigenous institutions and knowledge are obstacles to development. But, as pointed out by Agrawal (1995), there is a problem with the position of those who seek to create the distinct categories of indigenous and Western knowledge. By maintaining that it is possible to delineate a finite and small number of characteristics which are unique elements contained within these categories, these theorists remain committed to the same kind of dichotomous classification that dominated the views of modernist theorists (see Warren *et al*, 1989), only this time the tables are reversed.

This attempt at exposing the fundamental differences between that which is indigenous and that which is Western or scientific is highly problematic. First of all, there is considerable evidence to suggest that a multitude of different indigenous and western knowledges exist. These distinctive indigenous and western knowledges result from unique histories of experience and specific patterns of change in particular localities. Indigenous societies, like the environments in which they live, are highly heterogeneous and resist generalisation. Anthropologists have successfully shown how rural communities are by no means homogenous entities (e.g. Cohen, 1993). Even "the views of scientists and especially their views on basic matters are often as different from each other as are the ideologies of different cultures" (Feyerabend, 1975, 1993: xi-xii). In the end, what we are left with are noticeable differences among philosophies and knowledges commonly viewed as indigenous or western. In regard to this neglect to recognise the differences within western and indigenous knowledge's, Agrawal (1995:421) bluntly states,

> Western knowledge is supposedly guided by empirical measurements and abstract principles that help order the measured observations to facilitate the testing of hypotheses. Yet, by what yardstick of common measure can one club together the knowledges generated by such western philosophers as Hume and Foucault, Derrida and Von Neumann, or Said and Fogel? And by what tortuous stretch of imagination would one assert similarities between the Azande beliefs in witchcraft (Evans-Pritchard, 1936), and the decision-making strategies of the Raika shepherds in western India? (Agrawal, 1993, 1994)

The classification of knowledge into indigenous or western is problematic not only because of the heterogeneity among the elements within these two categories, it also falters at a more fundamental level. It makes cultural knowledge appear to be a rigid, unchanging system rather than a highly flexible and adaptive process. It seeks to represent "indigenous," "western", or "scientific" forms of knowledge as static and totally separated from the possibility and richness of their historic interactions. Countering this depiction, Chambers (1993:83) has drawn attention to how "rural people's knowledge is also added to, influenced by, and destroyed by knowledge from outside the area." Krupnik and Vakhtin (1997), in their work among the Yupik of Siberia have pointed out that IK, at least in the way that it may be partially constructed by individuals, has become as open to novel sources of data as other elements of Yupik culture. Indeed, the very meaning of "indigenous" and of "non-indigenous" is both problematic and contentious, as the "indigenous" and "non-indigenous" lie more along a sliding scale of ethnicity than in completely separate camps with impermeable boundaries (Beteille, 1998; Coomes and Barham, 1997; McNeely and Pitt, 1985).

On the other hand, representing all elements of indigenous and western knowledge as completely distinct, all of the time, cannot be sustained either. There exists much evidence which shows substantial similarities in specific elements within these two groups. For example, it has been shown how hunter-gatherers in such diverse environments as Australia and North America have developed "functionally equivalent perspectives" on the methods and effects of employing habitat fires in managing plant and animal resource distribution and abundance (Lewis, 1982; 1989; Lewis and Ferguson, 1988).

There are some notable similarities between indigenous and western elements as well. For example, in comparing the resource management interpretations of Inuit and western scientists, Nakashima (1991:66) points out that while there may be a discrepancy in the end-product that scientists and Inuit respectively culturally construct, there also exists "...striking similarities in intellectual process." Other research has shown that indigenous hunters and Western scientists sometimes apply the same ecological indicators in their respective evaluation of the local environment. For instance, Feit (1988) shows how the Cree of James Bay continually collect information on the composition of beaver colonies from ecological signs around the site, the sizes and sex of beaver caught while hunting, and from information collected in the process of butchering beaver. This information on beaver colonies is sought in order to determine how many beaver are present and how many may be taken. Thus, the empirical principals used by indigenous people are

essentially the same as those which have evolved in the Western science of wildlife management.

The attempt by many IK theorists to expose a small number of essential differences between that which is indigenous and that which is Western or scientific knowledge suffers from an additional problem. It fails from what Hutchins (1995) calls an "attribution problem," the unclear distinction between those aspects of knowledge which are individual and those which are social. This failure to recognize the cultural, and individual, nature of cognitive processes often leads to a misidentification of the boundaries of the system that produces the evidence of that knowledge (ibid.). Although the boundaries between individual and culturally generalized knowledge are highly fluid, the failure to properly consider those aspects of knowledge which are individual and those which are cultural has often resulted in mistaking the properties of complex sociocultural systems for the properties of individual minds, or contrarily, placing cultural characteristics of knowledge incorrectly inside the heads of each individual.

There appears to be a problem with the way many IK theorists think about culture. This involves the way they envision the interaction between structures in the mind and structures that are in the external world. Although not normally explicitly stated, many authors, nonetheless, appear to embrace a definition of culture as a purely mental phenomena consisting of meanings, knowledge, values, and beliefs. Therefore,

> The structures that exist in the physical world as objects or events -- the patterned sounds of language (including ordinary talk and specialized narratives), role behaviour, the countless pieces of material culture, the enactments of ritual -- are all thought to be produced by the structures in the mind, and thus considered to be more or less a ***reflection*** of these mental cultural structures (emphasis in the original. (D'Andrede, 1995:146).

This ideational definition of cultural knowledge -- that cultural knowledge is inside the heads of individuals -- prevents us from seeing that systems of socially distributed cognition may have interesting cognitive properties of their own (Hutchins, 1995). The inability to recognize this results from a tendency to see cultural knowledge as *content* rather than as *process*. There is a failure to take into consideration the interaction between both mental and physical structures which are the results or residue of the *process* of cultural transmission and adaptation rather than its *content* (D'Andrade, 1995). In the end, this definition legitimizes the study of mental structures at the expense of studying structures in the external physical world.

The legitimization of the study of mental structures over external physical structures has lead many IK researchers to ignore the importance that the latter can play in the generation, organisation, storage, and dissemination of knowledge. Ignoring the implications that using particular tools of the trade present has lead to problems in the accurate representation and interpretation of IK.

Two important but very common structures that exist in the physical world as objects or events are the tools of language (patterned sounds) and literacy (pencils, paper, computers). Looking first at the implications of language, there is the tendency among IK practitioners to assume that all knowledge worth having is encoded verbally and can be articulated by local people. Evidence for this view is revealed in the work of Krupnik and Vakhtin, who initially hypothesize, "that the loss (or decline) of traditional ecological knowledge takes place by generations, that is to say that it fully correlates with age, as does the loss of the mother tongue" (1997). In keeping with the assumptions of much IK literature, Krupnik and Vakhtin initially believed that older generations of Yupik-speaking people should posses a larger volume of traditional ecological knowledge than the present-day elders of the next generation (ibid.). In their longitudinal study, however, they found that the results did not support their original assumptions. They conclude that, "the transition in and replacement of indigenous ecological knowledge is a far more complicated process than any model built on language loss could stimulate" (Krupnik and Vakhtin, 1997:7). This runs counter to earlier views in cognitive anthropology (Tyler, 1969), which saw language as essential for conceptual thought.

Related to the linguistic aspects of IK loss, are the growing examples in IK literature that allude to the inability of indigenous people to effectively explain how and why they do certain tasks. Descola (1996:86), has said that "most members of a given community will find themselves unable to state explicitly the elementary principles of their cultural conventions." This is because humans are not normally conscious that their everyday experiences, internalized as environmental knowledge, structure individual and

social relationships while also being structured by them. As Sillitoe says about attempts to document the most basic elements of IK,

> we can report New Guinea highlander horticultural practices and their comments about the soil and its behaviour under cultivation, about 'grease' levels, and so on, but if we ask people what it is about the soil and crops that allows them to farm this way, they are likely to respond 'they just do' (Sillitoe, 1998:226).

In other words, if one is a farmer, one just knows. It is clear that much practical cultural knowledge is not learned and stored as linear verbal codes, but rather is internalized by doing, watching, and living in particular places at a particular times. Therefore, not only can knowledge be internalized in a non-linguistic fashion, but it is difficult to render some types of knowledge into words (Bloch, 1992a; Bourdieu, 1977). It is crucial to incorporate these theoretical aspects into IK research which suffers from theories of knowledge which are still overly language-based.

Literacy, and the techniques and tools that go along with it, is another structure that exists in the physical world whose implications on IK research cannot be ignored. Ecological knowledge is commonly viewed as being "inextricably linked to technological knowledge" (Lewis, 1993). Certainly a way of thinking goes along with the techniques and tools that people use to perform everyday tasks, and the techniques and tools used by oral and literate traditions are no exception.

Some surprising side effects on the relationship between knowledge and the tools of literacy can result from mistaking the properties of complex sociocultural systems for the properties of individual minds.

> If one believes that technology is the consequence of cognitive capabilities, and if one further believes that the only place to look for the sources of cognitive capabilities is inside individual minds, then observed differences in level of technology between a "technologically advanced" and a "technologically primitive" culture will inevitably be seen as evidence of advanced and primitive minds. Differences in mental capacity seem necessary to account for differences in level of technology (Hutchins, 1995:355).

Once this train of thought is adhered to, it is easy to maintain that oral cultures, who lack literate technologies, are "primitive" and "simple" rather than simply different. Ridington, however, in looking at the technologies of indigenous peoples has revealed how "we inadvertently overlook the artifice behind technology in favor of the artifacts that it produces" (Ridington, 1982:481). The technologies of indigenous people entail much more than just the material tools and techniques they use, but rather, the knowledge behind the employment and production of artifacts used in the performance of everyday tasks.

The tools of literacy are commonly seen by IK theorists as structures that stand between the performer and the task being performed, mediating their relationship. This stand-between reading of the mediating structures of literacy assumes that the task and

the performer can be bounded independently, instead of seeing the tools of literacy as structural elements brought into coordination in the performance of a complex task. Attention to the structural elements, and how these elements are brought into coordination in the performance of everyday tasks, is something that IK researchers must concern themselves with if they hope to accurately represent the cultures they study.

Many tasks in the world are performed and described using written procedures, but many are not. Particular attention and care, therefore, must be given to attempts at representing oral knowledge in a literate fashion. There has been the tendency, particularly among ethnoscientists, to arrange, categorize and formalize aboriginal classifications as if they were consistent with literate forms of communication and tradition (Goody, 1977). This is made evident in the use of tabular representations, binary oppositions, charts, lists and diagrams, and ethnoscientific assumptions that these methods are suitable. For example, as Ellen (1993) points out "there is good reason to believe that the 'observed' uniformity of folk classification are in part produced by their transmission to paper and by perceiving them as an instance of this mode." Writing reduces the multitude of connections possible in the human brain to two dimensional graphic representation on the printed page. In short, Ellen continues, "the behavioural act of writing makes what is mental material, what is temporally sequential synchronic, preserving speech and thought over time to form a potentially permanent record (Ellen, 1993:32)."

Thus, any particular everyday event, whos meaning normally can change over time depending on context and situationality, can become fixed in time through the act of writing. Writing something down on paper, or in a computer permits "the inspection of wholes never before accessible at any one moment" (ibid.:33). Once a fragment of knowledge is written down, it can be inspected and compared to other similar fragments using the written words or by conducting a computer search. This inspection can often expose contraditictions in knowledge. When one fragment contradicts the same fragment from another elicitory situation, without some details of the elicitory context, there is often strong pressure to modify it in ways which eliminate those contraditions. It is possible to live with these contraditions in oral cultures, because it is physically impossible to inspect all information, but contradictions of this type become problematic in cultures which use the tools of literacy.

In this regard, one documentation and storage strategy being advanced by a large number of IK researchers is the use of international, national, and regional archives and computer databases. Advocates of this strategy argue that IK can be disseminated from one part of the world to another in order to solve problems faced by other societies in other areas (Ulluwishewa, 1993:11-3; Warren, et al. 1989:167-8; Warren, et al 1995:2-4). As sound as this approach may appear at first glance, there are several problems. First, it leads to the interpretation of IK using the canons of science. If there are fundamental differences between indigenous and scientific elements in the generation, storage, organisation, and transmission of knowledge, as these authors contend, then how can IK be organised and stored adequately using scientific means? Agrawal candidly points out that it

"is not coincidental that the strategy they espouse -- *ex situ* preservation -- is technically the easiest, and politically the most convenient (1995:427)." Second, it leads to the inability to see the relationship between knowledge, power and control. Knowledge stored in these archives and databases are ordinarily most readily available to scientists and bureaucrats, privileging its use to the scientific and political community over the local, who it was initially intended to help. Third, it has proven to be a difficult enough task to apply IK in local every-day contexts which are urgent and immediate. How cannot the gathering and storage of such knowledge in international databases run the risk of simplifying, decontextualising, and depriving knowledge of its meaning? The decontextualization of knowledge leads to an inability to understand the multiplicity of meaning and intention that internalised knowledge can posses in distinct situations.

For example, modernist depictions of cohesive and unchanging traditional communities living in harmony with nature is an idea that can, and has been, used by indigenous leaders and organisations to their apparent advantage. This tactic has been used in some cases to ensure their initial involvement in alternative development and resource management strategies, and as an argument for their continued rights and involvement in traditional lifestyles which might include the hunting of a species now designated as endangered (Freeman et al., 1998). For example, as pointed out by Nuttall, in regard to the contemporary political use of IK by indigenous organizations,

> Just as the idealised and simplified image of community can prevent resource managers from understanding the diversity and wealth of knowledge within localities, so the image of the homogenous community can be used to vital effect as a rhetorical device in political contexts... Land claims are easier to advance and argue for if competing and heterogeneous ideas about what different groups within a region should get are not apparent. Similarly, the claim of indigenous knowledge is stronger if politicians and representatives of indigenous people's organizations construct simplified images of a community or people in harmony with the environment, possessing undifferentiated sets of knowledge relating to appropriate environmental conservation (Nuttall, 1998:26-27).

Success in these endeavours has often depended on the ability of indigenous communities to show that, not only are these traditional activities essential for economic and cultural survival, they are also sustainable activities. There exists the danger, however, that emphasizing environmental knowledge as "traditional" may foreclose opportunities for indigenous peoples to become involved in emerging non-traditional activities such as commercial forestry and tourism. Thus, it is important to understand the processual nature of all knowledge and its contextual use to meet certain circumstances, including political circumstances. Attention should be focused on seeing knowledge as embedded within changing and complex cultural and environmental contexts.

All these problems indicate that improvement of our comprehension and use of IK as an instrument for sustainable development and resource management requires a revision of some of our present conceptual, theoretical, and methodological understandings. If we want to know how and why indigenous knowledge can be different from that of other societies, then our interest is not so much in finding what makes up

"indigenous" knowledge, as it is an attempt to understand the way in which *knowledge* is conventionalized into *culture* (D'Andrade, 1995). We must see the formation of cultural knowledge not as *content* but as *process*. I have shown how modernist positions on cultural theory can be criticized for treating culture as unified, uncontested, and unchanging, but postmodernist critiques of culture that go to the opposite extreme and describe culture as totally diverse, never accepted, and never the same can also be shown to be questionable. The problem is not so much determining which account of culture is correct but, rather, how can we explain the fact that both accounts exist. This leads us to thinking about the kind of architecture of cognition that is required to accommodate this flexible constitution of cultural knowledge, and to the ideas of serial symbolic and connectionist models.

2.3 Architectures of Cognition

The standard model of the architecture of knowledge used in computer programming, artificial intelligence, and much of cognitive psychology and anthropology since the 1950s has been the sentential linear model of the mind-brain (D'Andrade, 1995). This model, sometimes also called the *sentence-logic model* or the *serial symbolic processing model* (Churchland and Sejnowski, 1989), has been intuitively attractive because it works well for the semantics of natural language and for those metaphors for the mind such as digital computers. This model is also the model of folk psychology; of how we, as humans, think we think (D'Andrade, 1987). Certainly the theoretical perspective of much IK research subscribes to this model openly or in an implied sense.

In this model, symbols are the basic objects of the mind. The human brain -- like the computer, because it is thought to have been made in the image of humans (Hutchins, 1995:363) -- uses symbols as the basic objects for its functioning. The senses, or input devices, gather information from the external world which is then encoded in symbols, or binary bits, so that a representation of the world can be created. Once this representation has been formed, the human brain manipulates these symbols -- the computer manipulates its' binary bits -- using the rules of logic. "These rules are applied serially, forming a chain of steps through which a decision is reached (D'Andrade, 1995:137)," much like the formal rules of grammar in language.

Routinely we use this language metaphor when we think about the knowledge in computers and in the human head. This metaphor suggests that when we learn something, there is a sentence in our heads representing that knowledge. This knowledge is spelled out in words that are received by sensory apparatus (eyes, ears, fingers) and sits in our brain somewhere. Learning this knowledge is undertaken through the linear inscription of these spelled out words and sentences in our brains. "Applying this knowledge is a process of drawing logical inferences or satisfying if-then rules (Strauss and Quinn, 1996.:62)." The problem with this folk model of describing human thought procedures is that processing complex yet familiar, every-day tasks would be impossibly clumsy and slow when compared to the efficiency and speed with which such processing actually occurs in real life situations.

A relatively new and admittedly controversial architecture of cognition called "connectionism" has begun to be experimented with by a number of cognitive scientists. Connectionism uses a neural metaphor to picture knowledge, instead of using the symbol/language metaphor of the mind. Also called a "parallel distributed processing network," connectionist computer models draw on the features of "neural networks" to simulate human knowledge, learning, and action (Rumelhart et.al., 1986). Connectionism suggests that we access knowledge either from memory or as it is conceptualised from a perception of the external world, through a number of processing units which work in parallel and which feed in information simultaneously. In these models,

> knowledge is not represented by symbols strung together in sentences, but by simple processing units arranged in layers (input, output, and one or more layers in between). Aside from units in the input layer, which are activated by (computer-simulated or recorded) experiences, each unit simply sums the positive and negative signals it receives from other units and passes on a weighted positive or negative total to the other units with which it is connected. (Or so it is imagined. All that is really happening is numbers changing, but these numbers are supposed to represent units exciting and inhibiting each other.) The weights on connections between units are modified through repeated exposure to examples of a set of input-output associations that need to be learned (Strauss and Quinn, 1996:63).

Human knowledge, according to this model, is not a sentence in the particular language of the brain, but rather a tendency of units representing certain "chunked" domains of knowledge and situations to activate other units (and those still other units) which, after sufficient training, initiate a response or behaviour.

Understood this way, knowledge is not a set of sentences but a pattern of interaction among strongly interconnected units, or "chunked" domains of knowledge, which can vary in their schematicity depending on the strength and density of these interconnections among the units of which they are composed. Knowledge is typically learned through repeated observation of events in the natural environment and/or participation in social interactions which create a gradual strengthening of the weights of association among these units. Speech and text can be part of the model's input, but because language is not privileged in this formulation, any kind of experience, including seeing, touching, smelling and other symbolic material, can be represented using a connectionist model (D'Andrade, 1995).

The theory of connectionism is important to the study of IK because it provides a relatively new and robust framework that accounts for how the process of internalising, utilizing, and transmitting cultural knowledge in the brain might work in a very human fashion. It provides an architecture of cognition that transcends the boundaries of the individual to include the socio-material environment of thinking and doing. This architecture of cognition accommodates the flexible and changing constitution of culture that emerged from our review of IK literature. Further, connectionism accounts well for the formation and utilization of knowledge as a consequence of experience.

One of the most important aspect of the connectionist framework in terms of its application to IK is that these networks are highly context-sensitive. This is because knowledge does not consist of simple pairs of links that are commonly postulated in older

associationist and language-like models, but rather whole interlinked webs or networks. The meaning of any one action is dependent on the whole set of actions learned along with it. Interpretations, therefore, depend on the learner's history of experiences and can change over time.

> Once a whole network of such links is in place, it can process information holistically. An event activates the units that respond to the features of that event; these units, in tern, then activate all the others to which they are strongly linked by associations learned from past experience, exciting some units and inhibiting others. This process continues until the network settles into a response that satisfies as many of the constraints as possible in the situation. (Strauss and Quinn, 1996:65).

What we can expect to find is that "the combined influence of the units activated by the particular features of any given event can lead to rather different outcomes from one situation to the next" (Strauss and Quinn, 1996:65).

Connectionism also has important implications in the study of the way humans learn and perform practical, everyday tasks. There is considerable evidence that learning to perform work is not just a matter of storing received knowledge, as is often implicitly assumed when IK theorists speak of cultural and individual representations. Instead, it appears that the process of cultural learning of all common practical tasks involves the creation of apparatuses dedicated to the efficient handling and packing of specific domains of knowledge and practice (Bloch, 1992a, b). This accounts for the lengthly process of becoming an expert at most familiar everyday tasks.

Learning to handle a family of related tasks requires that connected networks, dedicated to specific domains of cognition and procedures, gradually become established through experience and training (verbal, literate, visual, participant). Such a process requires that a good deal of time be involved in packing and connecting these knowledge domains, but as the packing and connecting proceeds, these networks can be accessed quickly and efficiently by multiple parallel processing.

Knowledge stored in sentential logical forms are too cumbersome and slow to account for observed cultural efficiency. It is the construction of domain-relevant networks that allows culture to be effective. Everyday practical actions and knowledge packaged into networks that take the form presumed by connectionist models allow for quick and proficient operations in familiar domains. It is not even necessary for this type of chunked knowledge to ever be put into words for it to be transmitted from one member of the community to another (Bloch, 1992a).

It is possible, however, to unpack these networks and transform them into linear sentential sequences which can then be put into words. This process of putting knowledge into words must require transformations in the nature of knowledge where the words have only a somewhat removed relationship to the knowledge referred to (ibid.). If such transformations commonly occur, then cultural knowledge can be seen to consist of information partly organised by connectionist networks and partly by sentential logical strings, each with rather fluid transformative boundaries between the two (ibid.). As Bloch continues, "we should perhaps see culture as always balanced between the need for

chunking for efficiency, on the one hand, and, on the other, linguistic explicitness. . . (ibid.:193)."

We can now understand Sillitoe's comments about the common inability of indigenous people to effectively explain how and why they do certain tasks. As indicated previously, to be a New Guinean highlander farmer means that "one just knows." Chunked knowledge is often difficult to put into simple words. When our informants honestly tell us in their own words how and why they do such things, as Bloch warns,

> we should be suspicious and ask what kind of particular knowledge is this which can take such an explicit, linguistic form? Indeed, we should treat all explicit knowledge as problematic, as a type of knowledge probably removed from that employed in practical activities under normal circumstances. (Bloch, 1992a:194)

But this raises the question of how we are ever going to appropriately document and interpret local IK. Consideration of the implications of the methods we use leads us to thinking particularly about the technique of participant observation.

2.4 Participant Observation

Evidence that the flexibility of knowledge formation in response to real-world situations and tasks appears to be an important human cognitive phenomenon in its own right was given in the previous sections of this chapter. Approaching the question of

appropriate methods of documenting and interpreting IK by placing the flexible constitution of cultural knowledge first means approaching the study of IK from a different starting point. The flexible and changing nature of cultural knowledge can be entirely missed by laboratory-type research paradigms that, for good reasons, intentionally limit the methods subjects may use to perform a task. It can also be missed by data-base-type methods of recording knowledge that, also for good reason, intentionally limit the degree of variation in the articulation of knowledge in different situations (Hutchins, 1995). From the vantage point of accepting the existence of flexible and changing cultural knowledge we are no longer interested in making attempts to normalise data. Instead we are searching for ways to account for and explain the flexible and mutable nature of knowledge. This demands prolonged research techniques in order that we may better understand the use of knowledge in particular contexts.

The degree to which the basis of our knowledge about the people we study comes from extended practical and informal co-operation with them should not be downplayed. There is much to be said about those researchers who have done prolonged fieldwork, living and participating with the people they study. The long-term nature of participant observation makes us learn the same procedures the people we study learn. This enables us to assess, in the field, the degree to which we are learning properly and improving our abilities to cope with many daily tasks, including social tasks (Bloch, 1992a, b).

As Sillitoe says, "one priority should be to convince policy makers that indigenous-knowledge research is long-term" (Sillitoe, 1998:234). Research methods like

rapid rural appraisal and participatory rural appraisal can be use reliably to document, interpret and assess indigenous knowledge only in situations where practitioners are fully familiar with the region and its people. This usually means that these techniques give good returns for effort on new and specific topics only when preceded by much ethnographic and participant observation work. It is in this way that the word "rapid" in rapid rural appraisal is exposed as a falsehood.

The documentation, interpretation and assessment of indigenous knowledge alongside scientific criteria -- what some have called the "knowledge interface" (Blaikie et al., 1996; Jiggins, 1986) -- is a concern that most non-aboriginal researchers share with holders of indigenous knowledge. As Wenzel says concerning his research among the Inuit,

> I consider interpreting data that I collect to be among my principal responsibilities as a researcher. That my interpretations retain the cultural context in which these data occur is also, in my view, essential. However, what precisely may constitute appropriate context is also very much a product of interpretation. (Wenzel, 1999:114).

I believe, through years of living with Clyde River Inuit, that Wenzel often proceeds with his research in much the same way as Bloch describes in his studies of the Malagasy cultures,

> [I look for facts], especially for statements, that confirm what I already know to be right because I know how to live efficiently with these people, or, if you will, because I have established in my brain non-linguistic chunked mental models which enable me to cope with most things in daily life at great speed (*emphasis his*, Bloch, 1992a:194).

To be sure, no methodology has proven itself without fault. Long term experience with a people and much participant observation are still the most respectable methods we have. Perhaps the only way to ensure that our interpretations retain a degree of cultural context is to continually "remind readers that most of our material is taken from the world of non-explicit expert practice and does not only come from linear, linguistic thought" (Bloch, 1992a:193). Thus, much of our interpretations must be recontextualizations of the production of knowledge. And while all IK practitioners should be concerned with the difficulties of appropriately documenting and representing IK, they cannot give up and pretend that they are merely involved in some kind of "political and literary undertaking" (Molnar et al. 1992:90). There is a practical necessity to continually make attempts at improving our methods and understandings of IK research.

2.5 Final Comments

Knowledge can no longer be seen as the *content* of a static knowledge system. Neither can it be seen as an ideological representation of reality, nor its passive effect. Rather, knowledge is a cultural *process* that affects, and is affected by, every other process in the social and natural world (Resnick and Wolff, 1987; Graham, 1990; Hutchins, 1995).

In studying IK, it is instructive to follow the methods of Hutchins (1995), who expands the boundaries of the cognitive unit of analysis beyond the individual person to the natural, and socio-cultural environment, where human cognition adapts to its every-day natural surroundings. This encourages what he calls "an ecology of thinking," to consider human cognition in interaction with the social and natural world (1995:xiv). Incorporating connectionist frameworks provides a means to envision how everyday thought and action are shaped, and re-shaped, through on-going interactions of people with each other and their material and social environment. This type of undertaking exposes the shortcomings of those accounts which represent IK as singular and consistent, while also taking issue with other accounts of IK as being totally diverse, never accepted, and never the same. Instead, we treat IK as a consequence of a practical engagement among humans and their environment which is reinforced by experience, shared but asymmetrically distributed, variably internalized, and embedded in a more encompassing cultural matrix.[4] Here, culture is seen as a process which not only provides the contexts and constraints for individual learning and action but which is also constituted by the knowledge and activities of its participants.

To ensure the appropriate collection, representation, and implementation of IK to improve development and resource management schemes, we must pay particular attention not only to how knowledge is generated, organized, stored, and transmitted, but also how it gets used in particular situations and what this use means to its users. As

[4] This definition of IK brings together aspects of D'Andrade's definition of culture (1995), Ellen and Harris's definition of indigenous environmental knowledge [1997], and my own .

Wenzel has said in regard to indigenous and scientific resource management systems, it is by illuminating the formational processes of IK "that may provide a more solid basis for fruitfully integrating aspects of these two systems" (Wenzel, 1999:118). If the formation of indigenous knowledge is largely a consequence of experience, then indigenous societies do have something to tell non-indigenous societies about development and resource management as long as this experiential knowledge is put to use under existing contexts rather than being abstracted. The strength of indigenous environmental knowledge, and all knowledge for that matter, lies in its experiential, contextual, and interactive nature. The argument for the use of IK to improve development and resource management regimes is weakened when this knowledge is taken out of the context of its immediate engagement with the socio-material environment of thinking.

CHAPTER THREE

The Present Study

In order to investigate the importance of experience and context for studies of Indigenous Knowledge, data were gathered with the Algonquins living in Barriere Lake, Quebec. Before moving on to look at the data, however, it is important to gain some understanding of the study area of the Barriere Lake people, the context under which this research was undertaken, and the methods used to collect and analyse data.

3.1 Study Area

The territory of the Algonquins of Barriere Lake is located in the midwestern part of Quebec, called the Outaouais region. The majority of the 450 Barriere Lake Algonquin's live on the 24 hectare reserve called Rapid Lake within the La Verendrye Faunal Reserve (Roark-Calnek, 1995b). In various seasons, residents can be found living on family hunting territories spread throughout the park. The extent of the area to be studied in this project is the actual total land-use area of the Algonquins of Barriere Lake, roughly 10,760 square kilometres, most of which lies within close proximity to the La Verendrye Faunal Reserve. The territory stretches nearly 140 kilometres from east to west and 115 kilometres from north to south (Elias, 1996).

The closest urban centres are the town of Maniwaki located approximately 90 kilometres to the south, and the town of Val d'Or located approximately 95 kilometres to the north. Both towns are located along Highway 117 which runs through the La Verendrye Faunal Reserve.

The territory straddles two major ecological forest regions of Canada – the Great Lakes-St Lawrence forest and the boreal forest (Hosie, 1973). These two ecological regions meet to form a mixed transitional forest zone whose diversity offers suitable habitat for many species of plants and animals. An average growing season for the southern sector of the region ranges from 160 to 170 days, and slightly shorter, from 150 to 160 days, in the Northeast sector (Dryade, 1994).

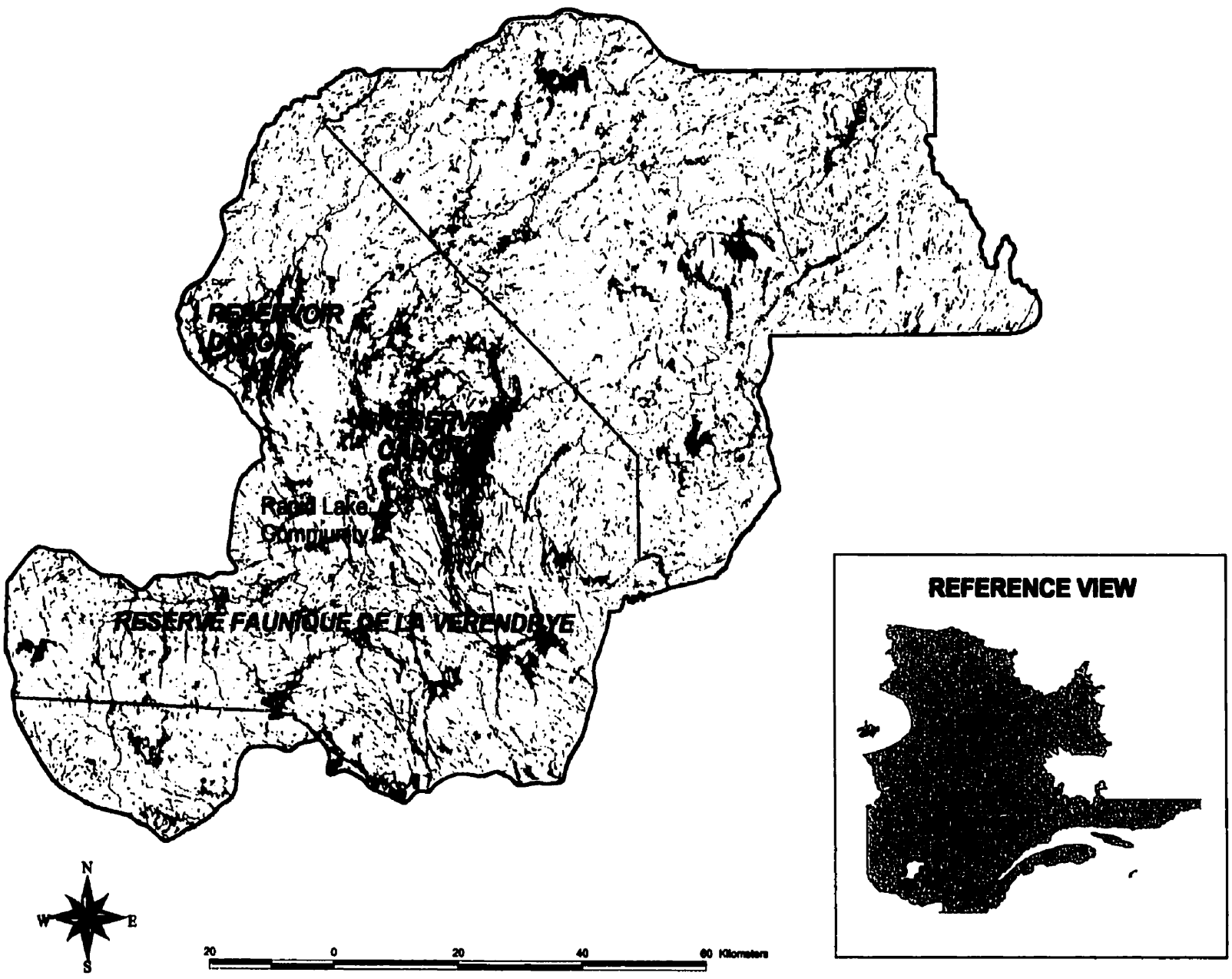
Mixed wood forest dominate the landscape. Commonly found on moderate slopes are balsam fir in association with black spruce and white birch, with some white spruce and trembling aspen (Byford, 1995). Dry, rocky habitats are colonized by white and red pine, while jack pine occurs on sandy terraces. Associations of black spruce and tamarack, or black spruce and eastern white cedar are found on wooded organic soils. On damp mineral sites, black ash and white elm occur. Past timber harvesting practices have depleted old growth forests, and in their place, less shade-tolerant species like red maple, birch, and poplar now grow. Transition communities composed of white birch and trembling aspen presently cover much or the territory.

There are at least 19 species of fish found in the territory's rivers and lakes (Nickels, 1995a). Many of the cold-water lakes in the Gatineau Basin contain lake trout and brook trout. Walleye and northern pike are found in the warm water lakes throughout the region. Some 167 species of birds and 50 species of mammals inhabit the Algonquin territory, along with an unknown number of amphibian, reptile, and insect species. There are developed natural histories for only a few of the resident species.

The territory is located on the edge of the Canadian Shield. The Shield's characteristic crystalline igneous Precambrian bedrock is found throughout the area below a relatively shallow soil of glacial origin consisting mainly of tills (Dryade, 1994). To the east of the Cabonga reservoir can be found some sedimentary and metamorphic materials. Relief in the territory varies on average from 360 to 457 meters above sea level, with highest elevations reaching 610 meters (*ibid.* 1994).

The regions watershed is typical of the Canadian Shield with very deep lakes, stagnant surface ponds and bogs, and fast flowing rivers in abundance. The western sector of the territory slope to the west, orienting the flow of water into the Ottawa River. To the north the Capitachouane and Camachigama rivers flow from Northeast to Southwest. The eastern section slopes in a largely southeasterly orientation draining water into the Gatineau River. The hydrographic landscape of the entire region has been modified considerably by hydroelectric development flooding the area between the Ottawa and Gatineau rivers to form the Dozois reservoir to the west and the Cabonga reservoir to the east.

Figure 1. Algonquins of Barriere Lake territory, Reserve Faunique de La Verendrye, and the Rapid Lake community.



3.2 Research Context

The context in which this study was undertaken is briefly outlined here because it has significant influence over all aspects of the research, from data collection to interpretation of findings. Participation rates and data reliability cannot be adequately assessed unless they are set against the background of local developments.

This study builds upon an on-going investigation by the researcher, in conjunction with the Algonquins of Barriere Lake, to document their ecological knowledge of the forest and its management. The goal of this research was to develop a means by which to understand and implement the Algonquin perspective of forest resource management into a contemporary Integrated Resource Management Plan.

The Algonquins of Barriere Lake, in an attempt to gain a voice in regional resource management, signed a Trilateral Agreement with the federal Government of Canada, and the provincial Government of Quebec. In this agreement each party has committed itself to the principles of "sustainable development" as expressed in the Bruntland Report (WCED, 1987). The expressed commitment is to give a "decisive voice for Indigenous People in resource management" within their traditional land-use area (Special Representatives, 1994). Each party is also committed to preserving the ecosystem within the current land use area in order to maintain and enhance the traditional lifestyle and pursuits of the Algonquins. For the ABL, it is hoped that this agreement will build on new management

principles that are more in harmony with traditional Algonquin systems of resource management.

Much of the information for this thesis, therefore, comes from my involvement in various research components of the Trilateral Agreement and Integrated Resource Management Plan. Research conditions in Rapid Lake during this period of this study were not ideal. A year into my data collection, a faction in opposition to the current band administration declared a provisional government, and lobbied the Department of Indian Affairs and Northern Development to set up a separate reserve for its supporters. Later, letters of protest, in opposition to all research undertaken under the Trilateral Agreement, were received from the heads of eleven different households. Many of these households included members that had participated in earlier rounds of thesis research, one of which was my principal translator. Many of the people who, up to this point, had willingly participated in research became increasingly ambivalent about continuing, and subsequently these households requested that the data they had provided be returned. This action was denied by the existing band council and the trilateral secretariat.

Access to this faction of the community for research purposes was, for a period of several months, denied. Not only this, but of the remaining Algonquins available to participate in the research, an enormous amount of their time and energy began to be invested in dealings with escalating internal political matters. Still, I was able to spend much time with individuals and family groups not involved directly in community politics. As political tensions eased access to community members increased.

After the Trilateral Agreement's termination, I continued to conduct research with Algonquins on my own. I never lost contact with members of the faction that were in opposition to Trilateral Agreement research, so these individuals had little problem assisting me in the extension of my research. Several later visits were, therefore, conducted to include members of these families that were denied in earlier rounds of research. In the end, I was successful in working with a large sample of community residents representing most households, on both sides of the faction.

3.3 Method and Analysis

From May 1993 to December 1994, with funding from The Trilateral Secretariat, the researcher laid the groundwork for this project and tested certain methodologies for their appropriateness in the ABL community. This involved: (1) discussions with researchers who have considerable experience in issues pertaining to this study, (2) a review of available Canadian and international literature on indigenous knowledge, and (3) preliminary interviews with several members of the ABL community.

To begin talking to Algonquins about their knowledge of specific plants and animals, a detailed review of the types of ethnoecological information that could be gathered (initially based on the work of Clement,1991), was conducted with a number of community appointed Algonquin experts on plants and animals. An Ecology of Flora Questionnaire and an Ecology of Fauna Questionnaire were subsequently formulated

(see Appendix 1 and 2) which established the details about these subjects that Algonquins found important to pursue.

The Ecology of Flora Questionnaire was not only used to gather general knowledge about specific plants and their ecological relationship with other plants and animals, but was instrumental in documenting the Algonquin use and preparations of particular plants. The Ecology of Fauna Questionnaire was similarly used to gather general knowledge about specific animals and their ecological relationship with other plants and animals. It was instrumental, as well, in collecting information on the Algonquin uses of particular animals.

These questionnaires, however, were not intended to be rigidly adhered to in the interview process, but were meant to establish the types of questions that could be asked. The formulation of this questionnaire went some distance in bridging the gap between the English and Algonquin languages, so that particular concepts could be understood in both languages, as well as indicating which concepts are most important to the ABL. This preliminary step is one that attempts to decrease the possibilities of my imposing my ecological ideas on Algonquin experts. Once I refined my techniques and was confident as to their application and appropriateness in the community, I began my actual research.

The empirical components of the study utilised methodologies which vary in accordance with the nature of the information collected. My work has involved a strategic combination of formal and informal methods. Although, in some instances, one of the

formal questionnaires may have been used, the majority of information for all sections of the thesis were collected using more informal methods which include participant, observational and conversational approaches. In other words, my methods went beyond the mere gathering of data limited to the conceptions of Barriere Lake residents because I supplemented their viewpoints with my own first hand observations of their interactions with the environment. These approaches were intentionally restricted to settings that are, for Algonquins at least, as nearly natural as possible, therefore minimizing the problems of artificiality that are associated with much laboratory research.

Initially, Algonquin Planning Committee members appointed aboriginal experts to be interviewed. I began to draw on community recommendations as well as previous technical consultants ethnographic expertise in land-use mapping, harvest survey, and toponymy work in the community to identify appropriate and representative informants. The ABL themselves recognise that particular domains of knowledge are known best by particular individuals. Once I gained an understanding and familiarity with individual Algonquins -- and they a degree of familiarity with myself -- I began to select particular families with which to participate in their everyday activities.

The majority of data for this thesis comes from semi-directive discussions with open-ended questions. This open and flexible discussion format avoids the rigidity of questionnaires. In this process only the general theme of discussion was set, and apart from keeping the focus of the discussion on a particular theme, the investigators' role was to encourage the discussants to speak freely about those aspects most pertinent. While themes

helped keep the discussion focused on specific subjects, they were not always rigidly adhered to. When an unexpected opportunity for discussion on a different but related topic presented itself, this lead was often pursued.

Before talking about plants and animals with Algonquins, I had to develop an inventory of the types they recognized. I had to learn what labels were connected to what resource items. The major techniques used to develop an inventory of flora and fauna recognized by the ABL were first to ask informants to name all examples of flora and fauna, irrespective of degree of inclusiveness. It quickly became clear that in order to converse with Algonquin experts about the ecology of flora and fauna I had to gain some understanding of how they view and talk about the temporal and spatial aspects of their environment. The most important of these aspects appeared to revolve around ABL conceptions of the short and long term environmental climatic influences, such as wind, daily patterns of the sun, and yearly changes in the seasons. Also, important are how the ABL view and classify various vegetative groups, geomorphologic landscape features, soils, and habitat. A basic understanding of these aspects were first required before I could delve into more complex ecological questions about flora and fauna with Algonquins.

In terms of obtaining botanical and zoological data, I have taken all reasonable steps to establish accurate scientific glosses. Most were conducted by myself. On occasion Trilateral Secretariat forest technicians and wildlife biologists provided scientific identifications. In all cases the identifier has been noted.

This type of information was entered into a relational data management system[5], which was developed for recording and manipulating indigenous knowledge information on a continuing basis. The data base contains two main Tables[6], T-Classification List and T-Forest Uses, of which there are many fields that store documented information. Organizing these tables so that data are easily entered for later retrieval and analysis is a complicated affair. I sought the help of a computer programmer and data base expert in setting up both the T-Classification List and T-Forest Uses tables.

The data base allows one to easily and efficiently input, store, order and manipulate data as the need arises. Details are easily retrieved and displayed when all pertinent information is entered. As efficient as the use of this data base sounds, I ran into several problems which made the data base inadequate for many of my analytical purposes. These inadequacies will become more evident in the chapters which follow. Nonetheless, as much information as possible have been entered into the data base.

At the request of the Algonquin band council, I did not attempt a systematic collection of botanical or zoological items. Still, Algonquins commonly brought plants and animals to me for discussion. Most identifications were made in the course of a normal day's activities. I was often present when a particular plant was being sought and picked, and when a particular animal had been hunted and killed. In these cases I was able to make

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[5] The data base used is Microsoft Access 2.0.

[6] In Microsoft Access language, the word "Table" is used where "data base" is normally used in most other data base programs. A Table is a rather large data base of its own which can be related and linked to other Tables in the Access data base.

detailed notes on a variety of subjects. When this was not possible, informants had to be relied upon to supply information regarding the context of collection. Still, on other occasions I was able to visit the site of collection after the fact to collect contextual information. Being present during instances of parental instruction to their children provided many instances of identification and discussion about plants and animals. Highway road kills provided yet another opportunity to talk extensively about animals.

Data on flora and fauna were accumulated on photographic film, sound recording tape, and on video tape. I also reviewed video material that had been previously taken by Algonquin individuals and other researchers on an opportunistic basis. On those occasions where it permitted, a tape recorder was used to capture conversations about plants and animals. The spontaneity of many interview opportunities, however, meant that many interviews were recorded by notes taken during the process of conversation, or after the conversation terminated.

Interviews and discussions have been conducted in most cases with individuals singly, and occasionally with small groups, of a variety of ages, gender, and knowledge. Any discussions have been duly noted, paying strict attention to who said what under what circumstances. This was very important for subsequent analysis. In addition to many informal discussions, forty-three formal interviews totaling 193 interview hours were conducted with Algonquins. These interviews were conducted with 36 individuals from 27 out of a possible 77 households in the community. Fifty-eight , 90 minute cassette tapes were recorded from these formal interviews, resulting in 87 hours of tape. Each

cassette tape was subsequently translated and analyzed. These formal interviews took place on an opportunistic basis, when people felt like talking, and when I had a tape recorder handy. These interviews took place in the Band office, peoples homes, cabins, and tents, as well as outdoors while undertaking a particular activity. Most of my time, however, was spent outside of these formal interviews in participant observation. Notes were made as soon as time permitted.

When the chance presented itself, I also made attempts at using various Algonquin words and their associated meanings in various field situations under a variety of contexts. This allowed Algonquins to indicate when I was using a particular term correctly or incorrectly, permitting the clarification in use and meaning of various Algonquin words under diverse situations.

Participant observation and subsequent discussions took place in a variety of locations, including: family dwellings and camping sites, familial hunting territories, forests leased to private logging companies, ZEC (zone de exploitation controlee), as well as provincial and common property forests, all of which are located within the current land-use area of the Algonquins of Barriere Lake. Interviews and discussions sought information covering a variety of time periods, ranging from events occurring on a single day to several days, from seasonal to annual events, to a histories covering decades.

Several books were used by myself for identification, keying, establishing local resource inventories, and making comparisons to scientific data. These books and their

detailed citations are given in Appendix 3. Occasionally, pictures in these books were shown to Algonquin individuals to clarify an identification or stimulate conversation about a particular type of plant or animal. There are, however, several drawbacks to the use of identification picture books which have come to light since the work of Heider and others (Heider, 1972). Using representations rather than the real thing means that on occasion, misleading cultural images may be projected. In situations where they are used the criteria adopted by informants may not be those normally employed by them. Pictures rarely exibit 'natural' colours, correct size, habitat, vocalizations, or motion, often critical features for informants. This decontextualization of the image is a problem to which I have paid particular attention. Accordingly, I have limited my use of picture books, but have also found it inappropriate to exclude them completely because some families now own and use a small variety of field guide and picture books.

Several Algonquins preferred to represent certain plants and animals, or parts of plants and animals, in personal drawings. This was particularly the case for Algonquin knowledge on plant and animal morphological features, where drawings by Algonquin individuals often provided the best explanation of understanding. I have collected and reviewed a fairly large collection of these drawings by Algonquin individuals of all ages.

Although I do not specifically address the subject of Algonquin classification of plants and animals in this thesis, I have found it difficult to avoid. This is because the everyday process of allocating an item of flora or fauna to a (usually) named category entails the matching of perceptual images, words, and concepts. Even assigning an

observed plant or animal to a terminal category (i.e. using its name) is, to a certain extent, a process of classification. Naming, identifying and classifying resources logically presupposes the existence of the other. The research procedures provided by Bulmer (1969; 1974) have guided me in many aspects of my ethnoscientific methodologies, particularly in terms of documenting Algonquin processes of identification, naming, and associated aspects of classification. I have avoided, however, many traditional formal ethnoscientific tests, such as card sorting and triad tests, designed to be administered to individual respondents under laboratory-type conditions, for reasons I have already outlined. This does not mean that I see such tests as serving no scientific purpose. Rather, such tests do not address the purposes of this thesis. Ellen (1993:27-31), has succinctly articulated the many drawbacks to these ethnoscientific tests in developing folk classifications, but at the same time he has shown how

> . . . at the very least, they remain an extremely valuable stimulus material, may suggest new queries, help to formulate and test new hypotheses, indicate the basic dimensions of variation, and shed light on important diagnostic characteristics. We may, however, doubt their usefulness as a basis for generating reliable quantitative results, or as a devise for establishing the main arrangements of categories. (Ellen, 1993:31)

I have opted not to use these tests because, though the laboratory may be one possible cultural setting for the articulation of knowledge, I am, in this thesis, interested in knowledge articulated in common everyday cultural settings. I am not convinced that these tests in rather foreign laboratory-type situations -- at least where Algonquins are concerned -- would not, in some way, artificially affect our understanding of how the

interconnected processes of identification, naming, and classifying takes place in ordinary cultural settings. This is another reason for my use of informal elicitation methods like participant observation and conversational approaches that have been intentionally restricted to settings that are as nearly natural as possible.

Attempts have been made to record all aspects of knowledge in the Algonquin language. Most Algonquins of Barriere Lake, in addition to their own language, speak English or French. I am still not fluent in Algonquin and much of my early work was conducted in English or French, and with various individuals adept at interpreting. Later, I tried to use Algonquin as much as possible, but this was often mixed with English or French. Interpreters and translators were regularly used in order that complicated and unclear meanings, which often stem from subtle language differences and unfamiliarity, could be painstakingly clarified. As interpreters and translators played a major role in the research process they were carefully selected. Their contribution to this research project involved much more than just translation. They were called upon, on occasion, to perform such difficult tasks as to phonetically break-down Algonquin words or groups of words to articulate their meaning as the Algonquins understand them. To distinguish nomenclature and evaluate semantic reference accurately would be impossible without the use of the vernacular and linguistic structure.

The Barriere Lake dialect has been used in all cases, except where noted. This is essential if one is to clearly grasp knowledge as the ABL understand it. If, as Gallagher (1992) says, that land management agencies have become the latest Western institutions

to suppress aboriginal language and culture, then a thorough documentation of knowledge in the Algonquin language is a necessary attempt to mitigate this situation. Throughout this report words written in the Algonquin language will be designated by bold and italicized type print. For example 'kîsis' the Algonquin word for "sun", will appear as ***kîzis*** in this report. Orthography has already been explained, but to cross-check my orthographic data with other sources I have spent much time comparing those words and meanings gathered by Algonquins in this study against those collected in other scientific literature for various Algonquin[7], Ojibwa[8], Cree[9], and Montagnais[10] groups.

In the later stages of writing I have found that reviewing thesis chapters with various Algonquin individuals interested in the work, helps to correct, criticize, validate, and improve my interpretation and understanding of Algonquin knowledge and action. This process, on occasion, stimulated differences of opinion not only between Algonquin individuals and myself, but also between different Algonquin individuals. Such a methodology has confronted Algonquins in ways they never experienced or expected. In many cases it has provided an opportunity for Algonquins to think about the way they think and act. I have little doubt, despite certain instances of criticism, that this process has improve the quality of my thesis. At the very least, even though there may be disagreements in interpretation between a few Algonquin individuals and myself, and

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7 See [Cuoq, 1886; Dumont, 1985; Lemoine, 1909, 1911; McGregor, 1994; Rankin, n.d.; Rogers, 1962].
8 See [Baraga, 1878a, b]
9 See [Brightman, 1993; Clement, 1994; Feit, 1978].
10 See [Clement, 1991].

between a greater number of Algonquin individuals, this methodology has kept Algonquins involved in the research.

Since February of 1998, I was also in continual email contact with one Algonquin individual who is extremely articulate in matters of Algonquin linguistics. In my late stages of writing numerous communications were sent back and fourth between myself and this individual, mainly in attempts to clarify or verify pieces of information.

CHAPTER FOUR

Cyclicality within the Forest Environment

Using the methodology described in the previous chapter, data on the life-cycle of Algonquins and their seasonal activities were examined in order to test whether consideration of context is essential for an understanding of indigenous ecological knowledge. In this chapter I take the view that much of what individuals learn and know about forest resources comes from the situations that arise out of social interaction in subsistence activities. Taking the position that, individuals and groups internalize knowledge while "doing," forces us to consider the various factors that influence the internalization of ecological knowledge in the performance of common everyday tasks.

In this chapter, therefore, I look first at the ABL learning life-cycle (from childhood to adulthood) of individuals engaged in the activities of trapping and moose hunting. I examine the implications that age and gender have on the internalization of knowledge among individuals and groups performing these tasks. I then look at the variation between past and present seasonal rhythms of dispersal and aggregation of Algonquin subsistence activities. This illuminates important social, historical, and environmental factors which have influenced changes in social subsistence activities and resource knowledge internalization.

I argue that examining these aspects through which Algonquins engage with their resources provides the means of placing the study of local ecological knowledge in a firmer sociological, ecological, and historical context. Without this contextual understanding it would be difficult to proceed to our chapters on Algonquin resource use and naming. If we are interested in understanding a peoples knowledge of forest resources, then we must look for the understandings produced by the practical everyday interaction of those people with their forest resources.

4.1 The Learning Life-Cycle

In order to understand the importance of context, a good place to begin is to look at the significance of change and permanency within the Algonquin life-cycle as it relates to their involvement with forest flora and fauna. Algonquins describe the process of learning and performing common tasks that involve forest resources as a "cyclical journey." The journey begins with the inability to perform most tasks at birth, and slowly, with increasing physical abilities, formal and informal training, observation, and several attempts at performing tasks, one learns to perform a task as a novice. With further experience and physical ability one can usually become proficient at a task, and with much experience and concentrated study one can become an expert. As age sets in, one may find it increasingly difficult to perform certain tasks because of a decline in physical and mental abilities (e.g., the eye sight starts to decline, the body starts to weaken, the mind is not quick). Finally, death makes room for new birth, and the cycle begins again.

In her work with the ABL over several years Roark-Calnek describes the ABL life cycle as "movement from childhood dependency into responsible interdependency" (1996:67). I think most Algonquins would agree that this is a good way to describe the learning process of most tasks for Algonquins. My field observations also supports this characterization.

Knowledge of plants and animals comes from many sources, usually from knowledgeable adults in formal and informal settings. Other common sources of environmental knowledge come from games, books, lectures in school, television, and personal experience in everyday activities. Most Algonquin children get first hand experience at naming and identifying flora and fauna species through their involvement in socio-cultural activities like hunting, trapping, and gathering of resource materials for various purposes. The details of these purposes will be outlined in the following chapter (Chapter Five).

The social context in which one learns about flora and fauna can be illustrated by looking in detail at two Algonquin activities that involve resources, namely, trapping and moose hunting. Below, I review the work done by Roark-Calnek (1996) on the demographic profile of harvesting task groups involved in these two tasks. Her research supplements my own participant observation and clarifies the contextual nature of the Algonquin learning life-cycle and the situational character of resource knowledge internalization.

4.1.1 Trapping

According to Roark-Calnek, initiation into trapping begins somewhere between ages 8 to 14 years old, where boys and girls begin "learning to snare rabbits close to home, mentored by parents and other close kin" (ibid.:68). The above statement is supported by my field observations. Children advance from using simple surface traps to setting small "house" traps, particularly for marten, before learning to set more complicated traps for animals such as beaver. As the children grow older the number of snares or traps is increased, as is the distance they are set from the home base. As the children increase their confidence, parents allow them to acquire more experience and responsibility by allowing them to travel greater distances. As the parents' confidence in their children increases, they begin to allow them to take younger siblings with them. These experienced children begin to take on a mentoring role to children of younger ages or those with less experience.

The trapping life-cycle continues, describes Roark-Calnek, with young men in their late teens or early 20s, dispersing "to trap seasonally with other persons - affines or friends" (ibid. :68). This is supported by information in a recent harvest survey conducted by Tobias (1995) which records the majority of active ABL trappers to be in their early 20s to late 40s. These sources also support my field observations.

After the age of 40, trapping activities appear to decline. There are exceptions, however. For example, in her sample, one elderly widow was still trapping in her late

70s. She continued this practice not only because she was forced to, having lost her husband, but because she preferred this activity to other kinds of economic employment that members of her immediate family were already involved in. She was also physically capable of continuing to trap. Another 65 year old man was still an active trapper until his death in 1993 (Roark-Calnek, 1996:68). Again, this individual preferred this type of economic activity and was physically capable of performing it until his death.

It is interesting to note that a "free territory" near Rapid Lake, the principal rendezvous point of the past and present day settlement, "was originally set aside in the expectation that elders would not be able to travel as far or trap as intensely as younger men, but might still need or wish to engage in some harvesting" (ibid. :68). This demonstrates the recognition by Algonquins of the changing social nature in hunting and trapping abilities with age.

Roark-Calnek further describes the Algonquin model of trapping partnerships as "dyadic." This means that trapping partnerships, in terms of their size and recruitment by kinship and household, normally consists of "two partners (and their families) or two hunters" (Roark-Calnek, 1996:69). Her analysis shows, that "most married women trap only with their husbands and take primary responsibility for processing the pelts they harvest" (ibid.:68). Factors such as ability, preference, access to other means of income and resources, divorce, and death, all to varying degrees influence an individual's engagement in trapping activities.

In her trapping task group sample, 253 trapping partnerships showed relatively close kin and in-law (affinal) relationships, another 116 partnerships involved more distant kin, and only 13 cases involved unrelated friends. Roark-Calnek continues,

> The familistic pattern of ABL land use and the mentoring role of close kin are reflected in the high frequencies of father/son and brother/brother partnerships. Outside of the nuclear family, there is no indication of preference for patrilateral over matrilateral kin. (ibid.:69)

These findings are entirely consistent with Roark-Calnek's characterization of the contemporary ABL kinship system as being bilateral. Today, there remains "few traces of what may once have been unilineal (patrilineal) descent groups of the sort historically found among the Saulteaux . . ." (Roark-Calnek, 1996:54). Although there presently exists great variation in the degree to which ABL households participate in trapping activities, the secondary recruitment pool for trapping partners comes typically from affinal relatives, most notably the wife's brother or the sister's husband. Clearly, as explained by Algonquins themselves, the existence of this dyadic task group model is due, in part, because it helps to increase safety when travelling, environmental knowledge band-width, and environmental knowledge transfer.

4.1.2 Moose Hunting

Like trapping, "a similar trajectory for the Algonquin life cycle is apparent in the demographics of moose hunting" (ibid.:68).[11] In her analysis of moose hunting task groups, only 13 of the 327 successful moose hunts reported children below the age of 9 as part of the hunting party and none of them was credited as being active hunters or helpers. My field observations support Roark-Calnek's findings which suggests that the activities of children between the ages of 5 to 9 are restricted to helping with very simple processing, servicing, and support task roles. Usually, but not always, their assistant role is conducted in the community before and after a hunt.

Young boys between the ages of 10 to 14 years begin to be included in occasional moose hunting parties after they have had much practice with slingshots and the shooting of small game like squirrels and grouse. These individuals are usually mentored by their fathers, older brothers, or uncles, and their primary activities are generally the roles of helping in the hunting party's preparation and functioning (ibid.:68). These individuals are given useful but menial tasks which involve little responsibility.

The level of autonomy in participating in moose hunting activities increases significantly between 15 and 19 years of age (ibid.:68). Boys of this age begin with observing experienced hunters and advance to guided practice. Young men between the ages of 15 and 24 begin "hunting more regularly and with a much wider range of partners

[11] See Appendix E , in Roark-Calnek, 1996. Social Customs Report, for details of community participation in moose harvesting.

(age mates and affines as well as close consanguines), and they are mentors in turn to younger boys" (ibid.:68). A sharp decline in participation in moose hunting occurs for men after the age of 50, and for women after the age of 60. Very few individuals remain active moose hunters up to and beyond 70 years of age. This is the age where most Algonquin individuals find it difficult to continue moose hunting activities. It is understood that elders do not normally travel far from base camps. The "free areas" reserved for elders and the infirmed for trapping were also to be used for moose hunting purposes as well.

Although Algonquins most readily articulate their learning life-cycle as being dependent upon age, further analysis of ABL activities in moose hunting reveal that this is, by no means, the only factor influencing the internalization of ecological knowledge about resources. The social activities of Algonquins in trapping and moose hunting also shows how activities and knowledge is dispersed within the population depending on gender. Roark-Calnek points out that,

> Active female participation in moose hunting is mainly confined to "helper" roles until they are married or enter a companionate relationship (accepted in the community as an alternative or prelude to formal marriage). They then may participate in hunt parties, almost always with husbands or adult children. Women were present on 65 of the 327 successful hunts, and over 1/4 of the 2-person hunt parties were husband-and-wife teams (ibid. :69).

Participation in moose hunting by married women with younger children depends to a large degree upon their access to care givers for their youngest children. Often

participation in moose hunting can only begin after older children, either in the immediate family or a close relative, become competent enough to care for younger siblings. It is when women with children are no longer required to care continually for younger siblings that they are free to engage in hunting activities usually with husbands or adult sons.

To a certain degree, gender must affect the types of resource knowledge that become internalized. Men generally do the actual killing of the animal, and it is the men who immediately, or soon thereafter, gut the moose so the meat will not spoil. Men are responsible for transporting the carcass to the bleeding and butchering sites. It is for this reason that men generally make assessments of an animal's health from an examination of internal and external signs. While conducting the initial gutting of the animal, men scrutinize the condition of internal organs and discover what the animal had consumed before its' death. Any discoloration, spots, parasites, or bleeding indicate an animal of ill-health.

The killing of moose is rarely credited to women. In fact, in Roark-Calnek's sample, "only three women claimed credit for kills (a total of six kills in six of the 327 hunts, none of them with husbands present) " (ibid.:69). The primary responsibility of women is to perform the skinning, butchering, and distribution of meat. Women, while performing the skinning and butchering, investigate the condition of meat, fat and bones in order to make assessments of the animal's health. All men initially involved in the killing, hauling, and gutting of the animal are generally present at the butchering site even though they rarely help in this activity. Much communication flows back and forth

between men and women about the events of the actual hunt, who was present before and after the kill, and assessments of the animals health from internal and external signs. It is the women who ordinarily lay the specific cuts of meat in their respective piles to be distributed to all beneficiaries of the kill.

Clearly, the moose hunting roles of Algonquins are largely, but not rigidly, gender-specific and complementary. It is also easy to see from the analysis above how knowledge of resources are learned, and the degree to which knowledge is dispersed within subsistence task groups. In terms of age, Algonquin children acquire knowledge of moose, and other plants and animals, gradually and unevenly as they gain familiarity with an increasingly wide range of skills and geographical areas. Some individuals must wait until they are quite old before engaging in certain activities and before they see and can begin to recognise certain animals and plants. We cannot expect that children and young men will have the same kinds of knowledge and abilities as adults and elders.

What we see here in the system of Algonquin hunting and trapping is that as individuals become more skilled they move on to other roles in the task-performance group (as helpers, processors, and hunters). As they do this they make way for less skilled individuals behind them, replacing more expert individuals before them who advance or leave the system. Those who advance to new tasks, fill roles previously held in the conduct of past tasks. They may be mentored either by individuals in that role who have not yet advance from that role, or by individuals who perform succeeding roles. As individuals become more skilled, once again they move on to other roles in the task-

performance group making way for less skilled individuals behind them and replacing the infirm or elderly who leave the system.

It is an emphasis upon age, perhaps, that leads many IK researchers to anticipate that the older a person is the more knowledge and capabilities that person will have. They logically postulate that because individuals have to learn about the behaviour and ecology of animals, as well as how to hunt them, it implicitly follows that the older the person is, the greater one would expect skills, lexicon, and knowledge to be. The older a person is, therefore, the more "expert" should the person be (*c.f.* Hays, 1974: 209-19, 254). But the preceding description of the social activities of Algonquin individuals in trapping and moose hunting task groups shows how contextual knowledge internalization can be. The knowledge and skills of individuals engaged in trapping and moose hunting activities are not necessarily internalized in a completely linear fashion according to age. For example, individuals at any level can leave the system and re-appear much later in life. Their experience, or lack of experience, in trapping or moose hunting activities does not necessarily correlate with age. In some situations, individuals are required to engage in resource activities with a minimal amount of mentoring, observation, and practice. Some individuals must teach themselves, while other members of the same family benefit from the direct mentoring of parents or family members. In the end, the hunting and trapping system needs to be flexible enough to accommodate as many individuals, and their accompanying knowledge and skills, as possible.

We also cannot ignore the evidence presented in the case of Algonquin trapping and moose hunting abilities that increasing age can bring with it physical and mental disability. This disability may, or may not, be in terms of finite knowledge and experience, but in the ability to perform certain tasks, which involves, to a certain degree the ability to "perceive, recall, and connect" (Ellen, 1993:136). Further, young children between the ages of 10 to 15, may in fact, have specific and insightful knowledge about certain aspects of resources that adults no longer have. This fact was made evident to me when, after questioning an Algonquin adult about present rabbit populations and trapping locations, he suggested it would be more instructive for me to talk to his 12 year old son who has spent a great deal of his time snaring rabbits. This adult, a reputable hunter and trapper himself, admitted that he had not engaged in snaring rabbits since his son became proficient enough to conduct the task on his own a few years ago.

His son trapped rabbit in order to supply his mother and sisters with fur for craftwork which were later sold for household income. His trapping activities also occasionally provided the family with supplemental pocket money from the direct sale of furs. Further, the activities engaged in were seen as a social learning experience. The boy's parents saw this activity as providing the necessary knowledge for him to proceed eventually to other social subsistence activities. The youth himself found this activity self-fulfilling not only because he was assisting his family in a useful role but he was "learning to do the things adults did". Beyond this, the large amount of time spent in this activity and his increasing familiarity with the local ecology made this youth the current local "expert" on rabbit populations and locations.

Evident, also, in the analysis is the degree to which Algonquin kinship continues to be an effective social instrument for relating people to each other on the land, and with the environment. Relationships between siblings, generations, genders, and families establishes the social foundation for the acquisition of ecological knowledge. These affinal relations continue to serve as routes to alternative types of resources and diversified sets of knowledge and skills. The flexibility of the moose hunting system allows families and friends to redeploy members in hunting task groups in response to changing local resource conditions and new opportunities and preferences for income, employment, and training.

The knowledge and activities of individuals in hunting and trapping task groups has been outlined thus far, not as a rigid and immutable life-cycle, but a socio-cultural process influenced to a large degree by age and gender. Clearly, there must be many other social, economic, and environmental factors that influence Algonquin experiences and knowledge. Alterations in the seasonal rhythms within this community of socially distributed subsistence land users, for example, undoubtedly provides new contexts for the internalization, articulation, and transmission of ecological knowledge. Looking at the recent changes in common everyday tasks that Algonquins undertake would give us a better understanding of the recent changes in experience and knowledge. These issues are examined in the next section.

4.2 Seasonal Rhythms

In addition to the learning life-cycle, seasonal rhythms also show the importance of context in understanding indigenous ecological knowledge. Looking at the history of Algonquin seasonal rhythms of dispersal and aggregation allows us to see how the subsistence activities of Algonquins have altered with time, and what factors influence such alterations. Changes in the everyday tasks of Algonquins undoubtedly leads to changes in experience and the types of knowledge that are needed to meet those tasks. Alterations in the seasonal rhythms of dispersal and aggregation also leads to changes in the place-specific knowledge of Algonquins; where they learn and what they learn.

The Algonquins of Barriere Lake were characterized by particular seasonal rhythms of dispersal and aggregation that preceded contemporary sedentarization. We know little about these rhythms except from Algonquins themselves and the scattered records of European fur trading posts and later Catholic missions that moved into the area. These posts and missions appeared to play a large part in establishment of seasonal rendezvous points for the Algonquins.

By the 1700s, there were numerous trading posts established in inland areas, some of which were adjacent to and within the present ABL territory, for example at Timiskaming, Abitibi, Fort Coulonge, Grand Lac Victoria, and Lake of Two Mountains (Mitchell, 1977). After 1823, Hudson's Bay Company posts were established in the land use area of the ABL at Trout Lake, Cawasseiamica, Nichcotea, and Cabonga (HBCA).

The Sulpicians conducted missions each summer from 1838 to 1842 at Trout Lake in their outreach campaign to convert the "pagan" northern Algonquins (Degangi, 1995). Then, from 1843 through 1863, it was the Oblates who conducted their mission at Barriere Lake. During this period, however, the Hudson's Bay Company posts were at Trout Lake and Cawasseiamica. By 1866 the mission had been moved to Cabonga Lake, but after it burned down in 1874, both it and the HBC post had been moved back to Barriere Lake (HBCA). Speaking of the Barriere Lake site, Roark-Calnek says,

> During the years when the missions and the HBC posts were at different locations, it is not clear which (or both) would have served as the band's main rendezvous. (Roark-Calnek, 1996:96)

Clearly, several locations have variously provided traditional rendezvous sites for Algonquins. Barriere Lake was certainly the main rendezvous point between 1843 and 1863 and again after 1874. The evidence of the 1724 trade license, and the existence of the ethnonym ***mitcikanâpikôk*** suggests to Roark-Calnek that Barriere Lake was likely the main rendezvous site well before the Hudson's Bay Company established its posts at Trout Lake, Cawasseiamica, Nichcotea, and Cabonga. It was from this main rendezvous site that the Barriere Lake people dispersed in small groups out to the land and back again, following winter snowshoe and summer canoe travel routes along arterial waterways.[12]

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[12] The winter and summer travel routes of the ABL have been documented in a series of maps by [Tobias, 1995].

The earliest description of the seasonal round of activities among the Algonquins, Crees, and Tete de Boule (Attikamek) was given by Vincent, who summarized such activities in the 1840s from mission records for that period. According to Vincent, these groups were dispersed during the winter on their hunting territories and they

> ... began to return to the trading post and mission just after the spring thaw. The month of June was, then, a month of social, commercial and religious activities, a month in which Indians renewed their relationships among themselves and with the whites; the sale of furs, participation in mission exercises, marriages, feasts, games, and the exchange of news. ...Later in some cases, each (family) left for (its) own hunting territory. Some men would be hired to transport furs to other posts of the company, to return with provisions for the post. They would sometimes be accompanied by their families, making the trip in short stages, hunting and fishing along the way. For as long as it was possible, the group would stick together about the post in June and July, living off fishing and smoking fish for the future. The missions could continue into August, but only in some places. In general the period in which the population of the Indians was most concentrated could not last much more than two or three weeks, sometimes only three or four days. Soon as the supply of meat was exhausted, and if the fishing did not prove to be fruitful, the group would be forced to redisperse again until the following spring (Vincent 1971:143-144 in Ogston, n.d.).

The trade was not only in furs, but other products such as game, fish, waterfowl, berries, and maple sugar. Items of manufacture like snowshoes, moccasins, and toboggans were also brought to the posts and traded depending on the season and the state of the regions resources (Degangi, 1995; HBCA; Ogston, n.d.).

From the recollections of her oldest informants, Bechmann-Khera explains a broadly similar seasonal round at Barriere Lake at the turn of the century. It began with the mid-September dispersal of Algonquin families to their early fall "trapping grounds". Traveling by canoe from Barriere Lake to the trapping grounds took anywhere from a few days to a few weeks, depending on the distance and route taken (Bechmann-Khera, n.d. v.1:67). On or about November 1, these dispersed family groups returned to Barriere Lake to trade their early furs and to feast. Family groups then left again for the bush until Christmas and the New Year. At the rendezvous point of Barriere Lake, Algonquins once again gathered to celebrate from Christmas through to the "Feast of the Magi". This event occurs on January 6, and is called ***nisin ogimâk*** "three kings" by the Algonquin. During this important period hunters and trappers traded their prime winter furs. After returning to the bush, few people returned from the outlying camps to Barriere Lake until spring break-up. At this time, usually in April, many families congregated at sugarbush camps to harvest sap which began to run from the maple trees. As soon as the ice opened up a spring beaver hunt took place. In May, families commonly returned to Barriere Lake for spring feast and the sale of their furs. At the turn of the century, many men were hired by the HBC post to transport furs and supplies by canoe to and from the company depots throughout the summer months. Those that did not gain employment, remained around Barriere Lake. On or about August 15, was the annual Oblate mission which was accompanied or followed by a summer feast. This feast was then followed by preparations for the mid-September dispersal and early fall hunt (Bechmann-Khara, n.d. v.1:3-5,67).

In regard to all families meeting at Barriere Lake, the main rendezvous point, Roark-Calnek states,

> Some community members remember traditions of alternate rendezvous points. They say that the chief might choose to call people together at Cabonga, Poulter Lake, Nichcotea (all of which at one time would have had HBC posts) or other places, and would send runners to announce the place and time to families still out on the land. It is not entirely clear, however, whether these other gathering places were in use during the same time period as Barriere, or whether they operated at the same level of segmentation as Barriere (or on a different, smaller-scale, more local level) (1996:98).

It appears, therefore, that major rendezvous sites shifted over time and with changing constraints and opportunities offered to Algonquins.

After 1958, many families began to find employment at lumber camps for the winter months. These families worked at these camps during the winter rather than trapping in the bush. Roads and motorized transport were beginning to affect peoples choices of where to trap, as some families preferred to camp in areas that were accessible by road or that were closer to Rapid Lake (Bechmann-Khera, n.d. v1:75ff.; v2:8ff.).

> By 1961-1964, as the community was settling in at Rapid Lake, this annual cycle had already substantially changed. Some individuals and families were working at American fur farms in October and November, letting others use their trapping grounds or deferring trapping until the spring season (which was shorter than in the past). (Roark-Calnek, 1996:98)

Today, there is rarely one single Algonquin activity which characterizes any one season. Instead, each season is separated on the basis of particular combinations of activities, their intensity and location, and the ability of community members to participate. Great variability exists in types, timing, location, and intensity of activities that various Algonquin individuals and families undertake. There is also considerable differences in these aspects from year to year by Algonquins who find it necessary to adjust their activities to varying socio-economic and environmental conditions. The context within which these activities are participated in has a great deal to do with the actual participation itself. This means that we can expect great variability in the knowledge that gets internalized by various Algonquin individuals and families on the types, timing, location, and intensity of activities. Before moving on to take a detailed look at the contemporary ABL seasonal activity cycle, we must gain a basic understanding of how Algonquins perceive the passage of the seasons and how this influences their activities.

4.3 Seasonality

To the ABL, the growth of plants, movements of animals, and activities of humans are all directly related to the winds, which are related to both the short term daily weather patterns and movements of the sun, moon, and long term seasonal cycles; what I call seasonality. Further, in the Algonquin language, there are important features which influence the understanding and communication of these ecological aspects in a unique way.

Linguistically, a gender distinction is not formally expressed in Algonquin, but a grammatical distinction between "inanimate" and "animate" is (McGregor, 1994). These labels are of course imposed from the outside, and the Algonquin grammatical distinction does not correspond to any of the natural properties of objects in a scientific classification. To many Algonquins, for example, the winds, the sun, and the moon are all reified as sentient living beings with a "soul" or a "spirit" and therefore of the animate category.

Algonquins, like many North American indians, are animistic in their outlook, and although not all Algonquins may have the same interpretation of the meaning behind items which are animate and inanimate, most, nonetheless, posses an understanding of the wind's effect on local ecology. This understanding appears to be central for most Algonquins in the functioning of their daily and seasonal lives. The next section outlines Algonquin understandings of the relationships between the winds, cardinal directions, the seasons, and environmental occurrences and activities.

4.3.1 Wind and direction

Today there is great variation in the way individuals in Algonquin society understand the winds. Some individuals show no interest in discussing the winds as "spirit beings," and instead speak of the winds only as visible physical elements. These individuals are much more comfortable presenting a more "secular" explanation of the functioning and effects of the winds on humanity and the environment. Other individuals

have great knowledge and interest in the winds as "beings." These individuals have at least some knowledge of the stories of wind beings passed down from their elders.

The notion of wind beings is commonly represented by older Algonquins as being the "traditional" way of understanding. These people speak of the four winds as "beings" who posses the power to influence an array of occurrences such as local weather conditions, the shift from one season to the next, animal movements, and hunter success. These individuals believe that each wind being lives at the ends of the earth in each of the primary directions. The four wind persons are called ***kîwedinok***, "north wind", ***câwanok*** "south wind", ***nigabîyanok*** "west wind", and ***wâbanok*** "east wind" (see Table 1).

Table 1. Algonquin names for cardinal directions and wind directions.

Direction in English	Direction in Algonquin	Wind in Algonquin
North	***Kîwedinok***	***Kîwedin***
South	***Câwanok***	***Câwaninowe***
East	***Wâbanok***	***Wâbaninowe***
West	***Nigabîyânok***	***Nigabîyinowe***
Wind = *Nodin*		

The winds are experienced by Algonquin individuals on a daily basis, and information from these recurrent encounters is gradually internalized with repetitive experience. Wind beings are conceived of as orchestrating the relationships between air movements, cloud cover, precipitation and temperature, all of which occur in recurring sequence and distribution throughout the seasons and the year. These weather conditions

are never thought of as separate from the everyday experiences and activities of plants, animals, and humans.

The north wind ***Kîwedinok***, is thought of as the "grandfather" , and is said to be the "father" of all winds. Most common in the winter season and infrequent in summer, this wind can be both beneficial and dangerous. It brings cold temperatures, snow and ice, storms, as well as clear cold air that comes usually from the north and north-west. This wind is the most important for hunting and is said to bring game to worthy hunters. It is also said to be very dangerous because of the effects the cold temperatures bring.

The south wind ***Câwanok***, is thought of as the "grandmother," and is said to be the "mother" of all winds. It is most common in the summer and brings good weather that allows plants to grow, providing food for animals. It is generally thought of as a good, kind wind, and when it is moderately strong in the summer it provides good hunting. In winter ***Câwanok*** brings precipitation which makes successful hunting difficult.

From my discussions with Algonquin individuals there exist two interpretations of the role of the east wind. ***Wâbanok***, is variously said to be "the stingy one" or the "guardian of the animals" and is generally thought to be the worst wind for most activities. Algonquins say that the animals are scared of the east wind which causes them to remain stationary, but at the same time making them nervous and easily disturbed. For these reasons hunting during an east wind is usually not successful. In traditional

teachings, the east wind is represented as stingy and keeps all the animals to itself without sharing. Perhaps it is the way in which the east wind controls the presentation of animals to human hunters that ***Wâbanok*** is thought to be the "guardian of the animals". More work is needed, however, to better understand the variation in understanding among individual Algonquins on the east wind. There is agreement that ***wâbanok*** is not a common wind, but when it comes, it can remain for long periods of time. It brings cloudy humid weather, rain in the summer, wet snow or freezing rain in winter.

The west wind, ***nigabîyânok***, has variously been explained as the "referee", "boss", or "leader" of the winds. It was explained to me that if one of the wind beings gets out of line, it is the west wind that will step in to regulate the situation. This is the prevailing wind which is generally thought of as a good wind, and brings good hunting weather.

Between each of the cardinal wind directions there is another wind being, making an eight-pole wind classification system. Thus, the north-west, south-west, north-east, and south-east winds are said to be the inferior winds and the "children" of the primary winds. These winds blow less often and are usually not as strong.

Although not all Algonquins today speak in terms of wind "beings", each wind is none-the-less associated with two important aspects: First, with producing particular seasonal and daily climatic weather patterns, and second, for influencing the specific seasonal and daily activities of plants, animals, and humans. These associations are

experienced, affirmed and reaffirmed on a daily, weekly, seasonal, and annual basis by Algonquin individuals. To many people it is this knowledge of wind "beings" which forms the explanation for the proposition that the winds give the "animals" to human hunters. For those who do not believe in wind "beings", it is still highly important to understand the winds and their daily and seasonal affects upon the environment in order to properly conduct daily and seasonal activities.

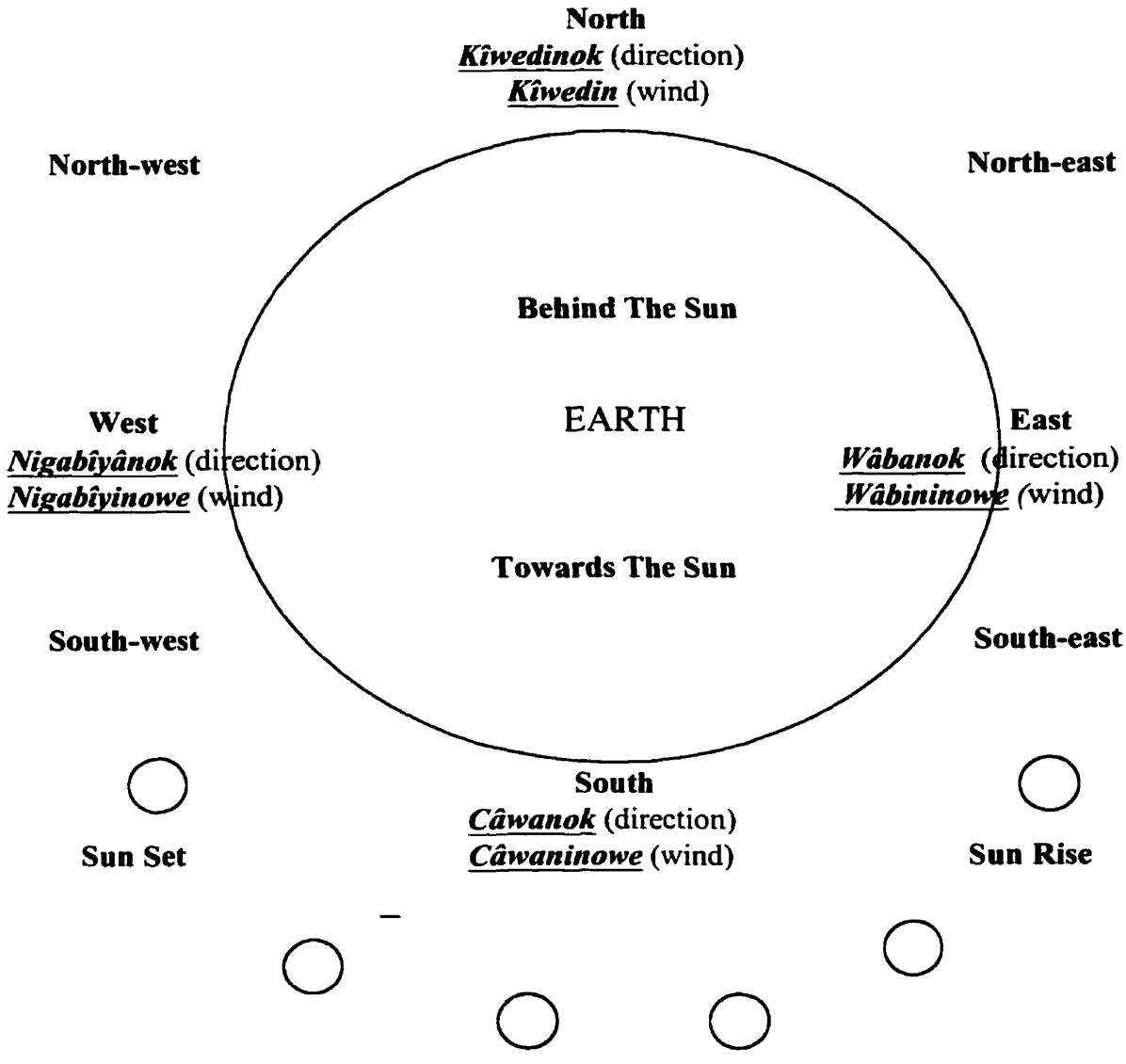
The complex concepts of the four winds emerge to become extremely important aspects of Algonquin ecological knowledge, whether one believes in wind "beings" or not. The concepts of the winds are connected to a wide range of relationships with other spatial and temporal categories by which the ABL understand the functioning to their activities. There are obvious connections to other ecological cycles, such as the learning life-cycle, the passage from birth to death and childhood to adulthood, and the changing seasons.

The wind beings are responsible for transforming the surface of the earth, ***âkî***, and the water, ***nîbî***. Because the winds are said to live at the ends of the earth in each of the four cardinal directions, they define the limits of the earth itself. The four winds delimit a four-pole directional classification system of the world as well as a horizontal classification system on the earth's surface (***Kîwedin*** north, ***Câwanok*** south, ***Wâbanok*** east, and ***Nigabîyânok*** west) which is related to the daily cycle of the rising and setting of the sun (see Figure 2). A two-pole classification also appears to exist which delimits a "towards the sun" and "away from the sun" orientation. As explained to me by several Algonquin individuals, because the sun, in all seasons, rises and sets to the south of the

line which connects the cardinal directions east and west, a "towards the sun" and "away from the sun" orientation is possible. Therefore, the south-east, south, and south-west directions always face toward the sun , while the north-east, north, and north-west directions always face away from the sun. This two-pole system is understood by Algonquins to be used for orienting human and animal activities in time and space.

Evidence of this two-pole system was given while on a lengthy canoe trip with an elder couple. On this trip I noticed that this couple repeatedly placed their tent in the south-east facing direction towards the water. When I asked why they did this, I was assured that it was to take advantage of the "towards the sun direction" and the warm morning sun. Most Algonquin cabins tend to be located on northwest shores of lakes or rivers in this towards-the-sun orientation. At least 60 cabins out of a total 90 cabins have been built in this way. Other Algonquin communities such as the summer community of Grand Lac Victoria exhibits this towards-the-south and on-the-shore orientations as well. Individuals say that the higher land behind the cabin offers protection from the cold north wind while at the same time such an orientation benefits from the warmth of the sun. It is in these locations where first occurs the snow melt, ground thaw, and ice break-up on lakes.

Figure 2. The relationship between wind beings, wind direction, cardinal directions, and diurnal periods (as viewed from above).



The Sun's path as it rises and sets on the earth

Of course other factors come into play which limit the practicality of placing cabins with the preferred southern exposure. Steep slopes or rocky soils, for example, are just two of the many constraints placed upon Algonquin individuals and families in selecting a cabin site. Mistakes in cabin placement, for what ever reason, do occur. I was told by one elder that she had built her cabin with the wrong orientation and wished she could move it to a southeastern exposure to take advantage of the many good aspects that the sun brings. It was spring, and she pointed over to the front of her daughter's cabin to show me how all of the snow had already melted there. Much snow still remained in front of her cabin because of shade provided by trees and the cabin itself. She complained that this retarded the time in which she could set up her summer kitchen in front of her cabin.

Algonquins generally agree that most animals in mid winter, when it is cold, prefer south-west facing slopes of hills and mountains because they are protected from the cold north wind and benefit from the sun's warmth. It is also in these southern exposed habitats where, in spring, the first plant growth occurs and where many herbivorous animals can be found feeding on them. Carnivorous animals in search of their herbivorous prey are known to move into these areas. Humans, in turn, encounter carnivorous and herbivorous animals, as well as medicinal and food plants in these locations.

Perhaps the most important association of wind and direction for Algonquins is with the seasons. How seasons change and how this affects Algonquin activities are related to the winds and direction.

4.3.2 Annual cycle

The classification of the Algonquin annual cycle, in its simplest form, can be divided into two halves, a summer and a winter season each of approximately six months. At a more detailed level, however, the year can be divided into four periods: a freeze and a thaw period each separated by a transitional period of freeze-up and break-up. ***Kîwedinok***, the north wind, is responsible for the coming of winter ***pibôn***, the period of ice and snow cover. The south wind ***câwanok***, is responsible for the coming of summer ***nîbôn***, the ice and snow free period. These two seasons are separated at one end by ***tigwâgan***, a period where cold weather becomes more frequent, ice eventually forms on water and snow begins to fall, and at the other by ***sîgon***, a period of rapid warming where ice melts on water and snow melts on land. ***Tigwâgan*** and ***sîgon*** are seasons where shifts in the predominance of the winds occur.

Most Algonquins, however, understand the seasons in a more complex way. Like their wind and directional classifications, which are divided into eight categories, so too are the seasons divided into an eight-fold classification (see Table 2). As explained by one elder, collectively the seasons are thought of as functioning similarly as does a single day. Just as each day contains gradually increasing amounts of sunlight after midnight and decreasing amounts of sunlight after mid-day, so too do the seasons have periods of increasing and decreasing sunlight on either side of midnight and mid-day (see Table 3).

Observable changes in a vast array of environmental conditions, such as temperature, precipitation, vegetation, prevailing wind direction, and other natural phenomena define the seasons for the Algonquins. Names for each season are non-descriptive, and unanalyzable and many cannot be directly translated. This is very different than what we see for the names of Algonquin months, which are descriptive, analyzable, and translatable (See Table 4).

The first season is ***pibôn*** (winter), approximated by the months December and January, is equivalent to night on the daily cycle. This is the season when lakes and rivers are frozen, and fluffy new snow falls on the ground to stay. This season traditionally includes a large feast, usually at Rapid Lake; and this practice is still observed today. The Algonquins see winter as the basic measure of a year, each winter representing a new year. The Algonquin word ***pibôn*** can mean both "winter" and "year" in English, as in ***nigopibon*** (one year) and ***nîjopibon*** (two years). ***Apitabibôn***, or "mid - winter", roughly equivalent to the months January, February and March, is the period after mid-night on the daily cycle. ***Apta*** means "half-way" or "the mid-point" in Algonquin and is the period where daylight hours, instead of becoming shorter, shift to become gradually longer. As one Algonquin individual aptly described ***apitabibôn***, it is where "the cold gets warmer and warmer". The sun rises further to the north on the horizon and higher in the sky each day. Early in this season is a period of extreme cold, where ice and snow are their thickest, and where the north wind predominates. Gradually as the days get longer and the sun stronger, days and nights get warmer. It is evident how multiple criteria are attached to the linguistic representation of each season.

Table 2. Algonquin seasonal classification.

Seasons Algonquin	Seasons English	English Gloss
Pibôn	Winter	"Winter" or "Year". Full winter. Lakes are frozen, snow stays on the ground and is fluffy. (Approximate span: December-January).
Aptabibôn	Winter	"Half Winter". Second half of winter (Apta =half-way), extreme cold, ice and snow are at their thickest, daylight hours begin to shift and get longer, sun rises further north and higher on the horizon each day. (Approximate span: January-February-March).
Sîgon, Sîgwan	Spring	Starts to become mild, sun much stronger, snow becomes crusty, then wet and gradually disappears, ice on lakes and rivers begin to thaw. Sugar bush season. *Break-up* (Approximate span: March-April-May).
Minokimin	Spring	Flowers start to bloom, soil becomes warm, days very long. Lakes open up, plants begin to grow. First flowers in bloom (Approximate span: May-June).
Nîbôn, Nîbôk	Summer	Warm weather, plants growing, gets hotter, many flowers. (Approximate span: June-July).
Aptanîbin	Summer	"Half Summer". Second half of summer (Apta=half-way), starts to get colder, daylight hours become shorter, sun rises further to the south on the horizon, and lower in the sky each day. (Approximate span: July-August-September).
Tigwâgan	Fall	Leaves start to change color, daylight hours getting shorter. Leaves begin to fall. (Approximate span: September-October)
Bidjîbibôn	Fall	"Beginning of winter", snow begins to fall but may not stay on the ground, plants dry and die, days become very short. Travel difficult. *Freeze-up* (Approximate span: October-November)

The next season is ***Sîgon***, the season that roughly coincides with the months of March, April and May, and morning on the daily cycle. This is a period where it begins to get mild, the sun-light feels warmer, and a crust often forms on the top layers of the snow as it melts in the day and freezes at night. After this we move into ***Minokimin***, a brief period which coincides with the months May and June. It is in this season where the ice on lakes and rivers thaw, break-up, and disappears, and where plants begin to grow. This is when another ritual feast is still observed by many Algonquin families.

Table 3. Algonquin seasons, daily solar cycle,[13] *and ceremonial feasts.*

Seasons in Algonquin	**Approximate Months in English**	**Equivalent on Daily Cycle**	**Feasts**
Sîgon, Sîgwan	March - April - May	Dawn, early morning	
Minokimin	May - June	Morning	Feast (basket)
Nîbôn, Nîbôk	June - July	Late morning	
	Solstice approx. June 22	***Noon***	
Aptanîbin	July - August - September	Early afternoon	Feast
	Equinox approx, Sept. 23		
Tigwâgan	September - October	Late afternoon	
Bidjîbibôn	October - November	Dusk, evening	Feast (basket)
Pibôn	December - January	Night to Midnight	Feast
	Solstice approx. Dec. 22	***Midnight***	
Aptabibôn	January - February - March	After midnight	
	Equinox approx, March 21		

Next comes summer ***Nîbôn***, roughly equivalent to the months of June and July, and late morning on the daily cycle. In this season plants grow, flowers bloom, and many

animals prepare to have their young. ***Apitanîbin*** "mid-summer", is the second half of summer as we move into fall, roughly equivalent to the months of July, August and September and mid-day or noon on the daily cycle. This is the period where daylight hours, instead of becoming longer, shift to become gradually shorter. The sun rises further to the south on the horizon, and lower in the sky each day. Traditionally this is a time of a mid-summer feast. Today, this ritual is observed often in the form of a pow-wow where ABL and other near-by Algonquin bands celebrate. A few ABL families still come together and observe this feast, but most go to the pow-wow.

The next season is ***Tigwâgan***, approximately equivalent to the months of September and October, and the coming of night-fall on the daily cycle. This is the period where leaves start to fall, day-light hours are getting shorter, the sun's rays are weaker, and plants begin to dry and die. Traditionally there is a fall feast during this season which is still observed by several families. This period is then followed by a short transition period ***Bijîbibôn*** "beginning of winter", where the daylight hours become very short, the snow begins to fly but may not stay, and ice has usually formed on lakes and rivers. This is the period of freeze-up which usually occurs around mid-November.

Several Algonquins who acknowledge the existence of spirit beings have described the changing of the seasons as "the dance of the Grandmother and Grandfather." In this dance, both beings are understood to be positioned with their backs

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13 The timing of the two periods of solstice occur around June 22, and December 22. These are the two points on the earth's eliptic orbit at which the distace from the celestial equator is greatest and which is reached by the sun each

facing their respective cardinal directions, facing one another holding hands. As the two dancers spin with hands clasped they move through a sequence in which each individual, in turn, asserts its character upon the world. Thus, in the north during winter, it is the grandfather who is in position, imposing its cold characteristics upon the world. In the north during summer, it is the grandmother's warm character which monopolize the world. As the two dancers turn together, from east to west, they reach a point where neither are in the dominant position, and the mutual affects of their very different characters are displayed. These are the transitional periods of spring and fall, which occur on either side of the alternating dominant positions of the Grandmother and Grandfather in their dance.

For all Algonquins the commencement of a season is determined, not by a calendar date but the timing and sequence of natural events. These environmental and ecological events serve as indexical signs of the seasons and their associated winds. For example, when fireflies are visible on hot calm nights, this is a sign of mid-summer, and an indication that sturgeon can be successfully hunted at night with torches along the edge of lakes. These signs are carefully monitored, like the weather itself, to make decisions about everyday courses of action. Algonquins understand that the timing of their activities and their harvesting success is largely conditioned by the seasons which influence the supply, movement, and quality of resources. Ecological knowledge about the relationships between seasonality and resources influences subsistence activities.

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year on the date given previously (once in summer and once in winter).

Table 4. Algonquin names for months and their English gloss.

Months in Algonquin	English Gloss	Months In English
1 ***Kaginositc, Kenozitc kîzis,***	"Moon of the Long Month" or "moon of the tall month"	January
2 ***Akokidjîc kîzis***	"Moon of the Woodchuck"	February
3 ***Nika kîzis***	"Moon of the goose"	March
4 ***Kâwâsikôtotc kîzis***	"Moon of the shining snow"	April
5 ***Wâbigôn kîzis***	"Moon of the flowers"	May
6 ***Odemin kîzis***	"Moon of the Strawberry" Odemin=strawberry	June
7 ***Miskomin kîzis***	"Moon of the Raspberry" Miskomin=Raspberry	July
8 ***Oditigwâgomin kîzis***	"Moon of the Blackberry" Oditigwagomin=blackberry	August
9 ***Kâkone kîzis,***	"Moon of the harvest"	September
Kâkweykokonan kîzis	"Moon of changing cloths" or "moon of the turning around"	
10 ***Nemekosi,***		
Namegos kîzis	"Moon of the Trout" when trout spawn	October
11 ***Atikame,***		
Adikime, kîzis	"Moon of the Whitfish" when whitefish spawn	November
12 ***Pidjîbibôn kîzis***	"Moon of the new year"	December

In the harvesting activities of their seasonal round, Algonquins apply ecological knowledge about many things. For example, the seasonal aspects of animal movements -- particularly the migration patterns of birds and the movements of large mammals along travel corridors -- is extremely important to understand if Algonquins are to make effective decisions about where and when to hunt. Knowledge of animal mating and reproductive behaviour is also important because selective harvesting techniques are often necessary to minimize the interference with the reproduction and rearing of young. Success in this undertaking requires specific knowledge about animal behaviour, biology, and seasonality. An understanding of the seasonal shifts in the local habitat of such things as food, water, and shelter, are again important if Algonquins are to travel, locate,

and harvest resources effectively. Similarly, seasonal shifts in the quality or usability of resources, particularly for meat, furs, wood, and bark, are important for decisions to be made about where, when, and which resources are to be harvested.

Today, Algonquins use a variation of the formal Gregorian calendar when it is necessary to conduct their civil or religious affairs, in and outside the community on a fixed daily and monthly schedule (see Nickels, forthcoming). From my participation with Algonquin individuals in daily village life I found that this rather static calendrical system which divides the year into shorter divisions of time: months, weeks and days, is commonly in use. This calendar is constructed of seven days which make one week, four weeks which make one month, and twelve months which make a year, essentially the Gregorian calendar which has substituted Algonquin names for each of the corresponding days of the weeks and months (see tables 5 and 4). Winter is the basic measure of a year, each winter ***pibôn*** representing a new year.[14]

Copies of this Algonquin version of the Gregorian monthly calendar are made available to families at the beginning of the school year in Rapid Lake. Children certainly learn this calendar in the curriculum, and use it when discussing the passing of their school year. Many households also have English and French copies of the Gregorian calendar displayed in their homes at Rapid Lake. Those who have wage employment in or outside the community use this calendar to organize their weekly and

[14] The Algonquin word ***pibôn*** can mean both "winter" and "year", and is commonly used to talk about the age of an individual (for example, ***nigopibon*** (one year) and ***nîjopibon*** (two years)).

monthly work schedule. Algonquins speaking to one another employ words for the calendar months in their own language, although I have also heard the English and French words used as well. When discussing civil aspects with non-Algonquins, English and French speaking Algonquins usually use the English or French words for the months depending upon the mother tongue of their audience. I have heard children using both Algonquin, English and French forms.

Table 5 Algonquin days of the week.

Days in Algonquin	Days in English	English Gloss
ickwâ manactâganiwan metisônigîjigan	Monday	Atonement day
âjenîgîjigan	Tuesday	Angel day
sôzepigîjigan	Wednesday	Joseph's day
icpaniganiwan	Thursday	?
tcîbâtogîjigan	Friday	Cross or Crucifix day
mânîgîgigan	Saturday	Mary`s day
manâctâganiwan	Sunday	Respect/Honor day

Outside of Rapid Lake, however, this is not what I observed. In participating with and discussing subsistence activities with Algonquins in the bush, or at their bush camps, I discovered that it is more important to clearly express cyclical and flexible temporal concepts when discussing ecological relationships. Interestingly, the major temporal concepts expressed by the ABL in these situations were not those of the formally adapted

Gregorian calendar but concepts such as the winds, and temperature, which are related to both the short term daily weather patterns and movement of the sun and moon, and the long term seasonal cycles. These are the major aspects that influence the environment as well as the daily and seasonal activities of animals and the ABL themselves. Any clear understanding of the movement of animals, the growth of plants, and how these relate to human activity and management, according to the ABL, requires experience and knowledge of these shifting local temporal aspects.

In conversations that have reference to past, present, or future ecological events, seasonal names are more frequently employed than the names for the months. The explanation for this is perhaps best stated by Hallowell, who, for the Saulteaux says, "[a]though less exact, these larger units are sufficiently precise and they function in much the same way among ourselves. Despite the instrumental value of our exact time scale, for certain purposes, constant reference to months, day, and hour of past events would appear pedantic even in our society" (1955:55).

The classification and use of the seasons, for Algonquins, takes into consideration a whole myriad of information from their everyday experience, both material and spiritual. The conceptualization and practice of using seasonal cycles in everyday activities requires much long-term experience in the bush including, observation, evaluation, feelings, smells, tastes, and conversation. Algonquin knowledge of the seasons is organized into highly complex and integrated networks whose elements are connected to each other in a great variety of ways. It does not appear to be learned from

the memorization of explicit rules, but by repeated experiences which are internalized, adjusted and re-internalized over time. Indexical signs may be used, but they do not, in themselves, entirely define a season. The utterance of any season can communicate an array of detailed information depending upon the moment of elicitation and the purpose of its communication.

The seasonal calendar used by the ABL is significantly different than that used by Euro-Canadians. Algonquins name and routinely refer to eight seasons in the year, and each name has a distinct meaning in terms of the characteristics that distinguish the particular season. Furthermore, the daily cycle, for Algonquins, also has eight distinct named intervals, and the annual, daily, and nightly intervals are conceptually keyed together along with their ritual activities and feasting. Events and experiences are internalized, narrated, and discussed in terms of the characteristics at the time of the occurrence: what is important about the experience is the state of the environment when it occurred. Similarly, the round of human activities is more closely aligned with actual environmental characteristics than with timed intervals. The structure of related intervals of activity is tuned for a people who occupy lands year round and whose annual round of activities must be closely timed to accommodate subtle, cyclical changes in the landscape and ecosystem. Activities, intentions and plans are routinely learned, articulated, transmitted, and performed in terms of these eight distinct and -- from an Algonquin perspective -- very different yearly, daily, and nightly intervals.

4.4 The Contemporary Activity Cycle

Now equipped with an understanding of Algonquin knowledge of seasonality and its influence upon the activities of flora, fauna, and humanity, we can move on to look at the contemporary ABL activity cycle. The following sections outline this cycle by season, starting with spring.

4.4.1 Sîgon and Minokimin (Spring)

There is often an increase in hunting at this time of year from the previously cold winter months. When a thick crust forms on the snow, moose are hunted with great success. Many Algonquins state that they try not to kill female moose in early spring because this is when they have their young, but occasionally females and young have been observed to be harvested. Females are easily hunted at this time of year, and winter salting of the highways attracts them to areas where they can be easily seen and killed.

Snowshoe hare are occasionally trapped or snared early in this period, often by younger children or adults. Most Algonquins go in search for beaver sometime from March until June because this is when beaver, on hot sunny days, position themselves in the open on top of the snow and ice of rivers and lakes. The unpredictable period of warm spring weather can occur anywhere between March and June, depending on the year. Beaver cannot be trapped or chiseled at this time because open water is often present along the edges of lakes and rivers which allows them to escape using these

techniques. Most individuals prefer to shoot beaver with .22 caliber rifles, which allows the hunter to be very discriminating in terms of age and sex categories taken. Most people shoot beaver on their family trap-lines, although many individuals are also invited to participate with friends in other territories. There is a one to two-week holiday (usually May) in which almost all Algonquins participate, going out in the bush to hunt beaver. School is closed at this time so that entire families can go out on the land. There is another established "Beaver Holiday" in the fall (around November) that lasts longer than the spring holiday (2-3 weeks). It is longer because trapping is better in the fall than the spring. Muskrat are also trapped during this season by those who have them in their family trapping territory. Beaver and muskrat hunting is completed sometime between late May and the ends of June. This is when the beaver start to change their diet from outer bark to poplar leaves and the meat takes on the flavour of these leaves. Most ABL do not like this change in the taste of the meat and stop hunting beaver at this time.

The migration of ducks and geese through the region is highly variable and dependent upon spring temperatures, wind direction, and precipitation. As soon as open water appears ducks and then geese begin to arrive. At this time they are often found in flocks bunched together in limited areas of open water, so that hunting them is relatively easy. Many elders have complained that old staging areas for ducks which were commonly used by ABL duck hunters have disappeared due to the building of hydro dams and resulting higher water levels. Once there is extensive open water, waterfowl disperse and are much more difficult to hunt. Hunting for waterfowl, therefore, occurs during migration, but most ABL stop hunting ducks and geese after the migration is over

(around early to mid-May). After this time female ducks which remain in the area over summer begin laying eggs and having young; some individuals frowned upon hunting them during this period; others will collect eggs on an opportunistic basis. Grouse are also hunted during this period by those at maple sugar bush camps and whenever they make themselves visible. Most ABL do not harvest rabbits, ducks or partridge late in this period because this is when they have young. By the end of May, beginning of June, most ABL state that beaver and duck hunting stops because both moose and fish become available, and indeed these are the major foods sought.

Along with winter, spring is the busiest net-fishing period for the ABL. Algonquins set nets for pike around April, walleye around May, and sturgeon around June, during their spawning period. This is the time of year where these fish do not bite at hooks, necessitating the use of nets. Pike are often speared or shot by Algonquins because they are frequently found traveling the shallows near shore. Most Algonquins comment that they can rarely leave their Walleye nets up beyond the opening of the sport fishing season. This is because sport fisherman are out in great numbers at this time and, not knowing about Algonquin fishing nets, often drive over them with their outboard motor propellers, ruining them. Sturgeon spawn around the month of June when they are hunted in certain rivers with special nets, wire snares, spears, and with bare hands in the daytime. Sturgeon are said to be in the deep water during the winter, move up rivers to spawn at the foot of rapids and falls in spring, and move to shallow shore lines in mid summer. In September they start to go deep again. Suckers also spawn in spring (around May or June) and are sought by many Algonquins at this time if other food

sources are lacking or dog food is needed. Using a snare on the end of a pole or bare hands to catch them, individuals search for spawning suckers in small streams that exit or enter a lake. Black bears are often doing the same thing, so it is not surprising that some bears are shot by Algonquins opportunistically at this time.

Spring was traditionally a time when families left their winter trap-lines to meet at sugar bushes, often called ***sîgwanisinan*** "spring camping place." At the sugar bush Algonquins collected maple sap to make syrup and sugar, construct canoes and baskets for summer use, and prepare for the ice to leave. Today, during this period several families can still be found at a sugar bush on the land base. This is also the best time to collect roots and birch bark for basket work, especially if "scratch-work" designs are to be made in the birch bark. There are still many individuals involved in this activity.

4.4.2 Nîbon and Aptanîbin (Summer)

Moose are killed during this period on an opportunistic basis. Many Algonquins fish during this period (some by net, most by line), some fishing almost everyday. Many fish in boats leaving from Rapid Lake and returning to sleep in the village at night; others leave to fish other lakes close to their cabins, returning there to spend the night. Around the months of June and July, many people leave the village for just an afternoon or a weekend to fish for brook trout in local rivers and lakes. Some groups go on special trips for trout (both brook and lake trout) that can last up to a week at a time.

In mid-summer, on hot calm nights when the fireflies are most active, is the best time for sturgeon hunting along the lake shores with a light. Sturgeon are said to be hunted, not fished like other fish species, and they are only hunted in the spring spawn and at this time. Occasionally they may be harvested accidentally from fish nets set for other species. Sturgeon are always welcomed, and usually boiled into a stew with potatoes and vegetables and sometimes smoked.

Rabbits and partridge are rarely harvested in summer because they are said to taste poor and often have worms. I have seen the occasional partridge taken on an opportunistic basis, however, but they are usually taken towards the end of summer as we move into fall. When discovered, partridge eggs are taken and eaten.

Much time is given to cabin building and repair during the summer months. Craftwork is commonly done in the morning and evenings. Later in the season, around August, many families head out to set up blueberry picking camps. Special trips for berries are made to the large clear-cut, the most popular areas for the past few years being Ottawa Lake, Pensive, Pompome road, and the clearing at an old abandoned Airfield. Blueberry camps can last for weeks at a time, bringing many families together. Often roadside stalls are set up to sell berries to passing tourists; otherwise the berries are sold to local suppliers who travel the region to buy blueberries. Raspberries are also picked by some families but in nowhere near the same quantities. Though cranberries and many other types of berries are present on the land base, few are picked by the ABL in any quantities that would justify selling commercially. The volume of cranberries and most

other berries are much lower than blueberries and raspberries and are generally considered for personal use. Some medicinal plants can be stored in the summer months but many must be picked fresh.

4.4.3 Tigwâgan and Bijibibôn (Fall)

Special hunting trips for waterfowl begin to be organized by some Algonquins around September, before and during migration. Locally breeding ducks are hunted before migration begins and later some migratory ducks are hunted during the migration. Ducks are shot in late summer, when they are flightless, to make a duck soup. Migration ends earlier for geese, around mid to end of October, except for some stragglers. Ducks frequent lakes and streams as long as there is open water. Duck and geese hunting ends when rivers and lakes become frozen around mid-November. As partridge have reached adult size, hunting for them starts around September as well.

The moose rut often begins in September, but many ABL hunt moose in August outside the period of competition with white sport hunters. They say that it is often too dangerous for them to go for moose during the sport hunting season because each sport hunter has been assigned a hunting location within the park. Algonquins can only hunt safely in areas not assigned to sport hunters. Big male moose are most desired at this time because they have a large quantity of high quality fat (often 2-3 inches thick) before the rut. The rut and calling of moose usually ends around mid-October. In late fall, after the rut, most Algonquins stop hunting moose until Christmas. This is for a variety of

reasons, one of which is the deteriorating quality of meat and fat; another is the fallen leaves on the ground that makes approaching the animals difficult without making noise and scaring them away.

Wolves are rarely trapped anymore by the ABL because the commercial fur value is low. In the past, individuals began trapping wolves in the late fall and continued through the winter until early spring. Wolves are commonly trapped or shot if they are troublesome and the fur is either sold or, more commonly, used locally.

Some Algonquins like to kill a black bear in the fall because this is the season when the fat is the thickest, the fat being used for various purposes (see Chapter Five). Most people shoot bear and steel traps are rarely used. Bear is usually shot opportunistically, often while out moose hunting, and only when needed. Black bear is rarely killed in the summer when the pelt is of poor quality.

Beaver start to be hunted with rifles for food sometime in mid-August when their diet begins to change and they taste better. Algonquins understand a connection between the food beaver eat and the taste and consistency of their meat, both of which follow a seasonal cycle. It is in late October that Algonquins often start the trapping season and they usually begin with beaver. They initiate beaver trapping in the most inaccessible locations first. This is because accessibility gradually decreases as the weather turns poorer, leaving the most approachable locations to be hunted when accessibility is the poorest. For example, beavers that live along rivers and streams with currents that cause

dangerous ice conditions for walking are attempted to be trapped first. Boat and traps are usually used to harvest beaver at this time. Again, there is a two to three week beaver holiday between the end of October to the end of November, which almost everyone participates in. At this time most of the ABL can be found out at their bush camps or beyond them on their trapping territories hunting beaver.

Rabbit snaring begins for some individuals, often children, as early as late August. Some Algonquins start trapping muskrat in October if there are sufficient numbers in their trapping area. Lynx trapping begins, for those who engage in that activity, around mid-November and continues until mid-March. Few people trap fisher because there are few in the land-use area at this time. Late fall is when trapping otter, marten and fox begins. It is said to be necessary to trap fox before the ground freezes. Mink start to be trapped around October and this activity continues until March. Most people stop trapping mink around March because of the poor condition of the pelt but persist trapping beaver and muskrat for a time. Whitefish is the most important fish during this Autumn period. Algonquins often set nets for them as they begin to spawn in late October to mid-November.

Medicinal plants are gathered mostly in the summer and fall depending on how particular plants are prepared. Many types of medicinal plants are dried and stored over winter, some becoming more powerful as they dry, others cannot be prepared by drying but must be used fresh. Still, several types of medicinal plants can be gathered under the snow as long as the gatherers know their exact locations.

4.4.4 Pibôn and Aptabibôn (Winter)

Moose hunting resumes in mid to late December and some bears are hunted in their dens during winter season, if dens can be found. Beaver are trapped all winter long and are hunted or trapped from late fall, throughout the winter, and into early spring. Spring is an important season for pursuing muskrat, which unlike beaver, are not usually shot but trapped. Muskrats are thought to be very good to eat, and some people trap them just for food, as opposed to selling the furs commercially. But there are few muskrat in the ABL land-use area according to the Algonquins. Only certain family trapping areas have an abundance.[15] Muskrat trapping stops in mid-May which only coincidentally coincides with the legal trapping season.

Otter is trapped just until Christmas, after that their hair curls and the commercial value of the pelts drop. Trapping for beaver and otter for many Algonquins stops in January and February because the ice is very thick at this time demanding much work to set traps. Algonquins switch to snaring rabbits in January and February when environmental conditions make such activity successful. Marten trapping continues until about early to mid March, when their breeding season begins and they begin to travel great distances making local trapping difficult. They can be trapped into breeding season, because unlike muskrat, their fur does not deteriorate from injuries sustained from other

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15 Many Algonquin say that each beaver cabin houses one muskrat. These individuals see the muskrat as the beavers maid (or domestic dog), who takes care of the lodge for the beaver. The muskrat is believed to be the first individual through the door of the lodge to see if there is danger, and because of this, they are often the first animal caught in beaver traps.

muskrat. Mink trapping begins around October and continues until March. Most people stop trapping mink around March but continue pursuing beaver and muskrat for a time.

The busiest net-fishing period is during the winter and early summer periods. Most fish including the northern pike are eaten during the winter months when caught by ice fishing. In other seasons most ABL do not like eating pike very much, especially in the summer when they are thought to taste bad and make one sleepy.

Now that porcupine has recently returned to the region they can be killed on an opportunistic basis and eaten throughout the year (mostly late spring). Not many Algonquin eat porcupine anymore, although it is said to be very good tasting. This may change as the animals abundance increases. Algonquins also shoot deer for food whenever they are encountered. Bears are hunted in their dens in mid-winter, for food and fur, by a few of the older Algonquins. The activity of wood cutting for firewood also goes on all year, as there is not a lot of stock-piling.

4.5 Continuity and Change in Seasonal Activities

Sedentarization has obviously transformed the subsistence activities of most Algonquin families by reversing old seasonal patterns. Instead of spending the entire winter at bush camps, as was the case before the 1960s, Algonquins now winter at Rapid Lake, or in some cases Maniwaki. Although some families still occupy bush camps for extended periods of time, most tend to employ short-term excursions to bush camps to

undertake subsistence activities. It is now summer, not winter, which is the season when families are most often on the land together for long periods of time.

Much of this change has resulted from the spin-offs of sedentarization. Once the Rapid Lake reserve was established in 1961, services had to be installed to meet the needs of those who moved onto the reserve. The establishment of services like the band office, the nursing station, and the school, required that they be effectively interfaced with already existing outside agencies and the structures and time-lines they followed. This forced many changes upon Algonquins. For example, the first school in Rapid Lake was run by an Algonquin woman from a tent as a summer school, in 1951. Summer was the best time for Algonquin children to go to school because this was when they traditionally came together to spend a few months at major rendezvous points (fur trading posts and missions). The building of a school in Rapid Lake in 1955 by Indian Affairs, and its administration by this outside agency, however, required that the summer school be replaced to become a winter school. The incompatibility between a winter school and the Algonquin seasonal round of activities -- particularly with regard to the late spring and early fall hunts -- meant that some changes in the functioning of the school year eventually had to be worked out. Soon, the fall and spring hunts in the bush became fall and spring "beaver hunting holidays" when the school was in recess so that children could join their families in the bush.

The number and types of regional employment and income possibilities, and the number of Algonquins seeking these alternative employment and income sources has

increased through time. Accompanying this shift has been an increase in the redeployment of individual and group roles in many families. Seasonal patterns and land use activities have also adapted to technological change. The shift from summer travel based largely on water transport by canoe to road transport by truck is perhaps the most significant transformation. The Algonquins expanding reliance on motorized transport (automobile and snowmobile) was already, even by the 1960s, increasing the distance that people were willing to travel. Today, the extension of a complicated network of logging roads has opened up access to the land for short-term, even day trip, harvesting expeditions. The shift in technology, combined with other social, economic and environmental changes, has undoubtedly contributed to the recent use of Rapid Lake for many families as a year-round base camp. This transformation in technology, in combination with other social, economic and environmental changes, has undoubtedly reorganized what knowledge becomes internalized by Algonquins. Still, the seasonal rhythm of going out on the land, and coming back to major rendezvous sites, however changed, have been a persistent Algonquin strategy for acquiring, sharing, and articulating environmental knowledge.

4.6 Final Comments

This look at the Algonquin learning life-cycle suggests that much of what individuals learn and know about forest resources comes from the situations that arise out of their social interaction in subsistence activities. Age and gender are clearly just two of

the many important factors that influence the internalization of knowledge within individuals and groups performing common tasks like trapping and moose hunting.

My recent field observations supports the characterization of the Algonquin learning life-cycle as a movement from childhood dependency to responsible interdependency. This characterization reveals that the larger socio-cultural subsistence process (trapping and moose hunting included) is to a certain extent, a cognitive process in its own right. This process establishes the contexts for the cognition of the people who participate in it, never forgetting that Algonquin participants also stand in a reflexive relationship to the cultural contexts that have been constituted.

The above discussion of seasonal activities reveals substantial continuity in Algonquin experience of their environment. But this account, when compared to the historical details of Vincent and Bechmann-Khera, also demonstrates how the Algonquin seasonal round of activities has adjusted to continuing social, economic, and environmental changes. Algonquin knowledge of the seasonal cycle is organized into a highly complex mental model with many integrated networks whose elements are connected to each other in a great variety of ways. What is evident from the details of this chapter is the degree to which the conceptualization of the Algonquin seasonal model is anchored in everyday experiences, sensitive to particular contexts. Algonquins integrate, among other things, visual imagery, other sensory perception, evaluations, indexical signs, and the cognitive aspects of learned practices in the formation, articulation and transmission of this seasonal model. Algonquin adjustments in their

seasonal round of activity influence adjustments in the type of knowledge that become internalized by various individuals and groups participating in these activities, whose repeated experiences are internalized, adjusted and re-internalized over time.

The examination of the ABL subsistence life-cycle and their seasonal activities usefully establishes the contexts under which Algonquin individuals and groups internalize knowledge about forest resources. Investigating the Algonquin conception of seasonal-cycles and their participation in the seasonal round of activities increases our understanding of the types of activities Algonquins engage in, when they engage in them, and illuminates important social, historical, and environmental factors which influence changes in social subsistence activities and resource knowledge internalization. Taking this approach provides the means of placing the study of local ecological knowledge in a firmer sociological, ecological, and historical context. Such an inquiry also effectively prescribes the social contexts within which we can better understand the details of the contemporary resources use by Algonquins which is the subject of the next chapter.

CHAPTER FIVE

Utilization of the Forest Environment

The last chapter examined the cycle of activities in the forest environment as conceptualized by the ABL themselves, my participant observation with them and an analysis of an others authors work. This chapter takes a detailed look at the utilization of forest resources by the ABL. Studies that examine how indigenous peoples use their resources today often overlook the social and historical context within which such use has arisen, and pay little attention to the factors that influence resource use. Coomes (1995) has shown how such work often presents a static, even timeless, quality to depictions of contemporary extractive activities. This literature commonly disregards the fact that some resources, and the knowledge that goes along with their use, are constantly being created, altered, and lost. Little attention is paid to how these social, historical, and environmental factors affect these changes.

Few works of IK consider the full range of forest resources used by a people. Most are content with reducing their scope of analysis to a small number of economically important subsistence species. While this has the advantage of giving substantial detail to the use and knowledge of a few reportedly important subsistence species, the drawback is that it often restricts the many other contexts in which resources are utilized. Overlooked is the important socio-cultural utility, both material and cognitive, played by these resources in a people's everyday activities. The in-depth look at resource use that

follows, provides us with the details of the great variety of everyday subsistence activities that indigenous peoples engage in. Introduced are the commonplace cultural contexts that present themselves when subsistence activities, in their broadest sense, are undertaken.

The Algonquins of Barriere Lake occupy a rich and diverse natural environment containing many species of plants, animals, birds, and fish. These resources are central to the Algonquin way of life. No work has specifically addressed Algonquin subsistence except the recent harvest survey of Terry Tobias (1995), although there are several accounts which document the resource use of indigenous groups neighboring the Algonquins (e.g., Rogers, 1962; Feit, 1973; Scott, 1983, 1986, Winterhalder, 1978).

In the course of documenting Algonquin forest use, a number of subsistence or use categories have emerged. I have outlined the various ways in which forest resources are used by the Algonquins of Barriere Lake by placing them in one of the following categories: food, water, medicine, shelter, fuel, tools, craftwork, commodities, ritual materials, or toys and games.

5.1 Food

The importance of animals as a source of food for Algonquins cannot be over stated. Plants, however, are often overlooked as providing important and substantial food and drink for northern Aboriginal peoples. In reality, it is difficult to isolate completely

the various roles of animals and plants as foods, medicines, and materials in traditional Algonquin life. Many medicines are consumed, as infusions or decoctions[16], or chewed and swallowed in entirety, and would have some nutritional affect on the person taking them. Many beverages are consumed routinely, over long periods of time, and are thought to have medicinal properties, either for particular ailments or for the general maintenance of health. To the Algonquin people, food appears to be an important link between the environment and human health. A healthy environment can promote human health by providing nutritious food, while an unhealthy environment is thought to cause sickness, disease, and poor human health. It is often expressed by Algonquins that *all* traditional foods are medicines. They blame the present poor condition of the environment and their reliance on store bought foods for causing the growing health problems in their community. It is difficult, therefore, to draw a determined line between animals and plants used as foods and those used as medicines. This boundary has perhaps been rather arbitrarily drawn here but Algonquin knowledge of plants and their use has been taken into consideration in an attempt to place those plants which most closely fall into one category or the other. Foods can be defined as items providing nutrition to Algonquins on a regular basis. Animals and plants consumed by Algonquins, or drunk as a beverage at regular meal-time, have been placed in this category.

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16 Turner and Thompson [Turner, 1990:43] distinguish infusions and decoctions this way: "an infusion is made by steeping the medical raw material - leaves, roots, bark, etc. - in water, usually water which has been boiled, as in making tea. A decoction is made by boiling the material in water for a given period of time. The resulting solutions usually vary in strength depending on the length of time allowed for boiling or steeping or the proportion of the herbal material to water."

The dietary uses to which the Algonquin put resources in the study area are for the most part recorded in a single table detailing the quantity and value of each species harvested from the occupied territory in a one year period. This snap-shot of contemporary Algonquin resource use, as shown in Table 6, reveals that by far the most important resources are those used for food: 461 Algonquins in 77 households took over 60,000 kg. of edible meat from the land, or about 780 kg. for each household and 130 kg. for each person. This amounts to .36 kg of food for each person, every day of the year. On average each household harvested meat valued at $6,623 in a twelve month period(Tobias, 1995).

The most important food resources are moose, walleye, and beaver, together accounting for 48,227 kg. of food, or about 80% of all food resources harvested. Moose is the single most important resource: 173 moose were harvested over a two year period and provided almost 60% of all bush meat in 1993-1994. Nevertheless, lesser species, including small game, other fish, edible fur animals, and plants are important as sources of dietary variety and as food to tide over times when staple species are unavailable. These species are also very important to the transmission of socio-cultural and environmental knowledge through the community.

Môs (Moose, *Alces alces*), ***amak*** (Beaver, *Castor canadensis*), ***wâbôs*** (Snowshoe Hare, *Lepus americanus*), ***wôdjick*** (Muskrat, *Ondatra zibethica*), ***môkô*** (Black Bear, *Ursus americanus*) and ***pijiw*** (Lynx, *Lynx canidensis*) are all species that are still regularly hunted or trapped for food. ***Adik*** (Caribou, *Rangifer tarandus*) and ***wâwâckecî***

(Whitetail Deer, *Odocoileus verginianus*) are taken on an opportunistic basis; ***adik*** being found only occasionally in the extreme north of the territory, and ***wâwâckecî*** being taken more frequently to the south.

Amak (Beaver, *Castor canadensis*) is commonly eaten by Algonquins, used as bait to catch fur bearing animals, and on occasion is used as dog food. ***Kâk*** (Porcupine, *Erethizon dorsatum*), known by many older individuals to be very good to eat, are rarely eaten today. Traditionally ***kâk*** were said to be frequently eaten, however, because their numbers in the territory have been extremely low for many years this species has been almost entirely deleted form the diet. Algonquin individuals have been heard saying, "we are not used to eating them any more" or "we have lost our knowledge about them" when discussing porcupine as a food item. ***Kâk*** have only recently returned to the territory, and will, perhaps, gradually begin to be included in the Algonquin diet. In terms of knowledge formation, this will be an interesting species to follow. It will be intriguing to determine whether Algonquin knowledge about the porcupine increases along with this species expanding numbers.

Table 6. Harvest during one annual cycle -- September, 1993 to August, 1994 (adapted from Elias, 1996 and Tobias, 1995).

Harvest category	Numbers harvested	Edible weight (kg)	Proportion of total weight (%)	Dollar Value
Food species				
Moose	151	35,636	59.4	309,320
Walleye	7,262	7,486	12.5	81,987
Beaver	669	5,105	8.5	34,255
Main food species total	8,089	48,227	80.4	425,472
Snowshoe hare	2,358	2,004	3,3	10,421
Northern pike	882	1,893	3.2	14,216
Lake whitefish	1,779	1,690	2.8	12,574
Grouse	3,664	1,282	2.1	7,410
Black bear	11	1,045	1.7	10,199
Lake sturgeon	210	970	1.6	9,438
Duck	1,090	861	1.4	4,684
White-tailed deer	17	782	1.3	6,717
White sucker	539	566	0.9	3,209
Brook trout	821	337	0.6	3,397
Geese	59	126	0.2	636
Muskrat	114	73	0.1	517
Lynx	19	73	0.1	515
Burbot	40	51	0.1	289
Lake trout	46	29	0.1	292
Blueberries (baskets)	91	578		3,838
Maple syrup (litres)	134			1,163
Other food species total	11,874	12,360	19.5	89,515
Total Foods	19,963	60,587	99.9	514,987
Other subsistence goods				
Fuelwood (face cords)	1,013			47,783
Construction logs	499			12,475
Other subsistence goods total				60,258
Total value of all goods				**575,245**

Small mammals like ***tcacagwey*** (Chipmunk, *Tamias striatus*), mice, and shrew, are not eaten because they are thought of as "pests" which "live underground in holes with snakes." ***Cugucî*** (Weasels, *Mustela spp.*)and ***Cigak*** (Striped Skunk, *Mephitis mephitis*) are not eaten because they are said to "smell." Some individuals understand, from external sources, that skunk can be eaten and may actually taste good, as long as care is taken not to cut the scent gland. While ***cugucî*** may have been eaten in emergencies, to my knowledge no Algonquin has ever attempted to eat skunk.

Both species of ***pine*** (grouse: Ruffed Grouse, *Bonasa umbellus*, and Spruce Grouse, *Canachotes canadensis*) are commonly hunted and consumed by Algonquins. ***Wâpise*** (Ptarmigan, *Lagopus spp.*) in certain very cold winters move south of their normal range and into the Algonquin territory. They have been seen and killed on occasion, but this occurrence is rather rare.

Most duck species found in the land-use area are also eaten by Algonquins. Both ***nika*** (Canada Goose, *Branta canadensis*) and the Snow Goose (*Chen caerulescens*) are also commonly sought by Algonquins during their brief stop-over during migration. Most species of owl have been opportunistically hunted for food and are said to taste very good. Immature ***kîyâck*** (gulls, *Larus spp.*) and ***odjîgîyâck*** (terns, *Sterna, spp.*) were said to have been traditionally eaten but are not eaten today. One individual spoke of eating ***pâpâse*** (woodpeckers of various species), this being confirmed by several other Algonquins. In this case, individual experimentation was the driving force for such

consumption and, to my knowledge, no other Algonquins have eaten woodpeckers recently.

Passerine birds are not eaten but may have been in emergencies. Adult mergansers, gulls, and terns are not eaten because they are said to taste fishy, but may have been eaten in extreme emergencies. The eggs of these species, however, were once commonly eaten and today are taken only opportunistically. ***Âde*** (Crows, *Corvus brachyrhynchos*) and ***kâkâgî*** (Ravens, *Corvus corax*) are not eaten and are said to be strongly avoided. This forbearance has been explained as being due to poor taste as well as the very strong spiritual characteristics given these birds.

All insects, reptiles, amphibians, and bats - in other words all ***mendjôc*** - are not eaten and are actually avoided. Very recently a few young adults have collected, prepared, and eaten frogs legs, but I was assured that this would never have occurred in the past. The knowledge of this practice was acknowledged to have come from external sources of Quebec tradition. A few elders spoke of eating ***makinâk*** (Snapping Turtle, *Chelydra serpentina*) as adults. It does not appear that this practice of making ***makinâk*** soup was wide spread. I have heard of no instances of Algonquins eating ***makinâk*** recently.

The types of fish that are eaten by Algonquins can be seen in Table 6. Species like the sucker are mostly eaten by Algonquins in the spring because they are easy to catch during the spawn. Northern pike are avoided in the summer because, as stated

before, they taste fishy and are said to make one sleepy. Many species of small fish are used for bait minnows but are not eaten.

The importance of plant foods in the traditional diet of the Algonquins of Barriere Lake is made evident by the fact that no less than 44 plants were found to be utilized in some way as a source of food, flavorings, or beverages. Fruits and berries are the most prominent use of plants for food by the ABL. Twenty-two species of plants fall in this category, of which ***minâdjîciwâtik*** (Blueberry, *Vaccinium, spp.*) and ***miskominânâtik*** (Raspberry, *Rubus spp.*) are but two examples. Seven species of plant have been documented as used by the ABL for beverages. Most beverages are used in the form of tea, for example: ***misebak*** (Labrador Tea, *Ledum groenlandicum*), mint (*Mentha arvensis)*, and ***asiswaymenâtik*** *(*Raspberry, *Rubus idaeus*) all are made by steeping the fresh or dried plants in previously boiled water. Staghorn Sumac (*Phus typhina*), on the other hand, makes a refreshing drink by placing the red seeds in cold sugared water and stirring.

Ininâtik (Sugar Maple, *Acer saccharum*), as well as ***wigwâsâtik*** (White Birch, *Betula papyrifera*) and occasionally ***wînikis*** (Yellow Birch, *Betula, lutea*) and ***tciginemizî*** (Beech, *Fagus grandifolia*) trees are tapped for their sap which is used as a sweetener and/or confection. Algonquin families have traditionally operated sugar bush camps each spring for the production of maple syrup, molasses, and sugar blocks. ***Ininâtik*** sap is sometimes used to replace water, and sugar, when making tea or coffee, especially when water is not immediately available. In the spring of 1994, an unusually poor year for

sugar production, only two sugar bush camps were in operation producing slightly over 134 liters of maple syrup and about 20 sugar blocks.

The roots of two species of plant are eaten by Algonquins, ***beniobak*** (Goldthread, *Coptis groenlandica*) and Two-leaved Pepperroot (*Dentaria diphylla*). Five species are eaten as green vegetables (which includes stems, leaves, sprouts, shoots). One example of a vegetable species is ***akidimo*** (Yellow Pond Lily, *Nuphar officinale*), whose underwater tuber is collected, washed, and boiled like a potato. While this was once popular among Algonquins, the domestic potato has largely replaced the use of all traditional tuber species.

The nuts of ***pagânâtik*** (Beaked Hazelnut, *Corylus cornuta*) are collected by Algonquins and eaten raw or roasted. Traditionally these nuts were also said to be pounded into flour from which a kind of bread was made. The gum of both ***minihîk*** (White Spruce, *Picea glauca*) and ***sesegâdik*** (Black Spruce, *Picea mariana*) were once used as chewing substances. If chewed it is said to take away one's hunger. I have only observed one individual chewing the gum of White spruce, and this was for demonstration purposes. The inner bark (cambium and secondary phloem) of most plants are also said to have been eaten in the past as emergency foods.

A species of hops growing in only a few specific locations of the study area was used as a leavening agent in the making of bread. Wild potato plants grow in one location. These potatos were harvested in the past, but have not been harvested to my

knowledge since 1994, with the death of the elder who continually harvested them. A small number of fruit bearing trees and shrubs have been purposely introduced by transplanting and are harvested for food.

Aninâdik (Balsam fir, *Abies balsamea*) is often used in the preparation of smoking meat and fish. ***Âskimôwânân*** (Common bearberry, *Arctostaphylos uva-ursi*) was traditionally used as tobacco but its use has been replaced by commercial tobacco products. Still, this plant is used on occasions when commercial tobacco products are unavailable for extended periods of time.

Interestingly, the Algonquins consider that types of food consumed by animals influence how or whether these animals will in turn be utilized as food by humans. An important part of Algonquin knowledge and belief is the observed and perceived associations between various plants and animals. Many of these associations have their origin in mythology; others are observed dietary relationships, and still others include pharmicophagia (the deliberate use of plants by animals for medicinal purposes).

Over 43 plant species have been found to be consumed by animals for specific medicinal purposes, according to Algonquins (see Table 7, for some examples). This list is only preliminary and I believe represents only a fraction of the total number of plants that Algonquins understand as having specific dietary or medicinal relationships with animals.

Table 7. Some examples of animals using plants for medicinal purposes.

Genus and Species	Common Name	Algonquin Name	Animal	Purpose
Abies balsamea	Balsam Fir	*Aninâdik*	Moose	Wounds, sickness.
Abies balsamea	Balsam Fir	*Aninâdik*	Beaver	Control body temperature.
Acer pensylvanicum	Striped Maple		Moose	Broken bones, sickness.
Nuphar variegatum, advena	Yellow Pond Lily	*Cikitebak, Akidimô*(the tuber)	Beaver	Lung capacity.
Nuphar variegatum, advena	Yellow Pond Lily	*Cikitebak, Akidimô* (the tuber)	Moose	Lung capacity.
Picea glauca	White Spruce	*Minihîk, Minahîk*	Black Bear	Helps bears through hibernation.
Picea mariana	Black Spruce	*Sesegâdik*	Moose	General health and prepare females for giving birth.
Populus tremuloides	Trembling Aspen	*Âzâdî*	Bear	Spring tonic, laxative, de-wormer.
Prunus pensylvanica	Pin Cherry	*Makidewigwâsâtik*	Beaver	To flush out the system.
Prunus pensylvanica	Pin Cherry	*Makidewigwâsâtik*	Moose	To flush out the system.
Sorbus (americana, decora)	Mountain-Ash spp.	*Mokominâtik*	Black Bear	Suppresses appetite and helps bear through hibernation.
Taxus canadensis	Canadian Yew	*Kagakiacik, Kâgâgiyojik*	Moose	Wounds and cuts, disinfectant. Aid during labour. Helps mother have an easier birth, also helps baby remain strong during labour.
Thuja occidentalis	Eastern White Cedar	*Kîckâtik, Kîjik*	Moose	Disinfects wounds.
Thuja occidentalis	Eastern White Cedar	*Kîckâtik, Kîjik*	Black Bear	Helps bears through hibernation.

I have documented 15 terms used by the ABL when discussing parts of plants eaten by animals. Table 8 shows the plant part name in English, its Algonquin translation, and English gloss. Moose, for example are known to eat the ***odikwân*** main branch, ***odikwânic*** secondary branch, and ***onaquâtik*** new seasonal growth on branches. They are

also known to eat the ***nibîc*** leaves of deciduous trees, and the ***cagâbî*** needles of coniferous trees. Porcupine are known to eat the ***onagek*** or ***ocegâ*** which is bark of most deciduous trees other than White Birch. Birds are observed to eat ***onâkâkok*** buds, and ***odjickwedjoc*** cones (squirrels eat mushrooms which is also ***odjickwedjoc*** in Algonquin). Insects are known by Algonquins to eat ***odibî*** roots, ***mitik*** wood, and ***odjîbak*** which is described as the area of the tree where the roots grow from (not acurately translated as stump in English), while mice are said to eat the seed heads of ***mîgick*** grass.

Table 8. Algonquin names for parts of plants eaten by animals and their English gloss.

Parts in English	Algonquin Name for Part	English Gloss
Branches	*Odikwân*	Branch (main branch).
	Odikwânic	Twig (secondary branch).
	Onaqwâtik	Twig (new growth).
Bark	*Onagek*	Bark (outer bark on trees other than birches, e.g., elm, maple).
	Wigwas	Bark (outer paper-like layer of birch).
	Pîtocqweyâ	Bark (layered bark, as in white birch).
	Ocegâ	Bark (inner or smooth bark, ex. poplar).
	Onâkâkok	Buds (verb for browse = *onîmikoke*).
Leaves	*Nibîc*	Leaves (as in deciduous).
Needles	*Cagâbî*	Needles (as in conifers).
Cone	*Odjickwedjoc*	Cone.
Grass	*Mîgick*	Grass.
Root	*Odibî*	Roots.
Trunk	*Mitik*	Wood.
Stump	*Odjîbak*	Stump (where roots and tree grow from, actually below the stump).

Pharmicophagia is just beginning to be investigated by "Western" scientists and little information or knowledge is available on this subject.[17] The Algonquins of Barriere Lake through their intimate contact and observation of local wildlife, view not only food but specific medicinal plants -- some of which are essential to certain species in specific seasons -- to be extremely important not only to the long-term health of wildlife populations, but also to that of humans.

This summary of flora and fauna items utilized as food shows the importance of context because utilization patterns have changed due to social, historical, and environmental factors.

5.2 Water

Water is in such great abundance in the Canadian boreal forest that it is often overlooked as an important resource for indigenous people. Spring water is the preferred drinking water for most Algonquins. A near-by source of spring water is often a consideration in choosing a cabin site.

Water is always included as an ingredient in medicinal concoctions. Most Algonquins prefer to collect aquatic medicinal plants from lakes and rivers that are unaffected by shifting water levels caused by hydro dams. The medicine from these

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[17] Personal communication, Tim Johns, McGill University.

"natural" lakes and rivers is said to be more healthy, and therefore, more powerful. According to the ABL, animals seek out particular parts of streams for medicinal purposes. For example, cedar is recognized by Algonquin healers as a cure for human wounds. Injured moose are known to search for streams which flow through the roots of cedar groves. The trees are said to release some of their medicinal properties into the water, which animals drink to gain the beneficial effects. Algonquins use these streams in much the same way as moose do.

Many families keep two tubs of water in their bush cabins, one of lake water for washing, and another of spring water for drinking. Water in the form of ice is used to preserve comestibles. Some Algonquin families have kept ice houses for the summer preservation of food. Ice blocks are cut from the lake in winter with chain saws and are stored in pits insulated under saw dust. This ice is used all summer to keep meat and vegetables from spoiling in the hot summer months. Today, electric and propane refrigerators are used, even sometimes in camps.

Water is also used for ritual purposes. Various forms of ritual are performed by Algonquins to restore or maintain the right relations between humans and other parts of the ecosystem. For example, water is poured over hot rocks to create steam during a ritual sweat. Some individuals and families have a tradition of walking from their cabin to a near-by spring early Easter Sunday morning to drink and wash. The liminal seasons, where water turns to ice and ice turns to water, are also spiritually important periods for Algonquins. Here, travel can be restricted and dangerous. Attempts to regulate these

dangerous periods of the year are maintained by activities of ritual feasting. As we can see water is a very important resource to the ABL, and in their view, care and respect must be granted to ensure its continued power, purity, and abundance.

Water is also considered an important travel corridor, and constitutes an integral part the habitats of all plants and animals. With increasing incidences of hydro-development projects, acid rain, airborne pollution and global warming, close attention to water as an important resource will become increasingly necessary.

This summary of the various uses of water shows the importance of context because of the diverse uses to which water is put, including changes in the state of water from liquid to ice.

5.3 Medicine

This section outlines plant, animals, and "inanimate[18]" objects that are used by the ABL as medicines. Medicinal plants comprise the greatest proportion of plant species used by the ABL. At least 104 species in this preliminary study were found to be used in some way as a herbal medicine for physical illnesses and injuries or for the maintenance of good health.[19] Many other plants exist which are used as charms and medicines for spiritual strengthening, denunciation, protection and purification. Although several

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[18] The inanimate category as explained earlier (see page 76) is not synonymous to Western notions of animate/inanimate.

[19] For specific details see (Nickels, 1995b, vol. I: 3-24 to 3-34, and vol. II, Appendix 16).

Algonquin experts have maintained their knowledge and use of medicinal plants, and though some remedies have remained popular for each Algonquin family, for many, the desire to use traditional medicines has been somewhat of a revival. This revival is due, in part, to the abundance of contemporary health problems among Algonquins and the seeming inability of modern science to cure them. Well over 80% of all households picked, prepared, or used medicines made from local plants during the 1993-1994 study period (Nickels, 1995b; Tobias, 1995). No dollar value has been attributed to the use of traditional medicines.

The categories of herbal medicines discussed by the Algonquins have been found to fall into one of these categories:

- tonics and general medicines
- purgatives, laxatives, emetics
- medicines for colds, coughs, tuberculosis, influenza, and general respiratory ailments
- poultices, salves or washes for wounds, infections, burns, sores
- medicines for arthritis and/or rheumatism and/or muscular aches and pains
- medicines for kidney and urinary ailments
- medicines for venereal diseases
- eye medicines; medicines for stomach and digestive tract
- medicines specifically for women (especially childbirth or menstruation)

- medicines for cancer
- medicines for circulatory system
- medicines for diabetes
- miscellaneous or unspecified medicines.

The species used in each of these categories are too numerous to include in this section. Also, medicines are often not only used as medicines. For example, beverages can, and are, often consumed by Algonquins as both a food and a medicine.

Many different parts of plants are used in herbal medicine preparation. These plant parts are outlined as follows: whole plants (including stems, leaves, branches); leaves; roots; bark, outer; bark, inner (phloem); sap/gum/pitch; flowers; fruits; cones; fungi, including spores; ashes of plants.

Methods for administering herbal remedies vary depending on the nature of the illness. Decoctions and infusions - variously called ***mickîkîabo***, "medicine water", and ***ânibîcabo***, "leaf water" (tea) - are by far the most prevalent type of remedies. These are used for most tonics, purgatives, laxatives, and emetics, medicines for colds and respiratory ailments, kidney and urinary medicines, stomach medicines, and medicines specifically for women. These decoctions and infusions are drunk by patients in varying dosages, continued over periods of days or even weeks. Sometimes parts of the plants, such as roots and fruit are eaten or chewed for ailments. External applications such as

cuts, scrapes, burns and even some eye ailments, are usually treated by poultices made from crushed plant parts which are mixed with water, tree sap or fat. Dermatological disorders such as rashes or dandruff are treated with powders made from dry crushed plants, or external washes made from infusions and decoctions. Inhaling the steam from decoctions or infusions are common methods for treating colds, and respiratory problems. Spores from dried puffball mushrooms (*Sceroderma spp.*) are sniffed to stop nose bleeding. Arthritis, rheumatism and muscular aches are often treated by soaking or washing limbs in decoctions or infusions. Protective air fresheners are made by either burning parts of plants, or boiling plants in a decoction and allowing the smoke or steam to fill the house, cabin or tent.

I have observed many medicinal plants stored in canvas bags or glass jars for long periods of time. Many people keep those parts of plants that are conducive to long-term storage around the house or camp in case they are needed. ***Aninâdik*** (balsam fir, *Abies balsamea*) gum, for example -- used to heal deep wounds -- is often cut from the tree without piercing the outer bark pocket. These intact gum "bubbles" are then stored in paper or plastic bags for many months until needed. I have also observed ***wikas*** (sweet flag, *Acornus calamus*) used for colds, heart disease, childbirth and menopause, stored in a canvas bag for well over a year. Other plants, because of their inability to be stored, require that they be fresh picked for immediate use. This is the reason Algonquins say there are so many different types of plants with the same purpose. Some plants, or their parts, are only available and/or recognizable during certain seasons of the year, therefore,

one has to be able to recognize and locate a variety of plants for the same ailment which can afflict a person in various seasons.

Algonquins keep track of the locations of medicinal plants, even in winter. Many plants, like moss, are found under the snow by sticking a spruce pole down through the snow and sampling a wide area. Such detection is made possible because plants will stick to the rough bark of the spruce pole and traces are visible when the pole is retrieved from the snow.

Medicines are gathered and prepared with care and respect for the plants being used. Even those used routinely, such as ***aninâdik*** gum for skin cuts, were gathered and prepared taking care not to pierce or cut too many sap pockets from the same tree. Most Algonquin experts on medicinal plants note that to be most effective, plant medicines should be gathered far from human habitation and preferably from undisturbed forests. Plants taken from these sites are said to be more powerful and efficient in treating the ailment in question. Although some medicinal plants were picked from cut-over forests, burned sites, and road-sides, these plants were for demonstration purposes and were never observed to be administered for medicinal purposes. Plants administered for medicinal purposes were always gathered from undisturbed sites.

Little research has been done to isolate the active ingredients of medicinal plants used by Canada's Aboriginal peoples. Clause et al. (1970) believe that there is little doubt that many, and probably most, of these medicinal plants do contain drugs that are

pharmacologically active. Steedman (1930), points out that 30 of the 160 genera in her list of plants from the Thompson Indians in British Columbia were being used medicinally in contemporary "western" society.

Eight mammals are used for various medicinal purposes most of which fall into the following categories: pain; eye problems; toothaches; wounds, cuts; coughs; heart trouble; birth; cancer; vaccination; insecticide; and for general health. For example, ***wodjick*** (Muskrat) fat is spread on the skin to reduce muscular pain, and human breast milk is placed into the eye to reduce pain caused by snow blindness, conjunctivitis, and general itchy eyes. The blood spot on the liver of ***esiban*** (Raccoon) is placed directly in the eye for various eye problems. Castor oil from ***amak*** (Beaver) is used to combat cancer, to dull the pain of a toothache, to stop the bleeding of a miscarriage, to combat hypothermia, and to help pull porcupine quills and wood slivers out of the skin. ***Moko*** (Black Bear) fat is spread on wounds and burns to prevent blisters, and a tea made from ***kâk*** (Porcupine) quills is used for people with a weak or fluttering heart. It is understood that ***cigâk*** (Striped Skunk) has certain properties which act as a vaccine against various illnesses. A drop of oil from the scent gland is placed on a spoonful of sugar and eaten, or boiled in a pot of water allowing the stream (and smell) to fill a cabin. These procedures are used to prevent the contraction of disease that other humans may carry. ***Akôkadjîc*** (Woodchuck) grease and a living ***pabagomakîc*** (Eastern American Toad, *Bufo americanus*) is rubbed on the skin as an insect repellent against biting mosquitoes and flies. The gut of ***môs*** (Moose) is believed to be particularly healthy because this is where

nutrients are concentrated through the process of digestion. This part of the moose is sought by Algonquin women that are pregnant. One species of mollusk is also used for medicinal purposes by the ABL. ***Alôs*** (fresh water clam, spp.) is used as a deewormer and to combat diarrhea.

Spring water, is the preferred drinking water of the ABL because it is thought to promote general health as well as combating constipation. Spring water is considered an ingredient in many medicinal concoctions. If eight ingredients are needed to make a particular medicine and water is used in the preparation, water will be included as one of the eight ingredients.

Ashes from an outdoor fire are spread on oozing boils to help them dry and disappear. Some may use the term "inanimate" for these objects, although it is important to realize that these objects are not necessarily thought of as inanimate in Algonquin language and perception but may, in fact, be animate, possessing a spirit or a soul.

This summary of flora and fauna items utilized as medicine shows the importance of context because the utilization of specific flora and fauna items is multifaceted, depending on the changing needs and experiences of Algonquins.

5.4 Shelter

Not much is known about the historical chronology of changes in the types of shelters used by the ABL and in the materials used to make them. The classification of occupancy sites by Algonquins place more emphasis on the duration and purpose of the site than the kinds of structures erected. Algonquins do, however, distinguish between structures themselves, according to shape and/or material used. For example, a canvas tent is ***nigâsimon***, a tent-cabin is ***wâkâhigan*** ("that which is walled around"), a tipiform lodge is ***pikogân***, and ***cigôbîmîgiwâm*** is a temporary dome shaped brush structure. Both these words have taken on the contemporary meaning of "house" or "home", and are used to signify a log cabin or frame house.

The original summer shelters (***pikogân***) would have been covered by birch bark, or perhaps hide, in single peak tipiform style. Large birch bark sheets were sewn together with spruce or cedar roots. ***Pikogân***, appears to refer to the shape of the structure rather than the materials used (*cf.* ***pikwa*** - a single point or hump, as in ***pikwadina***, "mountain"). At least two ***pikogân*** have been built by community members since 1988 and used for wedding ceremonies. About twelve feet in diameter at the base, these ***pikogân*** are tipiform, made from birch bark over wooden poles. Cedar bark is used as flooring placed around a central fire pit ringed with stones. These structures have been maintained for several years.

Traditional temporary winter camping shelters of conifer brush over a dome-shaped pole frame are called ***cigôbîmîgiwâm***. Algonquin elders remember and are capable of constructing these structures, but they are not in common use today. The ***cigôbî*** prefix of this word describes the use of conifer brush in the fabrication of this structure, while the ***mîgiwâm*** suffix appears to be the usual ABL term for "house" or "home." Today, this word is regularly applied to both log cabins in the bush and frame houses on the reserve, but does not specify shape or materials.

In winter, birch bark breaks when peeled from the tree and is also brittle in cold weather. It is for this reason that ***aninâdik*** (Balsam Fir, *Abies balsamea*) and spruce branches are place against a frame of poles to make the structures walls. Spruce branches are usually placed towards the outside of the shelter while fir branches placed towards the inside of the structure. ***Aninâtdik*** needles are preferred for the inside wall surface because they are less abrasive, finer, and thus, warmer than other conifer branches. Poles are then laid from the outside over the conifer branch tent cover to keep it in place. Finally, snow is packed over this wall to complete the structure. Lean-to's, constructed in a similar fashion were also used as a temporary shelter.

Canvas tents were introduced at some point in the second half of the 19th century and quickly replaced other types of structures. The material could be obtained from the Hudson's Bay Company posts, and were sewn by women. All middle-aged people in Rapid Lake remember living in canvas tents, at least seasonally. The word ***nigâsimon*** ("tent") refers to the canvas material, not the shape of the structure. ***Wâkâhigan*** ("that

which is walled around") is the term people now give for a log-cribbed tent-cabin, but might well have been used in the past for any walled structure, including cabins. This is the typical structure used today by most Algonquins at the spring sugar bush.

Algonquins did not likely have the tools to make substantial log cabins until early this century, but by then, most families possessed a cabin as a kind of "headquarters" in their trapping territory. It is from this central cabin site that men started laying out their trap lines. These cabins were built from round logs with the bark left on so that the moss or oiled cotton chinking (often cotton mattress filling) could easily be stuffed and held in place between the cracks. The floor, made of boards, was raised above the ground about 2 feet by stones used as a foundation. In some cabins and frame structures, birch bark sheets were nailed to the inner walls to improve insulation. The walls were most likely made from locally available trees, commonly, ***minihîk*** (White Spruce, *Picea glauca*), ***sesegâdik*** (Black Spruce, *Picea mariana*), ***okik*** (Jackpine, *Pinus banksiana*), and ***micikîwâtik*** (American Larch, *Larix larcina*). Older cabins were often made with double-sided notching without scribing. Cabins with the bark left on the logs and double sided notching were quickly built but deteriorated rapidly, needing to be replaced every 1 to 2 years. The roof consisted of poles fastened at one end at the ridge pole and the other overhanging the outer walls. These roof poles were covered with overlapping sheets of birch bark held in place by sand, or poles, which were placed on top (Bechmann-Khara, n.d.).

A second type of roof was also used by the ABL until the 1970s (*ibid.*). This roof consisted of hollow logs, split in half, lengthwise. The logs were laid over the roof lengthwise, side-by-side, fastened at the ridge. The hollow inner side was turned skyward and another layer of hollow logs were placed parallel over these with the hollow side facing down. In this way, the upper log covered the space between two lower logs, making the roof impermeable to rain. Cedar logs were used for this purpose because they are hollow from top to bottom.

Cabins were likely of various sizes but on average may have measured 8 feet by 9 feet with heights of 8 feet or less. Cabins had only one room, as most do today. The social intrusions of non-Algonquins had great influence on the type of materials made available and the subsequent construction and location of shelters. Early cabins likely had only one or two glass windows, which were either obtained from the HBC or recycled from vacant cabins. At the early Barriere community, families whose house sites were flooded by the construction of a dam in 1929 were compensated with boards, not logs, to build new houses (HBCA).

Today, most Algonquins maintain a frame house in Rapid Lake and one or more cabins in the bush. In 1993-1994, 500 pine and spruce logs were used to build new bush cabins and several other buildings (Tobias, 1995). When constructing contemporary cabins, the bark is now peeled from the trees. Cabins are built slowly but are expected to last many years. Most cabins are now built in the Quebec style, using up-right corner logs to which the walls are attached. Rarely does one see a cabin with corner scribing

and notching. Many species of tree are used in cabin construction, depending on local availability and possibility of transport. The most common species of tree used today for log cabins are: white and black spruce, Jackpine and even larch. Several species of tree have particular qualities of wood that make them suitable for specific purposes in cabin construction. For example, because larch is fairly rot resistant, it is often used for foundation logs. Pine, being stronger that spruce is often used for door and window frames. Today, because windows and glass are easily obtainable, cabins often have several windows.

This summary of the flora and fauna items utilized for shelter shows the importance of context because utilization patterns have been modified over time due to environmental changes, fluctuation in social activities, and outside intrusion.

5.5 Fuel

The ABL traditionally used only wood, and some animal grease for fuel (cooking and heating). Today diesel fuel runs the generator in Rapid Lake which provides the electricity for lighting and cooking, and in most cases, the heating of homes. Many houses in the community supplement their electric heating needs with wood. Outside Rapid Lake, although gasoline generators are beginning to be used to provide electricity for lights, the majority of cooking and heating needs are satisfied by wood cut from the surrounding forests.

An estimated 1,013 face chords of fuelwood were cut from the study area between September of 1993 and August of 1994 (Tobias, 1995). On average, each household at Rapid Lake burned 10.5 face cords of green and dry fuelwood, mostly birch. For every unit of drywood used it has been appraised that 3.6 units of greenwood have been burned (Tobias, 1995, v1, section 6.4). The total value of wood as fuel was almost $48,000 (ibid. v1:1).

The ABL knowledge of specific qualities of wood for fuel is immense. The ABL also have a detailed vocabulary for speaking about wood and techniques for converting forest resources into fuel. A ***mitik*** (tree, ***mitegôk***, plural) is converted to many ***micî*** (blocks of wood) by the act of ***tâckahise*** (splitting).

The ideal technique for ***sakahân*** (light a fire) in a ***pôdawân*** (fireplace, stove, or space heater) is to begin with ***wigwâs*** (birch bark). Most Algonquins collect ***wigwâs***, the fire starter of choice, because it has good burning qualities, is readily available, and costs nothing. Newspapers, paper bags, and anything that burns easily is also used if ***wigwâs*** is unavailable. ***Pîgabôjigan*** (splinters of wood left after splitting or carving wood) are sometimes placed over ***wigwâs*** when building a fire.

Pâtemicî (dry-wood, usually Jackpine or spruce) is the fuel of choice to place directly over ***wigwâs*** and/or ***pîgabôjigan***, especially starting a fresh fire when the stove is cold. ***Pâtemicî*** is also used to get a sluggish fire going, and when high heat is required. ***Minihîk*** (white spruce, *Picea glauca*), ***sesegâdik*** (black spruce, *Picea mariana*) and ***okik***

(jack pine, *Pinus banksiana*) burn quickly and hot and are, therefore, the preferred types of wood to use when starting a fire or, rejuvenating a sluggish one.

Micî (freshly cut wood, not dried) is used most often during the day and especially at night to "keep the fire going". ***Wînikis*** (yellow birch, *Betula alleghsniensis*), ***wigwâsâtik*** (white birch, *Betula papyrifera*), ***inanâtik*** (maple, *Acer spp.*) and lastly, ***Âzâdî*** (trembling aspen, *Populus tremuloides*) are the preferred woods to burn during the day and at night in either the round or split forms. Poplar is noted as being less efficient for burning than the other hard woods. Hard woods burn clean, slow, and evenly while producing good heat. These types of wood can keep a cabin warm while decreasing the time necessary to tend the fire. They are, thus, good choices for late night burning while house residents sleep, or if residents must leave the cabin -- but keep it warm -- for long periods of time. Hardwoods are also burned, usually in the round as night time burning logs. Other species of tree are used as fuel by the ABL if the above species are not readily available

Micî is burned more often than ***pâtemicî*** simply because of its slow burning qualities and because it takes space and time to dry wood. The exact permutations and combinations of species and quality of wood used for fuel depends upon such things as climate, availability, number and age of people using cabin (babies and elderly often require more heat), and activities (e.g., cooking, sleeping, leaving cabin for a long period of time, etc.). Again, the context of individuals and their activities determines how wood gets collected and used.

Ôdjickwedjôc (a species of conk, *Fomes spp.*) was traditionally used to keep a fire going while traveling on the land base. This dense fungus, once lit on fire, smolders extremely slowly. It is a small and easily transportable item and its coals were used to start a new fire once a destination was reached.

This summary of flora and fauna items utilized as fuel shows the importance of context because utilization patterns change due to resource availability, fluctuations in social activities, seasonal changes, and outside intervention.

5.6 Tools

This section outlines the gear and tools used by the ABL. This section describes, in a general way,[20] the ABL uses of plants, mammals, birds, fish, and insects for utilitarian purposes.

5.6.1 Plants

Over 13 different species of plant in a preliminary investigation are found to be used by the ABL for tools. Most of these items are made out of either ***mitegôk*** ("trees"), or ***âkî*** ("earth"). In Algonquin, ***mitik*** (***mitegôk***, plural) has two meanings: "tree" and "wood". When used as "tree" ***mitik*** is employed in the animate gender, when used as "wood" the inanimate gender is employed. Generally, different types of trees and their

various stages of development (e.g. ***angwâsak***, driftwood, ***pâtesak***, standing dead-wood, and ***mitik***, living tree) become ***wicî*** or ***podwe*** (wood cut into blocks for firewood) through the process of ***tâcakîse*** (to split wood). Wood from trees to be fashioned into particular useful items such as canoes or snowshoes are given particular names to express the purpose. For example, ***pasehige*** is used when a tree is transformed into wood for the making of a canoe, and ***pasâgime*** is used when a tree is converted to wood for the making of snowshoes.

Men were usually responsible for working with "wood," whereas women usually worked with "bark" or fibrous materials. Today, although this holds for-the-most-part, men have occasionally been seen working with both wood and bark materials, but usually with the intention of selling the items made.

All tree species are said to be necessary and useful to the ABL, each fulfilling a specific function or purpose. A few tree species, because of their wide-ranging usefulness, limited supply, and sensitivity to disruption, have recently been given special attention by the ABL. White birch (*Betula papyrifera*), eastern white cedar (*Tujia occidentalis*), ash (*Fraxinus spp.*), and to a lesser extent american larch (*Larix larcina*) are all designated by the ABL as specialty woods. Areas necessary to the survival of these specialty woods have been outlined in the Sensitive Area Study maps from research conducted under the Trilateral Agreement.

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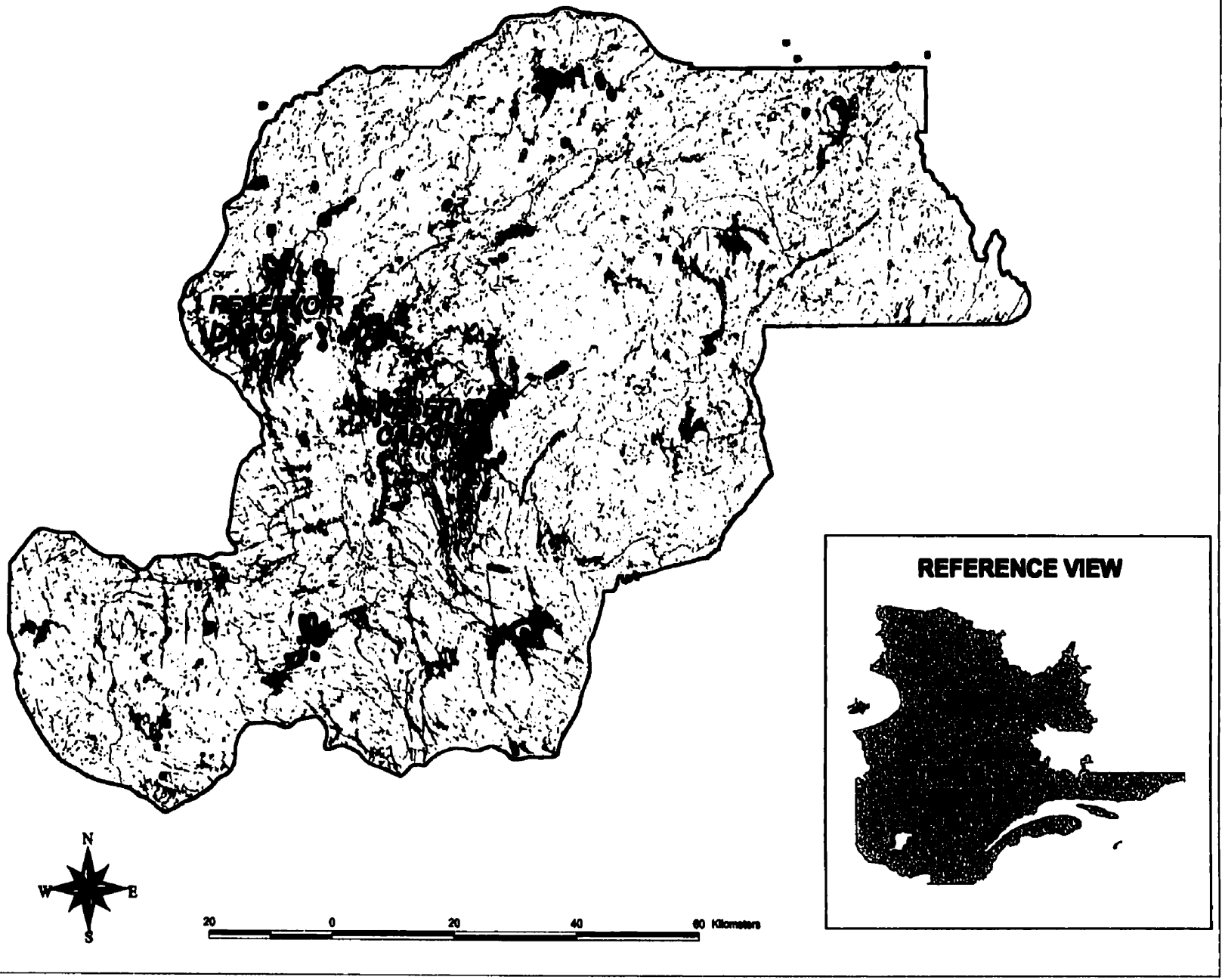
[20] Little information exists on artifacts and technologies of the Algonquins of Barriere Lake. For information on traditional canoes and canoe building see (Gidmark, 1985, 1988).

Figure 3. Algonquins of Barriere Lake territory and specialty wood areas



The criterion used to designate certain tree species as special has to do with their characteristics, quality, use, and abundance. Quality trees are those that display not only the characteristics adequate for Algonquin use but also for the purposes of other plants and animals. Many Algonquins consider the same indicators of tree quality for utilitarian purposes as indicators of forest health. A forest stand with many good quality trees (using Algonquin criteria) is considered to be healthier than a stand with few high quality trees. Forests with trees of this quality, and by extension, health, will be able to withstand wind, erosion, insect infestations, and provide a better re-seeding environment, as well as higher quality food and shelter for animals. Although there maybe ample representatives of specialty wood species, today, fewer and fewer representatives of those species display good quality and are believed to require immediate protection.

The principles used for finding high quality specialty trees for Algonquin utilitarian purposes is similar for all species. It is necessary to locate trees in a healthy undisturbed forest, usually in interior forests away from roads, cutting activity, flooding, clearings and with little insect damage. Trees near road-sides, cutting activity or clearings are exposed to winds which tend to twist trucks, break branches, create knots and make trees asymmetrical. When trees of this sort are cut and split down the middle, the grain rarely runs straight.

Algonquins search for trees of sufficient size, circumference, straightness of grain, and free of blemishes for the purpose at hand. Non-coppiced trees are often necessary for most purposes, and naturally seeded trees are preferred. Naturally seeded

trees are said by Algonquins to be much stronger than planted trees for two reasons. The first is because the seeds are said to come from the parent stock which has lived in the area and passes on its characteristics, knowledge, and experience to the next generation, much like Algonquins do with their children. The second is because naturally seeded trees are said to develop improved root systems to better nourish the tree than is the case with artificial stock.

A large number of tree species are used for making wood implements. Axe handles, for example, are perhaps the item most often fabricated into a tool by the ABL. ***Wînikis*** (yellow birch), ***wigwâsâtik*** (white birch), ***agamâk*** (ash), and ***kîckâtik*** (eastern white cedar) are all used to make axe handles. ***Winikis*** and ***agamâk*** are the preferred types of wood to use for this purpose but depending on availability, the other types of wood can also be used. ***Micikîwâtik*** (american larch, *Larix larcina*) has also been used if other types of wood are unavailable.

Many different species of tree are used in the construction of traditional birch bark canoes. For example, ***wigwâsâtik*** (white birch), is used for the outer skin covering of the canoe. ***Agamâk*** (ash), ***minihîk*** (white spruce), and ***kîckâtik*** (eastern white cedar) are all used for various parts in the canoes fabrication, while ***aninâdik*** (balsam fir) gum is used to caulk the seams of the birch bark (see also, Gidmark, 1985; 1988; 1994).

Choice trees are long and straight, free of knots and blemishes. Several elders and their young apprentices, interested in constructing traditional birch bark canoes, have

indicated a regional lack of good quality bark of appropriate size for this purpose. They remark that even in the past, finding good bark for canoes was not a simple but very time consuming job. A tree with all the right qualities was difficult to find, but one was always sure that an adequate tree for the purpose could eventually be found. Today, they say the job is much more difficult due to the increase in forest disturbance from roads, commercial logging, flooding, and insect infestation.

Agamâk (Ash, *Fraxinus spp.*), ***minihîk*** (White Spruce, *Picea glauca*), and ***kîckâtik*** (Eastern White Cedar, *Thuja occidentalis*) are all used by Algonquins to make canoe paddles. Paddles made with ***minihîk*** are generally used by females and youths because of their light construction. Different individuals design and make different sizes and shapes of canoe paddle depending on age, gender, and purpose.

Wînikis (Yellow Birch) and ***agamâk*** (Ash, *Fraxinus spp.*) are also used in the fabrication of snowshoes by Algonquins. Snowshoes to be used in the warmer winter months (ex. spring) when the snow is wet are made from ***wînikis***. This is because this wood retains it's rigidity when wet better than ***agamâk***, therefore, snowshoes made from agamâk are reserved for the cold winter months. The round trunks of ***mokominâtik*** (Mountain Ash, *Sorbus spp.*), because of its pliability, are often used to make make-shift bear-paw snowshoes, as well as snowshoes for children. Babishe is made from moose hide and is tightly strung between the snowshoes wooden frame. Moose hide was traditionally used to make snowshoe harnesses. Today many Algonquins buy their leather, lamp-wick, or rubber harnesses, but I have also seen all sorts of ropes or belts

being ingeniously employed by particular individuals when other harnesses were unavailable.

Wînikis (Yellow Birch), ***wigwâsâtik*** (White Birch), ***agamâk*** (Ash spp), and ***Micikîwâtik*** (American Larch) are all tree species used in the fabrication of winter sleighs. ***Wînikis***, ***wigwâsâtik***, and ***agamâk*** are used variously for the sleigh body while ***micikîwâtik*** is used specifically for the runners because of its durability. These sleighs used to be pulled behind dogs but today are occasionally seen pulled behind ski-doos. Commercially made metal, wood, and fiberglass sleighs are becoming more prevalent, but there is the growing possibility and interest by some Algonquins to manufacture and sell the wooden commodity to a small but growing outside specialty market.

Kîckâtik (Eastern White Cedar) trees are used to manufacture the ***tikanâgan*** (traditional Algonquin cradle board). Cradle boards are still in use today by most Algonquins. To make a cradle board, a Cedar tree must be felled and cut into pieces between 1 and 2 inch thick in a variety of sizes depending on the age and height of the child it is to be used for. Cedar is said to be used because it breathes while it is held against ones back, transferring the perspiration through the wood making it very comfortable. The wood also floats well in case a boat is capsized in water. Cedar for cradle boards has to be cut by a saw-mill, of which there is now one owned and operated by an ABL resident. A thin piece of ***agmâk*** (Ash spp), and occasionally ***ininâtik*** (Sugar Maple, *Acer spp.*) is used for the "bear-ear" headboard handle, affixed to the cradle, because it is easily steam bent. Traditionally, cradle boards were made of ***minihîk*** (White

Spruce) branches lashed together with leather to form a wood platform on which the cradle was lashed. Cedar, however, has been used for decades, if not more than a century, and is the preferred construction material today. Cedar cradle boards are sold to customers in various places around the Province of Quebec, but mostly in Quebec city. Prices vary depending on the size, detail, and fabric used.

Kîckâtik (Eastern White Cedar) is used as floats for fishing nets. The outer surface of the cedar floats are often burned because this prevents them from sticking to the ice. In winter, fishing nets are guided with a long wooden stick between numerous holes made in the ice. Beaver washes and lodge entrances are checked by Algonquin trappers using a ***wâgidâk***, a long curved stick perfectly adapted for this purpose.

The wood of many tree species are used by the ABL for making utensils. For example, at the sugar bush, a wedge made of ***wînikis*** (Yellow Birch) was traditionally placed into a slash made by an axe in a maple tree. This wedge caught the sap which flowed from the slash and caused it to drip into a sap collection container. Today metal taps and containers are used by most Algonquins, but still these traditional wedges can be seen in use. Spoons and stirring utensils are commonly fashioned out of various types of wood.

The outer bark of ***wîkobî*** (Leatherwood, *Dirca palustris*) and ***adopîâtik*** (Willow, *Salix spp.*) was traditionally shredded and used by the ABL as rope or string for various utilitarian purposes. The bark of ***kîckâtik*** (Eastern White Cedar, *Thuja occidentalis*) is

peeled and used as flooring in tents and traditional birch bark structures, while various forms of moss (*Sphagnum spp., Cladina spp.*) are used to wash out greasy pots and pans, as a toilet paper, as diapers or feminine pads for menstruation, and to chink the seems of log cabins.

Sheets of bark from the White Birch are put to many opportunistic uses by the ABL. These include: pads or seats to protect the head and posterior from the rain; to avoid chaffing of the head by a tumpline; to protect the hands from heavy articles; a quick drinking vessel; an improvised pipe, and many other purposes. The ***môzogadâgan***, or traditional Algonquin "moose-call" is made by folding bark into a funnel shape and sewn along one side with babiche or root. This is also commonly used by Algonquin hunters, as well as being sold to tourists. Birch bark is also the material used in the manufacture of Algonquin baskets and containers, but this use of the bark will be covered below in the section on Craftwork.

Common Horsetail (*Equisetum pratense*) is often used as an abrasive for scouring pots and pans and polishing wood or bone tools. ***Wisikebak*** (Sheep Laurel, *Kalmia angustifolia*) is rubbed on leather articles to be left in the bush for long periods of time because it prevents animals from eating it. This plant was traditionally used for leather traps that were placed in the bush to catch animals. It is interesting to note that Sheep Laurel is also commonly known to sheep farmers as "Lambkill" because it is poisonous to sheep which feed on its leaves. This plant is known by scientists to contain a

poisonous glucoside (Grieve, 1980) which might be responsible for animals avoiding eating leather articles rubbed with this plant.

Aninâdik (Balsam Fir, *Abies balsamea*) boughs are commonly placed into small metal pails and burned as a smudge against mosquitoes, black-flies and other biting insects. This tree is also used to smoke hides and meat, as a comfortable bedding on which to place a sleeping bag, as a door mat to prevent mud and dirt from entering a tent, and as a covering for picked berries to keep them cool and prevent spoiling. Large ***cigwâtik*** (White Pine, *Pinus strobus*) that stand well above the other trees on hill-sides are commonly used by the ABL as direction markers, or as cues for position and travel.

Few animal parts are used specifically as tools by the ABL. The various ways that mammals can be used by Algonquins can be categorized as follows: Hides for utility and decreased abrasion; fur for utility; meat for bait; fat (grease) to decrease friction; and bones for tools.

5.6.2 Animals

Moose hide babishe is used in the fabrication of snowshoes to increase floatation in deep snow. Hides of many kinds are used as gloves between hands and tool to decrease abrasion. Hide is also used between hands and hot fry pans to prevent burning the skin. The skins of ***môkô*** (Black Bear, *Ursus americanus*) are commonly used as mattresses and sleeping mats, and many types of wild meat and fat are used in the baiting

of traps, especially to catch fur bearing animals. The grease (fat) of many animals is often used in situations which require decreased friction, for example: door hinges, latches, and even between metal parts of trucks and ski-doos. The grease (fat) of ***môkô*** is also used in the process of tanning moose hides, while the fat of ***mos*** (Moose, *Alces alces*) was used in the past to seal and preserve fruit in jars or birch bark containers in a similar fashion as wax sealed jars. A particular bone of ***wâpicecî*** (Marten, *Martes ammericana*) was used traditionally as a needle when sewing with hides and fabric. ***Mos*** antlers are often used for knife or pot handles and toggle buttons, and at least two ingenious Algonquins have recently shaved down this material and glued it into dentures to replace broken false teeth.

Only two fish have been found to have utilitarian purposes, but certainly there were more uses for fish as tools long ago. A glue is made from ***name*** (Lake Sturgeon, *aclpenser fulvescens*) bladder and is used for various utilitarian purposes. ***Hâwâdosî*** (Lake Chub, *Couesius plumbeus*) is commonly used as bait to catch larger fish with rod and reel, especially walleye.

One species of insect was recorded as having a utilitarian purpose. Fire-Flies are used as a signal to Algonquins of the best time for hunting Lake Sturgeon. Algonquins say that hot, calm nights when the fire-flies are at their peak, lighting up the evening sky, are the best times to search for sturgeon with light and spear along the lake shore. Other environmental indicators are used by Algonquins, such those that signal the changing

seasons, but further study is necessary for a clear understanding of ABL environmental indicators. Certainly there are likely many more applications to which Algonquins put insects to use, for example in baiting fish.

This summary of flora and fauna items utilized as tools shows the importance of context because utilization patterns depend upon seasonality, availability, and social needs.

5.7 Craftwork

5.7.1 Plants

Many of the six species of plant that are used by the ABL for craftwork are similar in use to those same species sold commercially. These species are outlined here because the intended use of fabricated items is for the personal use of individual Algonquins. There is some overlap here, as items can be made for personal use, for ritualistic use, or even sold if the need for money arises.

Wigwâsâtik (White Birch) is undoubtedly the most widely used species of tree by the ABL. The Algonquins understand it is the qualities of this tree species which make it sought after by both the commercial forest industry and themselves. Algonquins say that quality White Birch trees are in limited supply, and require immediate protection. Quality tree are those that display the characteristics adequate for Algonquin birch bark

use. To find good bark it is necessary to locate trees in a healthy undisturbed forest, found in interior stands away from roads, cutting activity, flooding, clearings, fire, and with little insect damage. One searches for a tree with sufficient size and thickness of bark and without low-lying branches or blemishes. Non-coppiced trees are necessary if one is to find good bark; thus, trees that grow from seedlings are preferred for craftwork than trees that grow from previously cut stumps as suckers.

The thicker winter bark, which is collected after the second frost, is best for making large vessels. The thinner bark, collected in spring, summer and early fall, is best for smaller containers and tools. Bark for scratch-work designs and bark-biting designs are best collected in early spring, often before the first of May. This is when scratching the various layers of the inner bark gives the greatest contrast between light and dark colour, thus, making designs possible. This is also the period when the roots, used to fasten the bark, are near the surface of the soil and easy to collect.

A sample of the bark is usually taken to see if the bark is suitable for the purpose it is to be used for. Size, thickness, suppleness, texture, clarity of blemishes, and short lenticils are all important indicators of good bark, and thus, a healthy tree. Bark with short lenticils is superior than bark with long lenticils because it is easier to work with, does not crack and leaks less. The first and second (inner and outer) bark can be peeled without harming the tree. The growing cambium layer of the tree is uninjured when the bark is peeled and the tree will survive and eventually grow a second bark to cover the

area of removal. This secondary (inner) bark is much more textured and grainy, making it inadequate for many purposes.

To remove the bark from the tree, the tree is girdled twice, the first as high up the tree as can be reached, the second as low as will allow for unflawed material. These girdles, set as far apart as possible, are joined by a vertical incision. From this incision point, the bark is peeled from the tree, usually in a clockwise direction. Tools of various sorts, such as a small wooden paddle, a hatchet, a straight stick or by hand, are used as an aid in bark removal. If a knot or blemish is found where the bark is difficult to separate from the tree, the bark is pounded loose from the outside before attempting to pull it free. The bark is then fashioned with a knife into sheets suitable for the desired purpose.

Freshly peeled bark can be easily shaped and, once cut, can be used all summer as long if it is kept cool and in the shade so it remains workable. Aged bark, usually stored flat or in rolls must be softened with steam before shaping. Dry bark is difficult to punch holes into for stringing roots and simply cracks and is unusable. Dry bark can be restored somewhat and made workable by steaming or soaking in warm water, but it becomes more brittle afterwards. The inner side of the bark is usually turned to the outside for most construction purposes, and ***okik*** (Jack Pine, *Pinus banksiana),* ***minihîk*** (White Spruce, *Picea glauca*) , and ***sesegâdik*** (Black Spruce, *Picea mariana*) roots used to stitch the sheets together tightly. ***Atetatiminatik*** (Saskatoon, *Amelanchier spp.*), ***kickâtik*** (Eastern White Cedar, *Thuja occidentalis*), and sometimes Willow (Salix spp.), are used as the round edge on many baskets. The resin or pitch of ***cigwâtik*** (White Pine, *Pinus*

strobus) is also used by some Algonquins as a glue in the manufacture of certain baskets.[21]

Various sizes and shapes of bark baskets are made for specific purposes (see Table 9). The most commonly made basket today is the ***wigwemot*** (wigewemodâ). This is a squared or rectangular basket with side-sewn seams, a wood rim, and a bark lid. This type of basket was formerly used to store and transport household goods on the back with a tumpline but is now mainly used to store sewing and craft supplies, and as a lunch basket. ***Nibiciôc*** is a tea canister, the lid of which often has a floral motif. This is a smaller, upright version of the ***wigwemot***. A ***webinâsinâkik*** "garbage pail" or alternatively ***webâsiniyôc*** "a small, everyday thing used for garbage" is a taller, upright, undecorated version of the ***wigwemot***. It is usually sewn with a simple, vertical side seams instead of the elaborate folding, cutting, and sewing of the ***wigwemot***. Another simplified version of the ***wigwemot*** is the ***âtâsiwin***; this is a plain, quick to make, storage basket.

The ***piskitenâgan*** is the simplest basket made by the ABL. A rectangular piece of birch bark is bent and folded at each end like an envelope flap and the folded seams sewn together with babiche or root stitches and knots. This is an all purpose utility basket, used as a dish for eating, and formerly as a sap bucket which collects maple sap that drips from the tree. It is also used as an emergency basket because it is very simple and quick to make. These baskets are undecorated, and many variations exist.

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21 Joelen Mulvaney gives a good description of the use of white pine resin as glue [Mulvaney, 1991].

Table 9. Common Algonquin Birch bark basket types.

Algonquin Basket Name	Description of Use
Piskitenâgan	Traditionally used for cooking purposes as well as collecting maple sap. Also used as an emergency basket because it is very simple to make.
Wigwemot	Storage receptacle with lid. These are made to hang on cabin walls.
Âtobân	Four winged square bottom basket without lid.
Kokojôhonâgan	Called "Owl basket" because it resembles owls face and eyes. Used as maple sugar molds for making hard sugar blocks.
Nîbîcîoc	Lid with floral motif.

One such variation to the ***piskitenâgan*** is the ***wîgwâs emikwân***, which is a birch bark ladle or spoon,[22] and another is a simple bark drinking cup called ***minikwâgan***, or simply ***onâgan*** meaning "vessel." ***Âtobân*** is a square, shallow basket with winged flanges at the corners. The flanges result from sewing a wood rim to the sides, but not the corners, of a steam-bent rectangular piece of bark where the corners are folded together and lashed. This basket has a square bottom and no lid. Now made only as a craft object for sale, this basket was traditionally used as a water storage vessel or for storing and serving food. ***Kôkôkohôngân*** "owl dish" is another basket now made mostly for sale. In its construction, the sides of the piece of bark are bent up and the corners folded in

22 *Wīgwâs* "birch bark," *emikwân* "ladle/spoon." *Emikwân* is also commonly used as the word for wooden ladles and spoons.

towards each other to form four round sections. These four sections look to Algonquins like an owl's face when viewed from above. The sections are partly separated compartments used for food storage and food service. An emergency pipe, called a ***wîgwâsipâwigan*** "bark pipe," is made by rolling a small rectangle of birch bark into a cone shape and sewing the side together with babiche or root. The ***môzogadâgan***, or traditional Algonquin "moose-call", is commonly used by Algonquin hunters, as well as being sold to tourists.

Almost every house or cabin has at least one birch bark basket present and in use. Traditional scratch design-work on bark baskets are flowers for women and animals for men. Most bark-work that is scratch-decorated is now made for sale.

Algonquin women used to make ***misindjîge***, birch bark designs by folding squares of birch bark and biting it with the canine teeth. When the bark is unfolded, intricate symmetric patterns and floral designs are revealed in the dark second layer of bark. Young Algonquin girls were taught very precisely how to conduct such work and many of the patterns had specific names. Some of these designs were probably used as templates for scratch decoration on bark and bark baskets. Though some individuals remember and know how to perform this practice, it is probably the introduction of dentures and the early loss of teeth which brought an end to this type of craftwork.

Many plants other than ***wigwâsâtik*** are used by Algonquins for craftwork. For example, ***adôpîatik*** (Alder sp., *Acer spp.*) is used to produce an orange dye used in the traditional processing of moose and deer hides when such a colour is desired. Other plants are used to produce other colours, for example, ***makidewigwâsâtik*** (Pin Cherry, *Prunus pensylvanica*) is used to produce a red dye. ***Agamâk*** (Ash sp., *Fraxinus spp.*) are used to make traditional drums of various sizes and shapes. These drums are often used in traditional rituals or sold as a commodity. ***Agamâk*** is also used to make miniature replicas of snowshoes, complete with thread as babiche and leather harnesses. Pearly Everlasting (*Anaphale margaritacea*) flowers are dried and used to stuff pillows. The seed head of ***paswekânak*** (Common Cattail, *Typha latifolia*) is used to stuff not only pillows but large mattresses as well. Stems of ***cikitebak*** (Yellow Pond Lily, *Nuphar varegatum*, and Fragrant Water Lily, *Nymphaea odorata*) are made into neck-laces for children and the flowers often used for decoration.

5.7.2 Animals

Three species of mammal are used by the Algonquins of Barriere Lake in their craftwork. Many more mammals are likely used, in one form or another, for craftwork by the ABL, and further research would undoubtedly show this.

Mos (Moose, *Alces alces*) and ***wâwâckecî*** (Whitetailed Deer, *Odicoileus verginianus*) hides are used to make mukluks, moccasins, mittens, sacks, clothing (jackets, shirts, pants), tumplines, and babiche. The skin around the lower leg of moose is

used to make a traditional waterproof boot for both children and adults, and hide is fabricated into a boot for dogs to prevent their feet from being cut from the sharp, course crystals of late winter snow. The ears of the moose are made into purses to hold small miscellaneous articles. The fur and skin of ***wâbôs*** (Snowshoe Hare, *Lepus americanus*) is made into a warm blanket which was traditionally used in the cold winter months. At least one such blanket is still in use today. ***Wâbôs*** fur is also used to line moccasins. The skin and fur of ***môkô*** (Black Bear, *Ursus americanus*) is commonly used as an insulative knee patch for Algonquin trappers who are constantly kneeling in the snow during their winter work. The teeth and claws are used to adorn necklaces and ear-rings. Similarly, the teeth and bones of ***amik*** (Beaver, *Castor canadensis*) are used to adorn necklaces and ear-rings, as are the fur and bones of ***cigîcî*** (Weasel, *Mustela spp.*) and the quills of ***kâk*** (Porcupine, *Erethizon dorsatum*). ***Kâk*** quill embroidery is common among Algonquin women.

Various species of dabbling and diving ducks (***cîcîp***), as well as ***mâk*** (Common Loon, *Gavia immer*) are used by the ABL in craftwork. Feathers and down are generally used to fill bedding and pillows, while the entire peltry of the loon is used for a seat cushion. Many other species of bird are used by Algonquins for their feathers and down, and many are collected on an opportunistic bases, being cleaned and stored for later use. For example, the feathers of partridge, morning doves, and even small warblers have been collected for various miscellaneous purposes. Waterfowl, without a doubt, are the preferred birds from which Algonquins gather feathers and down. This is because they have oily feathers which shed water and give pillows and blankets good loft, making

them very warm for their weight. Some feathers are placed on earrings and dream catchers, which are used personally or sold at pow-wows and to tourists. Interestingly, dream-catchers were not originally Algonquin but were introduced form other indigenous cultures. The glue prepared from ***name*** (Lake Sturgeon) bladder, is used in many types of craftwork, for example, to stick feathers on to pieces of wood as decorations at a wedding. Certainly, glue bought at stores has replaced the use of sturgeon glue, but I have seen it used in several camp situations when store bought glue was unavailable.

This summary of flora and fauna items utilized in craftwork shows the importance of context because the use of what is created may be personal, commercial, or ritualistic, depending upon the intentions and needs of the creator. Likewise, utilization patterns may vary depending upon the availability of resources, the social activities of Algonquins, and the introduction of novel crafts and technologies from the outside world.

5.8 Commercial Commodities

This section outlines those items intended to be sold for income. Six species of plant have been outlined as having specific commercial uses by the ABL. ***Wigwâsatik*** (White Birch, *Betula papyrifera*) are made into canoes and various types of birch bark baskets (discussed above), which are sold to museums and tourists. The wood from ***agamâk*** (two species of Ash tree, *Fraxinus americana* and *nigra*) are used as rims on birch bark baskets as well as being made into many other items, such as drums and

miniature snowshoes which are sold to tourists. The miniature snowshoes are exact replicas of the real thing, including bindings, and are very good pieces of workmanship.

Asiswaymenâtik (Raspberry, *Rubus idaeus*) and the other associated species have been known to be sold to buyers and tourists in good years, but the amount of raspberries collected does not come close to the volume of ***minâdjîciwâtik*** (Blueberries, *Vaccinium angustifolium, corymbosium,* and *myrtilloides)* that are sold (see Table 6). ***Kîckâtik*** (Eastern White Cedar, *Thuja occidentalis)* wood is used for rims on birch bark baskets, but the wood is used mainly in the construction of cradle boards to be sold to museums, buyers in various city centers, and tourists.

Seventeen species of mammal are used by the ABL commercially (see Table10). The hide and/or fur of these mammals are made into some type of craftwork, clothing, or toys and games and are sold privately or at local pow-wows. Though not traditionally Algonquin, many cabin, house, and truck windows display the leather and feather dream catchers of the Iroquois culture. A myriad of styles of dream catchers, ear-rings, bracelets, small sacks, are now frequently made by young Algonquins for sale.

New markets are continually being sought by enterprising Algonquins. For example, wild ginseng (*Panax spp.)* has begun to be studied and collected by a few Algonquins with the express intent of selling the plants to Chinese merchants for medicinal purposes. Few traditional birch bark canoes have been made over the last 10 years, but in 1996 a renewed interest in making canoes for commercial purposes has

grown, with several young men apprenticing to a few elders. This revival in canoe building coincides with an increasing number of interested private and museum purchases.

This summary of commodities shows the importance of context not only because the use of what is created may be personal, commercial, or ritualistic but also because markets change radically and resources are constantly being adapted to fit new circumstances.

5.9 Ritual Materials

A limited number of observations have been made on the use of plants and animals for the purpose of rituals. ***Wigwâsâtik*** (White Birch, *Betula papyrifera*) is made into special baskets used in seasonal ritual feasts and weddings in which food gets deposited as an offering to forest and water beings. Food for a feast is generally placed on a table, buffet-style, so that each person stands in line to gather his or her own food. At the end of the table two birch bark baskets are placed (some families use only one basket). Each person is instructed, while in the food line, that before beginning to eat they must place a morsel of food from his/her plate into the first basket at the end of the table. Another small morsel of food is to be guarded and, upon completion of the meal, is placed into the second basket. Later in the evening, a feather and a piece of tobacco are dropped into each basket, and one basket is taken into the forest, and the other is placed floating in the near-by lake or river.

Table 10. Animals used commercially.

Genus and Species	Common Name	Algonquin	Use
Alces alces	Moose	*Môs*	Ears used to make moose-ear purse. Antlers. Hide.
Canis lupus	Gray Wolf	*Mahîgan*	Fur.
Castor canadensis	Beaver	*Amak*	Teeth and bones used to adorn necklaces and earrings. Bones used for toys. Sold often at pow-wows. Fur, fur hat.
Erethizon dorsatum	Porcupine	*Kâk*	Quills used for necklaces and ear-rings sold to tourists and at pow-wows.
Lepus americanus	Snowshoe Hare	*Wâbôs*	Fur to line moccasins. Rabbit foot key chain. Fur.
Luta canadensis	River Otter	*Nîgîk*	Fur.
Lynx canadensis	Lynx	*Môlômak Pijiw*	Fur.
Martes americana	Marten	*Wâpicecî*	Fur.
Martes pennanti	Fisher	*Odjîk*	Fur.
Mustela erminea, rixisa frenata	Weasel	*Cigôcî*	Fur and bones used as adornments on clothing, drums, as jewelry, toys, and games.
Mustela vision	American Mink	*Câgwecî*	Fur.
Odocoileus virginianus	Whitetail Deer	*Wâwâckecî*	Hide, antler purses.
Onadatra zibethica	Muskrat	*Wôjick*	Fur.
Ursus americanus	Black Bear	*Môkô Makwâ*	Teeth and claws used to adorn necklaces and earrings. Hide.
Vulpes vulpes	Red Fox	*Wâgôc*	Fur.

This action maintains the right relations between humans and other parts of the ecosystem in which they participate.

Sheets of ***wigwâsâtik*** (White birch bark) were also traditionally used in burial ceremonies where the corps was wrapped in a blanket, buried in the soil, and covered with bark.

Môkô (Black Bear, Ursus americanus) and ***makinâk*** (Snapping Turtle, *Chelydra serpentina*) are also used in ritual feasts. ***Môkô*** (Black Bear) are very important animals in Algonquin religion and are seen as the ***ogîmâ*** (chief, leader, guardian) of ***awâysîsik*** (animals), who, in stories passed down through generations, possess a bag which contains all animals. It is ***môkô*** who releases animals from the bag to worthy hunters.

Bear skulls are used variously in ritual feasts by different families. Some families paint the skulls, others do not, some families place flowers in the eye orbital, while others do not. Ritual care is taken to position the skulls in the center of the table facing the correct cardinal direction.

Care is also always taken to clean the bones of small animals and dispose of them in a respectful manor. The ritual disposal of bones includes returning cleaned beaver bones back to the water (especially after feasts) and tying and hanging rabbit bones and the skulls of fur bearing animals in trees. Moose were perhaps treated with more respect in the past than presently in terms of ritual disposal of remains, but many people will, if

they happen to kill a pregnant female, place a lump of the mother's fat in the fetus's mouth and bury it. The fat represents the nourishment the fetus received from its mother and will continue to receive when its spirit is reborn in the form of another moose. Some older Algonquins are emphatic that dogs not be allowed to chew the bones of moose, while other disregard this practice.

Several types of drums are made and used for ritual purposes by the ABL. At least three types of drum have been observed being used at feasts, weddings and funerals: a single membrane, boron-style, deer skin and ash drum; a double membrane, boron-style, deer and ash drum; and a barrel drum made from a hollowed out tree stump and stretched with either deer or moose skin depending on the sound desired. Drums can be adorned with bear knuckles strung to the edge of the ash rim to give a snare effect, and leather thongs with feathers are often attached to the drums as well. A rattle made of wood and stretched moose parricidal membrane has been used at weddings by at least one family.

Shaking tent ceremonies using tents covered in birch bark were traditionally Algonquin, though they are no longer conducted (*cf.* Beckman-kara, n.d.). At least two families, however, in recent years have conducted sweat lodge ceremonies. Dome shaped tents originally covered in birch bark - now covered in canvas - are used. The liver of the ***name*** (Lake Sturgeon, *Acipenser fulvescens*) is dried, pounded into powder and tossed into the fire as an incense which helps induce visions. Some Algonquin families make

outdoor fires for ritual purposes. Summer fire ceremonies where individuals dance outdoors to a drum are common.

Eagle or hawk feathers are used at community meetings, being given to the speaker to signify that he or she has the floor. And at least one Algonquin individual has carved what he calls "talking sticks" for a ritual feast. These sticks are about 3 to 4 feet long and carved with intricate patterns. Bottle caps or pieces of metal are often nailed to the stick so that it makes noise when shaken.

One Algonquin kept a turtle carapace filled with beans as a ritual rattle. This item does not appear to be a traditional Algonquin item but this neo-traditional article was, nonetheless, made specifically for use at a wedding. Algonquins have long had contact with Mohawks further to the south, where the carapace rattle is common (Roark-Calneck, 1996). It is likely that this rattle was acquired from them sometime in the past. More research on the ceremonial and ritual life of the ABL would undoubtedly uncover vast amounts of flora and fauna being used for ritual purposes.

This summary of flora and fauna used in rituals show the importance of context because utilization patterns have varied with respect to emphasis on purposes (feasts versus offerings), social activities (shaking tents versus sweat lodges), ritual items (drums versus rattles), and species emphasized (moose versus turtles). There have even been changes in the respect given moose and the use of some rituals like the shaking tent.

5.10 Toys and Games

Many games are made by ABL individuals and these are important not just for enjoyment but also as teaching tools, especially for young children.[23] Each game is said to have a specific instructive purpose. For example, some games taught children to count, others stimulated coordination, and at least one, if performed correctly by a child, informed parents that enough skill may have been developed to allow the child to navigate short distances from home alone without fear of getting lost (Larose, 1988).

A ***nâbowan*** is a traditional game made by the Algonquins. There are two types of ***nâbowan***. The first, is made from the outer cambium of small trees or shrubs about 1 to 2 inches in circumference. The trees are cut into thin rings with the centers removed. These rings are attached to a short stick, usually ash, with a piece of leather. The object of the game is to toss the rings in the air and try to stab the stick into the rings center. The second type of ***nôbowan*** has the same objective, but the ring is made from a bear knuckle bone attached with leather to a short spear made from a shaved down moose shin-bone. Black bear phalanxes have a natural hole in them that are just a little wider than the moose shine-bone spear so that it is rather difficult for the player to succeed in stabbing the knuckle bone with the spear.

Many different types of mobiles are commonly fabricated by different Algonquin families and hung from cabin beams or a ***tikanâgan*** (traditional Algonquin cradle board).

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23 Dr. Susan Roark-Calnek, personnal communication.

At least one individual has made a mobile by cleaning out fresh water clam shells and filling them with small stones. Holes were drilled and the shell halves were wired together so that when shaken, they made a rattling sound. This particular mobile, like many others, was hung from the head-brace of a ***tikanâgan***.

Many daily activities are turned into an instructive game for children. For example, in the process of moose hide tanning, it is necessary to pound the hide in order to make it pliable. Hides are often stretched tightly to wooden frames set above the ground and the children invited to jump on them like a trampoline. In this way the children are doing the necessary work to make the hide supple, while at the same time are having fun.

The above summary involving toys and games shows the importance of context because utilization patterns combine work, play, and learning, and depend upon the age, gender, and environmental resources.

5.11 Final Comments

This detailed look at forest resource utilization by a people counters standard depictions of contemporary extractive activities as static and timeless. Instead we see that resource uses, and the knowledge that goes along with such use, are constantly being created, altered, and sometimes lost. Disclosed are the many social, historical, and environmental factors which induce such change. Further, considering the full range of

forest resources reveals the important socio-cultural role, both material and cognitive, played by these resources in the everyday life of Algonquins.

In reality, it is difficult to isolate completely the various roles of animals and plants which allow them to be placed in a single category of utilization. Clearly, the placement of a resource item into one or another category depends upon the context and meaning of the item employed to the user. The categories of utilization adopted in this thesis are exposed as being rather arbitrary because the boundaries of these categories are not always fixed, and may, infact, keep changing. For example, berries can be picked for personal consumption but later sold for commercial gain. The same applies to items of craftwork, clothing, toys and games. Some resource items, normally consumed as food items in other situations may become medicinal in application. For example, a particular cut of moose meat, usually consumed as a food-stuff, may on occasion be administered as a medicine to a pregnant woman. It is in this way that resource use is highly contextual.

Many traditional items continue to be used by the ABL, but several items of material culture that were once utilized, have been shown to be no longer used. These items, for all intents and purposes, should perhaps be included in the repertoire of ABL resource uses, because, as we saw, these items always have the potential of being revitalized to fulfill the same or some new requirement. Recently contrived items of material culture, or items whose use have been influenced by another culture should also be included in the repertoire as they are fulfilling a contemporary need in Algonquin society. Individual Algonquins are continually saying, "I have heard my grandfather talk

about this, and now I have made it," or, "I dreamed it, and then I made it". This kind of revival, or innovation is common for all kinds of Algonquin products, and is a good example of just how responsive to new and changing situations cultural knowledge can be.

Articles of material culture used by each family, regardless of any disagreement between families as to their tradition, must also be included, because, as one community member puts it "each family has its own experience, its own area, its own ways". If one person makes or uses an item of flora or fauna, then it is part of the potential knowledge pool for all Algonquins, and should be included. Such an inclusion would be entirely consistent with the decentralized, familistic social organization, and information management system described previously in chapter four. It is also consistent with the emphasis on visionary revelation and renewal in traditional Algonquian religion.

Significantly, a person's perception of the significance of resource utilization may change from one situation to another in the course of everyday tasks or dialogue, as well as over time historically. A people's utilization of flora and fuana resources and the significance behind such use is the product of the long history of those who sustain it. This involves the everyday experiences a people have interacting among themselves, with other cultures, and the environment.

This detailed look at resource use describes the changing contexts with which Algonquin individuals and groups engage with, and internalize knowledge about their

forest resources. Comprehending the contextual nature of resource use will improve our understanding of the process with which Algonquins apply names to plant and animal resources and how those names are used in everyday circumstances. This is the subject of the next chapter.

CHAPTER SIX

Terminology for the Forest Environment

This chapter is about the words that Algonquins apply to plants and animals: their names, identification, number, meaning, and changes in the use of these ecological terms. This research also examines why there are so many difficulties in setting up a single list of names that can be readily translated from Algonquin to English. As in previous chapters, the part played by context and experience in explaining these difficulties will be investigated.

6.1 The Algonquin Approach to Naming Flora and Fauna

I begin this exploration with how Algonquins represent their process of naming environmental resources. Algonquins suggest that names given to living things are not bestowed arbitrarily, for economy of thought, but are the product of an order that has been laid down since the world was created. In the distant past, it is believed animals and humans had a common language and could communicate with one another. Events occurred which terminated this communication between animals and humans. Today animals, like humans, have their own language, their own culture, and their own names by which they address one another. Although it is often stated that most animal and plant names were given by the creator at the beginning of earth's history, contemporary

Algonquins also acknowledge that they have, on occasion, produced their own names, particularly for newly encountered plants and animals.

Algonquins do not see nature as infinite when it comes to applying names to plants and animals. There is a belief that all animals and plants have names, even if these names remain unknown to Algonquins. Elders explain that it would be disrespectful to give a plant or animal a formal name "like white people do," for they do not know by what name an animal or plant wishes to be called. There is an insistence that animals and plants are given names that signify their usefulness to Algonquin society or describe some distinctive morphological feature. A formal name may be given to a child or a family pet, but one would not consider giving a formal name to a complete class of animals, like a dog or a bear. In Algonquin naming theory, plants and animals have been, and continue to be named, using one, or a multiple, of the five human senses: how one sees, hears, feels, tastes, and smells the object in question. Though the name given a plant or animal may not be thought of as a formal name -- but a descriptive one -- many names, nonetheless, over time are applied and used in a relatively consistent fashion analogous to a formal name.

Naming, through the use of observed morphological characteristics of plants and animals is most common in ethnoscientific literature (Berlin, 1992) and is frequent among Algonquins. For example, ***pobogomagaki***, the Eastern American toad (*Bufo americanus*) is the combination of the words ***povogazi***, meaning lumpy, and ***omagaki***, the

word for frog (***pobogazi*** + ***omagaki*** = ***pobomagaki***). The name for this animal implies the lumpy texture of the skin of this amphibian.

Another example of a name given to an animal because of the way it appears visually is ***napâdjizinîkisî***, which is the name given to the two kinds of moles living in the region. ***Napâdjizinîkisî***, is a complex uninomial with the first half of the word ***napâdj*** evoking the *placement* of an object. The last half of the word ***izinîkis*** expresses the sense that *arms (appendages) are backwards*. Thus, the mole is recognized and represented lexically as the animal whose arms have been placed backwards, which is a fairly accurate anatomical characteristic of this animal.

Sound appears to have an important influence in Algonquin naming practices. Onomatopoeia is used in naming several animals, but is particularly important in naming birds. For example, the name given to a type of hawk is ***kâkâgî***, and the name given to several types of owl is ***kôkôkahô***. In these cases, clearly the names given these birds are human phonetic representations of the sounds that these organisms emit. Onomatopoeia has been found to play a large role in the ornithological vocabulary of other cultures (Berlin and O'Neill, 1981). This is perhaps not surprising since it is often the calls of birds which are used by these cultures -- Algonquins notwithstanding -- as an aid in their identification. This is particularly true for those birds that are difficult to observe because they are nocturnal, fly very fast, or their normal habitat is high in the tree canopy.

An example of a name being given to an organism because of the way it feels to the human touch is the porcupine, ***kâk***. The word ***kâk***, in Algonquin, is a particle, which becomes a name, denoting something sharp, precipitous, or steep, like the quills of the porcupine. The meaning clearly expresses the sense of touch, the stimulus that is experienced when a quill is handled.

Naming plants and animals through the employment of how they smell can be given by the example of the skunk (*Mephitis mephitis*), and the weasel (*Mustela spp.*). In Algonquin, the word for skunk is ***cigâk*** and the word for weasel is ***cigôcî***. The ***cig*** prefix, in both ***cigâk*** and ***cigôcî***, comes from the word ***cigiwin***, which is the word for urine. Both animals are recognized as being able to produce strong odors from a scent gland. Although most adult Algonquins understand that the aroma of these animals is not produced from the urine itself but a separate scent gland, the method of odor dispersal is nonetheless similar to the act of urination. The odor produced by these animals is urine-like and the names for the animals reflect this.

One example for the use of taste in naming plants and animals is one that may not indeed imply taste directly, or exclusively, in the meaning of its name. ***Wînikis*** is the Algonquin name for Yellow Birch, and ***wînikisibak*** is the name given Wintergreen (*Pyrola, spp.*). ***Wînikisibak*** is a low leafy herb used by Algonquins as a tea and medicine, which has a distinctive flavour and odor. ***Wînikis*** is a tree that can be readily identified by most Algonquins, even in winter when there are no leaves for identification purposes, by the taste and smell of the inner bark of a broken branch. Both the taste and

odor of the broken inner bark resembles the taste and odor of crushed ***wînikisibak*** leaves. It is difficult to tell which item was named after which, but according to Algonquin statements and physical evidence, it appears likely that one of the plants was named because of its similarity in terms of taste and smell to the other. This is perhaps a better example of naming through *similarity* than a case of naming due to taste or smell, but even so, it is clear that taste and/or smell are among the potential parameters used by Algonquins in applying names to organisms.

6.1.1 Identification of Resources in Natural Settings

The differences between the process of naming and identification are not always transparent. Identification concerns the allocation of an item to a (usually) named category, while naming involves the application of a label to a recognised item. To a certain extent, one logically presupposes the existence of the other. Both commonly entail the matching of perceptual images to words, or vice-versa.

In my participation with, and attention to, Algonquins performing the everyday tasks of identifying and applying names to plants and animals, I found these processes to be as much a collective exercise as an individual one. Differences in knowledge, experience, skills, and abilities of Algonquin individuals performing the task of identification and naming frequently lead to uncertainty or disagreement. Often individuals actively sought the advice of others, and the experience, counsel, and status of those interacting often affected the outcome of the identification.

In the numerous cases where individuals admitted an inability to provide an accurate identification, or where another's identification was disputed, a recurrent procedure was set in motion. Generally, all individuals directly, and even indirectly, involved in the debate would go together to the precise location where the identification event took place. This was done in order to gather "first-hand" information from which to settle the dispute and reach a final decision on the identification. Criteria sought by Algonquins with which to resolve the problem were of broad spectrum, including such things as, habitat, slope, aspect, colour, sound, feel, smell, taste and behaviour. Once enough information was gathered, subsequent discussion ensued until all individuals either began to agree, acquiesced to a more knowledgeable authority, or simply agreed to disagree. This is the process Algonquin individuals commonly go through in the process of learning to identify and name items of flora and fauna.

For example, on one occasion an Algonquin individual was unable to provide an accurate identification for a particular tree branch in winter. Having no visible features like leaves or seeds with which to distinguish this particular winter twig, this person sought the advice of a more experienced relative at the bush camp. As is common with most Algonquin plant identification experts, the experienced adult broke apart the twig in order to taste and smell the secondary bark and inner xylem. The twig was readily identified as being ***wînikis*** (Yellow Birch), which has been previously discussed. The experienced individual explained to the inexperienced one that ***wînikis*** is identifiable because of its particular tastes and smell which resembles ***wînikisibak*** (Wintergreen). Several Algonquin

individuals who are experts in medicinal plants or basket making are able to make accurate winter identifications of plants having only the bare branch and bud scars.

Chapter Four outlined how experience greatly determines what they learn. My field observations supported Roark-Calneck's characterization of the Algonquin trapping and moose hunting life cycles as a "movement from childhood dependency into responsible interdependency" (Roark-Calneck, 1996:67). This characterization revealed that for Algonquins, the larger socio-cultural subsistence system is to a certain extent, a cognitive system in its own right, and this system in turn, establishes the contexts for the cognition of the people who participate in it.

Paying strict attention to the everyday process of flora and fauna identification among Algonquins, it is clear that individuals learn to identify resources with time and experience. The perceptual images of resource items and the words that are matched with them are built up slowly with repetition, often in particular habitats and instances that involve other people. My observation and participation with Algonquins in the matter of flora and fauna identification compels me to agree with Ellen, who discussing animal identification among the Nuaulu, states,

> The process of identification is contingent upon social relations, is culturally complex, and *is* a process; by which I mean it involves an identifiable (though variable) sequence of steps rather than a one-off decision. (emphasis in the original, Ellen, 1993:66)

Only when an individual has had repeated experience with resource items and their labels can they internalise that knowledge and eventually perform an identification rapidly as a one-off decision with any confidence. This supports connectionist-type thinking where schemas are built up slowly over time, one schema being connected to another, and those connected still to others. Building these webs of connected schemata is slow, but once they are organized, decisions can be made rapidly. It is in this way that identification is a complex cultural *process*, often requiring a sequence of steps rather than a quick and simple logical decision.

The existence of different knowledge, experiences, skills and abilities in individuals, therefore, should be expected. These different knowledges, experiences, skills and abilities in naming and identifying resources can lead to the existence of uncertainty and disagreement between individuals. When faced with uncertainty, Algonquins frequently involve other Algonquins in the identification process. There occur many occasions in which Algonquins simply agree to disagree. I have had great difficulty considering my options in those situations where one person's experienced resource knowledge contradicts another's, or where contradictions in the use of terms exist in different contexts. For example, in those situations where Algonquin individuals agreed to disagree about their identification and label for a resource item, why should I, the ethnographer, accept one person's answer over another's? To what extent should IK researchers be permitted to generalize their findings at the exclusion of contrary opinions of other persons? These questions cannot be dismissed as being narrowly cognitive or ethnoscientific; they are instead, fundamental to IK theory and methodology. Resolving

this problem is made possible by looking at knowledge in context which illuminates the heterogeneous, fluid and contested nature of knowledge. The next section will address this difficulty by looking at the part played by context in the establishment of ethnographic lists of flora and fauna.

6.2 Difficulties in Establishing a Single Ethnobiological List

It is a common practice for researchers of indigenous knowledge to develop inventories of resources known by the groups they study. These inventories are commonly represented as complete ethnographic lists of names in a given language. My experience with the ABL leads me to question the feasibility of this practice. In this section I show that it is only when one ignores the articulation of knowledge in specific contexts can such "complete ethnographic lists" be formulated.

In the process of field research from 1993-1998, I have recorded some 169 terms that were repeatedly used by Algonquins to describe types of animals, and 69 to describe types of plants at various degrees of inclusiveness. From my contact with the Algonquin, I reached a point at which I was obtaining no new terms for local mammals, amphibians, and reptiles. This has provided me with some indication that I have approached the point of recording about as many terms as exists in the Algonquin language. This is not the case, however, for Algonquin terms for birds, fish, insects, and plants, where surely many more terms exist that went unrecorded in this research. Encounters with additional

informants, new habitats, and novel contexts would undoubtedly provide situations where fresh information would become available.

My research, however, encountered several obstacles which make it difficult for me to state definitively that a completed list of flora and fauna has been, or ever will be, achieved. For example, I found that many of the terms for the same items are pronounced differently and some are synonyms. There is an abundance of private terms, or terms shared by only a few individuals. Often in everyday speech Algonquins use terms borrowed from other individuals or cultures. It has been difficult for me to decide, at times, to what degree a term is a formal name or an *ad hoc* description. Further, developmental terms and terms for sexual types have presented some problems for me in deciding what Algonquins view as distinct natural kinds. Each of these issues are covered in the next sections.

6.2.1 Problems with Phonological Variation

Phonological variation in the names applied to particular species is common in the nomenclatural systems of most languages (Berlin, Breedlove, and Raven, 1974; Boster, 1986:179; Stross, 1975). I have found great variability in the way Algonquin individuals pronounce specific words applied to flora and fauna. Dialectical differences are common between Algonquin communities, particularly between the three most northern communities (Barriere Lake, Grand Lake Victoria, and Lac Simon) and Maniwaki, and I have already briefly outlined the historical factors which may have contributed to these

differences. For the purposes of this thesis I have chosen to concentrate on terms given by Barriere Lake Algonquins only, and do not discuss dialectical differences between Algonquin communities. In saying this, however, I must concede that a large amount of travel, communication, and intermarrying between communities must, to some extent, affect the degree of dialectal mixing. Many Barriere Lake Algonquins are moving to Maniwaki permanently, and this must influence word choice and pronunciation, particularly for children who are learning to speak.

My attempts to record the Algonquin names for flora and fauna revealed that free variation is common. When this occurred I was left with two or more morphemes of same word and had to make a decision as to which of the two words was correct, or at least, which morpheme I was going to use consistently. In the beginning, when I started working with Algonquins, my inability to transcribe accurately Algonquin pronunciations of words commonly resulted in several word variants. With time and effort, and my increasing abilities with the language, the number of word variants decreased. Still, on many occasions, my inability to isolate a single word variant among several choices began to convince me that not all Algonquins agree on the pronunciation of all words.

A particular puzzling example occurred when trying to isolate a single word variant for two types of tree, the Sugar Maple and the Balsam Fir. I consistently recorded two different morphemes for the Sugar Maple, ***ininâtik*** and ***aninâtik***, and three different morphemes for the Balsam Fir, ***aninâdeg***, ***ininâdeg***, and ***ininâtik***. It is readily apparent that the pronunciations for these two different species are very similar, one pronunciation

even overlaps. My attempts to isolate the most "accurate" word for each species left me with four possible applications that linguistically separated the two tree species. The four combinations in which Algonquins employ words for the Maple and Balsam Fir can be seen in table 11.

Table 11. Four possible utilizations of the words for the Maple and Balsam Fir by groups of Algonquins.

Utilization by group	1	2	3	4
Maple	*ininâtik**	*aninâtik*	*ininâtik*	*ininâtik*
Balsam Fir	*ininâtik**	*aninâdeg*	*ininâdeg*	*aninâdeg*

* Trees told apart not by pronunciation but by the context of the conversation.

Only a few Algonquins I spoke with, usually the younger children, saw no difference in the pronunciation of the words for Maple and Balsam Fir; both are ***ininâtik***. These individuals, column 1in Table 11, use the context of the conversation to differentiate between the two types of tree. I also found three individuals who either used the ***inin-*** or the ***anin-*** prefix for both species of tree and differentiated between the two trees in conversation only through their distinctive suffixes, the second and third categories in Table 11. These individuals appeared to grasp, and give credence to, differing second syllables for distinguishing the two types of trees.

The fourth group of individuals differentiated between two very different words, ***ininâtik*** for the maple, and ***aninâdeg***, for the Balsam fir. These words are different in their transcription but are difficult to distinguish by pronunciation. Both words have two parts, and no Algonquin I spoke with was able to give the etymology of the prefix of each

word, but several individuals were able to provide the etymology of the sufix. These people reported that the ***-atik*** suffix, in maple, refers to "wood" or "stick," while the ***-deg*** suffix, in Balsam fir, refers to "needles." ***Atik***, is the Algonquin word for stick or wood which, in this case, is attached to a labeling prefix to make up the word for the maple tree. The suffix ***-deg*** comes from the word ***anenadegazitc***, which is asking a question about the characteristics of needles. Since Balsam Fir have needles, this appears to be a convincing explanation for the differences between the words. Certainly, the majority of adults I spoke with used the pronunciation in group 2, even if they did not know the etymology of the words they were using. Elders repeatedly told me that this was the correct pronunciation of the two words, even if there are those who are using the first three categories in table 11.

The above evidence shows how variation in pronunciation, of terms which label the same things, occurs in everyday Algonquin speech. Subtle differences in transcription of one or two letters for the same word are common. Sometimes, the same individual used different variants on different occasions. I would have liked to indicate all variants in this thesis because I have not always been able to test whether one variant is more common than another. I have not done this purely for readability. Instead, I have restricted my use to either the most common variant or, in instances where I did not know which variant was most common I tended to use variants employed by Algonquins interested and experienced in their language. These individuals put much thought into their assessments of why one variant was better than another, and I simply followed their lead. Admittedly, on some occasions I have been forced to make an arbitrary decision to

use one variant over another. Whatever conventions I used, variation remains, and warrants further investigation.

The existence of variation reveals the degree to which Algonquins place emphasis on the fact that everybody must pronounce words similarly. Algonquins commonly state that there are precise pronunciations for words and that young Algonquins commonly must be corrected on their pronunciation. But when confronted with this lack of agreement on pronunciation there is a certain admission that individuals and families have there own ways of pronouncing words. When provided with examples of conflicting pronunciations Algonquins readily admit that individual "families have their own way of doing things" and "their own way of saying things." Word pronunciation, for Algonquins at least, is one task that requires some accuracy but not total consistency. There is no formal Algonquin institution, other than elders, which establishes the correct pronunciation of words and oversees that all individuals pronounce words similarly. Nor is there yet, any literate technology such as a grammar rule book, or dictionary to which individuals can refer, to ensure the correct pronunciation of words. This lack of literate technology must, to a certain extent, act to decrease the degree of reflection on conflicting pronunciations, because there is no normalized literate list to refer to and arbitrate in instances of uncertainty or contradiction. Because of this, one can, perhaps, expect to find a certain amount of inconsistency in strictly oral cultures that would be difficult to live with in literate cultures.

Phonological variation can be caused by rapidly changing languages (Brown, 1984). The extent to which Algonquin phonological variation stems from rapid changes in the language is difficult to tell. Certainly, contact with other cultures has had, and continues to have, an effect on language. The extent to which this Algonquin lack of emphasis on pronunciation existed in the past and how much it continues to change, I am in no position to comment about. All languages are in a state of flux, and the degree with which they emphasize phonetic and grammatical accuracy must also be assumed to be changing as well.

6.2.2 Problems with Synonyms

In the above cases of phonological variation Algonquin informants, nonetheless, apparently agree on the referential ethnobiological range of these various expressions. In addition to differences in simple phonological form, one frequently finds synonymy (lexical variation) in ethnobiological nomenclature (Berlin, Breedlove, and Ravin, 1974; Ellen, 1993:47; Hays, 1974:234). A synonym is a distinct or partially distinct term that can be used interchangeably with another to refer to exactly the same ethnobiological item or category.

I have found such synonymy exists in the Algonquin language when discussing flora and fauna. For example, moose (*Alces alses*) in English, can be called by two completely different names in Algonquin: ***câbôganegâbwî*** and ***môs***. The first word is analyzable and roughly translates as "the one who steps through deep snow to touch the

ground." Older Algonquins use this term in conversations, which demand formal respect to the animal. Elders telling hunting stories and traditional narratives, which feature the moose, commonly use this term. The second word, ***môs***, is semantically unanalyzable by Algonquin individuals and simply signifies the animal. This term is more commonly used in casual everyday speech about moose, and is the only word for moose used by younger Algonquins.

Similar to the use of the terms for moose, Algonquins variously use two words for the Eastern White Cedar. The first, ***Kîjik*** is the word older Algonquins apply to the cedar tree. This term is featured in a few local toponyms that could only be semantically defined by elders. Like ***môs***, the second term, ***kîckâtik***, meaning "cedar stick," is the term used more often in contemporary everyday language by young to middle-age Algonquins.

The yellow pond lily (*Nuphar variegatum*) and the fragrant water lily (*Nymphaea odorata*) are also identified by a single term in Algonquin, which is ***cikitewebak***. This word is commonly used in everyday discussions and identifications of the flowers and leaves of the two plants. The tuber, however, of this same plant is called by another name which is ***akidimo***. The term ***akidimo*** is commonly used in situations where the tuber is visible on the surface of the water or when the tuber is specifically being referred to in everyday conversations. Most Algonquins recognize that the words ***cikitewebak*** and ***akidimo*** signify different parts of the same plant, but there were those individuals I spoke

with, mostly children, who had heard both terms and believed them to be different plants altogether.

A final example of synonymy is that of the plant Lady's Slipper (*Sorbus spp.*). Two terms are commonly used for this plant, the first is ***mosôtawâgâbak***, which means "moose ears, " and the second is ***picôc***, which is the word for "vagina." In each case, these terms describe the morphology of the plant and its similarity to another item. These terms may appear to be merely *ad hoc* descriptions, but the regularity with which these terms were encountered in the everyday identifications by separate individuals convinces me otherwise. I have heard males and females using both terms and their use may or may not be predicated by specific conditions or illicitory contexts. Elders who held a great deal of dignity in their report with me, and persons who did not know me well, especially women, were understandably reluctant to use and translate ***picôc*** in my presence. ***Mosôtawâgâbak*** is a potentially less embarrassing term to use, especially if one becomes aware that they might be called upon to translate the words they use. If nothing else, this is a good example of how the illicitory context can shape the choice of the terms chosen. Other examples of synonymy in plant and animal terms have been recorded and surely many more exist that went unrecorded.

6.2.3 Problems with Private Terms, Borrowed Terms, and Descriptions

I outlined in section 6.1.1 the Algonquins understanding that animals, like humans, have their own language, their own culture, and their own names by which they address one another. The names given to particular plants and animals by Algonquins may not be the name by which that particular plant or animal is called by its own kind. It is for this reason that Algonquins use terms for plants and animals that signify their usefulness to Algonquin society, or describe some distinctive morphological feature.

If Algonquins do, in fact, see names and naming in this fashion, this would call into question the use of the term "name" -- as viewed from its meaning in English -- and how it applies to the use of plant and animal terms by Algonquins. This must also have some bearing on the degree to which Algonquins accept and value private terms, borrowed terms and descriptions.

I have found that Algonquins commonly address one another not by their official given name, but by private names. One individual may have several nicknames, each of which is exclusively used by one or more acquaintances. Further evidence for the type of linguistic variance that private terms represent, has been given by Roark-Calnek in discussing the ABL process of giving names to particular places. She observed how considerable variance in ABL toponymy reflects a "differentiated, localized, but also partially overlapping nature of land use in a familistic hunting society" (1995a:26). She

states that a full account of this variance "requires understanding the logic of ABL knowledge construction, and taking into consideration the experience of informants and their families with different parts of the ABL land base" (ibid.)

The seasonal, and yearly composition of harvesting task groups produces a certain degree of shared toponyms, particularly for major travel routes, landmarks, and rendezvous points, but also a certain degree of unshared toponyms because individuals and task groups differ in the detail with which they know, and name, certain areas. Describing the ABL process of giving names to physical geographic features, Roark-Calneck states,

> [I]n reviewing interview transcripts for the resolution of variance, it became clear that informants were sometimes naming particular courses with which they were familiar, sometimes extrapolating from their (differing) experience (differing) assumptions about "where the water comes from", sometimes using toponyms to describe what their families needed to know about the immediate area in order to use it, and sometimes memorializing family land use stories that are instructive and amusing (what one elder calls "funny names"). ABL toponymy as an organized and adaptive system of environmental knowledge accommodates all of these ways of naming and the variance that inevitably results. . . Algonquins themselves can manage the variance by comparing where they (or their family) came from, where they were going, where they passed, what they noticed, and sometimes agreeing to disagree. (ibid.:27)

Much of the experience of Algonquin individuals and groups is rooted in specific places. If the Algonquin naming of plants and animals is anything like their naming topographic

features, then we would expect a great number of private terms. We would expect that not all Algonquins would know the same terms because their experience in particular activities and particular places has been different. Further, we would expect that the existence of heterogeneous and private terms would not surprise Algonquins, who would commonly agree to disagree about the terms they use.

There are few instances where I recorded the use of private terms for animals and plants among Algonquins. I feel this is largely due to my difficulties in distinguishing private terms from descriptions. I have likely recorded many terms for plants and animals as descriptions when in fact they may have been proper private terms. For example, some Algonquin individuals refer to small passiform birds as ***nibinapinecic*** "summer birds" while others use the term ***pinecic*** "small birds." It is difficult to tell whether the two terms for this same class of bird is a description of the birds themselves or whether separate individuals have greater propensity to privately use one term over another.

When members of one family have a specific disposition to use one term over another, especially when they are aware of the use of conflicting terminology by members of another family, it becomes difficult to draw the line between that which is a private term, that which is a description, and that which is a legitimate name for an animal or plant.

We have already seen that different Algonquins use two separate terms for the Lady slipper plant. In several instances, there is some disagreement among Algonquin individuals as to whether a term is legitimate name for the animal, or is simply a consistent and accurate description used by a fairly large number of individuals. The following examples fit this category:

- ***kagogwangwackon wabigocic*** – "jumping mouse" for both the Meadow and Woodlands Jumping mouse.
- ***mosomagaki*** – "moose frog" for the Grey Tree Frog.
- ***nibikilebak*** – "water snake" for the northern water snake.

Each of these terms is used by a large number of people, yet other individuals are of the opinion that they are simply "descriptions" and not "names." This raises the question of how one defines what a legitimate term is. How do we make a decision on the degree to which a term is used consistently? Do we make this decision based on the overall number of community members that consistently use the term, or on the number of families in the community in which at least one member uses the term? Or, do we base this decision on the overall number of members who use the term within a particular family? We can see that when it comes to the use of terms for plants and animals, at least for Algonquins, deciding what is a legitimate and consistent animal and plant term, is a difficult thing to define.

Terms with limited use and circulation are commonly excluded from ethnographic lists. This action automatically excludes many terms that are borrowed on a temporary basis. For example, there are no Algonquin terms equivalent to the two major forest types *coniferous* and *deciduous* found in the English language. With expanding involvement in commercial forestry activities, an increasing number of Algonquins can be found using these two terms more frequently, intermingled between Algonquin words in conversations. Were I to include these words in my ethnographic list, however, I would be forced to address the problematic issue of whether terms known to Algonquins by virtue of their fluency in English should automatically be incorporated into their animal lexicon.

Also problematic are those terms that normally do not come up in ordinary conversation but may be prompted by particular situations. For example, ***ikodjic*** is the term normally used for the flea found on many animals. In some situations, however, I found several types of flea to be clearly acceptable animal terms for most Algonquins. Interestingly, the list of possible named types of flea is extendable, to some degree, by qualifying the term ***ikodjic*** with the name of the particular flea bearing animal. For example, the dog flea becomes, ***animocikodjic*** (***animoc*** = dog), and the cat flea becomes ***pijiwikodjic*** (***pijiw*** = cat). Each would be recognized by most Algonquins as quite distinct forms, with quite distinct morphological and behavioural characteristics. I expect that this rarely occurs in everyday language and is limited to only a certain number of animal species. It would not be appropriate, for example, to say ***anicinabeikodjic*** (human flea) in the Algonquin language. One would instead use ***ikojic*** in this instance.

The fact that some seemingly *ad hoc* descriptions, at least for Algonquins, appear to qualify as names causes problems in my attempts to compile a definitive list for resources. It is possible that some perfectly acceptable names used today may have had their origins in situational "ad hockery." In any case, it is important to keep in mind what Ellen says about descriptions:

> Words do have origins, even if it is sometimes hazardous to speculate just what these might be, and if we go back far enough many of them are bound to be descriptions. (Ellen, 1993: 46)

The topic of *ad hoc* descriptions has been the subject of much discussion in the literature (Berlin et al., 1973:49; Hunn, 1977: 26-27; Taylor, 1980: 113; Taylor, 1990: 39-40, 70). Even Algonquin speakers experience difficulties in this area. The degree to which one can distinguish names from expressions is complex and not yet resolved. This section undoubtedly gives us a good understanding about the degree of cultural acceptance of private terms, borrowed terms, and *ad hoc* descriptions over the use of formal names as it does about the degree of cultural knowledge about resources.

6.2.4 Problems with Developmental Terms and Transformations

Developmental terms are generally excluded from scientific taxonomies and ethnobiological inventories of "natural kinds". The degree to which I should establish exceptions to this rule for the forms covered by the English terms tadpole, caterpillar, and

maggot is unclear, however. Algonquins, respectively, treat these terms, ***podjoc***, ***tibagonigecic***, and ***oqwey***, as natural kinds, despite a perceptive knowledge of the processes of metamorphosis.

I have already outlined in section 6.2.2 how the yellow pond lily (*Nuphar variegatum*) and the fragrant water lily (*Nymphaea odorata*) are both identified by the term ***cikitewebak***. The use of the word ***cikitewebak*** is restricted to the plant in general, or to conversations which discuss the use of the flowers, leaves, and stems. For example, in situations where the discussion revolved around the flowers being used for decorative purposes, the floating leaves being used as animal and insect perches, and the stems being made into necklaces, the word ***cikitewebak*** was always used. In situations where the tuber of the plant was being discussed, such as in conversations about its consumption by animals or humans, the term ***akidimo*** was always used. Thus, the *use* of the particular part of the plant, and the subject of the conversation determines the use of the particular synonym of this plant in any conversation.

Single resource items that have unique words for different developmental stages are rather problematic for those ethnologists who try to record one term for each resource item. When recording each item, it becomes clear the extent to which one must pay attention to the context of the illicitory event in order to understand the use of a particular term.

A final mention should be made of the relationship between plants and animal names and the spirit world. Names can be applied to resource items through their association to particular events or personages in traditional teachings. Algonquins recognize spirits and spirit categories in much the same way as they recognize types of resources. Algonquins treat spirits as natural kinds and as equally significant parts of their environment. Many animals and some plants are known to intentionally transform into spirit beings. Although I do not discuss this subject in this dissertation to any great detail, this back-and-forth transformation from resource to spirit being does present some difficulties in how to proceed with recording a resource inventory. Again, one must understand the context of the situation to know whether an item is, in any instance, a resource or a spirit.

6.2.5 Problems with Deletions and Additions of Terms

The deletion of terms in the Algonquin language for flora and fauna can occur in several ways. Those terms for species that have become rare or extinct may simply have been forgotten or become synonyms for other similar types. Terms may have disappeared through the loss of semantic content, motivated by changing patterns of activities. It is virtually impossible to discover which terms have been deleted from an unwritten language such as Algonquin without any diachronic data from which to make comparisons. But the loss of flora and fauna resource terms in any language would not be unexpected.

The same possibilities exists for those terms added to the Algonquin lexicon, but it is, perhaps, easier to make some statements about these additional terms because such events may have occurred in recent history (Cronon, 1989). Algonquins have moved into the present area -- along the border of the St. Lawrence- Boreal forest regions -- from other habitats. The historical record of indigenous movements before and after contact make it conceivable that the descendants of the ABL may have once been familiar with more southerly flora and fauna (Hessel, 1993). Once established in their present location, both animal and plant species may have appeared or disappeared in the local system due to, natural movements of the animals and plants themselves or due to changes in the environment. The recent fluctuations and movements in and out of the area for caribou and deer provide a case in point.

Changes in the environment can lead to changes in a people's terminological use for resources. Evidence for this can once again be observed in the study of Algonquin toponymy. Roark-Calnek has observed two groups of toponyms that reflect environmental changes. The first group, "includes names that describe geographic features as they appeared before the flooding that followed the construction of the large dams at Cabonga and Dozois earlier in this century." In discussing the practical and cultural value of retaining "pre-flood" toponyms, she says:

> Algonquin elders say that it is good to remember the locations of old shorelines, streambeds and rapids because it enhances travel safety. Snags from drowned forests or differences in ice thickness resulting from differences in depth or underwater turbulence can be anticipated. The pre-flood toponyms thus preserve a mental map of an inundated, but still relevant, landscape. (Roark-Calnek, 1995a: 77)

Further, Roark-Calnek states that ,

> ABL toponymy, like other systems of nomenclature, has adapted to change, in some cases coining new names as replacements or alternatives for old names, which are differentially recalled by informants. Toponyms for the same features may thus be a mix of old and new names, compounded by age differences between informants. (Roark-Calnek, 1995a:28)

New items can also be incorporated into the Algonquin biological lexicon through several other mechanisms of change: the borrowing of outside terms, the indigenous invention of entirely novel names, and the translation of non-Algonquin terms into Algonquin.

Today, all ABL speak Algonquin unless they have left the area. Most Algonquins speak a second language, either English or French , and many speak both. Terms and categories were likely introduced to Algonquins through habitual multilingualism. People who develop a command of more than one language often freely interchange terms from one language to another. This occurs because complete lexical separation is rarely maintained (Brown, 1984).

It is much easier for me to show how knowledge of animals introduced by Europeans brought with it new terms. Some examples of these new terms can be seen in Table 12, which lists some of the domestic and exogenous species documented during research. The introduction of domestic species by missionaries, fur traders, loggers, and settlers would undoubtedly have made some changes in the nomenclatures of flora and fauna. The varieties of ways these terms are formulated and the meanings they encode are many. For example, the horse is known as the animal with "one nail," a fairly good description of its most unique feature. The carrot is known as "leg root" because of its shape, and the domestic cat is simply called by the same name as the locally known Lynx, ***pijiw***. These two feline terms are differentiated in discourse only by the context of the conversation and explanation.

An important adjunct of an exposure to the English and French languages and their influence on the Algonquin language has been literacy itself. Missionization, trade, employment, and schooling has not only made the incorporation of English and French words and categories easier, but also the writing of the Algonquin language itself using a phonetic alphabet has as well. The degree to which this has affected the Algonquin lexicon is difficult to say and beyond the scope of this thesis, but I would venture to say that it has been enormous.

Common Name English	Algonquin
Horse	***pebedjigockwe***
Cow	***adjikoc***
Dog	***animoc***
Pig	***kokoc***
Sheep	***manitcenic***
Monkey	***medjinaswesi***
Tiger	***micabijw***
Donkey	***micaboc***
Lion	***micanimoc***
Giraffe	***kaginwagowetc***
Camel	***kabikwaganetc***
Cat	***pijiw***
Turkey	***misise***
Chicken	***pakawakwan***
Rooster	***nabese***
Carrot	***okadiyabi***

Table 12. List of some domestic and extrinsic species in the Algonquin Language.

Evidence that Algonquins directly translate extrinsic terms into their own language is given by Roark-Calnek, who examines the ABL process of giving names to particular places. She explains that,

> In comparison with Eurocanadian place names, a surprisingly small number of toponyms are formed from the names of persons. In almost all cases, these persons were French or English Canadians associated with early logging, provisioning farms, or the fur trade whose names have been *algonquicized* and attached to sites associated with them (e.g., mersîyewâjâk, "Mercier bay" for the former Baie Mercier on Lac Byrd). (Roark-Calnek, 1995a:28).

This is obviously an example of direct translation. But as Ellen says, "it is not always easy to distinguish between terms which have been directly translated from terms whose semantic equivalence arises from the common identification of salient characteristics" (Ellen 1993:192). This conundrum can be easily shown by the Algonquin word for pineapple, ***cigwakomin***, whos literal translation is "pine fruit" (***cigwâtik*** = pine + ***min*** = fruit). Here it is difficult to tell whether the use of ***cigwak*** is a direct translation of the English "pine," or whether it comes from the fruit's resemblance to the bark or cone of the pine tree. In this case the only thing that is certain is that this word is a relatively recent addition to the Algonquin lexicon as pineapples have relatively recently arrived in Canada.

Another example which illustrates this problem of the translation of outside terms is the relationship between the Algonquin terms ***wâbocigwâtic*** and ***miskwâcigwâtik***, with the English terms 'white pine' and 'red pine', and the French terms 'pin blanc' and 'pin rouge.' Each of these terms mean literally "white pine" and "red pine", and refer to the scientific genera *Pinus strobus* and *Pinus resinosa* respectively. I had always questioned whether the ***wâbâ*** prefix (meaning "white") and the ***miskwâ*** prefix (meaning "red") were not recently added to the word ***cigwatic*** through contact with English and French speaking people. My initial suspicion developed from the fact that in most everyday situations where these species were mentioned, only the word ***cigwâtic*** was used. Employing the ***wâbâ*** and ***miskwâ*** prefix is optional, and indeed they normally are not

used. In other words, the use of the term ***cigwâtic***, in most instances, is sufficient to appropriately convey the necessary meaning. Infrequently, when the situation necessitates a distinction between the white and the red pine, were the optional prefix ***wâbâ*** and ***miskwâ*** used. These occasions surfaced most often after inquiries were made about some aspect the trees biology or morphology. In these instances Algonquin abilities to distinguish linguistically between the two trees and provide detailed information about their biological and morphological characteristics required the use of the optional prefixes.

The name ***wâbocigwâtic***, Algonquins say, comes form the white colour of the trees outer bark, while the name ***miskwâcigwâtik*** is said to come from the red colour of the trees outer bark. Most Algonquins did not know, or care, whether these two tree terms were originally Algonquin or translations from other languages of semantic equivalents arising from a common identification of salient features. One individual, however, stated her belief that the term ***wâbocigwatic*** was in fact truly Algonquin. As evidence she said that the name "***wâbocigwatic*** must have come before whiteman because we [Algonquins] had the word ***wâbidô*** before [contact]." ***Wâbidô*** is the name of a "white" fungus used traditionally as a medicinal plant by the Algonquins and is said to be commonly found on the white pine. In this person's opinion, the ***wâbâ*** prefix is given to ***wâbogigwâtic*** (white pine) because of the trees relationship with the fungus. It is plausible, according to this Algonquin elder, that the white pine was given its name, ***wâbocigwâtig*** after its association with a fungus called ***wâbidô*** that was found on it.

A good example of the addition of terms to a language is given by Brightman who explains,

> In the 1700s, Crees trading at York Factory distinguished only triadically between mahkisiw or red fox (*Vulper fulva*), mahkisis 'small fox' (*Vulpes relax*?), and wapahkisiw or arctic fox (*Aloplex legopus*), all presumably included within a generic category also labeled by "mahkisiw" (Graham 1969 [1767-1791]:24-25). This generic taxon, fox, today subsumes seven specific taxa (Berlin et al. 1973). Crees define the five color phases of the red fox as a single interbreeding species, but most regard the two phases of the arctic fox as different animals, and everybody distinguishes the red and the arctic foxes as different animals. (Brightman, 1993:350)

Similar to the Cree, Algonquins lexically distinguished between only ***wâgoc***, the red fox (*Vulpes vulpes*), and ***wâbo wâgoc*** the arctic fox (*Aloplex lagopus*). They also recognise three major colour phases: ***sonîyâ wâgoc*** ("silver" fox), ***cîbayâtig wâgoc*** ("cross" fox) and ***makadewâ wâgoc*** ("black" fox). Attaching the colour qualifier to the ***wâgoc*** root word forms each term . The arctic fox is named similarly, with the colour qualifier ***wâbo*** "white," being attached to the ***wâgoc*** root word.

It is interesting to note that the Algonquins I spoke with insisted that the three colour phases of the red fox ***wâgoc***, were simply varieties of the red fox, but ***wâbo wâgoc***, the arctic fox -- though a ***wâgoc*** -- is a different kind of ***wâgoc***. This was explained by saying that the red fox can interbreed with any of the colour varieties and depending on the combination, a particular colour phase will result, all of which is ***wâgoc***. There is potential for the red fox (or one of its three variations) to interbreed with the arctic fox, but

Algonquins say that this must rarely occur because of geographic isolation. Clement (1994:8)[24] asserts that "very few ethnobiologists have considered the presence in traditional societies of a notion of species as a category defined by its reproductive isolation." In this classificatory instance, it appears that the ABL utilise a concept similar to the genus/species/variety structure found in Linnaeean classification. As with the Cree, the segmentation of the fox taxon at the specific/varietal level corresponds precisely to the colour discriminations recognized by the Hudson's Bay Company and independent fur auctions.

Contrary to Brightman's interpretation, however, that "it is neither biology nor domestic consumption but differential exchange value that has subcategorized the generic taxon in the Cree lexicon" (1993:350), I believe it to be both the biology of the animal and differential exchange value that have induced the elaboration of new varietal terms for "fox" in the Algonquin lexicon. It is, after all, the physical and social biology of the animal that produces the different colour phases in the first place. The fact that varietal terms are even possible are, in-part, due to tangible colour differences which are a product of biological processes. Differential exchange value is also important because fur agents often encouraged Algonquins to trap certain colour phases that are in vogue and which provide differing sums of money for pelts depending on the aesthetic tastes of non-Algonquins. Today, the Algonquin sub-categorization of ***wagos*** is consistent with the

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[24] See, (Clement, D. 1994). Taxa, phena, and the notion of species: a case study in Montagnais zoological classification. Manuscript, Canadian Museum of Civilization, Hull Canada.

uses they make of them, and these uses are, in turn motivated by the changing markets with which they have participated since the 1700s.

Brown (1984), has approached the problem of how terms and categories get added to languages by addressing general evolutionary trends at the expense of the contingencies of local historical process. That the human evolution of thought, action, and technology are gradually getting more complex and extensive, is a common way for us to think, but much locally oriented research is showing us otherwise. This is not to imply that research on general evolutionary trends is useless compared to work on specific historical trajectories, but to say that we must be cautious of reductionism either way. IK research that pays attention to the use of knowledge in context has the potential to reveal how and why the accumulation of terms and categories at the local level are likely a process of notable fluctuations in the growth, decline, and reorganization of nomenclatural and classificatory schemata. The diverse experiences of Algonquins, the animal and plant introductions and extinctions, the environmental changes, cultural contact and domination, and lexical change all have the potential to influence the internalization of knowledge about resources.

Perhaps, as the Algonquins believe, these mechanisms have all been accelerating over the past 200 years. But languages have always been in contact and borrowing has always been a potential source of innovation. It is important to remember that additions and deletions of words in the Algonquin lexicon is not restricted to the post contact period but could have been functioning among Algonquins and other distinct indigenous

cultures before this time. Due to a lack of diachronic data on this subject, it would be difficult for me to make any comments. I have no examples of terms added to the Algonquin language as a result of contact with another indigenous culture although it is probable that they exist.

One thing remains certain: although flora and fauna terms may be added or deleted from the lexicon and used with increasing or decreasing frequency, and even though the salience of labels may alter, or the salience altered while the labels remain the same, there nonetheless appears to be a certain degree of continuous intelligibility between Algonquins through time. But even though a certain degree of intelligibility is continuous, the route to ensure that intelligibility is likely anything but static and inflexible. Innovation in the lexicon of flora and fauna, as with everything else, is essentially a process of cognitive reorganization.

6.2.6 Problems with Increasing and Decreasing Frequency of Term Use

Changes in patterns of activities, technology, and the material and social conditions of life may affect the exposure people have to particular species and their significance. Changes in human interaction with resources would likely alter the degree of cultural significance for those resources, which could eventually bring about lexical and categorical change.

That changes in social activities and technology are occurring among indigenous peoples of the boreal forest is argued by Winterhalder (1981a, b), who has documented, using optimal foraging theory, that diet breadth will contract if technological factors operate to reduce search time. The introduction of dog traction in the late 1800's and the snow mobile in the mid 1900s materially increased the Cree's access to preferred resources, from fish and small mammals to larger mammals like moose.

The effects that this shift in the importance of resources has on the everyday use and internalization of a people's lexicon is interesting to contemplate. For example, one might expect that the names of decreasingly significant plants or animals may be used with ever-decreasing frequency until they are ultimately forgotten. Conversely, as hypothesized by Berlin (1992:255), terms for resources that are encountered or interacted with less frequency may be given semantically transparent (obvious) names in order to help in their cognitive management. Resources used infrequently, therefore, may need to be given names which help the speaker-hearer make connections between the signified and signifier. Following this logic, we would expect that as a resource becomes more culturally important the corresponding term may occur with increasing frequency in ordinary speech and so become less semantically transparent. As Berlin explains, psychologically, terms dealt with regularly "can afford to be semantically opaque in that their use is frequent enough for the speaker-hearer to learn them by rote" (ibid.:258).

I have little hard evidence of the extent to which this may be occurring in the Algonquin language, but changes in the subsistence technology similar to those observed

by Winterhalder for the Cree, we have seen, has occurred among the Algonquin. Further, Algonquin elders point out that some words for plants and animals have been increasing in the frequency of their use while others have been decreasing; some to the point that they are in jeopardy of being lost altogether.

An example of this is the case of moose. As we saw earlier, in the Algonquin language, moose can be called by two names ***câbôganegâbwî*** and ***môs***. The first is said to be the traditional name which imparts respect to the animal while the later is said to be a more contemporary usage that, although being much easier to say, does not convey the same respect to the animal. As mentioned above, ***câbôganegâbwî*** roughly translates as "the one who walks through deep snow and still touches the ground." This is a description of an obvious physical characteristic of the animal, and thus, is compatible with Algonquin naming theory by not being offensive to the moose. No Algonquin I spoke with was able to provide a meaning for the word ***môs***, saying, "it just means ***môs*** (the animal)." Clearly, if this term once had a meaning it has been lost to the ABL. This is surprising due to the fact that the Canadian Dictionary of Etymology (Barnhart, 1995), says the English word moose was probably borrowed form an *Algonquian*[25] language, of which Algonquin is one. ***Môs*** compares well with the Narragansett ***moos***, which apparently comes from ***moosu*** "he strips off" in reference to the animal's habit of stripping bark off of trees and shrubs for food. All Algonquian speaking languages use

25 The Algonquin language is part of the larger Algonquian language family group, which includes, among others, the Cree and Ojibwa languages.

some phonological variant of the term ***môs*** to identify the animal scientifically known as "*Alces alces*".[26]

If Algonquins once used the verb ***moosu***, they no longer do so, and this could account for their inability to translate semantically the word ***môs***. Today Algonquins use the verb ***pakwanî*** to mean "to strip, or peel the bark from a tree." This verb also denotes the time of spring when it is best to peel the bark from the trees for such utilitarian purposes as making baskets. How and whether the usage of this verb has changed with time I am in no position to say, and Algonquins could have borrowed the name for moose from other related indigenous groups with or without understanding its etymology.

To further illustrate the degree to which the meaning of moose has been lost over time to the ABL, one adult I spoke with insisted that the word ***môs*** must have come from the English word "moose" which, he claims, was gradually adopted by Algonquin moose hunting guides who guided white hunters "in the early days." This individual feels that Algonquins simply adopted the use of an English word through habitual use. This is highly unlikely given that the newly arrived Europeans originally called moose "Elk" which was adopted from Germanic usage (Barnhart, 1995). Thus, it is more likely that English speaking Europeans began using the term 'moose' through their interaction with Algonquian (not necessarily Algonquin) speaking people sometime after contact. Repeated use, training, internalization, and adaptation of the word ***moos***, or one of its

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[26] Other phonological variants are: *mus*, Waswanipi Cree (Feit, 1973), *môswa*, Rock Cree (Brightman, 1993), Montagnais (Clement, 1991), *môns*, (Rogers, 1962).

indigenous equivalents would have eventually lead to the present English usage as moose. It is, of course, also probable that as interactions between Algonquin and other native groups and Europeans increased that ***môs***, and it variants began to be internalized and used with increasing frequency. It is also plausible that newly arrived Europeans may have heard the word ***câbôganegâbwî*** but would have chosen to employ habitually the shorter, less complicated, version ***môs***.

I have no way of knowing the degree to which each of the two synonyms ***câbôganegâbwî*** and ***môs*** were used in the past. According to Algonquin testimony, however, fewer and fewer Algonquins are found using ***câbôganegâbwî***, the traditional word for moose. Today, I have heard elders use the term in certain formal contexts and some adults offered the word but only because they knew of my interest in animal terms. I never heard an Algonquin youth use ***câbôganegâbwî*** in everyday speech and many of those I questioned did not recognize the word when asked.

Exerting further pressure on the increased use of the term ***môs*** is the fact that English speakers have adopted its usage, making it again more linguistically efficient for most contemporary Algonquins to use in their everyday dealings with Anglophones. This appears to be a case where the direction of change in the use of two terms for the same resource is towards the increased use of the synonym who's semantic transparency is the inverse function of the cultural importance of the animal to which the name is applied. In other words, the decreasing use of the term ***câbôganegâbwî*** could be simply due to the fact that the appropriate instances in which it can be used are decreasing. It could be that

the instances of elders telling stories to their children have decreased, and therefore, the use of the respectful form for the animal has proportionately decreased.

6.2.7 Problems with Changes in the Meaning of Terms

We have seen some of the reasons why the Algonquin flora and fauna lexicon cannot be expected to be historically static. Words have been added to the vocabulary while others may have been deleted. Terms have also been used with increasing and decreasing frequency over time. There is another mechanism that occurs which has significant ramifications for a peoples' internalization and use of terms in everyday life. This is where a term has been maintained over time but the meaning attached to it has changed. In other words, just because the use of a term -- its pronunciation, spelling, and the item the label is attached to -- may have remained static over time, the significance attached to that label may not have. This is important, because talking about something using its associated linguistic structure is not the same when the meaning for that 'thing' has changed. In any given instance where a term is uttered, a change in its meaning would surely affect what connections get made with other chunks of internalized media.

Indeed, individual Algonquins can have their own understanding of resource terms. For example, one individual described to me his version of the etymology of the word ***wabos***, the snowshoe hare. He believes the word comes from the Algonquin teaching, which includes ***Tcikabec***, a powerful personage featured in many traditional Algonquin teachings. In this story ***Tcikabec*** goes to the land of the ***anicinabeces***

(miniature or dwarf Algonquins), and when he comes upon a group of them, they tell him that they are hunting moose, pointing to tracks on the ground that they are following. Tcikabec recognizes these tracks not as moose tracks but the tracks of ***wabos***, the snowshoe hare. ***Tcikabec*** is confused until he realizes that ***wabos*** for the ***anicinabecec*** are the equivalent to moose for larger humans. Both animals are similar to each other in that they are herbivores, are often found in dense forests, and provide abundant meat for their captors. It is in this way that ***wabos*** is the combination of the Algonquin words ***wabigoncic*** for mouse, and ***mos*** for moose (***Wabigocic*** + ***mos*** = ***wabos***). ***Wabos*** is the mouse-sized moose of the ***anicinabecec***. No other Algonquin I spoke with had this same interpretation of the significance of the term ***wabos***.

Algonquin elders freely admit that although the terms for several plants and animals have remained the same, the meanings attached to them have been modified over time. For example, the name of the snapping turtle, ***makînak***, is known to most youths whom I questioned in Rapid Lake as coming from its resemblance to the spade in a deck of common playing cards. In fact, the shape of the shell of the turtle does resemble the shape of the spade in the deck and the word ***makînak*** is used for both the spade and the turtle.

In one instance, after hearing a teenager tell me that the meaning of the word ***makînak*** comes from its resemblance to the spade in a deck of cards -- the characteristic answer that most youngsters have given me -- an adult criticized the youth loudly by saying in English "the turtle had a name before we [Algonquins] ever see a deck of

cards!" Elders point out, however, that it was not the turtle that was named after its comparable likeness to the spade in a deck of playing cards, but rather the spade which was named after its anatomical resemblance to the shell of the turtle. Elders indicate that ***makînak*** is seen as the "strong puller," coming from the fact that, though turtles may move slowly, they have strong legs and jaw muscles which give them strength for slow pulling.

In this case the introduction of a particular technology, a simple deck of playing cards, has adjusted the meaning of a term for a specific animal among a particular Algonquin age group. The ways in which this affects how Algonquin youth use the term ***makînak***, and how this might affect the way they speak about and classify turtles remains to be seen. Certainly, for Algonquin youth, however, there now exists a connection between the turtle and a deck of playing cards that did not exist before cards were introduced.

Elders find these new and inaccurate connections disturbing, for there is a genuine fear that Algonquin youth are not learning the proper meanings for many Algonquin words. Anxiety exists that improper meanings will be learned, reinforced, and passed on to the next generation. The concern here is that the original meanings will be lost to the next generation.

As far as the historical change and the durability of cultural meanings goes, it has been shown how old ideas can be expressed outside of the individual mind, "in oral

narratives (Ortner, 1989), in books, drama, music, and architecture (e.g., Lave, 1988; Hutchins, 1990, in Strauss and Quinn, 1996:138)." Hutchins (1995), has shown how physical and mental tools, routines, and the organization of groups can pass on information and practices that are outside the skin of the individual person. He shows how cultural knowledge is always greater than any individual can possibly contain. This actuality has great affect on the historical durability of cultural schemas.

It must also be understood, however, that new ideas can be disseminated through these same vehicles and that this can account for historical change in some instances. Certainly, as we have seen, the sense of continuity presumed by the presence of the old can be deceptive (Strauss and Quinn, 1996:138). While the old word has been retained for the contemporary snapping turtle in Algonquin, for example, its use and meaning has changed. The mere presence of the word ***makinak*** for snapping turtle, as expressed in the Algonquin language in the present, does not guarantee its' original meaning or force from the past. As expressed by Strauss and Quinn about words,

> ...unless the appropriate understandings and feelings about them and the appropriate motivations towards them are passed on across successive generations, the things themselves will be as lifeless and uncommunicative as the mental, stone, and ink of which they are composed. It is especially hard to predict what things will retain their meaningfulness, and what meanings they will end up having, across time and complex historical shifts in the contexts of their use (1996:138).

In addition to recreating the world they know by the schemas they enact, Algonquins also act intentionally to pass on practices and beliefs that they value. This insures that many of their own specific schemas will become the enduring schemas of the next generation of individuals.

6.3 Ellen's Solution to the Problem

Consideration of the points raised in the above seven sections presents some problems to my claim of recording 238 'terms' in particular biological domains. Even where the categories and terms appear complete, as in the case of mammals, amphibians, and reptiles, this type of numerical presentation of the data conceals several problems and misleadingly implies a degree of fitness and accuracy, which in practice is largely unattainable.

Including any term under one of the preceding seven headings raises crucial "*conceptual* problems" with what ethnologists often call the "total inventory", and also what we mean by a "term" (Ellen, 1993:43). It also may have some significant statistical influence that may be misleading in any cross-cultural comparison, such as the comparison of Algonquin lists of terms with scientific phylogenic lists. I must agree with Ellen that, rather than treating the inventory as some kind of objective record of the extent and character of public community knowledge for various plant and animal groups, "it must be viewed honestly as the sum of the partial knowledge's of a number of individual

informants" (*ibid.*: 43). In an attempt to increase his accuracy, Ellen ingeniously distinguishes between:

> (1) *minimum core knowledge*, being the total number of terms, categories or species known to all adult speakers (m), and (2) *maximum theoretical knowledge*, which is the total number of terms, categories or species reported (M). $M = m + [x(1), x(2) \ldots x(n)]$ where $x(1)$, $x(2)$ and so on represent the specific unique knowledges of particular individuals, related to variation in knowledge, situation, context (*ibid.*:43).

Thus, for any specified population an index of the degree of variability in their zoological knowledge would be given by $M - m$. This is an interesting way to look at the everyday use of animal and plant names and their classification because even though we must concede that the informants chosen may be particularly knowledgeable in some areas and not in others, we must also consider the fact that the categories elicited from any population may not always differ just because informants vary in the degree to which they apply labels to natural species, but because of the contexts in which names are elicited in certain situations (including by other Algonquins or the ethnographer). This is consistent with connectionist frameworks because it provides a way to remember that the *instance of elicitation* may invoke among informants the use of certain categories to the exclusion of others.

Thus, when compiling the lists used in this dissertation I have tried to take these matters into account. My inventory is, therefore, of *all* names repeatedly elicited for categories at *all* degrees of inclusiveness, for a culturally defined domain. The completeness of my

ethnoscientific lists and the possibilities for achieving this are not only related to the difficulties in obtaining minimum core knowledge and maximum core knowledge on a number of biological domains, but also the very notion of what we think of as a "complete" list and the validity we give to the unit used to compile the 'complete' list.

6.4 Final Comments

Much of the IK literature on language and taxonomy has tended to reinforce the view that nomenclature and its arrangement into classifications consists of rule-bound processes and reified categories, rather than being an experiential process ever responsive to new situations. This static and inflexible view of indigenous knowledge of resources is inaccurate in the case of the ABL, where linguistic and semantic changes have occurred over time, and where contemporary nomenclature is being employed flexibly depending upon the situation. Flora and fauna terms have been shown to be added and deleted from the lexicon and used with increasing or decreasing frequency. Resource labels and categories can shift, and what is culturally salient can be altered. Salience may also be altered even though the labels remain the same. But none of this excludes that fact that there exists much consistency over time, and between individuals and families when Algonquins discuss flora and fauna.

Ellen (1993:40) says, "language is, even at its most complex and effective, unable to reflect all of the discontinuities of nature by assigning them separate words." This is because language has certain constraints in terms of information storage and retrieval.

For example, there are phonetic constraints. Humans can physically produce only a certain number of sounds, and the combinations in which these sounds can be arranged, though enormous, cannot possibly account for all discontinuities in nature. Moreover, the total numbers of discrete items the human brain can memorize, are not infinite. Even cultural mnemonic devises -- like the use of adjectives and the polynomial construction of words, rhymes, literacy, books, dictionaries, keys, catalogues, and computer databases -- can all help maximize or extend item retrieval but can in no way provide a complete inventory. Information storage and retrieval for those cultures restricted to oral language alone have their own set of particular limitations when compared to literate cultures. Many of these limitations are related to the reflexivity of language made possible by literate technologies.

Naming environmental resources must unquestionably have some advantages. Giving something a name ensures rapid and precise back-referral, maximizes comprehension, and facilitates communication between the speaker and hearer. But there may be no practical necessity for humans to name all the parts of their environment.

Those items that are rarely seen, used, or spoken about, or those items that look like other items can easily be glossed over without making any real distinctions. It is evident, for Algonquins that concepts can exist even though names are not applied to them. Recognized resource items do not necessarily need a name applied to them. For example, Algonquins can recognize and describe in detail two types of moles, several types of woodpeckers, and even several types of mosquitoes, but their language encodes

just one word for each. There is often no need to give separate names to each organism, and this can be because they are so familiar or similar to each other, or because they occur so infrequently in everyday tasks, or because they are not forcefully internalized. Organisms can be lumped under one name even though it is recognized that they are different. This is a kind of internalized cognitive economy that can make recall quick and leave cognitive space for more important details.

Algonquins appear to name, classify and recall various parts of the environment which have, economic and cultural significance, which are salient in some other respects, or because they are significantly related to animals, plants, places or activities which are functionally significant or salient (*cf.* Bulmer, 1969:12-13). In this way Algonquins are no different in their naming activities than any other culture. As Ellen says:

> We name those things which we have most need to communicate about, or which can serve as props in the process of communication and expression. We name those things to which we accord *value* [emphasis in the original, Ellen, 1993:41).

Certainly, those things that are culturally significant or perceptually salient are not always easy to distinguish. For example, animals may become perceptually salient because they are economically important, because they have some religious significance, or because they are strange, frightening or dangerous, or because they are physiologically different than everything else, to name but a few. As we saw in Chapter Five, on the utilization of the forest environment and the broad categories of resource use, the

perception of salience may change from one situation to another in the course of everyday life, as well as over time historically. A people's lexicon of flora and fauna is the product of the long history of those who sustain it, involving the everyday experiences they have interacting among themselves, with other cultures, and the environment.

CHAPTER SEVEN

Conclusions

This thesis, particularly the theoretical chapter (Chapter Two), has taken the position that IK can be best studied and understood by approaching it in specific ways. The researcher has extracted from the previous chapters three basic principles which can be put forward regarding IK:

1. Indigenous knowledge is a contextual and experientially driven *process* rather than a static and timeless *content*. This knowledge formation process involves the natural-material and socio-cultural environment, expanding the typical cognitive unit of analysis beyond the individual person to include his or her entire natural and social surroundings.

2. This contextual and experientially driven process gives rise to heterogeneous, fluid, and contested knowledges. The knowledge-formation process goes beyond the mere generation and transmission of knowledge to how knowledge is articulated and used in particular everyday situations.

3. This process-approach has implications, which, if ignored, will prevent researchers from developing an adequate understanding, and appreciation of the contextual nature of IK because the research will fail to consider the everyday experiences which become internalized, shared, and later put to use.

The analyses presented in the empirical chapters of this thesis (Chapters 4 to 6) support these three general principles in numerous ways. Supporting evidence for these principles will be given separately for each principle.

Supporting Evidence for Principle 1

As presented in Chapter Four, the analysis which characterizes the Algonquin learning life-cycle as a movement from childhood dependency to responsible interdependency demonstrates how the larger socio-cultural subsistence process (trapping and moose hunting included) is to a significant extent, a cognitive *process* in its own right. The age, gender, and abilities of individuals, as well as the areas they visit, the animals and habitats they encounter, and the friends and family members they associate with, all influence the degree and type of knowledge that becomes internalized. In addition, although the discussion of contemporary seasonal activities emphasizes substantial continuity in the Algonquin experience of their environment, this account, when compared to the available historical details, shows how the Algonquin seasonal round of activities has adjusted in dynamic and fluid ways to continuing social, economic, and environmental changes. Adjustments in the seasonal round of activity influences adjustments in the type of knowledge that becomes internalized by various individuals and groups participating in activities that involve the social and physical environment. Repeated experiences with these environments are internalized, adjusted and re-internalized over time. It should also be noted that not only do these adjustments

affect the cognition of individuals and groups but also these cognitions are instrumental in affecting their physical surroundings.

As presented in Chapter Five, the analysis of the range of forest resources utilized by Algonquins demonstrates how their knowledge of resource use is as much an individual as a socio-cultural *process*. Brought to light in this chapter is the important socio-cultural role, both material and cognitive, played by resources in the everyday life of Algonquins. An extensive look at most resources use by the ABL, rather than a detailed look at only a few of the most common ones, effectively establishes the changing contexts within which Algonquin individuals and groups perform their daily tasks and internalize knowledge about their forest resources. In addition, this chapter brings to light the many social, historical, and environmental factors which induce such change, usefully expanding the cognitive unit of analysis beyond the individual person to include his or her natural and social surroundings as well. Algonquin forest resource utilization is shown to be a dynamic, fluid, and interactive process. The types of resources that are used, how and why they are used, and the knowledge that goes along with such use, are constantly being created, altered, sometimes revived, and sometimes lost.

As presented in Chapter 6, the analysis of the Algonquin terminology for the forest environment demonstrates how the process of naming, identifying, and using terms for flora and fauna is to a significant extent, a cognitive *process*. The procedure of applying words to flora and fauna resources is a cognitive process that involves an interaction among people, the words they use, and the aspects of their lives referred to by

these words. The breadth of this knowledge process is revealed in that it is applied to the physical and social surroundings of the language users. The abilities of individuals, the areas they visit, the animals and habitats they encounter, and the friends and family members they associate with, all influence the degree and type of knowledge that becomes internalized. In addition, the physical attributes of flora and fauna, like colour, movement, taste, and smell are all used in identification and naming. Although the discussion of the contemporary use of terminology for flora and fauna emphasizes the substantial continuity in the Algonquin experience of their environment, it is clear that the Algonquin use of flora and fauna terms has adjusted in dynamic and fluid ways to continuing social, economic, and environmental changes. Adjustments in the use of particular terms influences adjustments in the type of knowledge that becomes internalized by various individuals and groups participating in activities that involve the social and physical environment. Repeated experiences of identification and naming are the very situations in which this type of knowledge becomes internalized, adjusted and re-internalized over time. This is why we see different Algonquin individuals and groups using the same words for resources in different ways, and even using different words for the same resource.

Therefore, all of these chapters support Principle 1 because of their emphasis upon indigenous knowledge formation as a contextual and experientially driven *process* rather than a static and timeless *content*. The chapters show how this process involves more than the typical cognitive unit of analysis, expanding beyond the individual person to include his or her entire natural-material and socio-cultural surroundings.

Supporting Evidence for Principle 2

As presented in Chapter Four, the analysis of the Algonquin learning life-cycle shows that much of what individuals end up learning and knowing about subsistence comes from the particular situations that arise out of their social interaction in subsistence activities. The subsistence process establishes the contexts for the cognition of the people who participate in them. As a result, not only do we see details describing high consensus cultural activities and knowledge shared by most Algonquin individuals, but we also see a proliferating number of distributed knowledges as well. In addition, such developing contexts make a significant impact upon the way Algonquins carry out these subsistence activities. Furthermore, what is evident from the details of this chapter is the degree to which an accurate conceptualization of the Algonquin seasonal model is anchored in everyday experiences sensitive to particular contexts. Algonquins integrate, among other things, visual imagery, sensory experiences, evaluations, indexical signs, and the cognitive aspects of learned practices in the formation, articulation and transmission of this seasonal model. This integrated knowledge is used in particular ways, by specific individuals in particular situations, depending on the moment of elicitation, the information that one wants to convey, the purpose of the communication, etc.

As presented in Chapter Five, the analysis of the Algonquin utilization of the forest environment shows that much of what individuals end up learning and knowing about resources and their specific uses comes from the particular situations that arise out

of their social interaction with these resources. This leads to considerable agreement between Algonquins on the uses of many resources, but the details of this chapter also reveal a proliferating number of distributed knowledges that are sensitive to context. For example, an individual's perception of the significance of using a particular resource may change from one situation to another in the course of everyday tasks, as well as over time (historically). In reality, it is difficult to isolate completely the various roles of animals and plants which allow them to be placed in a single category of utilization. This is because the placement of a resource item into a use-category depends upon the context and meaning of the item employed by the user. The boundaries of these categories are not always fixed, and may, in fact, keep changing as the experiences of Algonquins keep changing.

The Algonquin process of applying words to resources is responsive to new situations, and demonstrates both the dynamic and fluid nature of language development and use. Although there exists much linguistic consistency over time between individuals and families when discussing flora and fauna, a detailed look at contemporary nomenclatural use by Algonquins reveals how words and terms can be employed flexibly by individuals depending upon the situation. Algonquins accept a certain degree of inconsistency in the use of resource terms, and there exists much heterogeneity and contestation between individuals and families in the words they know and use. The Algonquin flora and fauna lexicon has had many additions and deletions over time, and terms have been used with increasing or decreasing frequencies. Resource labels and categories can be seen to shift, what is culturally salient can be altered, and the meaning

applied to a particular item can be transformed. All these things can change from one situation to another in the course of everyday life as well as over time (historically). In fact, terminological ambiguity appears to be almost a condition of ABL knowledge. Hence, the difficulty of etically applying IK to western needs.

Therefore, all of these chapters support Principle 2 because of their emphasis upon the fact that this contextual and experientially driven process gives rise to heterogeneous, fluid, and contested knowledges. They clarify that an understanding of knowledge-formation goes beyond looking at the mere generation and transmission of knowledge to how knowledge is articulated and used in particular everyday situations.

Supporting Evidence for Principle 3

Extension of the above discussion of Principles 1 and 2 provide the foundation for the support of Principle 3. This Principle suggests a number of important implications, both for research and practice. The advantage of conceptualizing IK according to the approach of this thesis may be contrasted with the disadvantages of ignoring this perspective.

Incorporating contemporary concepts from the cognitive sciences, like schema/connectionist frameworks, provides a new approach to account for how the process of internalizing, utilizing, and transmitting cultural knowledge in the brain might

work in a very human fashion. This architecture of cognition accommodates the flexible, changing, and context-sensitive constitution of culture that emerges from the analysis of Algonquin knowledge and action. This approach provides a robust theory which explains how culture can be both partially shared and partially diverse, partially contested and partially accepted, partially changing and partially permanent.

IK researchers who turn away from the study of society by looking inward to the knowledge an individual has to know to function as a member of culture place the locus of knowledge inside the individual. The only methods of research available to them in this case is an analysis of declarative knowledge, that is, knowledge that is expressed or expressible in language. These researchers are limited to a methodology that only documents what people can say about what they know. Looking at knowledge this way overlooks the "tools of the trade" and the skill needed to perform cultural tasks. By simply trying to learn about *what* people know, researchers overlook paying attention to *how* people go about knowing what they know and the contribution of the environments in which the knowing is accomplished. We must pay attention to practice if we are to fully understand knowledge and its formation. There are more tools at our disposal when we go about "locating cognitive activity in context, where context is not a fixed set of surrounding conditions but a wider dynamical process of which the cognition of the individual is only a part" (Hutchins, 1995:xiii).

IK researchers that rely solely on the discourse of the people they study also neglect the diverse aspects that influence the knowledge formation process. Because language and speech are not privileged in this approach, researchers are encouraged to pay attention to other kinds of experience, including, seeing, touching, smelling and tasting which are all part of the internalization of knowledge. It allows us to illustrate how the people we study slowly build webs of connected schemata, that once organized, can result in rapid decisions that are context sensitive.

Taking this approach allows researchers to incorporate rather than replace the shared, inflexible, and static view of knowledge. Instead of concentrating on describing one small part of a high consensus cultural content that each individual is expected to share, this perspective anticipates and strives to account for a certain amount of shared and unshared knowledges. This encourages those of us who study IK to understand and represent it not as completely shared and uncontested content, but as an incomplete account of a much more complex process.

Placing the flexible constitution of cultural knowledge first, means approaching the appropriate methods of documenting and interpreting IK from a different starting point. The flexible and changing nature of IK can be entirely missed by laboratory-type research methods that intentionally limit the methods their subjects may use to perform tasks. It can also be missed, as we saw in the case for Algonquins, by data-base-type methods of recording knowledge that intentionally limit the degree of variation in the

way resources, and words for resources, are used in different situations. Accepting the existence of flexible and changing cultural knowledge reduces the emphasis researchers place on data normalization, and instead search for things that account for and explain the flexible and changing nature of knowledge. Paying attention to knowledge in context provides the necessary tools and approach to understand the existence of contestation, disagreement and revival within cultures.

The recommended approach requires the use of long-term research techniques in order that we may better understand the use of knowledge in as many situations as possible. Long-term participant observation provides a good means of placing the study of local ecological knowledge in a firmer sociological, ecological, and historical context. These techniques also provide a means to integrate ecology and cognition in order to envision how everyday thought and action are shaped, and re-shaped, through on-going interactions of people with each other and their material and social environment.

For IK to improve development and resource management schemes, it is essential that information be appropriately collected, represented, and implemented. To do this properly, particular attention must be given not only to how this knowledge is generated, organized, stored, and transmitted, but also how it gets used in particular situations and what this use means to its users. If, as I have outlined above, the formation of indigenous knowledge is largely a consequence of experience, and given that the experiences of most indigenous peoples are to a certain extent unique, then indigenous people do have

something to tell non-indigenous societies about development and resource management on their lands. But this will be true only as long as this experiential knowledge is put to use under existing contexts rather than merely being abstracted. The strength of indigenous environmental knowledge, and all knowledge for that matter, lies in its experiential, contextual, and interactive nature. The argument for the use of IK to improve development and resource management regimes is strengthened when this knowledge is placed in the context of its immediate engagement with the socio-material environment.

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APPENDIX ONE

Ecology of Flora Questionnaire

Date:
Expert:

Algonquin Name **English Name** **French Name** **Latin Name**

_____

_____ _____
id specimen no.

Algonquin Meaning:
_____
_____

Remarks:_____
_____

1. Lexeme:

Type: (circle) Amimate (Living) Inanimate (Not Living)

Etymologie:_____
(history of word, other dialects, etc.)
_____
_____

2. Sexual Differences:

_____
_____

ABL FLORA Date: _____ Expert: _____

3. Locational Attributes:

Topography (site position): _____

Aspect: (circle) north south east west

Slope: _____

Stoniness: _____

Soil Texture: _____

Soil Drainage : _____
(dry, medium, wet, aquatic)

Disturbance: _____

Abundance (past): _____
(regionaly, per habitat)
(present) _____

Density (overstory): _____
(open, intermediate, closed)
(understory): _____
(open, intermediate, closed)

4. Relations With Animals:

Part(s) of Plant Used	Animal Using	Season of Use

ABL FLORA Date: _____ Expert: _____

5. Algonquin Utilization: (circle)

food beverage medicine smoking Utility ceremonial commercial Art/Craft

Part Utilized: _____ _____
_____ _____

Purpose:_____
_____

Preparation: _____
_____

Season\Month Gathered: _____

Season\Month Used: _____

Number of Croppings: _____

Quantities Gathered: _____

Storage: _____

Known Location: _____

ABL FLORA Date:_____ Expert:
_____

6. General
Beliefs\Stories: _____
_____
_____
_____

Ethnographic Notes: _____
_____
_____
_____
_____

Botanical Notes: _____
_____

MAP SCALES: 1:500,00, 1:250,000, 1:50,000, 1:20,000

Map Number: **Grid #:** **Ref. #:** **Color:** **Data Location:**

Interviewer:

Expert: _____

Signatures:

APPENDIX TWO

Ecology of Fauna Questionnaire

Name of Expert(s):

Signatures:

Interviewer:

Date Interview
Interview #
Cassette #
Duration (Time start/end/total):
Map #
Map Scale
Colour

Other Experts on subject to contact:

Animal Name in Algonquin:

Name English:

French Name:

Scientific Name:

Theme 1: Nomenclature Date: Interview #:

1.1 Name according to age and sex

Age (English name)	Male (Algonquin name)	Female (Algonquin name)

1.2 Popular Name(s):

1.3 Other dialect(s):

names	origin

Additional Remarks: _____

Theme 2: Taxonomy Date: Interview #:

2.1 Varieties: Do you know any other kind of _____ ? Which one?
(name of animal Algonquin)

_____

_____

2.2 Class: Is _____ a
(name of animal in Algonquin)

Waysisik Pinacic Kigos Mendjoc Other ?

2.3 Intermediate class: In which family of (what sort of?) Waysisik Pinacic Kigos Mendjoc Other
is _____ ?
(name of animal in Algonquin)

_____

Why?: _____

_____

2.4 Mendjoc: Is it a mendjoc?:
_____

Why is it a mendjoc?:
_____

Additional Remarks: _____

- Kingdom (animal Plant), Phylum, Class, Order, Family, Genus, species

Theme 3. Description of Animal Date: Interview #:

3.1 Color of fur/skin: Type of fur/skin Colour(s)

In General _____ _____

Male/summer _____ _____

Male/winter _____ _____

Female/summer _____ _____

Female/winter _____ _____

3.2 Consistency of the meat:

In General: _____

Male/summer: _____

Male/winter: _____

Female/summer: _____

Female/winter: _____

3.3 The quality of the grease:

In General: _____

Male/summer: _____

Male/winter: _____

Female/summer: _____

Female/winter: _____

3.4 Method of Movement:

In General: _____

Summer: _____

Winter: _____

3.5 The Season of the Animal: Summer Winter Summer/Winter

Theme 3. Description of Animal (continued) Date: Interview #:

3.6 Sexual Differences:

Male

Female

Determination of sex can be done in the bush (or in the hand):

3.7 Birds (way wings are flapped, description of flight, etc):

3.8 Sensitivity of Species - Physical Capabilities:

How well can they hear (distance, in wind, seasonal variation)?

How well can they see (distance, day/night, seasonal variation)?

How well can they smell (distance, seasonal variation)?

How is their sense of touch?

How sensitive are they to heat/cold?

In what way does the animal perceive danger?

3.9 Communication:

Call(s) particular:

Mode of communication (sound/scent/visual/touch):

Among themselves:

With other animals:

Distance that communication is possible:

Hours of communication (day/night):

Season(s) of communication:

Explain how they communicate (physical, actions):

Making sounds under what circumstances (e.g. when happy, scared, sad, etc.):

Theme 3. Description of Animal (continued) Date: Interview #:

What can affect communication (certain types of unfamiliar sounds, noise, etc.):

3.10 Description of track:

3.11 Description of trail:

3.12 Hibernation or migration: (circle) hibernation migration

Name of phenomenon (in Algonquin): _____

Place/Habitat:

Duration:

description:

Theme 4: Seasonal Cycle Date: Interview #:

4.1 Grouping:

Season(s) when grouping occurs:

Place/habitat:

Why there:

Groups make-up (Males/females/young/mixed):

Size of group (numbers):

Other occurrences (e.g. feeding, breeding etc.):

Local movement in the area (describe):

Seasonal changes in group composition:

Theme 4: Seasonal Cycle (continued) Date: Interview #:

4.2 Sleeping: (circle)

Nocturnal: _____ Diurnal: _____ Crepuscular: _____
(Algonquin) (Algonquin) (Algonquin)

Number of hours/period:

What is sought in a specific site (habitat):

Location:

Orientation (aspect):

Type of material used:

Mode of construction:

Seasonal differences:

Theme 4: Seasonal Cycle (continued) Date: Interview #:

4.3 Shelter:

Season(s) :

Type of material used:

Mode of construction:

Place of construction:

Orientation (aspect):

What is sought in a specific site (habitat):

Seasonal differences:

Theme 4: Seasonal Cycle (continued) Date: Interview #:

4.4 Shedding:

Season(s) occurs: male:

female:

Physical changes (colour change, fur quality):

Age dependent:

4.5 Physical Changes in Life cycle (skin/fur, teeth, reproductive organs, other, etc.):

	season(s)	type of change	description
male:			
female:			
young:			

Theme 4: Seasonal Cycle (continued) Date: Interview #:

4.6 Seasonal Movements (Map):

Months of major movements (Males/Females/Young):

Patterns of movement:
Direction (North/south east/west):

Elevation, Land/lakes:

What conditions determine when an animal must leave the area?

Where do they go and how (routes, elevation, etc.)?

Territory covered (size):

4.7 Are there any species doing the same thing at the same time?

4.8 What other species are related with the animal during their life cycle?

Theme 5: Reproduction (Breeding) Date: Interview #:

5.1 The season of reproduction:

Begins Ends

Month/Season (Algonquin)

No. times/year:

5.2 Description of Breeding site:

Site desired for (protection from elements, predators, closeness to food)?

Are the same breeding sites used each year?

Does feeding occur at this site? male:_____ food:

female:_____ food:

Does the animal travel long distances to reach these areas?

For rank habitats: Islands, peninsulas, shoreline, wetland, upland >500m from water, <500m from water, other:

5.3 Description of breeding:

Role of the Male:

Role of the Female:

Age at first Mating: male: _____ female:

Age stop Mating: male: _____ female:

Duration of the pregnancy:

Additional Remarks:

Theme 6: Having Young Date: Interview #:

6.1 The season of birth:

Begins Ends

Month/Season (Algonquin) _____

No. times/year:

6.2 Description of birth site: habitat

Site desired for (protection from elements, predators, closeness to food)?

Are the same breeding sites used each year?

Does the animal travel long distances to reach these areas?

Rank Habitats: Islands, peninsulas, shoreline, wetland, upland Far from water, close to water, other:

Are these areas important to the Algonquins?

Why?

Has logging/hunting/hydro affected these areas?

6.3 Feeding at breeding site: Does feeding occur at this site?

food part(s)

male

female

young

Theme 6: Having Young (continued) Date: Interview #:

When do young start feeding?

on what (plant/animal)?

part(s)

6.4 Description of birth activities:

Role/activities of the Male:

Role/activities of the Female:

Activities of young:

Number of young, eggs, etc.:

Parental relations (time remain with parents, etc.):

Do parents protect young?

How?

Eyes born open or closed?

Additional Remarks:

Theme 7: Interrelationship Between Species Date: Interview #:

7.1 Pray (it eats who?):

7.2 Predators (it is eaten by who?):

7.3 Parasites (Are there any? Which ones?):

7.4 Communalism/Symbiosis (Do they eat the remains of dead animals, or food left by others? Which?):

7.5 Reaction when in danger. (Do they warn, or are they warned by other animals? Which/How? _____

7.6 Friends (Do they live with other animals? Which?):

7.7 Enemies (Are the other enemies which pray on, or are their predator?):

7.8 Describe how you think local animals are related to other populations (to the north, south, east, west)?

Theme 8: Disturbance and Danger Date: Interview #:

8.1 Disturbances:

What do they do when they get disturbed?

How do they find each other again after they have scattered?

Are there areas that make movement difficult (rapids, roads, etc.?):

8.2 Dangerous areas:

Why?

During what seasons?

When is it dangerous? Season:

Timing (morning, noon, afternoon, evening, night?):

How do they avoid this?

Theme 9: Critical Areas Date: Interview #:

9.1 Which areas are essential for their survival? Describe:

Delineate (Map).

9.2 Definition of critical:

1) Critical to the survival of a species.
Concentration areas (Why and how do the animals use these areas?):

2) Culturally critical (related to a hunter's mental map?):

3) Critical in the defense of your territory:

4) Critical do to Economic Geographical reasons (closeness to road, cabin, or area of familiarity):

5) Other (Describe):

*Sensitive areas are sometimes more defined in some areas than others thus it is important to describe.

Additional remarks:

Theme 10:Changes in Patterns of Behaviour/Habitat Date: Interview #:

10.1 Have you noticed any changes (Population size, travel corridors, seasonal use of habitats, year-to-year variability in numbers?):

10.2 Is this caused by: hunting pressure logging activities hydro activities

noise pollution tourism ZEC's and Outfitters

Other (explain):

10.3 In the past were there other habitat sites important to the animal which no longer exist:

10.4 Are there new places the species is using nowadays?

10.5 Any changes in group size?

10.6 Composition of groups?

10.7 Changes in behaviour? Additional remarks:

Theme 11:Relationship With Hunter Date: Interview #:

11.1 Locate and approach:

A. Method to locate:

Observational indices (track, trail, droppings, odor, call, etc.):

Ritual means (sweat lodge, scapulimancie, dreams, etc.):

B. Method to attract (imitate the call, use noise, decoys, dog, etc.):

C. Precautions of approach (take account of the wind, temperature, precipitation, etc.):

Theme 11:Relationship With Hunter (continued) Date: nterview #:

11.2 Capture: arms utilized description of capture

11.3 Butcher and transport:

Tool(s) used:

Location of butchering:

Description:

Transport (means, place, etc.):

11.4 Rules of distribution and disposal of the remains:

A. Distribution: part(s) mode of distribution

special rules:

B. Disposal of remains (part(s), place, etc.):

Additional remarks (anecdotes of the hunt, specific rituals, etc.):

Theme 12: Parts Date: Interview #:

12.1 Characteristic Parts:

English name Algonquin name

12.2 External Parts:

English name Algonquin name

12.3 Internal Parts:

English name Algonquin name

Additional Remarks:

Theme 13: Subsistence (Feeding) Date: Interview #:

13.1 Preferred Food: Month/Season (start/finish) | Part(s) eaten | Method of Obtaining and Eating | Place where it Eats (location/season)

(animal)

(plants)

(others)

13.2 Preferred Food **Male**:

Month/Season (start/finish)	Part(s) eaten	Method of Obtaining and Eating	Place where it Eats (location/season)
(animal) Sigon			
Minokimin			
Nibon			
Apitaniban			
Tigwagan			
Pibon			
Pidjibibon			

Theme 13: Subsistence (Feeding) Date: Interview #:

(plant) Sigon

Minokimin

Nibon

Apitaniban

Tigwagan

Pibon

Pidjibibon

(other)

Theme 13: Subsistence (Feeding) Date: Interview #:

13.3 Preferred Food **Female**:

	Month/Season (start/finish)	Part(s) eaten	Method of Obtaining and Eating	Place where it Eats (location/season)
(animal) Sigon				
Minokimin				
Nibon				
Apitaniban				
Tigwagan				
Pibon				
Pidjibibon				

Theme 13: Subsistence (Feeding) Date: Interview #:

13.3 Preferred Food **Female**:

Month/Season (start/finish)	Part(s) eaten	Method of Obtaining and Eating	Place where it Eats (location/season)
(plant) Sigon			
Minokimin			
Nibon			
Apitaniban			
Tigwagan			
Pibon			
Pidjibibon			
(other)			

Theme 13: Subsistence (Feeding) Date: Interview #:

13.4 Preferred Food **Young**:

	Month/Season (start/finish)	Part(s) eaten	Method of Obtaining and Eating	Place where it Eats (location/season)
(animal) Sigon				
Minokimin				
Nibon				
Apitaniban				
Tigwagan				
Pibon				
Pidjibibon				
(plant) Sigon				
Minokimin				
Nibon				
Apitaniban				
Tigwagan				
Pibon				
Pidjibibon				

Theme 13: Subsistence (Feeding) Date: Interview #:

13.5 Reason(s) for seasonal changes in food items:

For example why do moose not continue to brows on small branches when they are still available in summer?

13.6 Daily feeding pattern: describe

male:

female:

young:

13.7 Yearly feeding pattern:

male:

female:

young:

13.8 Mineral licks:

Are there mineral licks in the area? Where

Are mineral licks important?

Theme 14: Algonquin Utilization Date: Interview #:

Type of Utilization	Mode of Utilization	
	Part(s) utilized	Preparation
Food		
Medicine		
Technical		

Theme 14: Algonquin Utilization (continued) Date: Interview #:

Type of Utilization	Mode of Utilization	
	Part(s) Utilized	Preparation
Clothing		
Arts/Crafts		
Ritual		
Other		

Theme 15: Cosmology, Stories and Legends

	Stories	Legends
Physical Portrayal of the Animal (transmitted character)		
Psychological Character		
Other Were _____ always as they are today? Describe changes and why they occurred.		

Theme 16: Management Date: Interview #:

16.1 What is the most important factor influencing the present status of the animals?

16.2 Do You think management and regulations are necessary for them?

16.3 What are some of the things you feel must be considered in order to make sure these animals survive in the La Varendrye region for many years in the future?

16.4 What are some of the problems you see for the animals and Algonquins who are forced to make decisions about them for the future?

16.5 If you were to tell a government person how you would manage the animal what would you them?

16.6 What ideas/policies do you see included in a species management plan?

How do you see the Algonquins being involved?

16.7 Community hunting

How many animals do you think can be taken in specific areas?

How many animals do you think were taken by the community last year? This year?

During what season are the animals killed by community members the most?

What years were/are their more? What does this depend on?

16.8 White Hunters

How many animals do you think can be taken in specific areas?

How many animals do you think were taken by them last year? This year?
(< >, 50, 100, 150, 200,...)

During what season are the animals killed by white hunters?

What years were/are their more? What does this depend on?

APPENDIX THREE

Books Used for Inventories and Identification.[27]

Mammals:

Banfield, A.W.F., 1974. The mammals of Canada. Toronto: University of Toronto Press.

Beaudin, L.and M. Quintin, 1991. Mammiferes terrestres du Quebec: de l'Ontario et des Maritimes (3 ed. ed.). Waterloo, Quebec: Editions Michel Quintin.

Burt, W.H.and R.P. Grossenheider, 1976. A field guide to the mammals. Boston: Houghton Mifflin Co.

Murie, O.J., 1983. A field guide to animal tracks (2 ed. ed.). New York: Houghton Mifflin Co.

Fish:

Bergeron, J.F.and J. Brousseeau, 1982. Guide des poissons d'eau douce du Quebec. Quebec: Ministere du loisir, de la chasse et la peche, Direction generale de la faune.

Bernatchez, L., 1991. Guide des poisson d'eau douce du Quebec et leur distribution dans l'est du Canada. La Prairie, Quebec: Editions Brouquet.

Scott, W.B., 1967. Freshwater fishes of Eastern Canada. Toronto: University of Toronto Press.

Scott, W.B.and E.J. Grossman, 1979. Freshwater fishes of Canada. Ottawa: Fisheries Research Board of Canada.

[27] This includes the use of photos for identification.

Amphibians and Reptiles:

Cooke, F.R., 1984. Introduction to Canadian Reptiles and Amphibians. Ottawa: National Museum of Canada.

Froom, B., 1982. Amphibians of Canada. Toronto: McClellan Stewart.

Johnson, B., 1989. Familiar Amphibians and Reptiles of Ontario. Toronto: Natural Haritage.

Birds:

Robbins, C.S., et al., 1966. A guide to field identification: Birds of North America. New York: Western Publishing Company , Inc., Published by Golden Press.

National Geographic Society, 1983. Field guide to the Birds of North America. Washington, D.C.: National Geographic Society.

Plants:

Bertrand, N., 1991. Les arbres du Quebec. Quebec: Governament du Quebec.

Budd, A.C.and K.F. Best, 1976. Wild Plants of the Canadian Prairies (3 ed. ed.). Ottawa: Research Branch, Canada Department of Agriculture.

Hosie, R.C., 1973. Native trees of Canada. Ottawa: Crown Publishing.

Lamoureux, G., et al., 1988. Plantes sauvages printanieres (2 ed. ed.). Saint-Augustin (Portneuf), Quebec: Fleurbec.

Macdonald, H., 1977. Native Manitoba Plants in bog, bush and prairie. Winnipeg: Manitoba Department of Agriculture.

Marie-Victorin, 1964. Flore laurentienne. Montreal: Les presses de l'Universite de Montreal.

Miller, O.K.J., 1977. Mushrooms of North America. New York: E.P. Dutton.

Rouleau, R., et al., 1990. Petite flore forestiere du Quebec. (2nd ed. ed.). Quebec, Quebec: Bibliotheque National du Quebec.

Rousseau, C. 1974. Geographie floristique du Quebec Labrador. Travaux et documents du Centre d'etudes nordiques no 7, Presses de l'Universite Laval.

Rowe, J.S. 1972. Les regions forestieres du Canada. Canada, ministere de l'Environment, Service canadien des forest, Publication 1300 F.

Insects:

Borror, D.J.and R.E. White, 1970. A field guide to the Insects of America North of Mexico. Boston: Houghton Mifflin Co.

Animals in General:

Wrigley, R.E., et al., 1974. Animals of Manitoba. Winnipeg: Museum of Man and Nature.