Guidelines for the Conduct of Participatory Community Research to Document Traditional Ecological Knowledge for the Purpose of Environmental Assessment and Environmental Management

Dene Cultural Institute

Introduction

The recent global trend toward sustainable development has focused attention on the importance of promoting self-sufficient communities which use sound environmental management and which reflect the cultural values and aspirations of local people (World Conservation Strategy 1980; Bruntland Report 1987). Paramount to achieving this goal is the involvement of local people in the design, implementation, and monitoring of environmental management programs. Their participation in environmental assessment and land use planning is also essential.

Since the coming of the first European explorers and the early missionaries to Canada, aboriginal peoples have been the subject of numerous studies seeking to describe various aspects of their ways of life. Unfortunately, in many cases, the topics of investigation were conducted without community consultation and as such did not address their concerns. Furthermore, most biological studies rarely included traditional ecological knowledge and where they did, the results were not communicated back to the people who had shared their knowledge, before application to resource management policies. The results of this approach were often inappropriate management laws or regulations which were impractical or ineffective and culturally unacceptable to the community involved or affected by them. In an effort to overcome this problem, aboriginal peoples have taken measures to acquire control over land-use and resource management programs using participatory community research as a base. This approach involves the direct and effective participation of communities from the outset of resource programs to their completion. Even with government initiated projects or programs, the target community

must actively participate in determining research needs, in the selection and training of community researchers, in the collection and documentation of data, and in application of data to environmental management. Since a fundamental goal of participatory community research is to build a community's capacity for generating knowledge to solve local problems, (SSHRCC 1983) it is usually problem-oriented, but towards locally perceived concerns. It may, however, include outsiders, but in a cooperative and sharing relationship that is sensitive to the viewpoints of both insiders and outsiders who can share knowledge and resources towards a common goal (Guyette 1983).

The goal of this document is to provide a set of guidelines for the conduct of participatory community research on traditional ecological knowledge for environmental assessment and environmental management purposes. The paper begins with a brief description of the nature of traditional ecological knowledge and some of the problems of documentation and application of this knowledge in the modern or non-aboriginal context. The second section outlines the chronological steps and guidelines necessary to carry out effective participatory community research on traditional ecological knowledge to fulfil environmental assessment and management objectives. The model presented in this document is based primarily upon the experience of the Dene Cultural Institute. Over the past two years, the Dene Cultural Institute has conducted participatory community research in three Dene communities on the subjects of traditional medicine, environmental knowledge and justice. These guidelines are drawn primarily from the experience of the traditional environmental knowledge pilot project, the purpose of which was to develop methods for documenting traditional environmental knowledge using a participatory

community research approach. It is applicable to either a government or non-governmental agency planning to carry out cooperative research within Canadian aboriginal communities. Because of the focus on our experience with Dene communities and the specific needs of our traditional environmental knowledge research project, some of the examples and recommendations may not be applicable to all aboriginal communities or projects. However, some of the guidelines may also be relevant to environmental, participatory community research projects being carried out in non-aboriginal resource dependent communities (e.g., fishing and agricultural communities in southern Canada). Suggestions and comments for the final document were provided by a number of groups and individuals involved in traditional knowledge research across Canada. A list of contributors appears in Appendix I.

SECTION ONE

The Nature of Traditional Ecological Knowledge

For thousands of years, aboriginal peoples around the world have utilised the natural resources of their local environment in an ecologically sustainable manner. Only recently, has this knowledge, built up over generations of careful observation and experience, begun to be recognized among the western scientific community as a valuable source of ecological information. Variously labelled as folk or ethno-ecology, traditional environmental/ecological knowledge or customary law, a growing body of literature attests not only to the presence of a vast reservoir of information regarding plants and animal behaviour, but also to the existence of effective indigenous systems of self-management which rely upon a sophisticated data base

to determine strategies for conserving natural resources.

Traditional ecological knowledge is both cumulative and dynamic, building upon the experience of earlier generations and adapting to the new technological and socioeconomic changes of the present. It includes a system of classification, a set of empirical observations about the local ecology, and a system of self-management that governs hunting, trapping and fishing.

It varies in quantity and quality among individuals of any community or cultural group, having been passed on by word of mouth (often through stories) and by direct hands-on experience. The legitimacy and authority for traditional resource use are determined at the local level. Any deviation from these rules and understandings is met by social pressure as necessary (Osherenko 1988).

Research has shown that hunters and scientists may apply the same general ecological indicators in their respective evaluation of the local environment. Feit (1988) examined James Bay Cree knowledge of moose and beaver. In the case of beaver, he explains, information about the composition of beaver colonies is continually collected by Waswanipi Cree hunters from signs of the beaver around the sites, from the sizes and sexes of the beaver caught, and from information collected in the process of butchering beaver. Knowledge of beaver colonies being hunted, of their age and sex composition is sought in order to determine how many beaver are present and how many may be taken. According to Feit (1988), similar patterns of monitoring occur for moose, although for a more dispersed population. The numbers of occupied moose yards, the size of yarding groups, the frequency with which females are accompanied by young,

and the frequency of twin young are all noted and discussed by hunters.

In both cases, Feit (1988) remarks that the parameters monitored by the Cree are all ones which wildlife biologists have found to be important indicators of the condition of the game populations and are useful indicators for management decisions concerning the sustainability of present harvests. Absolute numbers are not recorded, but trends in the basic parameters are noted and discussed by Waswanipi hunters.

According to Berkes (1988), the ability of aboriginal peoples to use resources sustainably stems from a combination of two factors: (a) the possession of appropriate local ecological knowledge and suitable methods/technology to exploit resources and (b) a philosophy and environmental ethic to keep exploitive abilities in check, and to provide ground rules by which the relation among humans and animals may be regulated.

Conservation strategies have been recorded by a number of researchers working in Canada and in other parts of the world. From a scientific perspective, in most instances these practices are rooted in sound ecological principles. For example, studies among the James Bay Cree by Scott (1986) of geese hunting and Feit (1978) and Berkes (1988) of beaver and moose hunting and research by the Dene Cultural Institute (Johnson and Ruttan, in press) on the system of resource management for the Ft. Good Hope Dene, showed that hunters and trappers follow a system of rotation and "resting" of hunting, trapping and fishing areas. This would allow the population in the area to renew itself.

Another important principle of sustainable harvesting among the Dene and the Cree is to take only what one needs. All parts of the animal should be used and the meat and hides should be shared with other members of the community according to need (Berkes 1988; Johnson and Ruttan, in press). Following from this general principle is the idea of hunting only the mature animals and leaving the females when they are pregnant or carrying for young ones (Johnson and Ruttan, in press).

Although hunters and scientists may apply the same ecological principles in their respective management regimes, the level of information available to the aboriginal hunter differs from that available to the scientist. From her work among the Inuit of the western Canadian Arctic, Gunn et al. (1988) note that scientists have the advantage of being able to draw upon the extensive ecological knowledge gathered in many parts of the world for comparison, and with the help of technology, can observe wildlife over large areas or beneath the ice and water.

Aboriginal hunters, on the other hand, have a reservoir of ecological knowledge that has accumulated over generations. For instance, the arctic ecosystem is characterised by annual variations in the abundance and distribution of wildlife - a single or two seasons' observations can be misleading. The observations of hunters can thus be a valuable guide to some of the longer term changes in wildlife distribution and behaviour. Similarly, the extensive travel of hunters during winter months leads to observations of behaviour not paralleled by biologists whose winter observations of arctic wildlife are often lacking.

Gunn et al. (1988:25) suggest that the difference between traditional knowledge and western

science lies not so much in the type of observation (quantitative vs. qualitative), but in the organization of the observations and the physical recording of them which for the scientist usually has to be sufficiently detailed:

> Inuit hunters rarely question observations related by others and do not always ascribe more importance to multiple than single observations: both those characteristics are vital in small social groups and in preparing a hunter for often rare contingencies. The same characteristics are, however, the antithesis of science: science is the stepwise attainment of knowledge based on questioning of observations to fit them into or modify the pattern formed by other observations. Scientific knowledge accommodates natural variation by seeking to collect enough observations to measure it hence the preoccupation with quantitative observations (Gunn et al. 1988:25).

Where western science and traditional environmental knowledge diverge most notably is in their explanations of ecological processes and their different concepts of environmental management. Western science separates the natural and the physical world from the human world. Phenomena are explained in terms of a set of laws which are continually tested over time through the accumulation of more quantified data. The natural environment is viewed as something that can be readily manipulated by humans to serve their needs. Aboriginal cultures, on the other hand, perceive humans and nature as being inextricably linked. The animals, plants and humans that live off the land each represent an integral part of the whole system. Animals are social beings, not cut off from humans as part of a natural order separated from human society. In many instances there is reference to a higher power "the Creator" who is responsible for ensuring that overall order is maintained in the system. One should not attempt to interfere with the course of nature - everything has its place in the natural cycle. Above all, humans do not have any greater power or authority over other living and non-living organisms. Among the Dene of the Northwest Territories and the Cree of James Bay, animals are believed to "give" themselves to humans, and humans in turn are expected to treat them with dignity and respect. If the proper

traditions of respect regarding the methods of killing and butchering of the animal and proper

disposal of its remains are not followed, the animal will no longer present itself to the hunter

(Berkes 1988; Feit 1988; Johnson and Ruttan, in press).

Among the Dene human qualities are often attributed to animals in many of the legends. Often

elders speak of the time when humans and animals were able to communicate with each other.

Many legends talk of people who went to live among the animals to learn their ways. This is

how Dene came to learn so much about the land.

Two distinct epistemologies underlie the indigenous and the state systems of resource

management. Usher (1986: 7 1) outlines their different characteristics as follows:

> The state system rests on a common property concept in which the state assumes
> exclusive responsibility and capability for managing a resource equally accessible to all
> citizens. The state manages for certain levels of abundance on a technical basis, and then
> allocates shares of this abundance to users on an economic and political basis. The
> system and management problems are resolved in a technical, a historical framework.
> This system of management is bureaucratic, which is to say, hierarchically organized and
> vertically **compartmentalized.** Managers become distinct from harvesters, authority
> becomes **centralized** and flows from the top down. The environment is reduced to
> conceptually discrete components which are managed separately. As these separate
> management units take on a life of their own, management objectives diverge and
> become focused on **specialized** objectives: maximizing fur production, trophy production
> or recreational expenditures. Not least, the management of fish and wildlife resources
> becomes separated from the management of the lands and waters that sustain them.

In contrast:

> The indigenous system rests on communal property arrangements, in which the local
> harvesting group is responsible for management by consensus. Management and
> harvesting are conceptually and practically inseparable. Knowledge comes from the
> experience of every aspect of harvesting itself - travelling, searching, hunting, skinning,
> butchering and eating. It is accumulated by every individual, and shared intimately and
> constantly within the household, the family, or whatever is the social unit of production.

It is also shared and exchanged within the larger society, and handed down in the form of stories from one generation to the next. In sum, these observations, like those of the state system's, become coded and **organized** by a paradigm or set of paradigms that provide a comprehensive interpretation of them. The knowledge so produced becomes the cultural heritage of these societies, just as what we call science is part of ours.

In the indigenous system, all members of the group are involved with management as well as with harvesting, but leadership and authority within the group are based on the greatest acquisition of knowledge and the demonstrated ability to use it effectively. As well, significant management data include not only immediate observations of direct cause and effect, but also accumulated historical experience and a long-range conception of the future.

Problems in the Application of Traditional Ecological Knowledge to Environmental Assessment and Environmental Management

As the above discussion illustrates, traditional knowledge and western science reflect different world views.   Often, however, the only difference between the systems is in how they are interpreted or expressed and not in the principles of either. Both systems rest upon the foundation of empirical observation and deductive logic, and both seek to manage natural resources in an environmentally sustainable manner.

While some progress has been made toward the recognition of the value of traditional ecological knowledge among western scientists, there has been scant progress toward its effective application to environmental assessment and management. This is not surprising when one considers the cultural biases and the lack of understanding of the nature and value of traditional ecological knowledge among most dominant non-aboriginal administrators. Furthermore, there

are a number of problems associated with traditional ecological knowledge that make its integration with western science difficult.

The first problem is the lack of comprehensive and accurate documentation in most communities. Traditional knowledge is passed down through oral tradition. Often it is revealed through stories and legends, which makes it difficult for non-aboriginal people to understand, and reinterpret or apply in a scientific form.

The second problem impeding the integration of western science and traditional ecological knowledge is that of trying to match the terms and categories of the different knowledge systems. Too often traditional ecological knowledge data is translated directly into English or French without taking the time to examine whether or not the scientific terminology accurately reflects the indigenous concepts presented. Scientific terminology may not be able to capture the subtleties expressed in the indigenous languages and hence some of the insights traditional knowledge may have to offer about environmental processes may be lost through translation. If western science and traditional knowledge are to be successfully integrated, scientists must accept the fact that it should not always be traditional ecological knowledge that is expected to adapt to the scientific framework, that western science may need to be adjusted as well (Johnson and Ruttan, in press).

The third problem is the perception of scientists and wildlife managers that given the very significant socio-cultural and economic changes now occurring among aboriginal cultures, any

indigenous system that existed in the past no longer continues to function effectively today. While the process of acculturation has undoubtedly had detrimental effects on the transmission and utilisation of traditional knowledge, nevertheless, most researchers and aboriginal peoples themselves, confirm the continued vitality of aboriginal cultures, and note that social norms and practices are changing or evolving rather than dying (Osherenko 1988).

The fourth problem is the need to **recognize** traditional ecological knowledge as a credible source of information for environmental assessment and resource management. Because of its qualitative nature traditional ecological knowledge is regarded by many scientists to lack scientific rigour and objectivity. Testimony presented by aboriginal peoples in environmental assessment hearings is rarely given the same recognition as evidence put forth by professional scientists. Yet, when it comes to understanding the natural resources upon which their livelihood depends, local people are often the first ones to notice the negative impacts of industrial development and modern technology on the land (e.g., any change in the quality of meat of an animal or the presence of disease). Therefore, aboriginal communities are able to identify, evaluate and monitor environmental impacts and to collect data for the purposes of environmental assessment and management. These qualities were clearly demonstrated during the Mackenzie Valley Pipeline hearings during the 1970's (Berger 1977)

The fifth problem is identifying what role traditional ecological knowledge and western science should each play in the environmental management process. There appears to be agreement among most scientists, governments and aboriginal peoples that integration of the two systems

is desirable given the pluralistic nature of society, and the fact that the decisions and actions of one group, no matter how autonomous, invariably have implications for other groups (Mulvihill 1988). Despite considerable discussion regarding the most effective and just means to integrate the two systems, no one to date has been able to describe what a truly integrated state/indigenous environmental assessment or environmental management arrangement would look like or what the best approach to attain this ideal would be.

Finally, one of the key problems of understanding and application of traditional knowledge by non-aboriginal administrators is the failure to understand that traditional knowledge is the "property" of those who possess and understand it and that these people are most able to apply it effectively. When these principles are understood and accepted, application in a modem management context can be accomplished by co-operative effort between the aboriginal user and the appropriate administration. In this case the aboriginal community assisted by appropriate administration identifies objectives, collects required data, makes and implements management decisions (Ruttan, personal communication 1991).

The problems outlined above are but a few of those which must be overcome before traditional knowledge can be effectively applied to either environmental assessment or management. The second part of this report presents one method of documenting traditional ecological knowledge held by an aboriginal community for the purpose of environmental assessment and the co-management of natural resources.

SECTION TWO

Traditional Ecological Knowledge Required for Environmental Assessment and Environmental Management

Although there are many similarities in the type of traditional knowledge data required to fulfil environmental assessment and management objectives there are certain basic differences in scope, detail and application. The type of information and the differences in data that are required are described as follows:

Environmental Assessment

Data sought by researchers are both descriptive and quantitative. Basic information identifies and describes the different habitat types in the area or region being studied and delineates the physical boundaries of the identifiable types on maps of the area for later quantification. For example the informants may describe the different habitat types such as forest, tundra, wetlands etc. along with the major variations in each, and assist the researcher in outlining the "boundaries" of each on maps of appropriate scale. During this process the informant also describes the identifying characteristics of these habitat types and variations as he/she knows them. Descriptions will include dominant and other vegetation, soils, terrain, moisture conditions and the various fauna that inhabit these areas.

Since assessment also includes evaluation, the researcher seeks information concerning the seasonal or year around use of these habitat types by various mammals, birds and fish and the importance of the habitat to specific life forms. For example, the informant is asked to identify

specific and/or critical winter habitat for large mammals such as caribou or moose, traditional calving habitat for moose and caribou, denning areas for wolves, foxes and bears, nesting areas for waterfowl and spawning areas for fish. Last but not least are the values of the various habitat areas for human use including hunting, trapping, fishing, berry picking etc.

Environmental assessment information also includes the impacts of natural and man-made disturbances (such as weather, flooding, wildfire, logging etc.) on the various general or specific habitats and the recovery or response of the environment to these disturbances or disruptions. The application of these traditional environmental knowledge data are focused on environmental inventory for land-use planning and on baseline data on which to identify and evaluate impacts of industrial development and other land-use practices. A clear knowledge of natural conditions prior to development are also vital to the development of mitigation and amelioration measures which should be incorporated in the design of the land-use plans.

Environmental Management

Traditional environmental knowledge data required for application to environmental management is similar to that of environmental assessment in many respects. However, the research is usually focused on specific areas or around specific problems such as habitat enhancement for particular species, harvesting of various wildlife, fish and forest products, disease "problems" (e.g., the diseased buffalo in Wood Buffalo National Park) or mitigation of impacts of industrial development and resource exploitation. In these studies ecological relationships, normal behaviour of various species and responses of species to harvesting and natural and man-made

changes in the environment are very important.

Establishing Cooperative Research Ventures: The Development Process

Assuming that a problem of environmental assessment or management has been identified and/or initiated by the government or another outside agency the chronological steps and guidelines to conduct participatory community research should be as follows.

1. <u>Identify the Partner Community and Establish a Cooperative Research Venture</u>

The first step is to identify the partner community and by consultation develop a joint agreement to carry out the project within parameters acceptable to both the community and the outside agency. This may require several meetings with local government and the community at large during which the objectives, proposed research methodology and expected results are thoroughly examined and explained in non-technical language. Prior to the signing of an agreement the community should understand the commitments it would be expected to make, the benefit it could expect to receive and should have the opportunity to add to or to modify the objectives or plans of the research program before it is implemented. Although elected community representatives are the signatories of the co-operative agreement, approval and support of the general community is essential to the project and should be obtained by consensus, if possible.

2. Establish a Community Administrative Committee to Oversee the Direction and Operation of the Project

Once the project is approved, the outside agency should consult with the local authorities to establish a permanent administrative committee in the community to direct and oversee the operation of the project. The committee members should include representatives from the community identified by the local authorities and one representative from the outside agency. The latter would play only a supportive and advisory role to the committee and liaise between the community and the outside agency. The responsibilities of the Community Administrative Committee should be as follows:

(a) Define the duties and responsibilities of the community and the outside agency including the administration of funds, payment schedules, control of information, reporting and evaluation of project;

(b) Define the work processes including the workplan, the research methodology and the training needs and develop an itemized total budget;

(c) Define the duties and responsibilities of community and outside researchers, a Community Elders' Council and a Technical Advisory Committee if required by the project;

(d) Decide upon method of payment for local informants and community researchers;

(e) Select community and outside researchers, Elders' Council and Technical Advisory personnel;

(f) Arrange for office space and training facilities for project and housing for outside researchers if necessary;

(g) Monitor the progress of the project through regular meetings with the community and outside researchers and the Elders' Council;

(h) Report project's progress to the local government and to the outside agency on a regular basis.

3. Obtain Approval of Work Plan and Budget from the Outside Agency and Establish a Funding Agreement and Payment Schedule

Once the terms of reference for the project have been defined, the various committees formed, a work plan drawn up, the criteria for selecting local and outside researchers and a budget established, the community should seek final approval from the sponsoring outside agency. Upon approval the funds should be deposited in an account in the community. A local person with

experience should take responsibility for the project accounting. If there is no one available in the community to carry out this responsibility, training should be provided.

4. **Establish an Elders Council of Experts in the Topic**

Since most traditional ecological knowledge is provided by the older community members it follows that an Elders' Council would be an important asset for a community research program. This advisory body could provide valuable assistance in the interpretation of language and data, suggestions for areas of research that are important to pursue and recommendations for the selection of community researchers. An Elders' Council would also help to restore the traditional role of elders as community teachers and advisors, respected for their knowledge and wisdom. The Community Administrative Committee in consultation with the local authorities and other knowledgeable community members should select the Elders' Council.

5. **Select Community Researchers**

The Community Administrative Committee in consultation with the Elders' Council should select the community researchers. One of the most important criteria in the selection of community researchers is their ability to speak fluently and write their Native language and English (or French in some cases). Without these skills, the work cannot be done effectively. The

alternatives are to have an intensive language(s) training program for researchers which may be too costly for individual projects or to have a qualified interpreter work with the community researchers for on-the-job training.

Other important qualities are awareness of local traditional culture, previous research experience, interest and motivation.

Because hunting and trapping are traditionally a male domain in many resource dependent societies, in a very traditional community it may be difficult for a younger woman to establish her credibility and gain the confidence of some of the older men. However, this should not be an impediment to hiring women. On nearly all broad subjects of research, there will be some perspectives and knowledge which is generally held by women and some generally held by men. A mixed research team presents the opportunity to discuss and deal directly with gender issues and will generally have the most adequate access to all perspectives. If gender is an issue in the interviewing of some older men and women, it may be advisable to let the researchers of the same sex work with these individuals. It must also be recognized that the rapport established between the interviewer and the interviewee depends on many social and interpersonal factors which are unrelated to gender (i.e., kinship and personality).

Payment of the Community Researchers

Payment of Community Researchers should be decided upon by the Community Administrative Committee. For our Ft. Good Hope traditional knowledge project community researchers were

initially paid an hourly wage for their work as both interviewer and translator/transcriber. However, as the project progressed it became apparent that this arrangement was unfair to the fast, efficient worker. This type of researcher with fluency in both English and North Slavey often earned less money than someone who was less capable. Accordingly, the Dene Cultural Institute, in consultation with the local researchers decided that henceforth local researchers would be paid a fixed rate upon receipt of the transcript. This rate was calculated on the basis of the hourly wage times one hour of taped interview times the average amount of time it takes to translate/transcribe one hour of tape times the total number of hours for each tape.

Work Schedule

For the Ft. Good Hope project, community researchers were employed on a part-time basis for the duration of the project. This was partly a function of insecure funding and partly the choice of the local researchers who wished to combine the research with other activities (e.g., homemaking, hunting, trapping). In retrospect the Dene Cultural Institute felt that community researchers should either be employed on a full-time basis for the duration of the project or on a lengthy seasonal basis. This would allow them to devote maximum time and effort to the project. Research assistants with **specialized** talent (e.g., linguistics, photography, etc.) but who were otherwise committed to other work (e.g., homemaking, wage employment, trapping) would be employed on a part-time or piece-work basis to augment the research project.

6. Select Outside Researchers

The Community Administrative Committee should select any outside researchers they feel would benefit the project. Their role should be one of offering advice and support to the community and to the local researchers. They should **not** be responsible for directing the research. Depending upon the nature of the project and the experience of the community researchers, the outside researchers may be required to provide technical training in western science (e.g., the basic principles of ecology, environmental assessment and management) and methods of documentation (e. g . , interviewing techniques, recording interviews, use of computers, report writing).

In addition to their academic qualifications, it would help if the outside researchers had some prior hands-on experience living with the culture they will be working with and be prepared to participate in community life as much as possible during their stay. Since they might also be responsible for delivering any required training, ideally they should have some teaching experience.

Although both outside and local researchers bring their own cultural biases and personal interests to any project, the credibility of the outside researchers will be enhanced if they are not perceived by the community to be closely aligned with government or non-government agencies whose interests may be in conflict with those of the community.

Outside researchers should remain in close contact with the local researchers throughout the project in order to provide them with guidance and feedback.

7. Select a Technical Advisory Committee

Where possible, a pool of resource people should be available to provide advice and feedback to the research team. Such an advisory committee should consist of professionals who are not aligned with the outside agency and who have extensive experience working in the different areas covered in the research (e.g., a biologist, a social scientist, a linguist, persons with previous experience in participatory community research or community development). Such persons would be called upon to assist in the design of the research methodology and to provide help in the analysis and review of the final draft of the report.

8. Begin Training Program

Community researchers in most cases would require some training in order to conduct the research. The type of training program provided to community researchers would naturally depend upon the type of project carried out, the individuals involved and the time and money available to run it.

If traditional ecological knowledge is being documented for the purposes of environmental

assessment or management, community researchers should become familiar with the basic principles of western ecology and modem resource management. They should also be introduced to social science research methods (e. g ., interview techniques, questionnaire design, sampling and analyzing qualitative data). Any traditional environmental knowledge research training program should provide a good balance of field and classroom activities. Ideally, all or at least part of this training should take place in a field camp setting and should include elders from the community as instructors as well as different scientists. This cross-cultural, interdisciplinary approach would permit local researchers to observe first hand the ecological topics under study both from a western scientific and from an aboriginal perspective. At the same time scientists would have the opportunity to learn about traditional knowledge. A field camp setting would also allow participants to concentrate on learning away from the distractions of everyday community life.

Depending upon the language fluency level(s) of community researchers there might also be a need for intensive language instruction in the Native language and English or French. An important addition to any training program would be the inclusion of a component on basic linguistics to help both the local and outside researchers understand and learn how to cope with the complexities of translation.

9. Select Informants

The Community Administrative Committee and/or the Elders' Council in consultation with the local researchers should select the informants. It is important to interview a wide range of informants to ensure that different perspectives are represented. The specific number of people to interview will depend upon informants' availability, the time frame of the project and the information collected. The researchers can assume that they have sampled the range of information available when they stop seeing significant differences in responses. While elders may be recognized as the most knowledgeable people to interview, there may also be many experienced middle-aged and younger hunters and trappers who would also be worthwhile talking to. As well, it is important to interview women. They may not have participated to the same extent as men in all activities but they are still very knowledgeable about them. They have heard the same stories and legends, which transmit traditional knowledge as the men and have listened to discussions about these activities throughout their lifetime. Women may also have specialised information which men do not possess (e.g., berry picking areas). Often within a community, different individuals will be recognized as being particularly knowledgeable about certain geographical areas or particular species.

Payment of Informants

Payment of informants should be decided upon jointly by the Community Administrative Committee and the Elders' Council. Payment may either be in the form of gifts (e.g., groceries)

or cash. For our project, informants were paid an hourly wage for each interview with a maximum amount for a whole day spent out on the land.

Developing The Research Methodology

Traditional knowledge research is a new and rapidly evolving field. There is no one correct method of data collection. Every project will have different objectives and limitations, hence the methodology will have to be modified to suit individual needs. The key to successful research is to remain flexible and innovative in your study and to be sensitive to the needs and lifestyle of the community you are serving. This section outlines the research methodology developed by the Dene Cultural Institute for the purposes of our own research project carried out in the Dene community of Ft.Good Hope, N.W.T.

10. Retrieval and Documentation of Traditional Ecological Knowledge
Participant Observation vs. the Ethnographic Interview

The ideal method to document and understand traditional knowledge is participant observation whereby a local researcher and a biologist work together as a team to interview informants in as natural a setting as possible (e.g., while participating in hunting, fishing and trapping activities). The traditional activity combined with the natural environment provides a natural

stimulus for discussion and learning for the scientist, the local researcher and the informant. However, few projects have the time or the financial resources available to use participant observation exclusively. For the Ft. Good Hope project our primary method of data collection was the ethnographic interview using a structured conversational approach supplemented by participant observation whenever possible.

Structured vs. Unstructured Interviewing

Assuming that community researchers are experienced or have received special training related to the project, the methods of questioning potential informants will vary among local researchers and informants. In some cases, the structured questionnaire with its direct question and answer format may be effective. In other instances a more casual conversational approach may be most suitable. Some people require a lot of prodding to get them to talk. Others tend to wander off on subjects which may be irrelevant to the question, although, often what appears to be irrelevant is in fact their way of answering the question (e.g., through a story or legend). A lot depends upon the skill of the interviewer to sense when it is important to probe for more information or gently steer the conversation back on track. The more knowledgeable the interviewer is about the subject matter being examined and the cultural way of expressing ideas, the more effective will be the interview.

In the pilot project at Ft. Good Hope, we found that the informal, conversational approach with a list of questions used as a checklist or guide for the interviewer gave the best results. Researchers were encouraged to allow the interview to flow in as natural a way as possible and

not to worry excessively about the order in which the information was collected or whether all of the topics were covered during one interview. Interviewers began by asking a general opening question (e.g., Can you tell me about beaver habitat in summer?) The idea was to give the informant the freedom to decide which subjects were important to talk about from his/her perspective and to present the information in a way that he/she felt was most appropriate. Along with the opening question, the interviewer had a list of probing questions to ask should the informant be unresponsive or wander off the topic. It is our opinion that this method would also be effective where the "participant observation" method of documentation is employed.

Framing the Questions

A critical concern in the construction of questions for the purpose of environmental assessment or management is how to obtain data that answer questions which are important from a scientific perspective but are framed in a culturally appropriate manner. In our experience, we found that it was better to avoid the use of scientific terms in questions because they are often difficult to translate into the Native language. There are also scientific concepts which, when translated, elicit a negative or confused response because they are culturally inappropriate ways of asking for that type of information. For example, the modern concept of wildlife management suggests the control of a species by humans. The idea of humans controlling the environment is considered by the Ft. Good Hope Dene to be an interference with the natural order, which from their cultural perspective is not acceptable. Another example from our study would be asking trappers information about specific numbers of animals they have trapped. Some informants were hesitant about revealing this type of information for fear that it might be used against them by

the government. For others, talking about the numbers of animals they had trapped was considered to be boasting. In both of these cases, the fact that local researchers played a major role in designing the questions and carrying out the interviews meant that these problem areas could be more easily identified and resolved.

Informants were also reticent when asked about conditions in areas where they had little or no personal experience. In such cases the local researchers found that when inquiring about marten habitat, for example, it helped to ask the informant to describe the physical characteristics of his own trapping area.

Group, Pair and Individual Interviews

Depending upon the objective of the interview either group, pair or individual interviews may be used. Individual interviews allow the more reserved person to speak freely. On the other hand, some people may feel uncertain about the knowledge they have and be more at ease discussing their ideas in a group situation. In our experience, unless the interviewer was very skilled at facilitating a group discussion, either everyone broke off into smaller discussion groups or one or two persons dominated the interview. Although we did not try it, group interviews are probably most useful when trying to reach a consensus about a particular subject where there appears to be a wide range of opinion among respondents. Pair interviews are good because one person may help to jog the other person's memory about a particular event or clarify a point. Often a husband and wife make a good team in this respect.

Recording; the Interview

Wherever possible, all interviews should be recorded on tape. However, permission to tape record must be given by the informant prior to the interview. Tape recording an interview allows the interviewer to concentrate on the questioning and encourage the informant by expressing interest and other culturally appropriate responses. However, not everyone may agree to be tape recorded, in which case it may be better to have two people participate in the interview, one person to ask the questions and the other to take notes. Even if the interview is being tape recorded it is always a good idea for the interviewer to take a few notes in order to clarify certain points at the end of the interview.

Where applicable, data such as specific habitats, migration routes, calving areas, fish spawning areas and other information relevant to environmental assessment and management should be recorded on maps of appropriate scale. Having a map of the area present during the interview may also help stimulate an informant to talk about a particular geographical area or species.

11. Conducting the Interview

Setting of Interview

Community researchers should conduct interviews where the informant is most comfortable. Although interviews on the land are preferable, this may not always be possible with elders, especially in winter. In this case a quiet, private place in the informant's home or other comfortable surroundings should be utilised.

Preliminary Interview

Interviews should be preceded by a brief, informal discussion with the informant wherein the purpose of the interview and the type of information sought are briefly discussed and the time and location of the formal interview arranged. If a general policy regarding the control and use of the project data has not been established by the Community Administrative Committee, informants should be informed of their right to decide how the information from their interviews should be used. All informants should be required to sign a release form at the beginning of each interview about a particular subject. The release form should indicate who should have access to the information beyond the use of the specific project (i.e., the general public, only community members) and what the time frame should be (e.g., immediately, in ten years or when the person is deceased).

Conducting the Interview

The most important step in conducting an interview is to put the informant at ease. Our local researchers found that often the best approach was to begin the interview by having tea with the informant. During the interview the interviewer should avoid asking leading questions and citing the names of persons who have provided contradictory opinions. The interviewer must make an effort to show interest in the conversation through eye contact and other responses. They should be sensitive to an informant's fatigue and if this becomes apparent, arrange to stop the interview and continue at another time. Most interviews should not last more than two hours.

12. Transcription and Translation of Interviews

Transcribing and translating tapes is a very time consuming process. Community researchers should transcribe the tapes verbatim into the aboriginal language as soon as the interview is completed. This way the information is still fresh in their minds and if there are any problems of interpretation the researcher can easily return to clarify points with the informant. It also prevents the build up of a back-log of untranscribed tapes. If the interviews are to be translated into English or French, community and outside researchers should work together to translate at least one interview of each subject early on in the interviewing to ensure that any problems of translation are resolved before the work gets too far along. It is important to fully understand the aboriginal terms and concepts to ensure that the meaning is not lost or distorted in the translation.

Once the transcriptions and translations of interviews are completed community researchers should go over their contents with informants to ensure correct interpretation. If there are major differences in responses among informants about a particular subject a meeting of the Elders' Council should be held to discuss the issue.

13. Analysis, Oreanization and Management of Data

It is difficult to recommend a particular method of data analysis and management because each project will have specific objectives and methods of documentation. From the experience of our

Ft. Good Hope project we can offer a few suggestions for analyzing and managing data that should have general application to other traditional ecological knowledge research.

Traditional ecological knowledge information for use by government administrators and the scientific community usually requires a certain amount of re-interpretation into technical/scientific language to make it more meaningful and useful to these outside users. It is therefore advisable for the outside researcher to review the verbatim English or French transcripts and to reinterpret and re-write the data in appropriate language.

The data is then analyzed and evaluated for completeness and relevance to the research objectives. Wherever possible environmental assessment information should be extracted from the transcripts and transferred to base maps upon which transparent overlays of land-use proposals may be super-imposed. The base map would reveal information gaps and the over-lays will identify potential conflicts between a development project and the environment. In any event the base map(s) are often more meaningful than the written report.

Organization and Storage of Data

Most traditional knowledge information is presented in anecdotal form and is therefore difficult to classify and analyze. Often people will discuss several different subjects in answer to one question. Because the information is often difficult to separate without taking it out of context it is necessary to develop some system of cross-referencing for any system of data classification. At the time of writing this document no **computerized** system of data management was in use

for our Ft. Good Hope project. Development of a formal data management system will depend upon the final application of the information.

The objectives of our pilot project were to try to answer questions about the nature of Dene traditional knowledge including Dene perceptions of the principles of ecology and the sustainable use of natural resources. To analyze our data we first classified all of the information according to different subjects. Then the information was summarized in non-technical English. Eventually, a **computerized** data management system could be developed to handle both the anecdotal and the summarized information.

14. <u>Dissemination of Information</u>

Throughout the duration of the project the Community Administrative Committee, the sponsoring agency and the community as a whole should be kept informed of its progress and of any major problems that arise. For the Community Administrative Committee and the sponsoring agency brief oral and written reports supplemented by mapped and other graphic data forms should usually suffice. Similar information may be presented to the community by talking about the project regularly on the local radio and/or by holding an open house whereby the community can drop by the project office to talk with local and outside researchers. It is important to take pictures (both slide and snap shot) for displays and public presentations.

Progress reports and a summary of the final report should be translated into the aboriginal language and distributed widely as a community newsletter. Depending upon the nature of the project, and the availability of funds, it might also be useful to produce a video of the work.

This would be useful for public education, for school curriculum and for professional presentations. In the preparation of the final report each of the participating groups should have input into its design and content before it is finalized (i.e., the Community Administrative Committee, the Elders' Council, the Technical Advisory Committee and the local and outside researchers). A draft final report should be distributed to other communities, agencies and individuals for comment. Once the report is **finalized,** a community meeting should be held to present the final results of the project. Copies of the final report should be sent to the community, the sponsoring agency and appropriate others for future reference.

APPENDIX 1

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REFERENCES

Berger, Thomas. 1977. Northern Frontier, Northern Homeland. The Report of the Mackenzie Valley Pipeline Inquiry. Volume One. Toronto: James Lorimer and Co.

Berkes, F. 1988. Environmental philosophy of the Chisasibi Cree people of James Bay. In M.M.R. Freeman and L.N. Carbyn (eds.) Traditional Knowledge and Renewable Resource Management in Northern Regions, Boreal Institute for Northern Studies, Occasional Publication No. 23, Edmonton. Pp. 7-2 1.

Feit, Harvey 1978. Waswanioi Realities and Adaptations: Resource Management and Cognitive Structure. Ph.D. Dissertation, McGill University, Montreal.

_____ 1988. Self-management and State-management: forms of knowing and managing northern wildlife. In M.M.R. Freeman and L.N. Carbyn (eds.), Traditional Knowledge and Renewable Resource Management in Northern Regions, Boreal Institute for Northern Studies, Occasional Publication No. 23, Edmonton. Pp. 72-9 1.

Gunn, Anne, G. Arlooktoo and D. Kaomayak. 1988. The contribution of ecological knowledge of Inuit to wildlife management in the Northwest Territories. In M.M.R. Freeman and L.N. Carbyn eds. Traditional Knowledge and Renewable Resource Management in Northern Regions, Boreal Institute for Northern Studies, Occasional Publication No. 23, Edmonton. Pp.22-30.

Guyette, Susan. 1983. Community-based Research. A Handbook for Native Americans, The Regents of the University of California, Los Angeles.

Johnson and Ruttan, in press. The Dene Traditional Environmental Knowledge Pilot Project. Dene Cultural Institute, Yellowknife, N. W.T.

Mulvihill, Peter. 1988. Integration of the State and Indigenous Systems of Wildlife Management: Problems and Possibilities. School of Urban and Regional Planning, Faculty of Environmental Studies, University of Waterloo. (unpublished paper).

Osherenko, Gail. 1988. Sharing Power with Native Users: Co-management Regimes for Arctic Wildlife. Ottawa: CARC Policy Paper 5. Canadian Arctic Resources Committee. 58 Pp.

Ruttan, Robert. 1991. Biologist. Dene Cultural Institute Traditional Environmental Knowledge Pilot Project, Ft. Good Hope, N.W.T. (Personal Communication)

Scott, Colin. 1986. The socio-economic significance of waterfowl among Canada's aboriginal Cree: Native use and local management. In A.W. Diamond and F.L. Filion eds. The Value of Birds. ICBP Technical Publication No. 6 Pp. 49-62.

Social Sciences and Humanities Research Council of Canada. 1983. Community-based Research: Report of the SSHRCC Task Force on Native Issues. Ottawa: SSHRCC.

IUCN, UNEP, WWF. 1980. World Conservation Strategy. Gland: Switzerland: IUCN, UNEP, WWF.

Usher, Peter, J. 1986. Devolution of power in the Northwest Territories: implications for wildlife. In Native People and Renewable Resource Management. Proceedings of the Alberta Society of Professional Biologists. Pp. 69-80.

World Commission on Environment and Development. 1987. Our Common Future. Toronto: Oxford University Press.