Integrating Traditional Ecological Knowledge and Ecological Restoration: Restoring Aboriginal Cultural Landscapes with Iskatewizaagegan No. 39 Independent First Nation

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Thesis Submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of Master of Natural Resources Management

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Integrating Traditional Ecological Knowledge and Ecological Restoration: Restoring Aboriginal Cultural Landscapes with Iskatewizaagegan No. 39 Independent First Nation

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Of

Master of Natural Resource Management

Abstract

The purpose of this study was to develop a site-specific methodology for documenting significant Iskatewizaagegan cultural landscapes and to develop, through an iterative process, ecological restoration plans for these sites. The research objectives were, (1) to identify, map, and perform preliminary documentation with assistance from the elders and community, five priority sites of aboriginal cultural landscapes which tell the story about land-based cultural history of Iskatewizaagegan people, (2) to conduct a biophysical and cultural documentation of the two priority cultural landscapes identified by the Iskatewizaagegan Independent First Nation (IIFN) elders using documentation methods developed through the iterative research process, (3) to develop ecological restoration plans for two of the identified cultural landscapes integrating traditional ecological knowledge from elders and other community members and the biophysical inventories through the iterative research process and, (4) to develop teaching and interpretation opportunities through restoration design on the two sites to be restored for the purpose of education and natural-cultural heritage awareness.

Fieldwork took place within the Shoal Lake watershed during the summers of 2002 and 2003. Preliminary scoping documentation of the five significant cultural landscapes was completed in the summer of 2002. The preliminary documentation gathered a life sciences inventory description of the biophysical characteristic of the sites. Historical importance and stories about each site were collected through site visits with elders and other interested community members. In-depth biophysical and cultural documentation was completed in the summer of 2003. Feedback for collected data was presented during participatory workshops. Community goals and objectives for the study

shaped the research methodologies used in the documentation and development of the restoration plans for cultural landscapes.

Through biophysical and cultural documentation, it became clear that cultural landscapes are unique sites that require unique site-specific documentation methods. The integration of traditional ecological knowledge and western science provided a foundation for understanding the human landscape interactions at each cultural landscape. As a result, it was possible to develop restoration plans that have the potential to fit the site's biophysical conditions and the goals and objectives held by the community for the site.

It is clear that the documenting and restoring of aboriginal cultural landscapes is not a simple task; it is an expensive, detailed and lengthy process. Furthermore, the restoration of Iskatewizaagegan cultural landscapes is affected by land and policy restrictions. Until local management institutions can be developed and partnerships formed with local governments and resource management agencies, the opportunities for cultural landscape restoration off reserve will be limited.

Overall, the study found that the people of Iskatewizaagegan see cultural landscapes as places of memory and places for teaching. Restoration of a cultural landscape does not have to involve any physical changes to the ecosystem or site itself. In the eyes of the Iskatewizaagegan elders, restoration of the site begins by restoring relationships with the place by, for example, using the site as a teaching/learning site for community youth. Through the research it became clear that some cultural landscapes have become memorialized over time. These sites have become sacred due to their strong historical and spiritual connections to the people in the community. This finding clearly illustrates the necessity of site-specific documentation of restoration plan development. It is clear that good ecological restoration plans for cultural landscapes entail negotiating the best possible outcome for a specific site based on the integration of traditional ecological knowledge, biophysical data, and participant goals and objectives. It is the process involved with documenting, designing and implementing successful restoration plans that is the most important part, not necessarily the end product.

Acknowledgements

I would like to thank all of the people that helped me to successfully complete my master's thesis. More importantly I would like to thank all those people who taught me something great outside of the academic environment. Living and working at Iskatewizaagegan No.39 was for me an enlightening experience which I will remember for the rest of my life. I would like to graciously thank Eddie and Roberta Mandamin for being such good hosts, good friends and good research partners over the past two years. Also, a thank-you to Phyllis Jack for her continued support and assistance throughout the project. A big thank you too, to Jimmy Holmstrom, Robin Greene, and Stephen Mandamin for sharing their knowledge of the lake with me. To all the elders, and other community members I thank them for sharing their knowledge and experiences with me. I also wish to thank the past Chief, Leon Mandamin and present Chief, Fraser Greene, and their councils for their participation in the project. Furthermore, I would like to thank Tom Shay and Don Flaten at the University of Manitoba for their assistance in understanding my data. I would also like to extend my appreciation to Colin Bowling, Peter Schaffer, and Scott Lockhart from the Ontario Ministry of Natural Resources (OMNR) in Kenora. Special thanks to Sandra Grant, and Nicky Koper who helped me with my statistical analysis of my data.

Thank you to my beautiful wife Jayne for her invaluable help in the field and at home. Her motivation and reality checks were very much needed and appreciated. And finally, I would like to thank my Mom and Dad for always supporting me and keeping me focused throughout this project.

I would also like to acknowledge the hard work and dedication of my supervisor Dr. Iain Davidson-Hunt and my committee members Dr. Fikret Berkes, Micheline Manseau, and Dr. Stephane McLaughlan.

The project was supported by the Sustainable Forest Management Network (SFMN) through a grant to Dr. Berkes.

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Chapter 1 – Introduction

Background

The 500-year-old doctrine of *terra nullis* (Latin for "land of no one") has greatly influenced the way in which Aboriginal cultures have been viewed and treated in North America by Europeans. The paradigm of t*erra nullis* holds that the lands of North America were "ownerless" because they were areas of vast uninhabited wilderness used only by hunter and gatherer savages who did nothing to warrant any claim over the lands (Anderson and Blackburn 1993). This assumption has been carried over into the early literature on ecological restoration in which the condition to which the land was to be restored was pre-contact and assumed to be bereft of the influence of Aboriginal people. The doctrine of *terra nullis* incorporated into the theory and practice of ecological restoration threatens to complete the colonization of lands by modern state managers. Work with Aboriginal people has started to reveal the depth of aboriginal knowledge, institutions and practices which led to the landscapes the colonists encountered.

Berkes (1999) provides an overview of the emerging paradigm which some refer to as Traditional Ecological Knowledge. Other scholars have demonstrated the ways in which the landscape was strongly influenced by aboriginal land management practices to enhance productivity (Anderson and Blackburn 1993; Kimmerer 2000, Boyd et al. 1999). In fact, some authors argue that there has been a loss of biodiversity in natural communities, such as the northwestern prairies, forests and savannas, due to the end of aboriginal practices on the land (Anderson 1996). Kimmerer, (2000) and other authors have begun to consider how traditional ecological knowledge's vast empirical information and cultural context can make valuable contributions to processes of ecological restoration.

Historical information and records make it clear that Aboriginal peoples' knowledge, technologies, institutions and land-use practices contributed to the diversity of the land before the time of European settlement. Management methods included fire, rotating crops, wild plant propagation and land drainage for agricultural purposes (Anderson and Blackburn 1993; Vale et al. 2002). This aboriginal management of lands in Canada changed with the arrival of Europeans. The implementation of federal Indian policies such as early treaties transferred property rights regarding management of lands to newly formed provincial jurisdictions (Davidson-Hunt 2003a). The outright removal of aboriginal peoples from their lands through relocation and disease also cloaked the aboriginal influence on the early landscapes of the Americas (Anderson 1996). However, knowledge of such past land management practices has not been completely lost, and, in fact, still exists amongst Aboriginal groups who were able to hold onto such knowledge through practices and oral traditions.

Despite fragmentation of aboriginal societies through the implementation of treaties and other policies intended to "settle" Aboriginal peoples throughout North America, traditional ecological knowledge, while fragile, still persists within the aboriginal societies relegated to reserves as well as within traditional communities who avoided the settlement process (Kimmerer 2000). Today, many Aboriginal communities are dependent on fishing, horticulture, subsistence agriculture, and hunting in their immediate area. It is these groups that are most likely to have maintained observations important to sustainable use and conservation of biodiversity accumulated over many years.

Purpose and Objectives

The purpose of this research is to identify, with guidance from community members and elders, important aboriginal cultural landscapes of Iskatewizaagegan which tell the story of Iskatewizaagegan people. A restoration plan is presented for Potato Island and Crowduck Lake using traditional ecological knowledge obtained from elders, biophysical inventory information collected at the sites, and social and cultural histories collected through stories and site visits. It is hoped that the restoration of relationships between Iskatewizaagegan people and these places will lead to the renewal of knowledge and practice out of which contemporary aboriginal cultural landscapes can emerge.

The need for this research emerged out of a review of the ecological restoration literature and through exploration with the community. The design and development of site-specific ecological restoration plans using traditional ecological knowledge is a practice that has not been explored to any extent in the existing literature of ecological restoration (Kimmerer 2000). Preliminary discussions with the people of Iskatewizaagegan and previous research projects has highlighted the fact that their knowledge of the region has not been included in recent land-use planning nor forest management (Roberts, Mandamin, Davidson-Hunt and Berkes 2003). Kimmerer (2000) believes that exploration of the integration of traditional ecological knowledge into restoration can begin a powerful dialogue with the potential for successful restoration plan development and implementation. Through the design and implementation of an ecological restoration plan, it is hoped that a network of cultural landscapes managed by aboriginal knowledge, institutions, technologies and practices will provide opportunities to secure meaningful aboriginal livelihoods. Resource management institutions in northwestern Ontario will be forced to recognize and include aboriginal resource management systems and organizations in future land management planning and decision-making. Thus, enabling Anishinaabe communities in northwestern Ontario to once again practice time-trusted resource management practices and benefit culturally, spiritually, physically and financially from their involvement and successes.

The objectives of the research were:

1. To identify, map, and perform preliminary biophysical and cultural documentation, with assistance from the elders and community of five priority aboriginal cultural landscapes.

2. To conduct biophysical and cultural documentation of the two priority cultural landscapes identified by the elder of Iskatewizaagegan No. 39 Independent First Nation.

3. To develop ecological restoration plans for two of the identified cultural landscapes integrating traditional ecological knowledge from elders and other community members.

4. To develop teaching and interpretation opportunities through restoration design for the two sites.

Iskatewizaagegan No. 39 Independent First Nation

Iskatewizaagegan No.39 Independent First Nation (IIFN) is a community of approximately 800 residents located on Shoal Lake, Ontario (Figure 1). The Shoal Lake watershed overlaps the Ontario and Manitoba border and is just north of the Canada and United States border. Vegetation in the Shoal Lake watershed is biologically very diverse as it shares species from the Prairie, Great Lakes-St. Lawrence Forest, and Boreal Forest biomes (Davidson-Hunt 2003a). There is a diversity of woody and herbaceous species, wetlands, bogs, and swamps which provide habitat for numerous large ungulate species, small fur bearing mammals, small game species, waterfowl, and fresh water fish. Iskatewizaagegan is literally translated to Shoal Lake. The English name for the lake is derived from the Anishinaabe word. The people of Iskatewizaagegan residing on Iskatewizaagegan No. 39 Independent First Nation are members of Treaty #3 and part of the Kenora Tribal Area. Treaty #3 was signed in 1873 between Anishinaabe people of the Rainy River, Rainy Lake, Lake of the Woods, English River and the Winnipeg River watershed areas and the Canadian Crown.

The people of Iskatewizaagegan have undergone a series of complex, intensive, and controversial changes that have greatly affected their culture and the way in which they live their lives. Elders within the community recollect the ways in which the Iskatewizaagegan people used to live off the land and manage it in a sustainable way. They remember the knowledge of the survival and land management practices that at one time were common knowledge amongst their people.

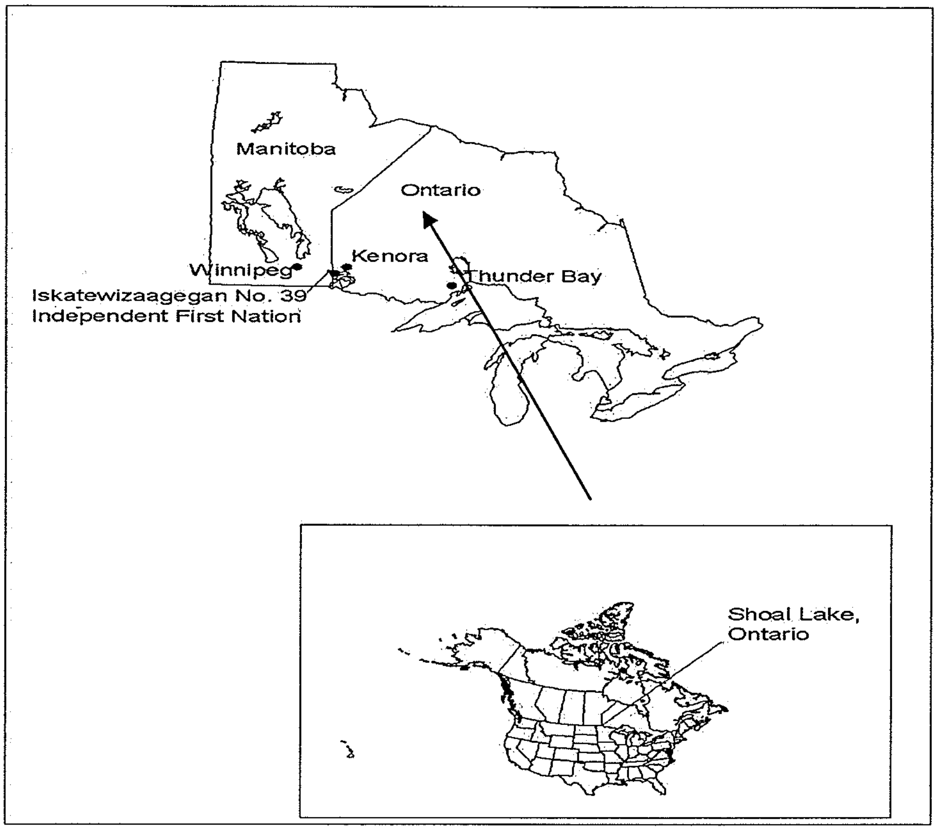

Figure 1. Iskatewizaagegan No. 39 Independent First Nation.

Elders have helped the community come to the realization that much of this knowledge and traditional, sustainable land management practices are being lost. The community has come to the conclusion that it is time to re-invigorate Anishinaabe knowledge of the land and the practices that take place on the land. Aboriginal knowledge, institutions and practices of resource management on the land in Northwestern Ontario has been ignored and in some cases outlawed by provincial land and resource management institutions. Aboriginal communities in Treaty #3 have been forced to try and survive on the land under constricting rules and in restricted areas (Kinew 1995). Many of the reservations in Treaty #3 are relatively small providing little opportunities for community members to make a living. Furthermore, crown lands surrounding Treaty #3 reservations are held under forest license by large multi-national forest companies. Non-aboriginal land and resource planners continue to ignore the vast knowledge of landscapes, plants, animals and environments in Anishinaabe regions. This continued exclusion from resource planning and involvement has resulted in a cycle of unemployment and decline in traditional land-based cultural activities throughout Treaty #3.

Anishinaabe reservations in the Treaty #3 region generally have a small, restricted land base which is surrounded by provincial lands that are part of a forest license held by a large forest company or privately owned by cottagers. Exclusion from resource harvesting off the reserve, restriction of movement off reserve, distance from employment centres, combined with many other social changes, is creating concern for cultural traditions and practice amongst the Anishinaabe of the Shoal Lake region (Davidson-Hunt and Berkes 2003).

The people of Iskatewizaagegan perceive landscape in units that represent a combination of vegetation and cultural practice (aboriginal cultural landscapes). These cultural landscapes are seen as important places for the processes of livelihood, teaching, healing, cultural awareness and heritage (Buggey 1999; Davidson-Hunt, Duchesne, and Zasada 2001). However, the biophysical characteristics of cultural landscapes have changed over the years, as a result of neglect caused by lifestyle changes and land management regulations enforced by outside agencies, such as the Ontario Ministry of Natural Resources (Greene, personal communication 2002).

To provide an opportunity for teaching, healing, livelihood, and interpretive tourism, community members have identified the importance of restoring some of the traditional cultural landscapes that exist within the Shoal Lake watershed. Through previous discussions during past research projects and workshops, citizens and the government of Iskatewizaagegan have identified the need to restore and manage their historic and contemporary cultural landscapes (Davidson-Hunt 2003b, Ruta 2002).

Project Funding

This project is funded by the Sustainable Forest Management Network (SFMN) and is part of a larger research project entitled Restoring Aboriginal Cultural Landscapes: Social-Ecological Health Indicators for Sustainability. The principle investigator for this project is Dr. Fikret Berkes. A research protocol has been signed by both the University of Manitoba and the IIFN outlining the rules surrounding the project and permitting the undertaking of the project.

Organization of Thesis

This thesis consists of six chapters. Following this introductory chapter, chapter two discusses literature important to the understanding and development of the research question to be considered during the research. Chapter three describes the iterative process and methodologies used for the development and completion of this project. Chapter four presents the results from the preliminary site documentation, in depth cultural/historical findings and biophysical documentation of the two priority cultural landscapes. In chapter five, detailed restoration plans for both cultural landscapes are provided along with a discussion of some of the requirements for restoration within the community. Chapter six outlines concluding thoughts for the management of cultural landscapes by First Nations such as Iskatewizaagegan No. 39 and ideas for future research directions.

Chapter 2 – Literature Review

Chapter Overview

In this chapter, I will review the current literature relevant to the understanding of how Aboriginal people can become involved in leading ecological restoration projects. An examination of the themes of aboriginal cultural landscapes, traditional ecological knowledge and ecological restoration plans will be provided. The inclusion of traditional ecological knowledge into restoration plans was performed to provide background knowledge and identify gaps in the ecological restoration literature. During the literature review, the research question to be considered during the research was identified.

Aboriginal Cultural Landscapes

Aboriginal cultural landscape is a term that has been used by National Parks of Canada to describe landscapes which have emerged out of long and complex relationships between Aboriginal people and the land. While specific sites are included aboriginal cultural landscapes, "Embody aboriginal traditional knowledge of spirits, places, land uses, and ecology" (Buggey 1999:27). National Parks of Canada (1994:119) defines a cultural landscape as, "Any geographical area that has been modified, influenced, or given special cultural meaning by people." Such landscapes also provide aboriginal communities with a representation of past cultural values, attitudes and practices with the land. However, this definition fails to identify the cultural landscape as a physical expression of the relationship between a society and an environment that is dynamic (Davidson-Hunt and Berkes 2003).

Cultural landscapes represent a specific geographic place and historical period as well as a society's place upon the land. The cultural landscape of one society is not always visible to members of another society due to differing perceptions, values and political interests (Davidson-Hunt 2003b). To fully understand another society's cultural landscapes, it is necessary to enter that landscape under the guidance of people who are intimately aware of the forms, functions and processes of the landscape (Ingold 2000).

The term cultural landscape reflects a general broadening in perspective in which researchers begin to look more holistically at the environment and the human perceptions and values linked to that environment (Paine and Taylor 1995). Cultural landscapes represent the relationship between people and place for a specific time in history as the structures we can see are the result of past experiences and events but at the same time new cultural landscapes are emergent (Ryden 1993). The concept of cultural landscapes emphasizes that Aboriginal peoples were actively modifying and managing landscapes using knowledge, technologies, institutions and practices to ensure their survival. Finally, the term cultural landscape foregrounds the agency of humans within landscapes often considered to be "natural" or "wildlands" (Davidson-Hunt and Berkes 2003).

Little consideration has been given to the potential of developing innovative cultural landscapes that can provide secure and meaningful aboriginal livelihoods for the future. Rather, today, it is common practice to "set-aside" and preserve pieces of historic aboriginal cultural landscapes similar to the way by which artefacts are stored in a museum (Anderson 1996, Ingold 2000). Planning and management goals for landscapes are the result of a society's environmental perceptions, values, institutions, technologies and political interests. In order for cultural landscapes to reflect contemporary values and provide opportunities for secure and meaningful livelihoods for Aboriginal cultures, they must be thought of in a more dynamic way (Anderson 1996, Ingold 2000, Anderson and Barbour 2003). First Nations need to be given the ability to participate in the planning and management of the land so that new aboriginal cultural landscapes can be given the opportunity to emerge.

Colonial, followed by industrial policies and practices of natural resource management have tended to favour the maximization of single products rather than the multiple products and services approaches of ecosystem-based management (Berkes 1999). Aboriginal peoples have often been excluded from pursuing planning and management goals and objectives to secure a meaningful livelihood for a geographic area. Current mono-resource management techniques, such as those for timber, are hindering aboriginal communities' ability to secure meaningful livelihoods (Davidson-Hunt, Duchesne, and Zasada 2001). Aboriginal communities are left to work in the unwanted gaps and other remote areas not sought after by other resource users (Anderson and Barbour 2003, Davidson-Hunt and Berkes 2003). Essentially, access to cultural landscapes and the freedom to pursue traditional land management practices performed at these sites has been restricted.

IIFN members have unique perceptions of the land within the Shoal Lake watershed differing from other non-aboriginal people. Unique perceptions of vegetative conditions, landscape characteristics and cultural sites have connected to them cultural tradition, knowledge and practice. These perceptions develop through life experiences which can be gained by physical, oral, and/or cultural interactions. Through life experiences these sites have become part of an individual's cultural landscape. People of

IIFN view such sites as important places for cultural activities such as healing, livelihood, teaching, interpretive tourism, and economic development. The condition of an individual's cultural landscapes can greatly affect an individual's ability to feel optimistic about one's self, culture, and opportunities. Wild rice and aboriginal gardens are two important cultural landscapes to the community of Iskatewizaagegan.

Wild Rice (*Manomin*)

Wild rice (*Zizania aquatica* L.), or *manomin* in Anishinaabe, has played a very important role as a wild plant of the boreal forest. Wild rice has been propagated and traded extensively by Anishinaabe people throughout northwestern Ontario (Vennum 1988). The grain has been used for centuries in a geographic area from west of Lake Superior to southern Manitoba and into Wisconsin and Minnesota. Different varieties expand the range of wild rice from Florida to northern latitudes of Ontario, Manitoba and Saskatchewan (Aiken et al. 1988).

Manomin has been nurtured by, and has in turn nurtured, the Anishinaabe people since before recorded time (Vennum 1988). It plays an important role in the Anishinaabe traditional economic cycle and was a dietary staple accompanying all other foods they ate. However, to the Anishinaabe people manomin is much more than a source of food. It is considered to be a gift from the Creator in exchange for which the Anishinaabe received a duty to be its custodian. The caring for, seeding, harvesting, processing and marketing of manomin has long since been part of the Anishinaabe culture (Kinew 1995). It is much more than just a crop. Anishinaabe culture has a deep connection with manomin, which is visible in ceremonies, legends, stories, and even taboos. In past times, the wild rice harvest was an event that included almost the entire community. Families would pack up their supplies and head out to the rice fields for the entire ricing season (late August to mid September). The harvest was said to be a time of family togetherness in which several generations bond together with each other and other families through the cooperative effort required, and the expectation of a good harvest (Vennum 1988, Kinew 1995).

Anishinaabe people possess an intimate knowledge of the physical, ecological, and spiritual aspects manomin. Traditional Anishinaabe life elevates rice above being food simply for consumption or barter. Stories and legends, reinforced by the ceremonial use of manomin and taboos and restrictions against eating it at certain times, show the tight linkage of wild rice to Anishinaabe culture. This intimate knowledge helped the Anishinaabe people develop and continue an unparalleled method of wild rice management (Vennum 1988, Kinew 1995).

The wild rice crops of the Lake of the Woods and Shoal Lake areas were greatly affected by the development of dams through the late 1870's until the early 1910's. Dams were built to maintain waters at a constant level to improve navigation and provide water to power the sawmills in the area. Immediately, fluctuating water levels proved disastrous for the Anishinaabe wild rice economy. During 1899-1913, water levels within the ricing areas fluctuated between .9 to 6.3 feet above normal (Kinew 1995). In 1921, a Lake of the Woods Control Board was created by federal legislation to ensure the most beneficial use of the waters of Lake of the Woods for domestic and sanitary purposes, navigation, fishing, power, irrigation and reclamation purposes. No mention of Anishinaabe wild rice or lands was included. First Nation communities made many unsuccessful requests to the Lake of the Woods Control Board to regulate the water levels in a manner more suited for wild rice development (high spring levels and gradually drop throughout the summer). As a result, the Iskatewizaagegan people were forced to find alternative ricing lakes in which water levels were not part of the flooded Lake of the Woods system (Holzkamm and Waisberg 1993; Kinew 1995).

During the first half of the 1900's, lakes in Manitoba to the west of the community, were used for ricing by the Iskatewizaagegan people. However, the establishment of the Whiteshell Provincial Park forbade wild rice harvesting within the park boundaries and once again forced the Iskatewizaagegan people to find new lakes for ricing (Davidson-Hunt and Berkes 2003). Lakes within close proximity of the community were selected for wild rice establishment. Lakes were chosen because they possessed the necessary muck bottom for successful rice establishment. Water levels on the lake were then controlled by the community to ensure a successful and abundant annual wild rice crop.

Wild rice is "an annual aquatic grass that grows in shallow lakes and rivers throughout eastern and north central North America" (Aiken et al. 1988). Wild rice is known to grow best in shallow, clear lakes and rivers with muck like organic bottom and an absence of plant competition. It grows from seed each year. It is believed that its vast growing area is the result of aboriginal peoples who sowed it beyond its original territory (Able and Friesen 1991).

Growth begins in the spring during late April and May with the germination of seed that has over-wintered in the submerged sediments. The seedlings grow through the water column during the submerged leaf stage; this stage can last up to six weeks. When the water surface is reached, a floating leaf is produced that grows for approximately two weeks on the water's surface during the floating leaf stage (Aiken et al. 1988). The stem and leaves emerge from the water during the vegetative aerial leaf stage and tillering may occur. During late July and early August, the panicles emerge and flowering begins. Seeds develop and mature within two weeks following fertilization. Mature seeds will either shatter and enter the water, be predated by insects and wildlife, or be harvested by humans (Aiken et al. 1988). The seeds that fall into the water, weighted by their heavier end and "rudder-like awn," fasten themselves in the mud close to the parent plant (Aiken et al. 1988). Regeneration will take place the following spring after break-up. It is estimated that only 2-5% of the seed of the standing crop is needed to regenerate an area, and dormant seed areas have been known to regenerate after an absence of several years (Van de Vorst 1987: Aiken et al. 1988).Water depth is the most important factor in influencing a wild rice crop. The ideal depth is approximately 0.3 – 0.6 metres. Depths that are too deep or too shallow will severely affect production levels. Deep water does not allow sufficient light penetration for normal photosynthesis to occur during the "emergence stage". Whereas, wild rice found in very shallow waters (<10cm) is known to not produce much rice.

Sudden fluctuations in water depth are also detrimental to wild rice production. If water depth is increased during the "floating leaf" stage while the roots are still small the wild rice plant may uproot itself as the buoyant leaves lift the roots out of the soft muck soil (Chambliss 1940). Also, flooded leaves can leave the plant unable to take up sufficient amounts of gases through the leaves. Furthermore, wind and water pollination may not occur if the water depth is increased too rapidly during the aerial leaf stage.

Wild rice requires an adequate oxygen supply. Lee and Stewart (1981) have shown that in very eutrophic conditions wild rice production is limited by a lack of carbon dioxide. It is believed that good flow in wild rice lakes will ensure an adequate supply of oxygen which will contribute to the processes important to the submerged stages of wild rice

There are numerous plants that compete with wild rice at all stages of development. During the emergent stage other emergent species such as bulrush (*Scirpus spp.* L.*)*, horsetail (*Equisetum sp.* L.), and rigid arrowhead (*Sagittaria rigida* Pursh.) have been found to deplete the nutrient reservoirs of the lake bottom thus causing small wild rice plants. During the floating leaf stage, floating leaf plants such as water lilies (*Nymphaea Odorata aiton.)* and bur reed (*Sparganium sp.* L.*)* impede the growth of any wild rice by stopping light from penetrating the water column.

Submerged species that affect wild rice growth include those with finely dissected leaves such as, Coontail (*Ceratophyllum sp.* L.*)* and Water–milfoil (*Myriophyllum sp.* L.) These species can form dense clumps that impede light from reaching the developing wild rice plants, and can also tangle with the submerged leaves and hold the plants under water (Aiken et al. 1988).

Aboriginal Garden Islands

In northwestern Ontario, Holzkamm and Waisberg (1993) believe that the Anishinaabe adopted horticulture in the 1800's as a means to increase their diversified subsistence resource base. It is believed that "garden islands" and the crops yielded there became a significant part of the Anishinaabe subsistence economy during the latter half of the nineteenth century in the Lake of the Woods region. Crops from garden islands helped to add to a diverse economy based upon gardening, hunting, and fishing (Holzkamm 1986). Gardens acted as a resource in which the Anishinaabe of the Lake of the Woods region were able to maintain a diversified subsistence base, shifting from one resource to the next when seasonal changes occurred. Historical records indicate that the gardens rarely failed (Holzkamm & Waisberg 1993). However, when failures did occur, they were generally due to excessive dryness. Increased wild rice production in dry years compensated for crop losses (Holzkamm 1986).

> "The Chippewa were a people subsisting chiefly on vegetable products and fish, though they secured deer and other animals by hunting. The making of gardens was an important phase of the industrial year, and a portion of the food thus obtained was stored in caches for winter use" (Densmore 1928).

The Anishinaabe in the Lake of the Woods region grew a variety of different crops such as: potatoes, squash, pumpkin, onions, carrots corn, beans, and other root crops. It has been estimated that garden islands were relatively small (0.8 acre), but very productive (Holzkamm and Waisberg 1993). Productivity was attributed to companion planting, prescribed burning, and fertilization. Once harvested, these crops were eaten, stored in pits for further times of need and/or traded for other goods. Anishinaabe agriculture was important not only for subsistence, but also, for the provisioning of Euro-Canadian fur traders, missionaries, government exploring expeditions, and others (Vennum 1988, Cronon 1983, Holzkamm & Waisberg, 1993). Plant foods were available for immediate use, but were also often preserved and stored for future consumption throughout the hunting seasons and winter (Waisberg 1984). Trading was a common practice during good years. However, in tougher years very little trading (provisioning) occurred, as the Anishinaabe were storing the food for themselves. Cultivated plant foods played an important role in the survival of the Lake of the Woods Anishinaabe people. So much so that they insisted during the treaty negotiations that agricultural opportunities be preserved by the establishment of farming reserves and the retention of garden islands (Holzkamm & Waisberg 1993).

Fire has been noted by many authors to have been the most significant technology utilized by Aboriginal people to modify the landscape (Boyd et al. 1999; Lewis and Ferguson 1988; Pyne 1982). Anishinaabe people began to experiment with landscape burning to maintain certain habitat conditions and enhance the production of important resource plants and animals (Boyd et al. 1999). Aboriginal landscape burning practices acquired through hands-on learning and generations of observation and experimenting does not receive the attention it deserves within current natural resource management practice. It appears that most burning took place in spring on islands, and outcropping points, of water systems. Control of the fire was obtained by igniting the fire in such a way that it burnt out at waters edge or when it reached the snow found in denser woodlands. Controlled landscape burning required a deep knowledge of the natural systems and the mechanics of burning during the spring. Seasonal traits, time of day, knowledge of wind, slope, size of the area, and frequency of burning, are all extremely important factors that were considered by the Anishinaabe before and during landscape burning (Boyd et al. 1999).

Traditional Ecological Knowledge (TEK)

The application of traditional ecological knowledge in ecosystem restoration offers many potential benefits for the restoration of aboriginal cultural landscapes and, in general, for the sustainable management of natural resources (Kimmerer, 2000; Berkes 1999). According to Berkes, traditional ecological knowledge is: "a cumulative body of knowledge and beliefs, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship between living beings (including humans) with one another and their environment". Traditional knowledge becomes adaptive through a process in which new information must be obtained to solve current problems (Davidson-Hunt and Berkes 2003). These adaptive responses give aboriginal communities the capacity to change their productive activities and modify local rules and institutions to ensure contemporary livelihoods (Berkes and Jolly 2001). Aboriginal systems of land management conserve biodiversity through an on-going process of trial and error and close observation to the feedback loops which link human action and its consequences. Through adaptive responses Aboriginal people can develop a stake in conserving and enhancing biodiversity of an area and its resources because they depend on that area for survival (Gadgil, Berkes, and Folke 1993).

Traditional ecological knowledge's vast empirical information content and cultural context makes it very valuable in the process of ecological restoration. Recently, restoration practitioners have begun to include the alternative interpretations into restoration planning which traditional ecological knowledge encompasses (Kimmerer 2000). There has been criticism placed on restorationists who are using only Western science when attempting to construct ecosystems (Anderson 1996 and Kimmerer 2000).

Currently the Society for Ecological Restoration (SER) "principles of good restoration practice" fails to make any mention of providing the stakeholders with the power to choose the direction, type, and methods of restoration, rather the SER places emphasis on empowering all stakeholders. The SER does note the importance of considering all forms of historical and current information, including scientific and aboriginal local knowledge, innovations and practices (SER 2005).

Western science is typically abstracted to a generalization of ecological communities; whereas, traditional ecological knowledge is highly localized. A localized traditional ecological knowledge base will provide particularly applicable insight into site-specific restoration and restoration design (Kimmerer 2000, Anderson & Barbour 2003, Ruppert 2003). In the viewpoint of western science, restoration serves the practical purpose of recreating ecosystem structure and function. Western scientists define restoration as "management to return a damaged ecosystem to its pre-disturbance condition" (Cairns 1988:6). However, there has been a shift in thinking and today many researchers are showing that in fact, North American landscapes have not experienced pre-disturbance conditions for thousands of years. There is an abundance of evidence that indicates that aboriginal people were continually managing landscapes with human initiated disturbance such as fire (Boyd et al.1999, Vale 2002, Anderson 1996, Anderson & Barbour 2003). In the context of dynamic and contemporary aboriginal peoples a goal of restoration should be to emulate a healthy, natural, and or, human influenced ecosystem that enables peoples who use that site to continue activities and practices that will continue the connection between people and the landscapes in which they live. Restoration can also include a number of other discreet and compatible goals such as the enhancement of biodiversity, cultural awareness and traditional land management practices (Kimmerer 2000, SER 2005).

The knowledge of the management practices at these sites will help to provide crucial information during the identification of the sites, planning and implementation of the restoration plan, and development of the management techniques (Anderson 1996, Kimmerer 2000). The knowledge of how these landscapes were formerly used, in a society based upon oral traditions, exists only with elders and a few other community members. Therefore, it is critically important to restore teaching sites to share knowledge and maintain the linkages between the past and the future.

Ecological Restoration Plans

Ecological restoration refers to a diverse set of practices that are directed towards lessening the human impact on ecosystems. The Society for Ecological Restoration (2002) defines ecological restoration as, "The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed". Higgs (1997) believes that the goal of restoration is to replicate a predetermined aboriginal ecosystem as close as possible to the state that once existed at the site. Restoration ecology is defined as the group of scientific practices that contribute to ecological restoration (Higgs 2003). Ecosystem restoration is an important theory for the integration of aboriginal knowledge into sustainable forest management. It recognizes the role of intervention into ecosystems and the importance of bringing deeper awareness of history into the management of an ecosystem (Davidson-Hunt 2003a). However, an aboriginal perspective may place more emphasis on restoring the processes and functions of a site; while respecting its historic structures it may also allow the site to become dynamic.

Restoration projects are seen as a powerful way to strengthen local communities, and contribute to the development of a more deeply held land ethic (Kimmerer 2000, Anderson 1996, Anderson & Barbour 2003). Restoration of cultural landscapes can help to restore language, traditional activities, awareness and appreciation of the culture and its relationship to the surrounding environment. Restoration projects may spark an interest within a community to re-establish their sense of place in the landscape. A community's perception of the environment and their relationship with it are not only reflected in the landscape, but are also created and closely linked to it (Bender 1996; Davidson-Hunt and Berkes 2003). Community members will feel a sense of empowerment through increased local control of these cultural landscapes (Anderson & Barbour 2003).

TEK and Restoration

Resource managers and local communities are increasingly beginning to recognize the value of including traditional ecological knowledge into ecological restoration and management projects (Striplen and DeWeerdt 2002). Every restoration plan is influenced by its own unique site, characteristics and history, and, as a result, we cannot fully know how successful the plan will be. However, understanding the history of the site can help restorationists make informed predictions about probable responses to restoration intervention (Steen-Adams 2002). As participants in restoration efforts alter their thinking of the landscape and strengthen their relationship to place, they often experience a reconnection with nature and landscape. By regaining autonomy over their ecological and cultural resources, aboriginal communities will restore their sense of place and connection with the land (Kimmerer 2000). Successful ecological restoration involves determining the best possible outcome for the specific area to be restored based on ecological knowledge and the perspectives of interested stakeholders.

Establishing Partnerships

Non aboriginal land management agencies and managers are failing to recognize the importance of non-abiotic factors influencing ecosystems across North America (Anderson and Barbour, 2003: Ruppert, 2003). Anderson and Barbour (2003) believe that in order to restore and maintain so called "wilderness," active natural resource management using aboriginal land management methods must be implemented. Ruppert (2003) believes that ecological restoration can be achieved in aboriginal communities through the development of working partnerships and agreements between local land management agencies and the aboriginal communities wishing to obtain access and harvesting rights to traditional resources. Developing partnerships with non-aboriginal land management agencies will help to create understanding of aboriginal land management practices. The benefit of establishing agency/community partnerships is in-- recognizing the deep cultural importance of access to land-based activities. Partnerships help to increase government-to-government relationships between federal/provincial agencies and aboriginal communities (Ruppert 2003). Furthermore, formal partnerships are adaptable. They have a better chance of surviving changes in local personnel, policies, and agencies. Through the creation of a working partnership with aboriginal communities, land management agencies would benefit by finding ways to incorporate aboriginal management techniques into their own management practices (Ruppert 2003, Kimmerer 2002, and Anderson 1996). Anderson and Barbour (2003) propose that aboriginal communities work with land management agencies to develop a management model that would enable aboriginal community's access to lands to practice traditional land management techniques. This would provide areas of learning where non-aboriginal resource managers could see in action the aboriginal management practices maintaining and restoring biodiversity at population, community, and landscape scales (Anderson & Barbour 2003).

Higgs (1997) believes that good restoration will always be rooted in what he calls "ecological fidelity" (historical reference conditions). When applied to restoration, ecological fidelity is comprised of combination of structural replication, functional success, and durability. Restoration practices that include the concept of ecological fidelity, and social and cultural goals will have a much better chance of being successful (Higgs 1997). Furthermore, restoration plans must include social, cultural and ecological principles if they are to be successful. Restoration requires a thorough understanding of the ecological role of Aboriginal peoples in the dynamics of wild plant populations and ecosystems (Anderson 1996).

Currently, resource managers and land management agencies are beginning to incorporate aboriginal land management knowledge, methods, and techniques into their ecological restoration plans. The literature indicates that indigenous communities are being given the "opportunity" to participate in the identification, designation, and management of cultural landscapes (Underwood, Arguello & Siefkin 2003). Anderson and Barbour (2003) and Kimmerer (2000) place emphasis on how a sense of empowerment will be felt within the aboriginal community through the process of restoration and re-establishment of some cultural traditions. Traditional aboriginal land management methods are being implemented throughout North America by land managers in an attempt to achieve desired restoration goals. These goals typically aim to improve native plant establishment and diversification and/or to protect pre-European fauna and preserve the pre-settlement ethnographic landscape (Anderson & Barbour 2003; Underwood, Arguello & Siefkin 2003).

While restoration of the elements of cultural landscapes is important the restoration literature does not emphasize the importance of the relationships of a dynamic social-ecological system. A relational approach to restoration considers both historical reference conditions while allowing for the changes necessary for contemporary aboriginal ways of life to adapt. As defined earlier, this approach is closer to the concept of ecological restoration as opposed to restoration ecology (Allison 2004). As previously mentioned, restoration ecology often refers to the science, ecology, and biology of restoration while ecological restoration is:

> "An activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability. Frequently, the ecosystem that requires restoration has been degraded, damaged, transformed or entirely destroyed as the direct or indirect result of human activities" (SER 2002).

As Allison (2004) points out even this focus of ecological restoration is primarily based upon restoring ecosystems to their historic trajectories and not the human-place relationships out of which those trajectories emerged. Allison's (2004) article is the only one within the ecological restoration literature that recognizes the importance of re-engaging human-place relationships within the ecological restoration literature as opposed to extracting humans from the ecosystem. The contribution of this thesis is to further develop the importance of restoring human-place relationships as an important process in the restoration of dynamic social ecological systems.

In this chapter, I have reviewed the literature and found that the restoration literature does not emphasize the importance of the relationships of a dynamic social ecological system. A relational approach must be developed which enables contemporary aboriginal ways of life to adapt without slavish adherence to restoration emphasizing historical reference conditions. Aboriginal peoples can lead restoration planning and management instead of simply providing information for restoration plans. In order to understand how Aboriginal people may be involved in leading ecological restoration projects, it has been necessary to review literature related to aboriginal cultural landscapes, traditional ecological knowledge, ecological restoration plans, and the inclusion of traditional ecological knowledge in restoration plans. In the next chapter, I turn to the methodology utilized during the research. This chapter will be followed by two chapters that present the results of the research and then a conclusions chapter.

Chapter 3 – Research Methodologies

Chapter Overview

The cultural landscape of one society is not always visible to members of another society due to differing perceptions, values and political interests (Davidson-Hunt 2003b). Therefore, cultural landscapes need to be documented to ensure that aboriginal culture, land management and practice may be allowed to continue in a landscape that is threatened by outside land management institutions. The documenting of cultural landscapes will help to verify aboriginal people's agency in creating landscapes to non-aboriginal institutions. It is hoped that this documentation will help to restore a relationship with the land and improve livelihood opportunities for Aboriginal people.

Through developing a methodology of documentation, it is hoped that the dynamics of people-place relationships of aboriginal cultural landscapes can be communicated to non-aboriginal resource managers. Furthermore, cultural, historical and biophysical documentation of cultural landscapes will provide the people of IIFN with the baseline information needed to measure any changes as a result of restoration or non-action. The methodology that was developed for documenting aboriginal cultural landscapes with Iskatewizaagegan No.39 will be discussed in this chapter. First, I will explore the iterative methodology that was used throughout the course of the research. I will then describe how the SER guidelines were built upon for the success of this project. Participatory workshops and the development of a criterion for prioritizing cultural landscapes were used throughout the project as a means of guidance and continual feedback. Finally, the methodology used to collect the cultural-historical and biophysical documentation of Crowduck Lake and Potato Island will be covered.

Iterative Methodology

An iterative methodology is an adaptive process that continually refines research methods, data and interpretation throughout the course of the research project. It is a cyclical process that is ideally driven by participant goals, objectives and decision-making (Munt 2002, Gibbs 2001). Participants in the research project help to develop what the research will attempt to achieve. The process of collecting data helps to conceptualize and clarify the issues within the areas of inquiry. Once collected, data are presented to the community or research partner for validation and reflection (Dick 2003). Upon reflection, the client is then asked to make a diagnosis of the situation and the nature and scope of the research. The next phase of the iterative process involves determining the necessary steps and strategies to achieve the desired goals and objectives of the project. By working together, the researcher and the community develop ways to measure and achieve desired outcomes. This type of participatory research provides the researcher with many opportunities to learn from the people in the community, and in addition, is meant to give something back to the community in which the research is done (Gibbs 2001, Munt 2002, Dick 2003). One way that this is achieved is through increased understanding of local issues. It is also an opportunity for community members to work together, to learn about each other, and to potentially strengthen their connections with each other.

Building on the SER Guidelines

It was determined that an iterative methodology would best ensure an end product which could meet research objectives and provide a beneficial outcome for IIFN. This approach would assist the community members in achieving their goals and objectives in relation to the restoration of aboriginal cultural landscapes. In addition, the Society for Ecological Restoration (SER) guidelines were reviewed and then adapted to better fit the research project to ensure that a successful restoration plan was produced at the end of this iterative process.

The SER guidelines are used for conceiving, organizing, conducting, and assessing ecological restoration projects. SER's guidelines are made up of six different tasks that are required to achieve successful restoration. These are: Conceptual Planning, Preliminary Planning, Installation Planning, Installation, Post Installation Tasks, and Evaluation. However, it is clear that the SER guidelines are generic, narrow in scope, and not designed specifically for restoration of cultural landscapes because they fail to recognize the cultural, historical, and ecological uniqueness of each cultural landscape. Furthermore, the SER guidelines fail because they do not promote an adaptive iterative process for documenting and developing restoration plans with the communities directly affected. Cultural landscapes are unique and therefore require unique methodologies for successful restoration. For the purposes of this project some of the SER's existing guidelines were used as a base to which new guidelines were added, while non-applicable guidelines were modified or eliminated. Through the modification and adaptation of these guidelines, a step-by-step method for documenting and restoring aboriginal cultural landscapes was developed by the researcher that was dynamic, adaptive, and one, which would receive buy-in from the community.

A grid style guideline was developed to ensure ease of understanding. The grid clearly outlined the necessary phases for restoration and the requirements in each phase, step by step. The guidelines enabled the researcher to identify and sequence the necessary steps for restoration planning as well as ensure that necessary information had been collected for the project (Appendix 1).

Participatory Workshops

Participatory workshops were used in conjunction with the SER's modified guidelines for developing and managing ecological restoration projects as a means to guide the direction of the research project. Participatory workshops were designed to provide a forum in which community members were able to provide feedback and have a direct input into the documentation of cultural landscapes and the development of a restoration plan. Workshops provided the environment necessary for the success of the iterative research process.

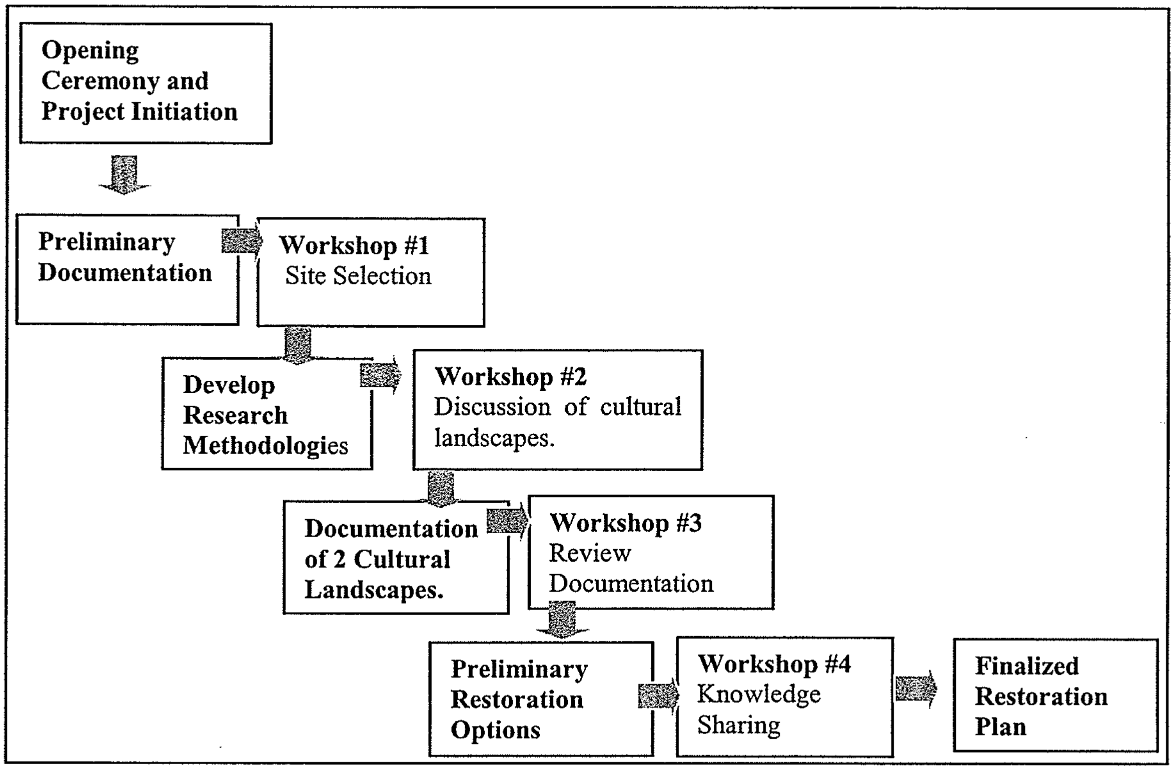

Figure 2 . Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes.

Preliminary Documentation: Natural and Cultural History of Five Selected Cultural Landscapes

The research that was undertaken in the summer of 2002 was a preliminary scoping exercise of five places and/or plant resources that make up the nodes of a cultural landscape. The five sites that were selected for the Iskatewizaagegan Cultural Landscape inventory were: *Gitiiganii Minis* (Gardening Islands/Potato Island), *Kaagaagiishib Zaagegan* (Crowduck Lake), High Lake & High Lake Access Trail, *Siizibaakoto Minis* (Stull Island) and *Miniikaa* (Blueberry harvesting patches) (Figure 13). These sites were identified during research reported in Davidson-Hunt (2003) that was undertaken with Brennan Wapioke and elders of IIFN from 2000-2001.

During this scoping work, aerial photography (scale 1:20,000) was used to generally identify the main plant communities of the sites. A transect was drawn which crossed through as many plant communities as possible while traversing the site in a straight line. When sites were resource patches (Wild Rice, *Zizania aquatica*), the transect was determined by the boundaries of the plant community. UTM coordinates and elevation for the geographical centre for each was recorded using a G.P.S. A list of plants was derived for each site by walking the transect and noting all plants encountered (Table 1.). Identification and the scoping of the five sites was completed to gather a rapid life sciences inventory descriptive of the biophysical characteristic of the sites. Its historical importance was documented by collecting stories about the sites through visits to these places with elders and other interested community members.

Development of a Criterion for Prioritizing Cultural Landscapes

A criterion was developed to help the community prioritize their cultural landscapes for restoration based on initial goals and objectives that were voiced at the start of the project. The criterion was developed to address the goals and objectives the community had surrounding future use and visitation to the sites. During the early stages of the research during workshop #1 the criteria was further develop to rank the sites. Six criteria were used to evaluate the five cultural landscapes initially selected by the community: Proximity to the community (safety for group travel and ease of access); infrastructure required to achieve goals and objectives; importance of the site to the elders and community members for culture and historical value; willingness to share the site with others (education and tourism); potential for quality and interesting interpretation; potential to gain managerial control of the site. Using data collected during the preliminary scoping stage of the research each site was evaluated by the community during workshops for its ability to best fit the community's desired goals and objectives for the research project (Appendix 2).

Cultural – Historical Documentation

To gain an understanding of the cultural landscapes from a cultural and historical perspective, numerous site visits were made to Crowduck Lake and Potato Island throughout both field seasons with elders, and other knowledgeable community members. During site visits elders and community members told stories about the site and discussed the ways in which the site holds a place in their memories. During site visits and meetings with elders and community members' data were collected through oral in the form of stories and discussion about all aspects of the landscapes participants felt comfortable sharing. Furthermore, to find out more details about the cultural landscape, one on one discussions were held with community members whenever the opportunity arose, again using a non-scheduled interview method. More information about the cultural landscapes were collected through research materials, other published literatures, the Ontario Ministry of Natural Resources and from personal communication with individuals outside of the Iskatewizaagegan community.

Biophysical Documentation

Biophysical Documentation of Crowduck Lake

There have been many studies on wild rice; however, no one methodology outlines the details necessary for establishing baseline data that could be used to monitor

Crowduck Lakes' rice production over time. Methodology for documenting Crowduck Lake was developed using techniques that the Ontario Ministry of Natural Resources (OMNR) developed for conducting wild rice suitability surveys and The Royal Botanical Gardens (RBG) methodology for monitoring and restoring wetland areas. In the 1980's, the OMNR wanted to develop new ricing lakes in Northwestern Ontario by identifying lakes with characteristics suitable for wild rice establishment and production (Lee 1986). It developed a methodology to guide lake surveyors in identifying suitable lakes for artificial wild rice seeding. The RBG developed a methodology for vegetation monitoring and restoration at some of its wetland habitat project sites (Royal Botanical Gardens 1996). In so doing, the RBG is able to collect the necessary baseline data to ensure the successful long-term monitoring of their wetland restoration projects.

A method for documenting the wild rice field had to be developed that was more practical, given the conditions on the lake, time restrictions and the equipment available. Furthermore, the method of documentation had to be replicable for monitoring purposes. Since a grid pattern would be very difficult to replicate it was decided that the development of transect lines through the wild rice, to the extent of its boundaries, would prove to be the most meaningful and practical means of documenting the presence/absence, habitat, and growing conditions of the wild rice. The transect lines were able to capture important features in the wild rice field such as patch edges, high-density patches, and low-density patches. Also, documentation of other influencing factors of the physical condition of the wild rice bay and wild rice production were collected such as inlets, outlets, natural structures (beaver dams, log jams, floating bogs), and man-made structures (roads, hydro) (Figure 19).

Beginning in summer 2003, the extent of wild rice presence or absence was measured along eight permanent transect lines which ran across the eastern most bay of Crowduck Lake (area which has wild rice). All eight transect lines ran in the same direction, 360° due North and went from the South shore to the North shore of the lake, ranging approximately 200-450m. Transect lines were spaced at random intervals to ensure that the diversity existing in this area was captured.

Transect Locations for Wild Rice Documentation

Ground truthing was used to determine where significant density shifts (Plates 13 and 14) occurred throughout the wild rice field. Field observations involved running a shoreline transect (West to East) from the start to the finish of the wild rice field to help determine significant wild rice density shifts.

Transect start points were located where the researcher could see clear signs of a density transition in the wild rice crop. The location of each consecutive transect are based upon significant changes in the wild rice density from low to high and from high to low density.

Using the Garmin GPS unit, the locations were recorded using Universal Transverse Mercator (UTM) coordinates. The assigned transect letter was clearly marked onto a "butter-soft" aluminium tag which was then securely fastened to the nearest tree, typically cedar (Plate 11). Ideally, it is hoped that these marked aluminium tags can be located with a GPS unit for future monitoring of the wild rice.

By collecting data on important features within the wild rice field, any changes to the growth of the wild rice crop and growing conditions in the following years will be easier to monitor (Lee 1986). Transect lines bordering the edge of a highly productive rice patch will provide future monitoring with a baseline to measure how much growth pattern change the wild rice crop for any given year has experienced, as compared to 2003 (RBG 1996). If characteristics for wild rice production are improved or worsened at Crowduck Lake the size of the wild rice crop could be compared to the 2003 baseline data.

Sampling Intervals for the Wild Rice

It was determined that water turbidity, water depth, and the presence or absence of wild rice would be noted along each transect, at different sampling intervals, using a canoe to navigate the lake (Aitkens, et al. 1988; Lee 1986). Changes in the presence and/or absence of wild rice dictated the sampling intervals along each transect. For example, if wild rice was present for two consecutive sampling locations e.g. (10m and 20m), sampling intervals would be increased by 10m. Distances were measured using a traditional metric hip-chain. This measurement pattern continued across all of the eight transects. At both the start and finish for each transect line, a 10 m shoreline buffer was applied to eliminate shoreline edge effect. Therefore, the final sampling interval for the final location along a transect was sometimes cut short and the measurement had to be taken at whichever distance along the transect line 10m from the end shore occurred.

Turbidity Measurements

Water turbidity was measured using the Secchi Depth Transparency methods at each sampling interval point along each transect. The Secchi Depth Transparency method is a direct measure of how deep sunlight penetrates the water column and an indirect measure of the amount of suspended material (algae, microscopic organisms, and sediment) in the water column. For this study, a 20cm Secchi Disc was used with a rope upon which were marked 0.5 m increments (Plate 12). Secchi measurements were taken first from the centre of the right hand side of the canoe before depth measurements to avoid any lake bottom disturbances interfering with the Secchi measurements. The depths of disappearance and reappearance of the disc where averaged to obtain the turbidity measurement for each desired location.

Water Depth Measurements

Typically Secchi Discs are used to measure turbidity. However, due to the loose muck condition of the lake bottom, a conventional depth-measuring device would not have given accurate measurements. For this project, determining the lake depth at which wild rice and other aquatic plants germinate and take root is of prime importance, though not necessarily the actual bottom of the lake. Prior research has shown that wild rice lake bottoms have been known to have muck bottoms many meters deep (Aikens et al. 1988; Lee 1986). Conventional depth-measuring devices would not measure depth at the rooting area, but would penetrate the rooting depth and continue onward to the actual bottom of the lake. It was decided that the resistance given by the 20 cm diameter plastic Secchi Disc made measuring the top of the loose "muck" depth possible. The top of the loose muck layer is the layer which at which the rooting of the wild rice and other submerged aquatic plants occurs. To take depth measurements the canoe was first anchored at the desired position using a 5-pound anchor. The Secchi Disc was then lowered from the centre of the right hand side of the canoe until it met with the resistance of the rooting layer (top of the loose muck). At this point the depth measurement was made and recorded at each sampling point for all eight transects.

Presence/Absence of Wild Rice

Presence or absence of wild rice was recorded at each sampling interval on all eight transects. To determine the presence or absence of wild rice in the field, the research team constructed a 1x1m wooden frame from poplar branches to resemble a large picture frame. For each measurement the bottom right hand corner of the square was placed by hand and held by the centre person at the canoe's centre brace (yolk). Holding the square over the water made it possible to judge the presence or absence of wild rice, which was determined and recorded by the person in the front of the canoe.

Percentage Cover Transects/Plant Identification

Obtaining a cross-section of vegetation cover of both emergent, floating and submergent vegetation will help to determine a baseline for which changes in plant species composition and vegetation density can be compared in future years (Lee 1986). Wild rice is a species that requires specific conditions for optimal growth, and its production can be determined by the presence or absence of other vegetation competing for some of those same conditions, such as, light and rooting space (Aitkens et al.1988 and Lee, 1986). Therefore, it is necessary to perform transects that record the types of other plants within the wild rice field and their density.

Two transect lines where chosen from the eight presence/absence transects that were representative of low vegetation density and a high vegetation density of the overall vegetative condition of the wild rice field. Using the same sampling interval system as developed for the presence/absence transects, the percentage coverage of emergent and submergent plants were recorded using the 1x1m wooden frame located at the centre of the right hand side of the canoe. Using the 1x1m frame as a reference, percentage cover estimates for all aquatic vegetation where recorded.

Vegetative Shoreline Plots

Three vegetation plots where collected 10m from the shoreline of both the north and south shore of the wild rice field on Crowduck Lake (Plate 15). Each 2m x 2m plot was located in an area that was deemed to be of high diversity by the researcher. Diversity in this case can be applied to areas that contained some plants not represented during the percentage cover transects. From the shoreline, the research team measured with a hip-chain, a 10 m distance north or south, depending on the location of the plot. At the 10 m point, the right side of the canoe was made to face the far shore. The boundaries of the 2m x 2m plot were visually estimated with the assistance of the 2m distance being marked off on the right hand side of the canoe with flagging tape. Researchers visually extended the 2m distances and took an inventory of the different vegetation that existed in each plot.

Biophysical Documentation of Potato Island

Potato Island is a very small island approximately 2 hectares in size, and as a result, 1:50,000 scale maps and aerial photography are unable to provide any detail of the vegetation detail of the island. Mapping Potato Island using a transect grid technique similar to that done at Crowduck Lake would prove ineffective because Potato Island is too small. Therefore, rather than attempting to map the island with a grid where scale problems would have arisen, the island was mapped using Universal Transverse Mercator (UTM) coordinates with a hand held Garmin "etrex" Global Positioning System (GPS) unit. UTM coordinates were collected mapping each of the vegetation polygons boundaries on the island. The recorded polygons where classified into one of four types; bedrock, wetland, forested or treed, garden or non-treed. In order to accurately map each of the polygons, the interval of UTM point collection on the GPS unit had to be determined due to scale (Figure 19).

A 5 m collection point interval was used to map vegetation polygons so that the finer details of the polygons would be recorded. For recording Potato Island polygon a 10m interval was used due to the larger and less detailed polygon. Polygon boundaries were determined in the field through visual observation, and identifying changes in vegetation. Once polygon boundaries were determined they were walked to record their UTM coordinates.

The UTM coordinates were then entered into Arcmap and used to create a digital map projection of the different vegetation polygons of Potato Island. This projection was then overlaid onto a National Topographic Data Map, 52/E at a scale of 1:250,000. Transect lines and plot locations were also included in the digital map to indicate how the transects span the island and to indicate where the differing types of vegetative polygons were located.

Transect Lines

Using three transect lines were completed at Potato Island to capture and record bedrock and surfacial geology and composition of vegetation types that exists on the island. This technique is best used where the vegetation community is either relatively undisturbed or where it is clearly understood what causes changes in vegetation presence and/or cover.

The starting point and azimuths for the transect lines where selected in the field to ensure that the majority of the vegetative polygons on the island were recorded. UTM coordinates were collected for all start and finish points for each transect. The three transects originated on the eastern shore of the island and ran at an azimuth of 270°W. Each transect was spaced approximately 30m apart, in an attempt to capture the diversity of the vegetation on the island. Notes were made about the shifts in vegetation polygons, soil, and slope. All new vegetation not found in the forest or garden plots was collected within a 50cm distance from either side of the transect and 1m total width of the transect.

Vegetation Plots

The Forest Ecosystem Classification (FEC) plots, 100 sq m vegetation plots, were used to gather information about the composition, diversity, and abundance of plant species in each vegetation type (Davidson-Hunt and Bowling, personal communication). Two 100 sq m plots were established in both the garden area and in the main forested area. Plots were located in areas within the polygons that were most representative of the vegetation present. Due to of the small size of the island and odd shape of the forest polygon, the dimensions of the plots had to be adjusted, therefore eliminating edge effect between the polygons.

Within each 100 square metre FEC plot, information about trees, shrubs and herbaceous plant species was recorded according to Describing Ontario's Ecosystems: Data Collection Standards for Ecological Land Classification (Sims et al. 1997).

Garden Vegetation Plot

A 100 sq m circular plot was located in an area of the garden that was free from bedrock outcroppings and where vegetation seemed most representative of the entire garden area. The boundaries of the garden area where identified during previous site visits with elders and by the presence of only disturbance origin vegetation. The centre of the plot was marked using a permanent sample plot (PSP) stake and a GPS position was taken.

Once the plot boundaries were established, the task of taking a plant inventory of the plants within the plot could begin. To ensure that no plants were missed during the inventory, a rope was tied at the plot centre and extended to the north increment marker. As plants were collected along the line, the remaining plants where cut down to the ground until the entire 100 sq m circular plot was cleared. Plants and other items located within the plot were collected and later identified.

Forest Vegetation Plot

The location and shape of the forest plot was dictated by the shape and size of the forest polygon. Being long and slender in shape as compared to the garden plot, the forest polygon required a different style of 100 sq m plot. It was decided that in order to minimize edge effect and provide a representative sample of the vegetation in the forest plot, a 50m x 2m plot would be established to provide the needed 100 sq m sample plot. To establish this plot, rough width and length measurements were taken of the forest polygon, to better understand the direction which the plot would need to be developed. It was determined that the length of the plot would run best in a North to South direction. Establishing the long side of the plot in a North to South direction would provide the plant collection with the highest diversity of species and enable the forest plot to be less influenced from the species of the garden area.

The establishment of the rectangular forest plot was accomplished by locating the two southern most corners of the plot. A fifty-metre line was measured using a tape and running an azimuth of 360° North. All vegetation specimens from the forest plot where collected and identified so that plant specimens could be pressed and presented to the community to be added to the community's plant collection.

Soil Analysis of Vegetative Zones

To gain a deeper understanding of these cultural sites, soil samples were collected by digging soil pits and collecting soil samples. Soil samples helped to determine soil depth, organic layer depth, moisture regimes, and soil texture (Sims et al. 1997). Soil pit analysis was very useful in determining some of the physical conditions of the soil and revealed occurrences that may have taken place on the Potato Islands with regards to human presence and land management.

With the assistance of Colin Bowling (OMNR Soil Scientist), two soil pits were dug on Potato Island to determine what type of soil existed if there were any differences between the soils in the garden area and the forest area. The two soil pits were dug in areas determined to be most representative of the vegetation regime. Organic and mineral layers were identified, measured, and "keyed" to a Soil Type and a Moisture Regime using the Field Guide to the Forest Ecosystem Classification for Northwestern Ontario (Sims et al. 1997). The process of "keying-out" soil included obtaining a soil core from up to 100 cm in depth, or up to the contact point with bedrock. To determine the Soil Type, texture of the C-horizon was "keyed" out using taste, feel, shine, ribbon, and moist cast tests according to the FEC field guide. Moisture Regime was then determined from the texture, and depth of the mineral or organic soils. Other characteristics of the soil pits such as the presence and or absence of mottling as well as the topographic position of the particular site were considered in determining moisture regime.

Sufficient organic and mineral samples were collected from the two soil pits dug on Potato Island and sent to Lakehead University Soils Lab for analysis. Tests were completed to determine the differences between the soils resulting from human activity, and to see if the soils in each vegetation regime are suitable for growing agricultural crops.

In conclusion, a methodology of documenting cultural landscapes led by aboriginal knowledge, goals, and objectives, must be developed to ensure that aboriginal culture, land management, and practice are allowed to continue in landscapes that are threatened by non-aboriginal land management institutions. Using a participant driven iterative methodology through workshops, site visits, cultural-historical and biophysical documentation, the people of IIFN successfully achieved their goals and objectives for the project. In chapter four, I will present the results of the research. The following chapter will present the development of a restoration plan for the cultural landscapes.

Chapter 4 – Documenting Cultural Landscapes

Chapter Overview

Fieldwork took place within the Shoal Lake watershed during the summers of 2002 and 2003. In this chapter, findings from the preliminary scoping documentation and the process for selecting and documenting two aboriginal cultural landscapes will be discussed. Secondly, cultural and historical documentation of Crowduck Lake and Potato Island will be provided in the form of stories and reflections about the sites and the issues currently influencing the sites. Thirdly, findings of the biophysical documentation of both Crowduck Lake and Potato Island will be explored and discussed. Finally, to conclude the chapter, human-landscape interactions will be discussed.

Participatory Workshops

The participatory workshops helped ensure that the research project was participant driven. From the initiation, to the completion of this project, four key participatory workshops were held. Each workshop was scheduled at a specific time during the research project to guide the next phase of the research, thus, enabling the iterative process to function effectively (Chapter 5).

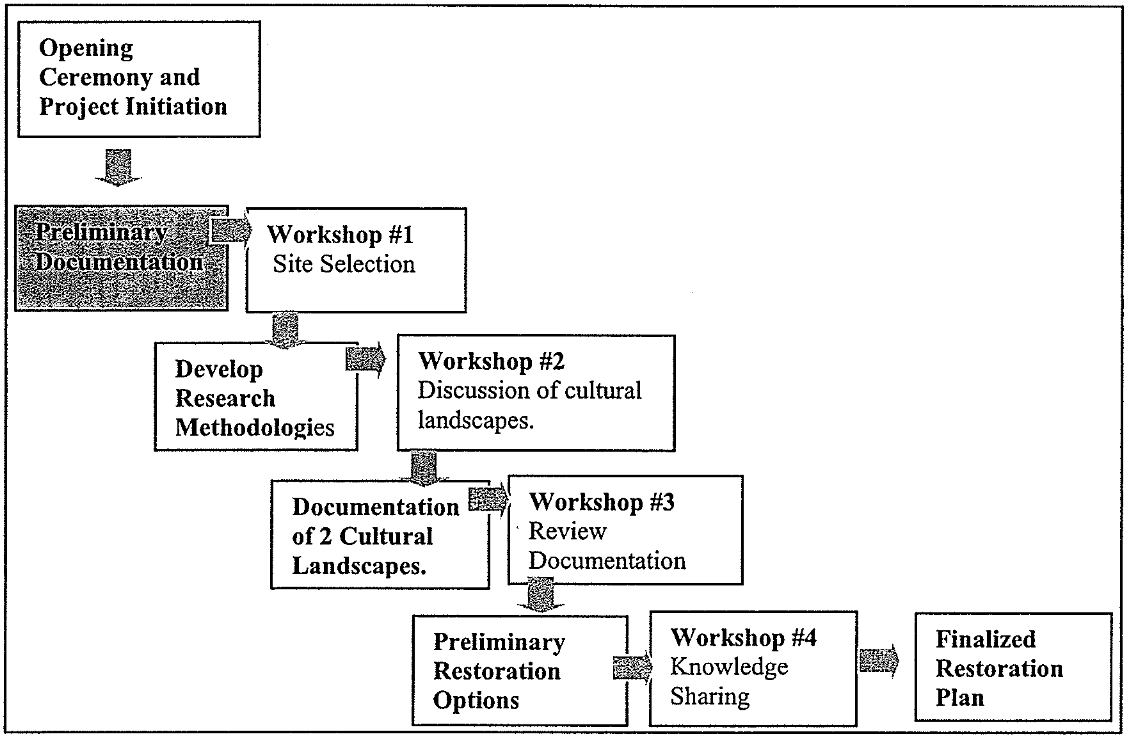

Figure 3. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Preliminary Documentation Stage.

Preliminary Documentation: Cultural and Natural

History of Five Selected Cultural Landscapes

To gain a better understanding of some of the cultural landscapes within the Shoal Lake area a preliminary documentation of five sites; Crowduck Lake, Potato Island, Stull Island, High Lake, and blueberry patches identified by the community was completed (Figure 13). This data was then used in the iterative process to select the two priority cultural landscapes for further documentation and restoration plan development.

Gitiigaanii Minis (Gardening or Potato Islands)

Location: N 49° 34' 22.1", W 95° 06' 15.1"

Elevation: 1087 ft above sea level

Historical Importance. Potato Island is part of an island system called the Gardening Islands. This group of five islands is located to the south of Iskatewizaagegan No. 39 (Figure 14). Until the late 1960's these islands were used for the production of food supplies for the residential school that existed approximately 800 metres to the west of these islands. The Potato Islands display evidence of some of the historical land management activities of the Iskatewizaagegan people. In the 1940's when the residential school was developed these islands were selected for crop production since their distance from shore would act as protection against wild animals in search of food, and because of the islands rich and dark loamy soil.

There is clear evidence that all vegetation on the islands was burnt and cleared in the past. Apart from some trees on the western side of the island, acting as a wind barrier, there exists no dead fall or stumps anywhere on the island (Plate 1). Elders have said that children from the residential schools took part in the planting, management and harvesting of the crops planted on the islands. Numerous people within the community remember attending the residential school and remember The Potato Islands producing large amounts of potatoes and other vegetables annually.

Today, Elders talk about using The Potato Islands once again for crop production and gardening. There has also been some discussion within the community about the re-establishment of a Manitoba maple stand on The Potato Islands through the transplantation of cuttings from the Stull Island stand. Elders believe that the soil regimes on The Potato Islands and Stull Island are very similar; both have very rich and loamy soil (Plate 2). The establishment of a new Manitoba maple stand at The Potato Islands would better enable community members to visit, manage, and maintain the newly developed stand due to of its close proximity to the mainland.

Site Description. The Potato Islands are located approximately 7 kilometres south on Shoal Lake from the central landing in Iskatewizaagegan No.39. The Potato Islands can be accessed most days by boat; however, because of its location on the lake travelling on windy days is not recommended by community members.

The total area of The Potato Islands is approximately 1.5 hectares in size. The Potato Islands are relatively free from major debris such as fallen trees, stumps, and major large vegetation. The lack of debris and stumps provides strong evidence that Potato Island has undergone major land management through clearing and prescribed burning. Much of the vegetation that does exist on Potato Island prospers in areas where disturbance has occurred. The soil on The Potato Islands is very dark, loamy and rich in nutrients. The Manitoba maple prefers rich moist soils on rocky slopes and flats, therefore the potential for the establishment of a new stand of relocated Maples on The Potato Islands is feasible.

Kaagaagiishib Zaagegan (Crowduck Lake)

Location: N 49° 39' 80", W 94° 58' 25"

Elevation: 1150 ft above sea level

Historical Importance. Traditionally, Crowduck Lake has been a source of wild rice and waterfowl for Iskatewizaagegan No. 39 (Plate 3,). Crowduck Lake was used regularly by the community for wild rice harvesting and hunting. Wild rice production and harvesting helped to provide much of the community's dietary needs. In the pre-1920's, before the decline in production due to the fluctuating water levels, the majority of wild rice was harvested along the shallow bays on Shoal Lake. In time, other lakes were sought out by the Iskatewizaagegan people for harvesting, most notably, Crowduck Lake. Crowduck Lake was the last of the rice lakes used by the community. It was productive wild rice lake until the late 1980's when disputes began to develop between traditional canoe harvesters and those with motorized ricing boats. Since the demise of ricing in the late 1980's, little has been done to ensure the continuation of a healthy and productive wild rice crop.

Site Description. The western end of Crowduck Lake borders the north-eastern most corner Iskatewizaagegan No. 39 (Figure 15). Crowduck Lake can be accessed easily on both the western end of the lake by Shoal Lake Road/Highway #673, 3km from the band office and on the eastern end of the lake via Rush Bay Road, approximately 33km from the band office.

The shores of Crowduck Lake are typical of those of the boreal forest region, with their mixture of rocky outcropping shorelines surrounded by Jack pine (*Pinus banksiana*

Lambert) and wet shorelines consisting of Common bull rushes and Eastern white cedar (*Thuja occidentalis* L.). Currently, there is some wild rice growing on the lake in reduced quantities.

There are currently two main channels on Crowduck Lake that are blocked and are causing the natural outflow of water from Crowduck Lake to be slowed significantly (Plate 4). Beaver dams are creating improper water levels for wild rice production and weed encroachment is disabling the rooting of wild rice. The removal of these blockages would increase water flow and help establish water depths necessary for the production of wild rice.

High Lake & High Lake Access Trail

Location: N 49° 40' 45", W 95° 08' 75"

Elevation: 1101 ft above sea level

Historical Importance. High Lake and the High Lake access trail have long been used by community members for transportation, hunting and fishing. According to Elders, the High Lake access trail was used by the community to access the Trans-Canada highway #17 prior to the development of highway #673, the Shoal Lake access road. In addition, High Lake and the High Lake access trail were known for their excellent fishing opportunities. High Lake was known to have supported a population of rainbow trout that was not present in Shoal Lake. In fact, it was recalled that some of the best moose, deer and waterfowl hunting occurred in the High Lake area (Plate 5).

Today, High Lake and the High Lake access trail are considered culturally significant amongst the community. A few of the community's hunters continue to harvest animals from this area. A camp-site is located near the southern tip of High Lake where High Creek originates. This camp-site is said to be used as an overnight stop for hunters in the High Lake area (Plate 6).

Site Description. The majority of High Lake is situated to the north of the IIFN reservation boundary (Figure 16). The southern entrance of the High Lake access trail is located on the north shore of Indian Bay just 100m east of the Manitoba/Ontario border. Distance to the trailhead from the landing by boat is approximately 4km. Once on the trail, distance to High Lake is approx. 3km. The existing trail is approximately the width necessary for skidoo travel in the winter and canoe portaging in warmer temperatures. Two portages will have to be made in order for visitors to reach the southern most tip of High Lake.

The access trail passes through a variety of different forest types such as mixed wood, upland jack pine, and lowland spruce/tamarack stands. The access trail has numerous points of interest, such as crossing an old mining road once used for hauling gravel. The trail also passes though an mixed wood, clear-cut area which had been previously harvested during the winter of 1998 by some of the Iskatewizaagegan No.39 people. High Lake and the High Lake access trail consist of an enormous amount of vegetation because the trail passes through so many different stand types (Table 1).

Siizibaakoto Minis (Stull Island)

Location: N 49° 27' 24", W 98° 59' 15"

Elevation: 1082 ft above sea level

Historical Importance. Stull Island was used traditionally as an area for the harvesting of maple syrup. Elders within the community believe that ancestors of current Iskatewizaagegan families transplanted Manitoba maple (*Acer negundo* L.) to Stull Island in the early 1900's. Before this time, families would have travelled to what is now southwest Manitoba to produce sugar for their own use. The sugar was primarily used to sweeten the pemmican made from dried blueberries (*Vaccinium myrtilloides* Michx *and Vaccinium angustifolium* Aiton) (Davidson-Hunt and Berkes, 2003). By transplanting the trees, Iskatewizaagegan people were able to make sugar closer to home.

Stull Island appears to be the only island on the southern end of Shoal Lake that has any large Manitoba maples. Elders believe that the soil composition on Stull Island has enabled the maples to grow and be more productive than other sites in the region. Stull Island has a long-standing history amongst the elder community members. Many fondly remember enjoying some of the maple syrup provided for the community by the caretaker of the syrup harvest.

Traditionally, one person performed the tapping and harvesting of maple syrup at Stull Island. Sometimes, two individuals would set up camp on the island before spring break-up and stay there for the duration of the spring sap run. In order to successfully and safely harvest the sugar, an individual would have to camp on the island to avoid the dangers of thin and shifting ice as maple syrup tends to run at the same time that spring break-up occurs. The sugar bush still exists today. However, the Manitoba maples at

Stull Island are no longer being used for the production of maple syrup. Elders and other community members regret that currently there are no community members willing to tend to the maples of Stull Island, due to the time commitments required to live on-site for the duration of the spring sap run.

Recently, though, there has been some discussion regarding the re-establishment of the maple syrup tapping operation at Stull. The community recognizes the cultural and historical importance of this activity for their community members. Currently, the elders within the community are expressing their interest in developing a program for the community's youth in order that they can experience the processes involved in the production of maple syrup. However, due to the unsafe access to the site, the community has realised that it may be best to re-establish the maples closer to the community. Elders have openly discussed the establishment of maples on a nearby garden island through the planting of cuttings from the Stull Island maples.

Site Description. Stull Island is approximately 4 hectares in size. It is located approximately 200 metres from the southern shore of Shoal Lake (Figure 17), just east of Elmo Point and Moosin Bay. To reach Stull Island from IIFN, one must travel south by boat for approximately 17 kilometres from the landing store. Due to this distance, and the fact that weather conditions on Shoal Lake can change very rapidly, boat travel can become extremely dangerous. In addition, the shores of Stull Island are very rocky making the landing of a boat very difficult. Therefore, trips to the island are only recommended for calm weather days with very little wind.

Once on the island, it is clearly evident that the vegetation is very diverse and very dense (Table 1, Plate 7). A southwest to northwest transect walk was performed at a compass bearing of 270 degrees helped to gain a sense of the forest types and prominent physical features of the island. Also, a brief vegetation list was made. The majority of the island's over-story consisted of some very large trees such as Bur oak (*Quercus macrocarpa* Michx.), American elm (*Ulmus Americana* L.), Manitoba maple (*Acer negundo* L.), and White birch (*Betula papyrifera* Marsh.) (Plate 8). The dense under-story consists of a large variety of species, thriving on the rich loamy soil evident on Stull Island. The ground cover on Stull Island is very thick and in many places scattered with deadfall from some of the larger American elms and Manitoba maples that are decaying.

Blueberry Harvesting Patches

Location: Various – Rocky points and ridges around Shoal Lake and sand flats north of Shoal Lake traversing Shoal Lake Road (Figure 13).

Elevation: Various

Historical Importance. Northwestern Ontario used to be known as the blueberry capital of Canada during the early 1900's (Davidson-Hunt 2003a and 2003b). Firms bought and shipped blueberries to Port Arthur, the United States and across western Canada. The increase in blueberries purchased and shipped in the region can be seen by the shipment reports that moved through the C.P.R. station in Rat Portage (Kenora). In 1898, the newspaper reported that 19,682 lbs of blueberries were shipped (The Miner, Aug. 12, 1898). As reported by the paper, even the prime minister of the day was surprised when he happened to be in Rat Portage during the shipment period (Davidson-Hunt 2003a). When told of the quantities of blueberries shipped from the Rat Portage C.P.R station, "The prime minister's features took on that peculiar expression that betokened a desire to tell the genial station agent that he was exaggerating." (The Miner, Aug. 12, 1898). While that amount of commercial shipment seemed large in 1898, by 1927, the paper of the day was reporting that 354,767 lbs. of blueberries had been shipped and 225,000 lbs. where shipped in 1928 (Kenora Miner and News, July 7, 1928). The dependence of this commercial crop on the cycles of the boreal forest can be seen when the crop crashed during 1929 and only 45,000 lbs were shipped (Davidson-Hunt 2003a). The reasons given for this decrease in amount harvested, are droughts, fire and the implementation of travel restrictions (Kenora Miner and News, Sept. 21, 1929). As reported by the newspapers of this time, the majority of harvested blueberries were picked by the "Indians" in the area (Kenora Miner and News, July 14, 1915) (Davidson-Hunt 2003a).

Site Description. As described by Iskatewizaagegan people, there is a linkage between blueberry patches and forest disturbance. A favourite place to harvest blueberries in the 1920s and 1930s was around Redditt, due to the large fire in the 1910s and 1920s. As these sites were also accessible by rail, the Anishinaabe people from all over the Lake of the Woods region would travel to Redditt to harvest blueberries. A favourite place to harvest blueberries in recent years, is a pocket of sandy soils that runs along an east-west axis and is found north of Shoal Lake along the Shoal Lake Road (Plate 9). This site has not seen fire in recent memory, although it was disturbed through logging which provided blueberry harvesting for a few years. Unfortunately, it appears, that the site preparation following logging did not always produce productive blueberry patches. Other areas where people picked blueberries in the Shoal Lake watershed were found on rocky knobs in the bush or along the lakeshore (Plate 10). These areas are dependent upon fire to produce productive blueberry patches. Currently, most of these sites are not productive blueberry patches and contain a mixture of vegetation and forest cover. Preliminary life sciences inventories of these plant communities were not completed in 2002.

Table 1. Preliminary Scoping Plant Species List of Five Cultural Landscapes (x=presence).

Scientific Name (Genus or Species)	Common Name (s)	Stall Island	High Lake	Crow Duck Lake	Potato Island
Abies balsamea (L.) Miller.	Balsam fir	X	X	X	
Acer spicatum Lam.	Moose maple, Mountain Maple	X			
Actaea rubra (Aiton.) Willd.	Bane berry	X	X		
Agrostis scabra (Willd.) Blomq.	Rough hair grass, tickle grass, hair bentgrass			X	
Alnus crispa (Michx.)	Green alder	X	X		X
Amelanchier spp. Medikus.	Saskatoon, Serviceberry	X	X		
Anemone cinquefolia L.	Wood anenome	X	X	X	
Apocynum androsaemifoloium L.	Spreading dogbane		X		X
Arailia nudicaulis L.	Wild sasrsaparilla		X		
Arctostaphylos uva-ursi L.	Bearberry	X	X		
Aster boreale Prov.	Marsh aster, Rush aster			X	X
Aster ciliolatus Lindley.	Fringed aster				
Aster macrophyllus L.	Large-leaved aster		X		
Athyrium filix-femina (L.) Roth	Lady fern	X	X		
Betula papyrifera Marshall	Paper birch, White birch		X		
Botrychium virginianum (L.) Swartz.	Virginia grape fern, Rattlesnake fern	X			
Bromus spp. L.	Brome grass			X	X
Campanula rotundifola L.	Blue bell, Hare bell				X
Carex spp. L.	Sedge	X	X	X	X
Chimaphila umbellata (L.) Barton.	Pipsissewa, Prince's pine	X			
Circaea alpina L.	Small enchanter's nightshade		X		
Clintonia borealis (Aiton) Raf.	Blue bead lily	X	X		X
Coptis trifolia (L.) Salisb.	Goldthread	X	X		
Cornus canadensis L.	Bunchberry	X	X		
Cornus stolonifera L.	Red osier dogwood	X	X		X
Corydalis sempivirens L. (Pers.)	Pink corydalis				
Corylus cornuta Marshall	Beaked hazelnut	X	X		
Cypripedium acaule Aiton.	Mocassin flower, Stemless lady's slipper	X	X	X	
Danthonia sp. Lam. & DC.	Oat grass		X		
Diervillia lonicera Miller.	Bush honeysuckle	X	X		
Dryopteris austriaca Villars.	Spinulose shield fern, Spiny wood fern	X	X		X

Scientific Name (Genus or Species)	Common Name (s)	Stall Island	High Lake	Crow Duck Lake	Potato Island
Epilobium angustifolium L.	Fireweed	X			X
Equisetum scirpoides Michx.	Dwarf scouring rush			X	
Equisetum sp. L.	Horsetail			X	X
Fragaria virginiana Duchesne.	Common strawberry				X
Fraxinus nigra Marshall.	Black ash	X			X
Galeopsis tetrahit L.	Hemp nettle				X
Galium triflorum Michx.	Fragrant bedstraw	X	X		
Geranium bicknelli Britton.	Bicknells' geranium				X
Geum allepicum Jacq.	Yellow avens	X			X
Gymnocarpum dryopteris (L.) Newman.	Oak fern				
Herocleum lanatum Michx.	Cow parsnip				X
Hieracium umbellatum L.	Narrow-leaved hawkwee		X		X
Juniperus communis L.	Common juniper		X		
Larix laricina (Duroi.) K. Koch.	Tamarack, Eastern larch		X		
Ledum groenlandicum Oeder.	Labrador tea		X	X	
Lonicera sp. L.	Honeysuckle	X	X		
Lycopodium annotinum L.	Stiff club moss		X		
Lycropodium obscurum L.	Ground pine	X	X		
Maianthemum canadense Desf.	Wild lily of the valley	X			
Matteuccia struthiopteris L. Tudaro.	Ostrich fern	X	X		
Myrica gale L.	Sweet gale		X		
Nymphaea odorata Aiton.	Fragrant white water lily			X	
Oxycoccus microcarpus L.	Small bog cranberry		X		
Petasites palmatus (L.) Fries.	Palmate-leaved coltsfoor	X	X		
Picea mariana (Miller). B.S.P.	Black spruce		X		
Pinus banksiana Lambert.	Jack pine		X		
Pinus strobus L.	White pine		X		
Poa sp. L.	Bluegrass	X			X
Polygonum sp. L.	Buckwheat	X			X
Polypodium virginianum L.	Common polypody	X			
Populus tremuloides Michx.	Trembling aspen	X	X		
Prunus virginiana L.	Chokecherry	X	X		X
Pteridium aquilinum (L.) Kuhn.	Fern				
Pyrola spp. L.	Wintergreen		X		

Quercus macrocarpa Michx.	Bur oak	X			X
Rhus radicans (L.) Kuntze.	Poison ivy	X	X		
Ribes lacustre (Pers.) Poiret.	Black gooseberry, Bristly black current	X			X
Ribes triste Pallas.	Swamp red current, Wild red current	X			
Rosa acicularis Lindley.	Prickly rose				X
Rubus idaeus L.	Wild red raspberry				X
Rubus pubescens Raf.	Dewberry, Dwarf raspberry				
Quercus macrocarpa Michx.	Bur oak	X			
Salix pyrifolia Andersson.	Balsam willow	X			X
Sambucus racemosa L.	Red berried elder		X		
Schizachne purpurescens (Torr.) Swallen.	False melic, Purple oat grass				
Sorbus decora (Sarg.) C.K.	Mountain ash	X	X		X
Streptopus roseus Michx.	Rose twisted stalk, Rosybells	X			
Taxus canadensis Marshall	Yew		X		
Thuja occidentalis L.	Eastern white cedar		X		X
Trientalis borealis Raf.	Starflower	X			
Typha latifolia L.	Common cattail		X	X	X
Ulmus americana L.	American elm	X			X
Zizania palustris L.	Wild rice			X	
Vaccinium myrtilloides Michx.	Common blueberry, Velvet leaved blueberry		X		
Vaccinium vitis-idaea L.	Bog Cranberry, Lingonberry		X		
Viburnum rafinesquianum Schultes.	Downy arrowwood	X	X		

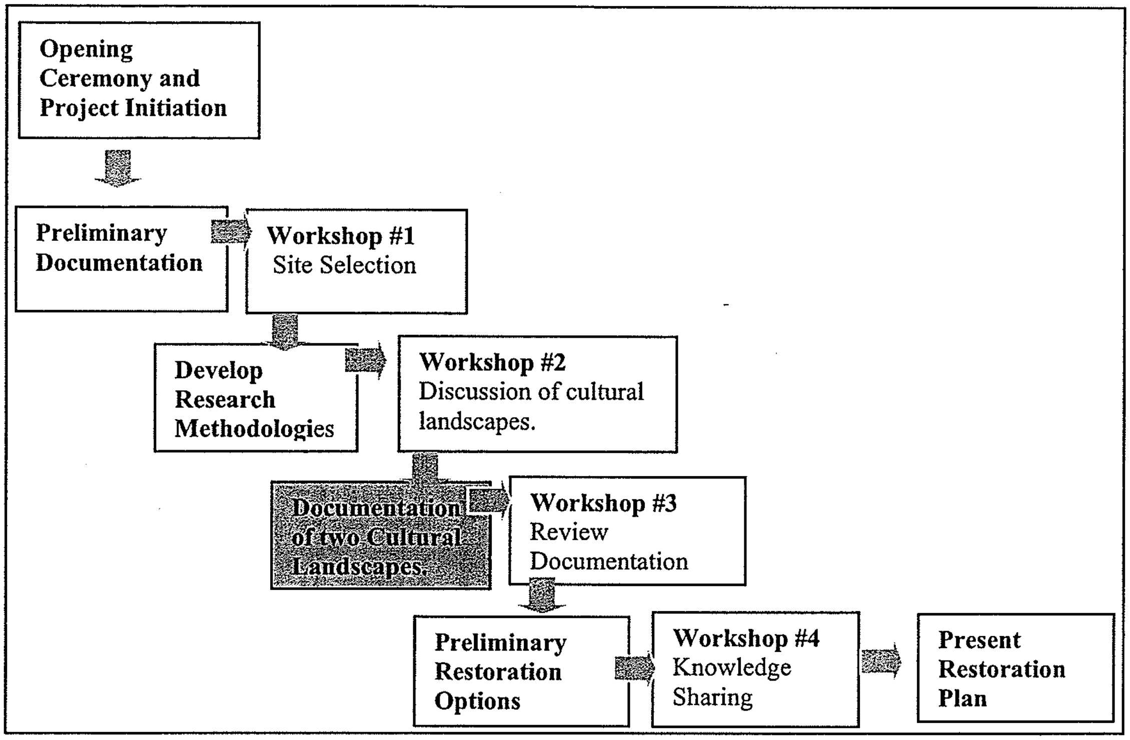

Figure 4. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Documentation of Two Cultural Landscapes.

Detailed Documentation

An in-depth documentation of both Crowduck Lake and Potato Island were completed to document cultural and historical perspectives as well as biophysical characteristics of the sites. These sites were selected for documentation by the community after they had a chance to determine if these sites best suited their goals and objectives outlined in the "criterion for prioritising cultural landscapes" that was developed using previous goals and objectives for the project (Appendix 2).

Documenting Crowduck Lake - Kaagaagiishib Zaagegan

Crowduck Lake and Wild Rice: Cultural and Historical Perspectives

Historically, Crowduck Lake was selected for wild rice establishment by the Shoal Lake people who were looking for a new ricing lake within close proximity to the newly developed reserve after being forced out of traditional ricing lakes in the mid 1900's as a result of the establishment of the Whiteshell Provincial Park (Greene 2003 – personal communication). Crowduck Lake was known to have the "muck" bottom necessary for productive rice; however, water depth on the lake was unsuitable. Walter Redsky, chief during this time, requested that the Ontario Ministry of Natural Resources blast a channel through a rock at the outlet of the lake. As a result of rice suitable water levels, the Shoal Lake people experienced healthy wild rice yields from Crowduck Lake (Davidson-Hunt and Berkes 2003). Crowduck Lake acted as the main source for commercially harvested wild rice for the Shoal Lake people during the 1960's, 1970's, and 1980's and was likely the last rice field where the traditional camp was set-up during the harvest (Roberts, unpublished field notes July 22, 2003).

Robin Green community elder and former IIFN chief and former Grand Chief of Treaty #3 discussed some of the background of manomin harvesting at Crowduck Lake. At one time within the community there was an established planting team who would seed the lake annually and at the same time, attempt to stir up the muck bottom to assist future germination of dormant seeds, mimicking natural disturbance such as waves, and ice scrapping. Furthermore, this group of men would make sure that lake inlets and outlets where free from debris such as beaver dams and sediment build up. This team would also remove unwanted aquatic vegetation such as water lilies that where know to interfere with the growth of the wild rice.

The elders explained that many families in the community would set up camp on the eastern shore of Crowduck Lake during ricing season. Typically the ricing period would last approximately two weeks (late August-early September). During this time, families would harvest rice, hunt, hold ceremonies, play games and celebrate. Many people within the community have fond memories of this time and feel that the annual traditional rice harvest at Crowduck played an important role in their cultural development/cultural awareness as a people of Iskatewizaagegan.

Rice harvested was either kept by the individual families and used for subsistence or sold to the rice buyer from Keewatin, Ben Ratuski owner and operator of Shoal Lake Wild Rice. To obtain wild rice, Ratuski would access the camp by truck down Rush Bay Road and trade cash and other supplies for the rice. Rice sold or traded to the buyer was often "green rice", rice that had not been dried and parched by the Aboriginal people (Kinew 1995). Later, after the decline of hand picking intensified the participation in the annual rice camp soon ended. Elders believe that the traditional harvest of 1968 was the last of its kind at Crowduck Lake. The lake was harvested mechanically until sometime in the late 1980's, however, in the early 1990's the annual production/harvest levels began to drop and ricing on the lake stopped altogether (Roberts, unpublished field notes August 10, 2003).

Wild Rice Harvesting

Within the community there appears to be several reasons why the wild rice crop at Crowduck Lake has been in a decline for the past two decades. Many community members believe that a decline in the wild rice production on Crowduck Lake is the result of a long-standing dispute surrounding harvesting and management methods of traditional harvesting vs. mechanized airboat harvesting (Roberts, unpublished field notes August 22, 2003). Traditional harvesters felt that the mechanized harvesters were taking more than their fair share of rice and not leaving enough for the traditional hand-pickers and that they were prematurely harvesting the rice before permission was given by the rice boss (Roberts, unpublished field notes August 10, 2003). Furthermore, hand pickers felt their safety was threatened by the presence of the airboats on the rice fields and as a result hand pickers started to dwindle in numbers. As a result of efficiency of the mechanized boats, little seed was left to regenerate and many fields became less productive (Roberts, unpublished field notes August 10, 2003).

The shifting interactions between social and natural conditions at Crowduck Lake began to change the wild rice crop. It was clear that traditional rice management institutions were disrespected from mechanized harvesters who were failing to follow the instructions of the rice boss in charge of the decisions at the rice field. This led the people who used to take care of the fields to stop. This dramatic shift in harvest practices lead to a steady decline in wild rice production at Crowduck Lake as water levels were left unregulated (Roberts, unpublished field notes August 2, 2003).

Wild Rice Habitat

Elder, Robin Greene related that prior to the late 1980's, the outlet and inlet channels where maintained and controlled by a community elder, also known as the rice boss (Cizek, 1993). This community elder also controlled the outlet into Crowduck Creek to ensure that water levels in the fields were at the required depth for the different growth stages (germination, submerged leaf, floating leaf and aerial leaf) of wild rice. Then, in the period following the late 1980's, a large piece of floating bog broke free from the shore and drifted to partially block the outlet channel. The natural flow of water and water depth was altered, resulting in a much smaller crop than the ones harvested when there was a management system is place.

In addition to this natural change, mechanized harvesters are blamed for the decrease in annual wild rice crops. Many community members believe that mechanized harvesting is too efficient. Rice areas that at one time could support hand picking by numerous families for up to two weeks are now harvested by one mechanized harvester in just one day (Roberts, unpublished field notes August 10, 2003). Some community members blame the thoroughness of mechanized harvesting for the lower production. Unlike traditional hand picking, mechanized harvesters allow very little of the rice to drop and fall to the lake bottom to develop a seed bank for the following year's crop (Roberts, unpublished field notes July 23, and August 10, 2003).

Under the old management structure, it was the duty of the rice boss and other harvesters, to weed the wild rice field of competing plants such as: fragrant white lily (*Nymphaea ordorata* Aiton), and pondweed, in the early spring. Weeding would provide increased exposure to sun and a lake bottom with more germination and rooting sites. Currently, competing wetland plants are left to grow, as they desire, thus, placing strain on the establishment and production of wild rice.

Wild Rice Access and Management Pressures

Crowduck Lake and its wild rice field are facing pressures that the IIFN currently has very little control over such as access, land use permits, and land management permits. A large portion of Crowduck Lake is crown land that is suitable for development. Currently, there is only one cottage development that exists on the crown portion of the lake but the potential for further development exists. Furthermore, Devlin Timber of Kenora, Ontario has the cutting rights to much of the crown timber surrounding the lake, apart from the small portion of the lake that falls within the reserve boundaries. Harvesting and development in these sensitive areas could greatly affect the ability of Crowduck Lake to support a successful and productive wild rice crop. At present, IIFN has little control over the water levels at Crowduck Lake.

In order for the wild rice to thrive, water levels at Crowduck have to be regulated by someone in the community with a strong knowledge of wild rice growth and production (Roberts, unpublished field notes July 22, 2003). To effectively do so, the IIFN needs to establish permissions from the OMNR to regulate annual lake depths; however, this could prove very difficult (Greene 2003 - personal communication). The rice manager requires the ability to manipulate the lakes inlets and outlets, thus controlling the water depth of the lake. He must keep the waterways clear from things that impede water flow such as sediment, sticks, floating bog, woody debris, beaver dams and wetland vegetation. Dredging may be required to eliminate the large amount of floating bog and sediment that has accumulated at the mouth of Crowduck Creek. In low water years the IIFN must be able to restrict water flow out of the lake to ensure minimal water depth for rice production (Greene 2003 – personal communication; Mandamin S. 2003 – personal communication).

Future Visions for Crowduck Lake

Elder, Robin Greene feels that one of the reasons why Crowduck Lake still has the potential to be a productive rice lake is that it is fed by inland lakes (lakes not connected to Shoal Lake or Lake of the Woods). Hopkins Lake, Darkwater Lake and

Bare Hill Lake all provide Crowduck Lake with relatively fresh and unpolluted waters more suitable for rice production. Robin Greene also believes that being able to control the cumulative water level is crucial for the wild rice on Crowduck Lake to be productive and dependable.

The main drainage outlet allowing water to leave Crowduck Lake is Crowduck Creek. This drainage channel was created back when wild rice was established at Crowduck Lake. Walter Redsky, community elder and former chief persuaded the MNR to blast open the channel through the rock to ensure that the Iskatewizaagegan people could control the water level in Crowduck Lake for manomin production (Davidson-Hunt and Berkes 2003).

It is also felt that the re-establishment of a community rice boss would help to regain some of the lost wild rice culture that existed previously. The rice boss would play an important role in making key decisions to ensure that the best possible harvest for any given growing season would be achieved (Roberts, unpublished field notes August 10, 2003).

Currently, there has been some discussion between the community members about what to do with the present situation at Crowduck Creek. Some community members believe that dredging or blasting the outlet would provide the quickest solution and promote the most water movement from inlets to outlets across the lake. While other members believe that the OMNR should get involved and build a small dam at the outlet into Crowduck Creek so that the IIFN would have ultimate control over water levels on the lake.

Biophysical Documentation of Crowduck Lake

The 1995 aerial photograph of the lake appears to indicate areas within the wild rice bay with very shallow water depth. They appear lighter in colour (Figure 18). When ground truthing was completed of the wild rice bay, this area seemed to have the most abundant and most dense wild rice. However, the wild rice growth was not limited to this area, but rather, was spread over almost the entire portion of the bay. The aerial photos were not very helpful in determining where the wild rice was in 1995, as the time of year, when the photo was taken, is not known. Therefore, attempting to make any comparisons between the wild rice growth in 2003 with the available 1995 aerial photography was not possible.

A digital map was created of Crowduck Lake for visual reference mapping: Crowduck Lake, wild rice, wetlands, roads (Rush Bay Rd.), access points, campsites, creeks (inlets and outlets), feeder lakes (Hopkins and Darkwater), transects (A-H), vegetative plots, trails to the lake, and the floating bog at Crowduck Creek (Figure 19).

The Secchi disc proved useful for measuring water depth along the transects in Crowduck Lake (Plate 12). Results indicate that the wild rice bay has a water depth that is relatively shallow and consistent from North to South and East to West. The greatest depths are found in Transect A which ran outside of the western boundary of the known wild rice growing limits where no wild rice was present on the transect. Depths found on transect B - H were found to be no greater than 2.22 meters and having an average of 1.18 meters (Figure 19). Results from the eight transects at Crowduck Lake indicate that wild rice will not be found in depths greater than 1.5 meters and less than 0.4 meters.

Generally, it appears that wild rice was most often present in depths ranging from 0.75 – 1.25 meters.

Findings indicate that no clear relationship exists between turbidity and the presence or absence of wild rice or its density. In many cases, the Secchi disc measurements were identical to the depth measurements taken at the same sampling point. These findings indicate that the water is relatively sediment free with little turbidity affecting the amount of light penetrating to the lake bottom. Therefore, turbidity is not a contributing factor to the uneven or patchy wild rice densities present on Crowduck Lake.

Results from the eight transects indicate that the wild rice on Crowduck Lake varies greatly in density (Plates 13 & 14). The perimeters of the rice field were in most cases less dense, likely because of water depth, competition from other plants, and potential lack of seeding. Identifying patches of differing densities of wild rice on the lake was very difficult, due to the sporadic and relatively non-consistent nature of the wild rice growth. However, generally, areas of low and high density wild rice where 'somewhat' visible once the canoe was situated in the rice patch itself.

Percentage cover transects indicate that the plants found on Crowduck Lake are typical of wetland plants found on other lakes supporting wild rice in northwestern Ontario (Aikens et al. 1988). Emergent species such as spike rush (*Eleocharis* Sp. R. Br.) and bulrush (*Scirpus* spp. L.) were found. Floating leaf species such as fragrant white water lilies (*Nymphaea odorata* Aiton) (Plate 16), bur reed (*Sparganium* spp. L.), pond weeds (*Potamogeton spp.* L.) and submerged species coon tail (*Ceratophyllum demersum*

L.) (Table 2). Mechanical and or manual removal can be used to control weeds within the wild rice crop to increase production (Aikens et al. 1988).

Vegetative shoreline plots indicate a greater diversity of plants exists closer to shoreline than to the wild rice field (Plate 15). Plants that were found in the shoreline plots such as: water marigold (*Megalodonta beckii* Torr.), grape woodbine (*Parthenocissus vitacea* (knerr) A.Hitchc.), tape grass (*Vallisneria Americana* L.) only were found at the ends of the transects closest to shore and not amongst the dense wild rice (Table 2).

Table 2. Plant Species Collected at Crowduck Lake while Documenting the Wild Rice.

Common Name (s)	Scientific Name
Wild Rice	*Zizania aquatica* L.
Water marigold	*Megalodonta beckii* Torr.
Broad Leaved Arrowhead	*Sagittaria latifolia* Willd.
Pondweeds	*Potamogeton spp.* L.
Stiff Arrowhead	*Sagittaria rigida* Pursh.
Fragrant White Water Lily	*Nymphaea Odorata* Aiton
Grape - woodbine	*Parthenocissus vitacea* (knerr) A.Hitchc.
Coon tail	*Ceratophyllum demersum* L.
Tape grass, wild celery	*Vallisneria americana* L.
Bulrush	*Scirpus spp.* L.
Spike rush	*Eleocharis Sp.* R. Br.
Bur reed	*Sparganium spp.* L.

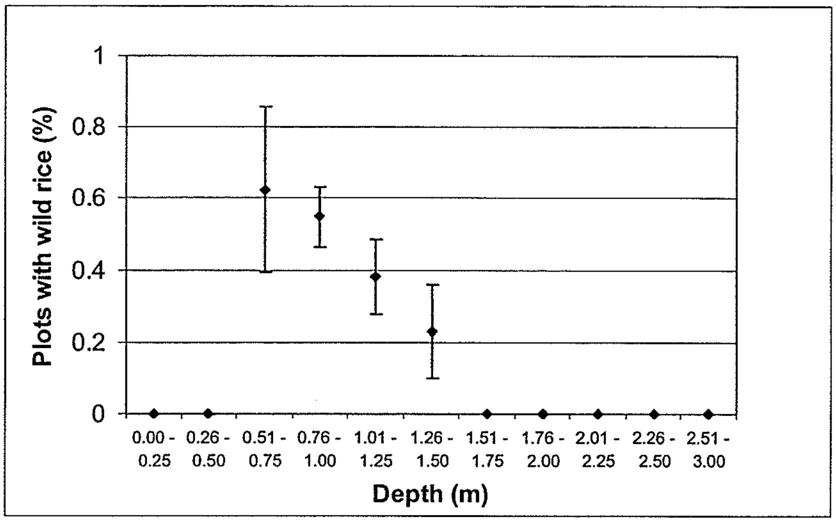

Figure 5. Proportion of Plots with Wild Rice (*Zizania aquatica* L.).

The above chart shows the proportion of sample plots taken on Crowduck Lake in which wild rice was found. Of the 122 sample plots taken along transects 1-8, wild rice was found in 56 of the plots (45.9% of all sample plots). Wild rice was found only at water depths between 0.51-1.50m. These findings are supported by the biological growth characteristics of wild rice which indicate that an optimal depth for a rice lake should be maintained between 0.60-1.0m. Aitken et al. (1988) indicates that unsuitable water depths can severely affect the plants production.

The highest proportion of samples with wild rice was found within the 0.51-1.00m increment. No occurrences were found before 0.51m. This is likely the result of emergent species such as bulrush (*Scirpus* spp.), horsetail (*Equisetum* spp.), spike-rush (*Eleocharis* spp.) (Lee, 1986) and rigid arrowhead (*Sagittaria* spp.) (Lee and Stewart, 1981) that are adversely affecting the wild rice growth. In the spring, these species quickly start their growth before the wild rice has time to establish. They deplete the nutrient reservoirs of the lake bottom by rapidly spreading out and sending up new shoots at frequent intervals (Aitken, et al, 1988). Furthermore, the presence of submerged species in shallower areas of the lake will affect wild rice growth. Species such as coon tail (*Ceratophyllum demersum* L.) have been found to impede light from reaching the developing wild rice plants or they can tangle with the submerged leaves and hold plants under water (Aitken, et.al, 1988).

At depths greater than 1.50m, no occurrences of wild rice were found. This is supported in the literature which indicates the plants requirements for sufficient light penetration for photosynthesis during the "emergent stage" is not being met. In addition, the increased presence of competing species such as fragrant white lily (*Nymphaea odorata* Aiton.) overwhelms the young rice plants. Aitken, et al. 1988 indicates that fragrant white lilies are not a problem, because they do better than wild rice in deeper water. At Crowduck Lake there were some lilies competing for space with the wild rice in shallower depths than literature suggests.

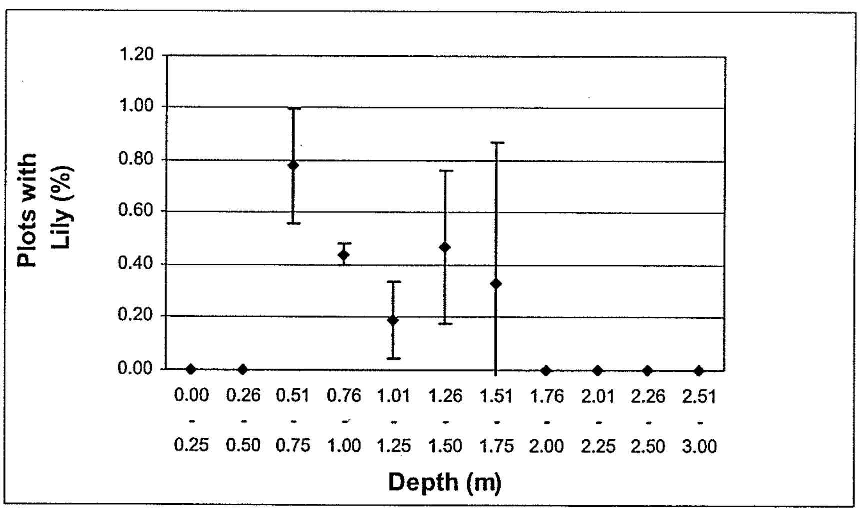

Figure 6. Proportion of plots withFragrant white water lily (*Nymphaea odorata* Aiton.).

Figure 6 represents the mean depth of the occurrences of fragrant white lily were recorded during the percentage cover transects (3). Of the 54 sample plots taken along transects 4, 5 and 8, lily was found in 25 of the plots (46% of the sample plots). Fragrant white lily was found only between depths of 0.51 – 1.75 m (fragrant white lily can survive at depths from 0.1 to 2.5 m). However, the plant grows best at depths greater than 0.50 m (Hotchkiss, 1972). From the literature it can be hypothesized that fragrant white lily on Crowduck Lake does best at depths greater than 0.50m, and is not present from 0.0-0.50 m due to competition from other wetland plants such as, the bulrush and horsetail which thrive in shallow depths along the shoreline.

Elders indicated that the wild rice at Crowduck Lake was not as abundant or productive as it once used to be when the site was actively managed and harvested. It can be hypothesized that the wild rice on Crowduck Lake is not as productive as in past times due to the lack of management practices which provided the rice with optimal growing conditions. Environmental conditions at the site which were once controlled to promote ideal wild rice growing conditions are now gone (e.g. controlling of the water levels, weeding of the competing wetland species, and annual seed bank dispersal). It appears that the ecological interactions between these wetland species follow what is in the literature.

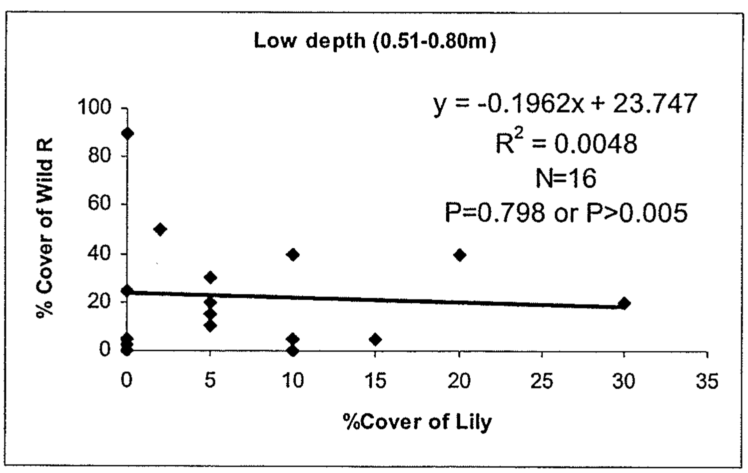

Figure 7. Presence/absence of wild rice (*Zizania aquatica* L.) in relation to the presence/absence of Fragrant white water lily (*Nymphaea odorata* Aiton.) found at low depths (0.51-0.80m) at Crowduck Lake.

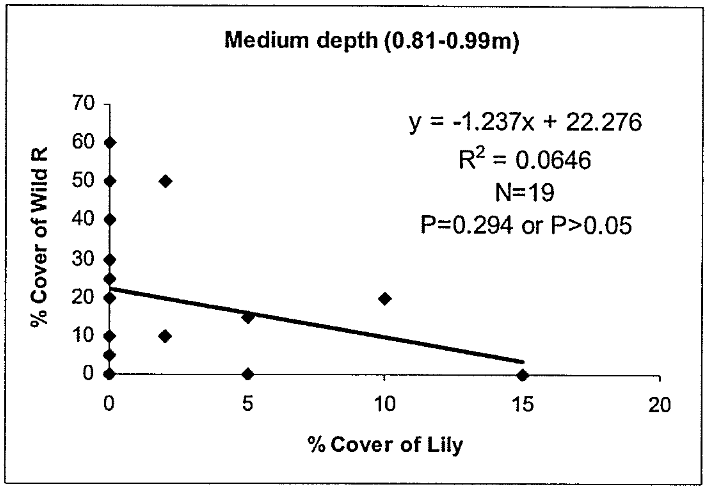

Figure 8. Presence/absence of wild rice (*Zizania aquatica* L.) in relation to the presence/absence of Fragrant white water lily (*Nymphaea odorata* Aiton.) found at medium depths (0.81-0.99m) at Crowduck Lake.

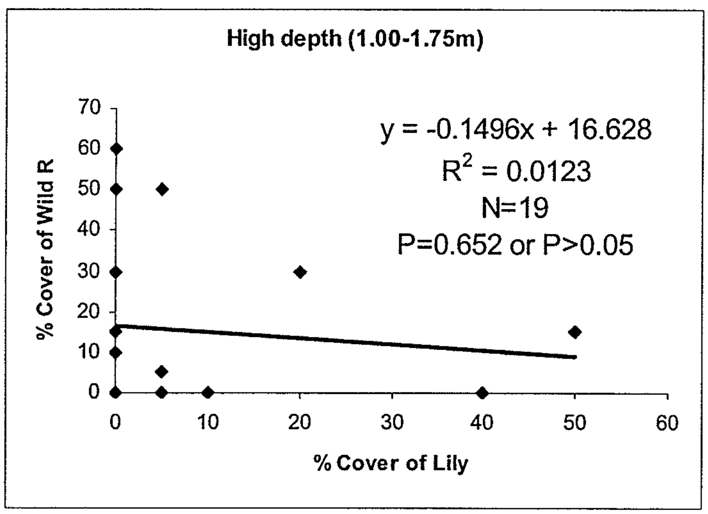

Figure 9. Presence/absence of wild rice (*Zizania aquatica* L.) in relation to the presence/absence of Fragrant white water lily (*Nymphaea odorata* Aiton.) found at high depths (1.00-1.75m) at Crowduck Lake..

Figures 7, 8 and 9 represent the three depth categories that were created to group together the data. These three categories are not based on biological characteristics but rather they attempted to evenly distribute the number of samples taken. For all water depths a weak association between wild rice and lily exists, but not a statistically significant correlation. However, the literature suggests that wild rice prefers depths greater 0.60m and therefore, the increased presence of white lily at greater depths will likely have no negative effect on wild rice.

The literature suggests that fragrant white lily competes with wild rice at a variety of depths (Aitkens et al.1988). However, these findings indicate that at Crowduck Lake the relationship between the presence/absence of wild rice has a weak relationship with other wetland plants which are not statistically significant. This may be the result of previous human management of the site. Past weeding of the lily crop may have had a long-lasting negative effect on its production.

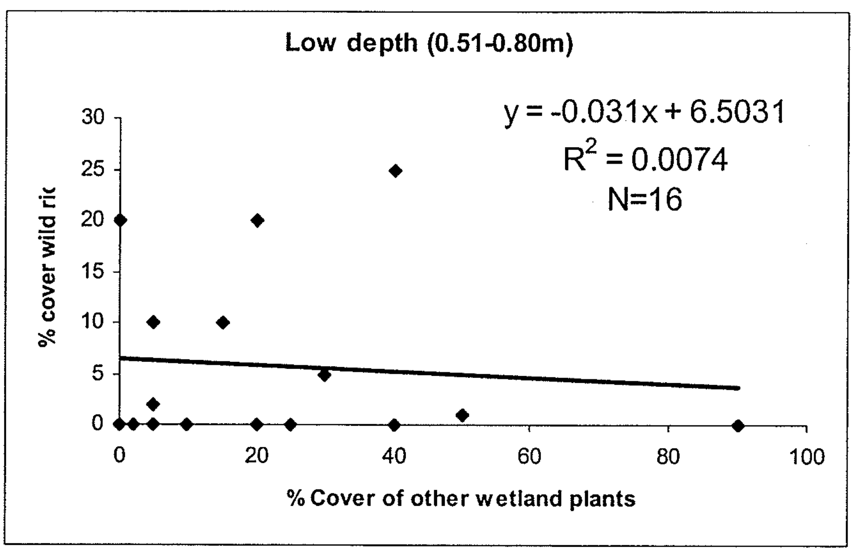

Figure 10. Presence/Absence of Wild Rice (*Zizania aquatica* L.) in relation to the presence/absence of other wetland plants found at low depths (0.51-0.80m) at Crowduck Lake.

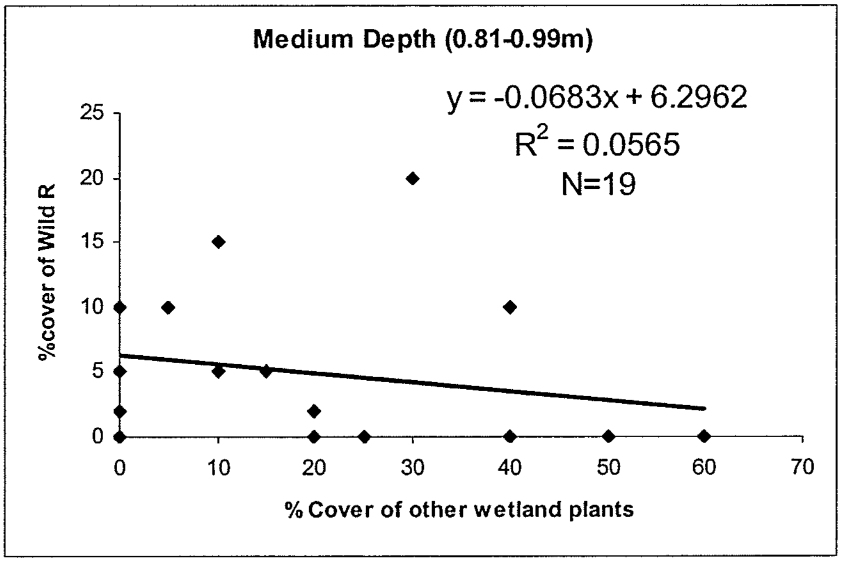

Figure 11. Presence/Absence of Wild Rice (*Zizania aquatica* L.) in relation to the presence/absence of other wetland plants found at medium depths (0.81-0.99m) at Crowduck Lake.

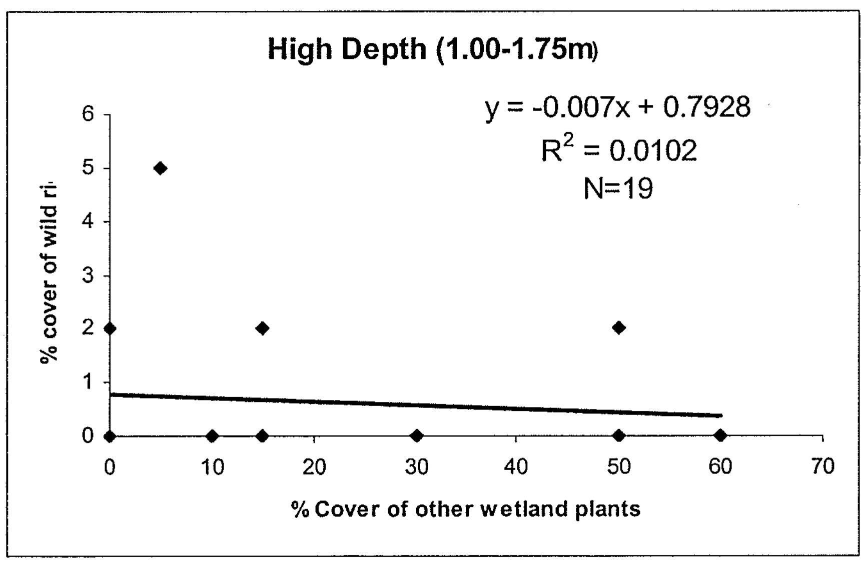

Figure 12. Presence/Absence of Wild Rice (*Zizania aquatica* L.) in relation to the presence/absence of other wetland plants found at high depths (1.00-1.75m) at Crowduck Lake.

Figures 10-12 use the same depth categories that were used as in Figures 7-9. Other wetland plants (other than fragrant white lily) found in the sample plots include: water marigold (*Megalodonta beckii* Torr.), broad leaved arrowhead (*Sagittaria latifolia* Willd.), pondweeds (*Potamogeton* spp. L), stiff arrowhead (*Sagittaria rigida* Pursh.), grape-woodbine (*Parthenocissus vitacea* (knerr) A. Hitchc., coon tail (*Ceratophyllum demersum* L.), tape grass (*Vallisneria Americana* L.), bulrush (*Scirpus* ssp. L), spike rush (*Eleocharis* sp. R. Br.), and bur reed (*Sparganium* spp. L).

In the low depth category (0.51-0.80m), medium (0.81-0.99m) and high depth (1.00-1.75m) categories no significant correlations have been found. The literature indicates that wetland plants such as bulrush (*Scirpus* spp.), horsetail (*Equisetum* spp.), spike-rush (*Eleocharis* spp.) (Lee, 1986) and rigid arrowhead (*Sagittaria* spp.) (Lee and Stewart, 1981) prefer to establish themselves in similar depths as the wild rice plants. While there appears to be weak associations there are no statistical significant correlations between wild rice and wetland plants in my data. These findings suggested past human management may have influenced the wild rice productivity by removal and suppression of competing wetland species. However, to determine this relationships would require a more rigorous quantitative experimental design that was appropriate for this research.

Documenting Potato Island (Gitiigaanii Minis)

Potato Island: Cultural and Historical Perspectives

Elders within the community explained that historically many of the islands on Shoal Lake and Lake of the Woods, were at one time, extensively used for gardening and other forms of harvesting, such as medicines and other resources. Elder, Jimmy Redsky noted that islands were used by the Anishinaabe for gardening and other purposes in a rotational style pattern, shifting islands regularly to avoid detection from enemy tribes and to ensure continued sustainable production. Jimmy Redsky also explained that garden islands within the Shoal Lake Watershed and Lake of the Woods area, were respected and left alone by other families from all the Treaty #3 First Nations. Community member, Les Ainspac told of materials, equipment and crops left on the island for the planting, tending, and harvesting for future seasons.

Gardening at Potato Island was just one of the many activities making up the Iskatewizaagegan seasonal subsistence cycle. Later, in the spring season, the clearing and preparation of the garden islands would take place. Then, in early June, planting the crops would begin. This process would need to be completed before the time of the blueberry harvest as community members would have to divert their energies to picking blueberries. Once the blueberry harvest was complete people would return to tend the gardens. For most of the growing period crops could be left to develop because there was little fear of disturbance from animals. However, garden islands were easily accessible by water and nearby there were good fishing and hunting areas, particularly moose. Often fishnets would be placed in close proximity to the garden islands so that nets could be checked in conjunction with the maintenance of the gardens (Redsky 2003 –personal communication, Ainspac 2003 – personal communication). The proximity of garden islands to these resources made it easier for community members to live out on the lake between the months of June-August which helped them to avoid the bugs inland.

There is knowledge in the community about island gardening, but clear knowledge of Potato Island has decreased over-time. Detailed recollections of gardening practices and occurrences at the island have been lost through time. However, some elders are able to recollect childhood memories of visiting these places by canoe with grandparents who were tending the island crops. Elder Ed Mandamin Sr. (2003) recalled that when he was a little boy he travelled to Potato Island with his grandparents, who were heading there to tend the crops. He also recalls that because of his young age, playing or swimming in the lake often occupied most of his time at the island. However, he sometimes helped out with the gardening activities (Roberts, unpublished field notes June 17, 2003).

Despite some loss of historical contact with the garden islands, the people of the community seem to retain a strong connection to Potato Island. Most people in the community are aware of the location of the Garden Islands. Many related that the fishing around the Garden Islands was some of the best on Shoal Lake, a favourite spot for summer bass fishing which was likely introduced as a sport fish for anglers on the lake. Furthermore, because of its associations with the Celia Jeffery Residential School (C.J. School), Potato Island, of the many garden islands on Shoal Lake appears to hold the deepest historical and cultural significance for the people of Iskatewizaagegan. It was identified by the community as one of the five cultural landscapes most important to Iskatewizaagegan No. 39.

Emphasis was placed on the importance of the island's soil quality. Elders indicated that soil on such islands was very rich and excellent for growing crops. They attributed this to past fertilization of the islands by Anishinaabe using natural fertilizers such as fish guts and beaver pond mud. Both of which are known to contain high levels of nitrogen (Mandamin, S 2003 – personal communication, Les Ainspac, 2003 –personal communication). Furthermore, it was clear that the island's vegetation patches had at one time, been altered through human disturbance.

Access, Development and Users

Potato Island is accessible by boat in the spring, summer and fall and by ice in the winter. The island is in relative close proximity to other potential users such as the visitors to the Presbyterian summer camp, numerous cottage owners, and fishermen. There is the potential for other lake users to misuse, vandalize, and abuse this sacred island. It will be important for the IIFN to establish a working agreement of respect with these other users to ensure that time and other users of the island don't put the effort spent on the island to waste, as the result of greed or ignorance. Furthermore, within the community itself, a level of respect and understanding for the restoration project must be developed to ensure long-term respect and success of the program on Potato Island.

Management Strategy

An appropriate management strategy must be developed to achieve and maintain suitable growing conditions for desired crops. To do so, the community must ensure that one person or one group of people is in control of management of the soil and garden management at Potato Island. Burning, tilling, crop selection, fertilizing, and planting must ultimately be controlled by one body to ensure that each important stage is done correctly and effectively.

Management Restrictions / Management Control

Currently, the IIFN has little control over Potato Island, because it exists outside of the reservation boundary. The IIFN must approach and work with the OMNR to have Potato Island redesignated, so that they can pursue necessary land management activities. The OMNR has mentioned that traditional activities on unoccupied crown land are permitted. However, if the IIFN is to undertake any serious management/restoration efforts on Potato Island there will have to be discussions with the OMNR regarding land use permits and management activities. A partnership with the OMNR for the restoration and management of the site is necessary as it would help to promote the IIFN's goals and objectives for the site. Long term access and land management would be safely guaranteed to the community as a result of this newly formed partnership.

Biophysical Documentation of Potato Island

A digital map was made of Potato Island showing island polygon, transects 1-3, forest and garden 100 sq/m plots, bedrock outcroppings, wetlands, and forest polygons 1-3. The digital map of Potato Island was used to develop some ideas about vegetation regimes in relation to the stories that were shared to the researchers during site visits with community members and elders (Figure 20). Furthermore, a greater understanding of the island was gained by walking the perimeters of the island for data point collection. The transition zone between the garden vegetative zone and the forest zone was easily identifiable, but very difficult to navigate due to the thick vegetation. Braun-Blanquet sampling technique transects on Potato Island helped to identify the changes in vegetation regimes through the identification and collection of plant species. Plants identified and collected along the three transects were representative of a variety of vegetation communities: wetland, forest vegetation, and disturbance vegetation (Table 3). Vegetation on this island was very diverse, considering the size of the island. Species collected in the 100 sq/m vegetative plots (garden and forest) indicated distinct differences in these two vegetative communities (Plates 17 & 18). Species collected from the forest plot are numerous and diverse in comparison to the species found at the garden plot. The forest plot contains a variety of trees, shrubs, and herbaceous species that are typical for this region; whereas the garden plot contained only a four species, which are disturbance origin species (Table 3).

Using the FEC, it is impossible classify the Potato Islands vegetation polygons into one of the 40 recognized vegetation types for the NW Ontario region because both polygons have been modified and lack any recognized overstory. Because the typing system is hierarchical (tree layer at the top), understory and ground layer vegetation does not provide enough information to begin the keying process; therefore V-typing the Potato Island is impossible within the current system.

Table 3. Plant Species Collected from the Forest and Garden Plots During the Documentation of Potato Island.

	Common Name (s)	Scientific Name
Garden Plot	Fringed bindweed	*Polygonum cilinode* Michx.
	Wild red raspberry	*Rubus idaeus* L.
	Slender nettle	*Urtica dioica* L.
	Red berried elder	*Sambucus pubens* L.
Forest Plot	Northern wild black currant / Hudsons Bay currant	*Ribes hudsonianum Richardson.*
	Jewel weed	*Impatiens capensis* L.
	Mint	Lamiaceae
	Red berried elder	*Sambucus pubens* L.
	Manitoba Maple	*Acer negundo* L.
	Prickly wild rose	*Rosa acicularis* Lindley.
	Chokecherry	*Prunus virginina* L.
	Wild lettuce	*Lacuta spp.* L.
	Golden rod	*Solidago spp.* L.
	Wild red raspberry	*Rubus idaeus* L.
	Cut leaved ragwort	*Senecio eremophilus* L.
	Red oaiser dogwood	*Cornus stolonifera* L.
	Eastern white cedar	*Thuja occidentalis* L.
	American elm	*Ulmus american* L.
	The mint family	Labiatae
	Western willow	*Aster hesperius* A. Gray.
	Prickly wild rose	*Rosa acicularis* Lindley.
	Smooth rose	*Rosa blanda* Aiton.
	Marginal shield fern	*Dryopteris marginalis* (L.) A. Gray.
	Northern bugleweed	*Lycopus uniflorus* Michx.
	Service berry	*Amelanchier canadensis* (L.) Medikus.
	Yellow evening primrose	*Calylophus serraulatus* (Nutt.) Raven

There are four main conclusions to be made as to why there are such contrasting vegetative regimes on Potato Island.

1. The forest or treed portion of the island was never gardened, but was rather left to provide shelter to the tenders of the garden who where said to have sometimes stayed over-night on the island.

2. The treed area also acted as a windbreak for the crops from the prevailing westerly winds.

3. The treed portion may have, at one time, been part of the garden but it was not as heavily managed (burnt as frequently) as the non-treed portion of the island and may have been rested for a longer period of time than the non-treed portion.

4. The treed area provided visual protection (hide) from other tribes out on the lake many years ago.

Soil Analysis of Potato Island

During the closing part of the latest completed division of geologic time a vast lake stretched from the southern end of the Red River Valley north to the Saskatchewan and Nelson rivers called Lake Agassiz. Lake Agassiz was the largest of the many Pleistocene lakes of North America, some of which were formed by the barrier of the ice-sheet during its recession, while others were produced by increased rainfall in the great western and region that has no drainage to the sea. Shoal Lake and Lake of the Woods area fall within the eastern most portion of the former lake bed.

Potato Island has lacustrine deposition soils, as it is known that at one point in history the islands were under water. The soil pits in both the forest and garden vegetation polygons best indicate an S5 (Fresh / Fine Loamy) soil type in the Ontario FEC manual (Sims et al. 1997). According to the FEC, S5 soils are most commonly associated with shrub-rich, hardwood dominated stands. The forest floor cover typically has a high component of broadleaf litter that is evident on Potato Island. S5 soil classifications are uncommon throughout NW Ontario; it is most frequently encountered in the eastern Central Plateau section. The S5 ranking seems to be the best possible choice for the soils on the Potato Island. However, the S5 soil type is for deep soils (>100cm); whereas the soil pits in both the garden and forest sites are <100cm. No shallow soil (profiles <100cm) S types possess a C texture of clay, which was determined for both the garden and forest pits.

It appears that the soils in the far southwestern portion of NW Ontario may contain soil depositions found in the prairie region. It would appear that Potato Island, other islands, some areas on the western shore of Shoal Lake are situated in a soil transition zone from Boreal Forest Region/Great Lakes – St. Lawrence Forest Region to prairie agricultural soils found in Manitoba. The soils indicate a fresh, moderately well drained moisture regime able to provide sufficient drainage for agricultural purposes. Results show that there were some differences between the soils found in the forest pit and soils found in the garden pit (Figures 21 & 22).

1. The forest pit contained two more soil layers (B and BC) than did the garden pit. This is thought to be the result of tillage and churning of the soil over the years, thus indicating human activity to improve the growing conditions on the sites (Bowling 2003 - personal communication, Flaten 2004 - personal communication).

2. The forest pit is cycling nutrients through the system, as a result of trees and plants decomposing and cycled through the plant's root system. However, the garden pit's surrounding vegetation consists only of annuals that do not have roots to access stored nutrients in the lower layer. Therefore, no new nutrients are being created. As a result, over time, the annuals have impoverished the upper level of the soil. There are few nutrients left. As a result, the garden soil has become a static environment with little nutrients (Bowling 2004 - personal communication).

3. Soils from both pits are acidic and have low pH levels; therefore both pits display high levels of Aluminium that in such high levels could be toxic to some plants (Appendix 5) (Flaten 2004 - personal communication.).

4. Bray P levels in both pits are extremely high and are considered to be of environmental concern (Appendix 4). This may be the result of heavy fertilizing on the site at one time.

5. Solid pieces of charcoal were found in the forest pit but not in the garden pit. It is believed that possibly all the charcoal and woody debris that may have existed in the soils of the garden site were completely broken down over the years of continued tilling and prescribed burning (Bowling 2004 – personal communication; Flaten 2004 – personal communication).

6. Furthermore, in both pits researchers noticed the faint odour of smoke. It is believed by some archaeologists that the smell of fire and smoke can remain in the soil for hundreds of years (Shay 2004 - personal communication).

Using the Ministry of Agriculture and Food table "Soil pH at which lime is recommended for Ontario Crops", the agricultural potential for soils found in the garden and forest pits at Potato Island was considered. Historic crops known to have been grown on garden islands such as; potatoes and corn would not be able to survive on today's acidic soils (Appendix 5). Ph levels in both pits - silt loam "A" horizons were below 3.60, whereas, the recommended ph level for all crop survival is above 5.00. However, raspberries, which require a pH of 6.1 seemed to be growing well throughout the island. These findings indicate that for successful crop establishment and development on Potato Island, the soil must be neutralized with lime to increase the pH level of the soil.

Cultural Landscapes – Human Modified Landscapes

Cultural landscapes are places of experiences and memories in which individuals, and communities identify themselves and help to distinguish their place in the world. The Iskatewizaagegan people identify themselves as Anishinaabe whose thinking is centred in the value of their basic relationship with the Great Spirit *(Gitchi Manito)*. Within this relationship lies the respect and responsibility for all life and for all of the Great Spirit's creations (Kinew 1995). Therefore, when cultural landscapes of the Iskatewizaagegan are threatened, either from internal or external sources, the people of Iskatewizaagegan feel threatened. As a result, the use and management of some cultural landscapes ceases in order to avoid detection or develop into a political battle with external parties. However, widowing of a landscape does not mean that the landscape has lost its historical or cultural value. Some cultural landscapes are significantly important to a culture just because of past events that may have taken place at that site. Furthermore, sites in their current condition may have developed spiritual or sacred importance to the community, rather than a physical/historical importance.

People who have memories, experiences and feelings towards a landscape are able to reveal much to individuals unable to see and understand the "unforeseen layer" of the place. Only those individuals who possess the knowledge, stories, and experiences of the site are truly able to convey the meaning of the landscape to outsiders who come to a place with little prior knowledge of what they are going to see (Ryden 1993). It is the people of a place who are best able to tell the legends, historical, cultural and personal meanings of a site. In this case the people of the Iskatewizaagegan are best able to communicate the sites forms, functions and process. It is clear that cultural landscapes are not places of "pristine wilderness" but are places of historical wilderness. They are places where human land management and modification efforts have shaped the landscape into its current state but due to a widowing of the site a historical snapshot has been created. Such sites have been utilized for centuries by the Iskatewizaagegan people for subsistence, cultural traditions and recreation. As a result of this utilization (human-site interactions), site conditions at these places have changed. It is important to understand how human activity and management has altered the conditions at these sites. Biophysical and cultural/historical documentation can provide a greater understanding of the human-site interactions over time.

Throughout the project, elders shared their intimate knowledge of cultural landscapes. Without this level of knowledge sharing, understanding would be virtually impossible. It was only through trusted exchanges that a true understanding of the forms, functions and processes of the landscapes was gained.

As a result of the biophysical and historical documentation of Crowduck Lake and Potato Island, it is clear that cultural landscapes are unique, and therefore, require the development of a site-specific methodology for their documentation. Through the documentation of Crowduck Lake and Potato Island, we see that there are certain similarities in the methods of documentation that were successful at each site and which could potentially be adapted for the documentation of other similar cultural landscapes.

Historical and cultural data collected for these sites will help both the aboriginal and non-aboriginal communities to better understand the current physical and cultural situation of each site. This, in turn, will help in the development of a successful restoration plan according to the goals and objectives of the community. This cultural and historical information provides invaluable information for future management, practice, and educational/interpretive purposes. The baseline data collected through biophysical documentation of these sites proves invaluable for understanding the physical conditions of the site. In turn, allowing us to understand how past human practices have influenced the current condition of the site. Furthermore, this baseline data can be used to monitor any physical changes that may occur at the site as a result of restoration or non-restoration activities.

In the next chapter, I will discuss how the iterative process enabled the communities goals and objectives to guide the outcomes of the research project. Furthermore, the fifth chapter will present restoration plans for Crowduck Lake and Potato Island.

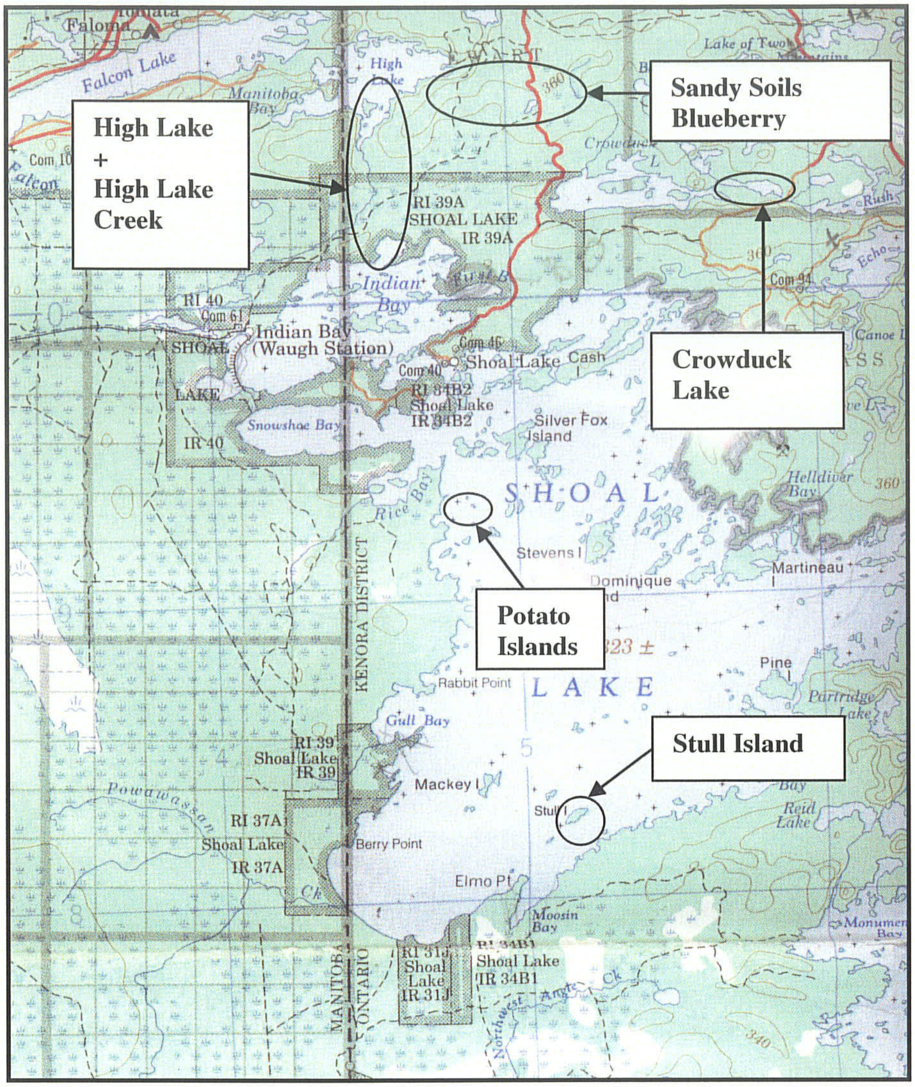

Figure 13. Location of Five Sites for Preliminary Inventory of Natural and Cultural history.

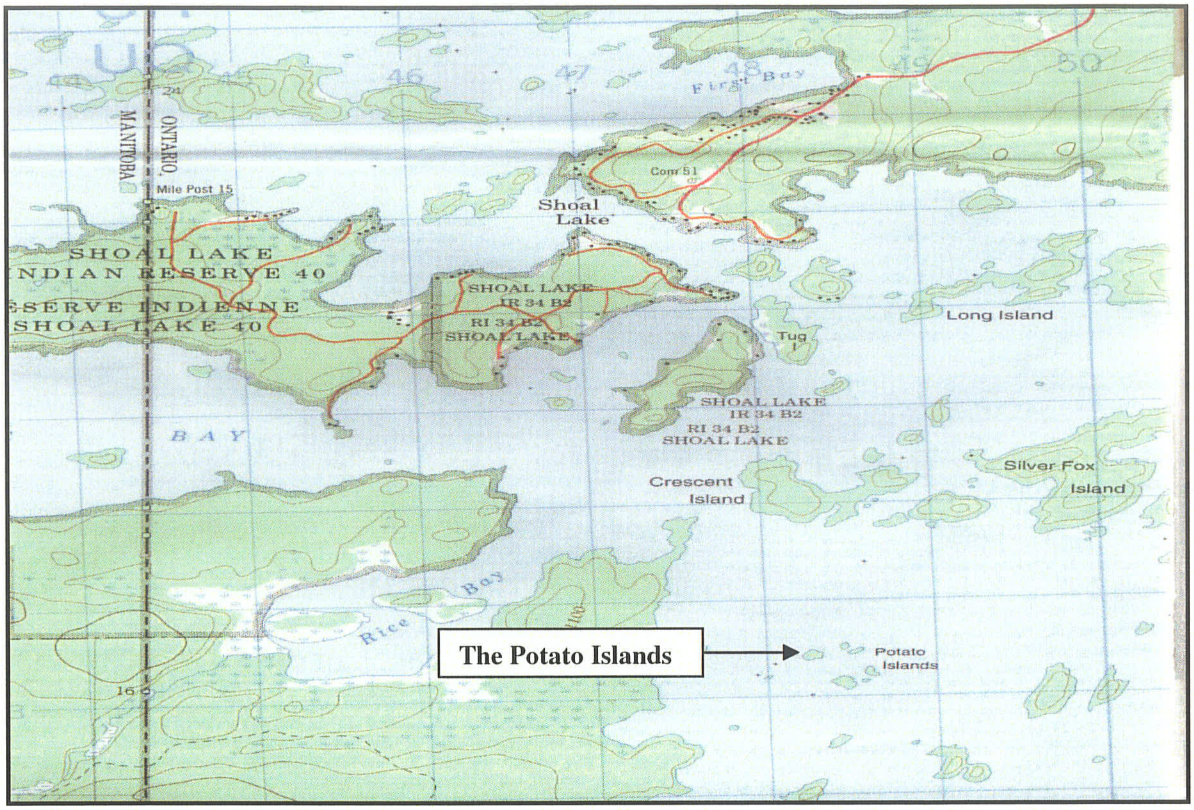

Figure 14. The Potato Islands

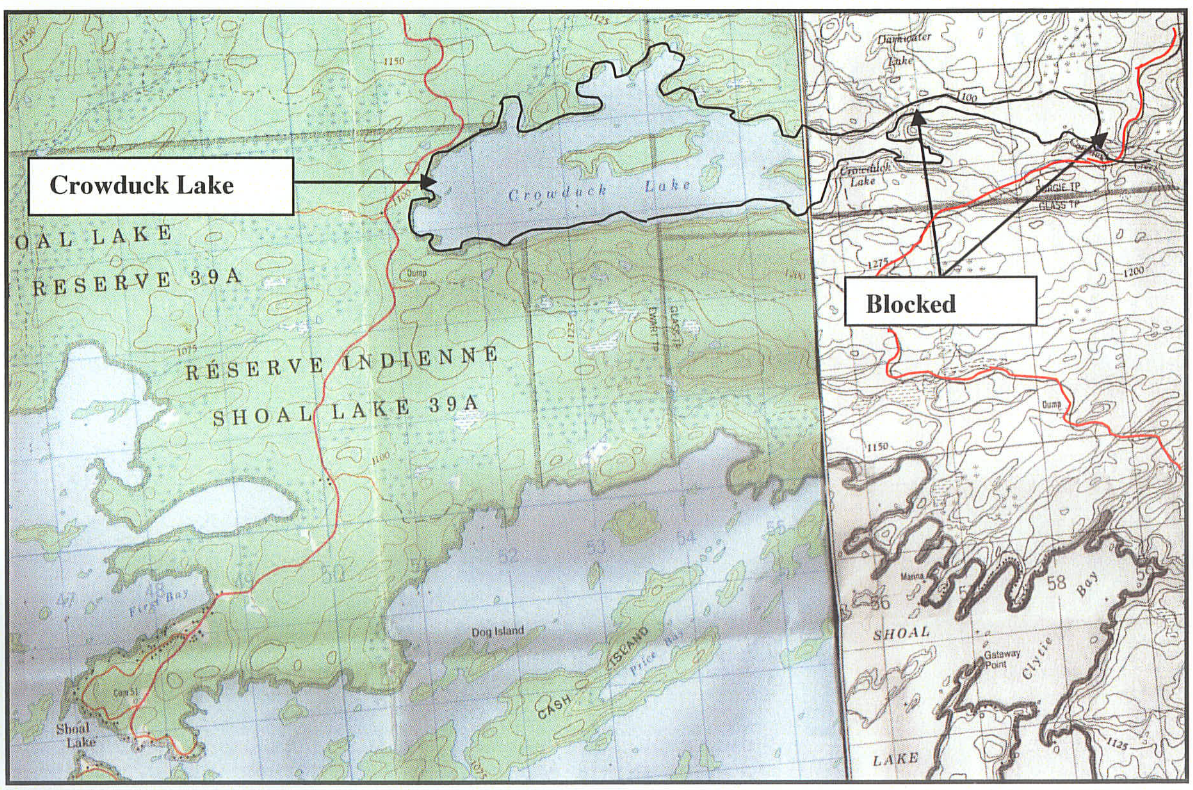

Figure 15. Crowduck Lake

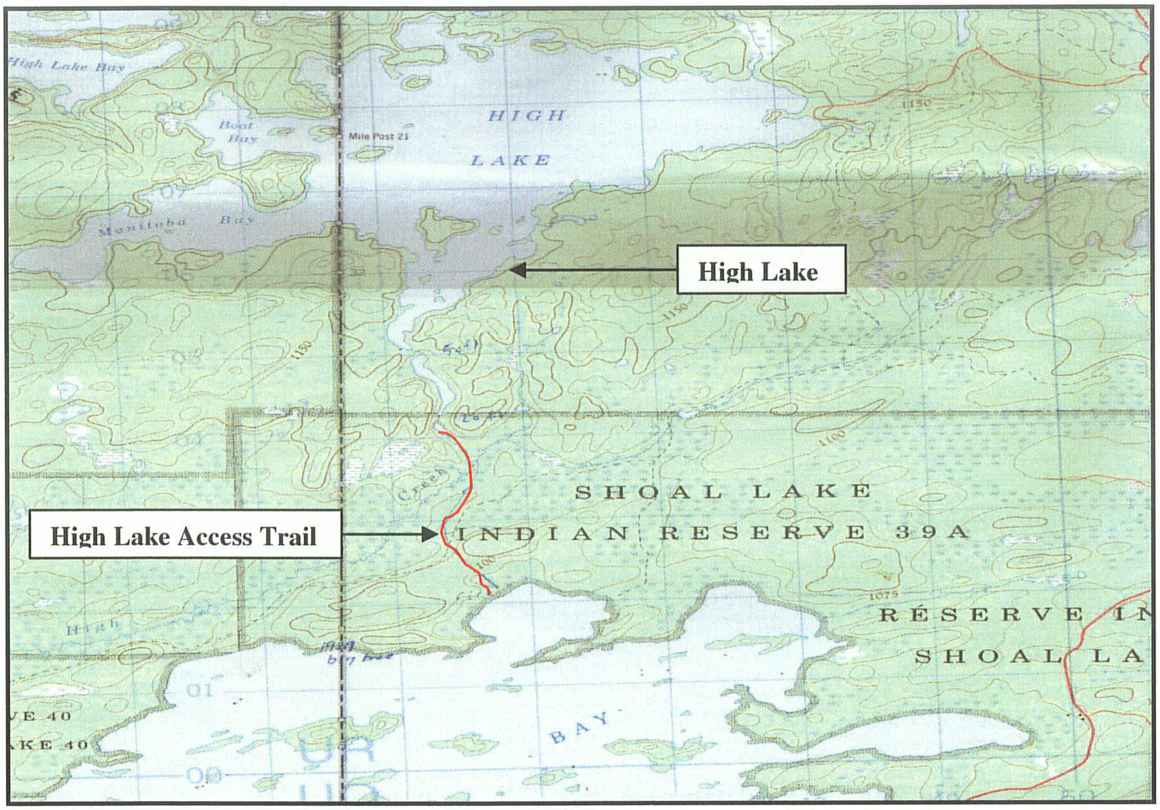

Figure 16. High Lake and High Lake Access Trail

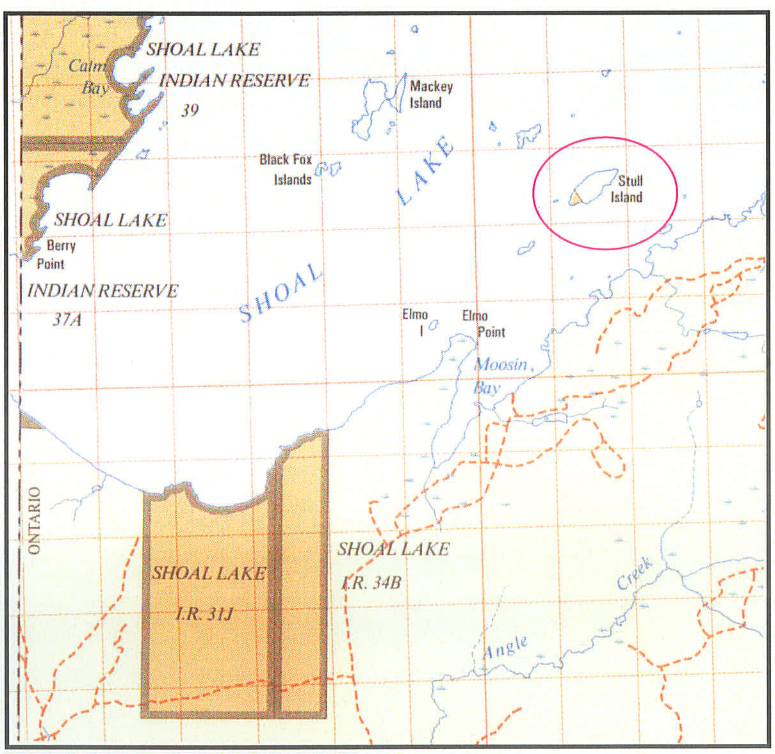

Figure 17. Detail of Stull Island location.

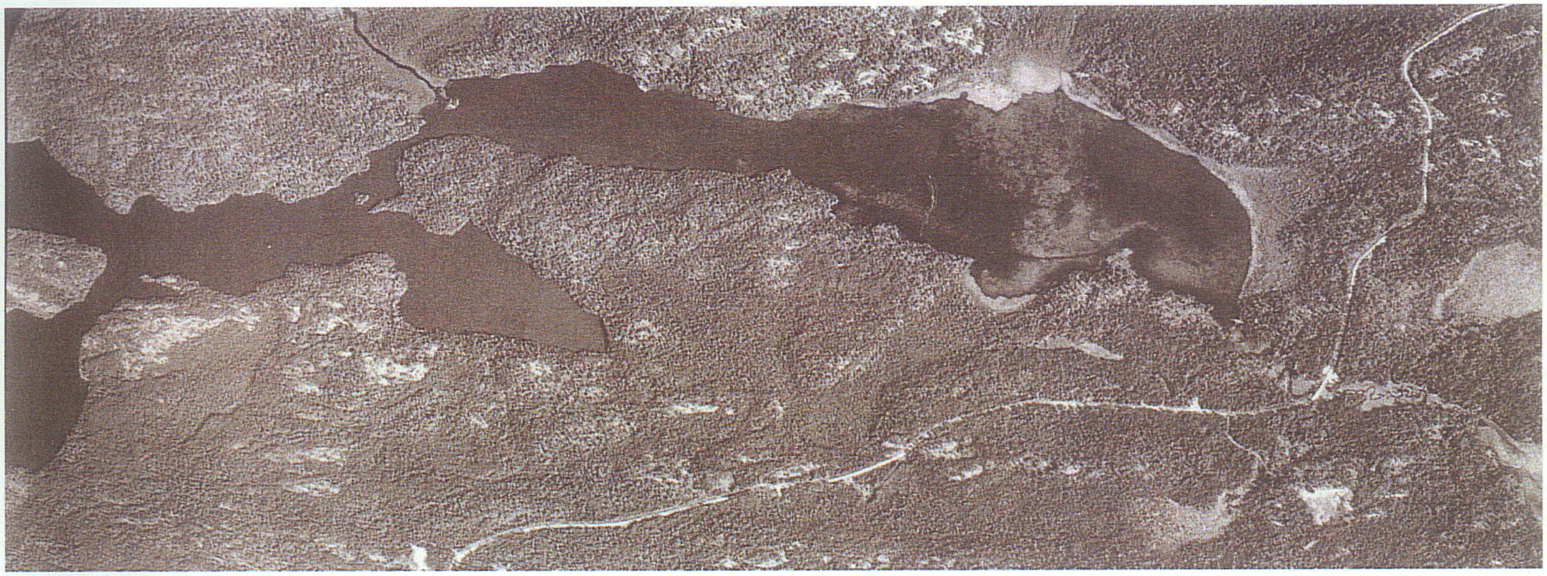

Figure 18. Aerial Photograph of Eastern Portion "Rice Bay" of Crowduck Lake (1995).

Kaagaagiishib Zaagegan Manowin - Crowduck Lake Wild Rice

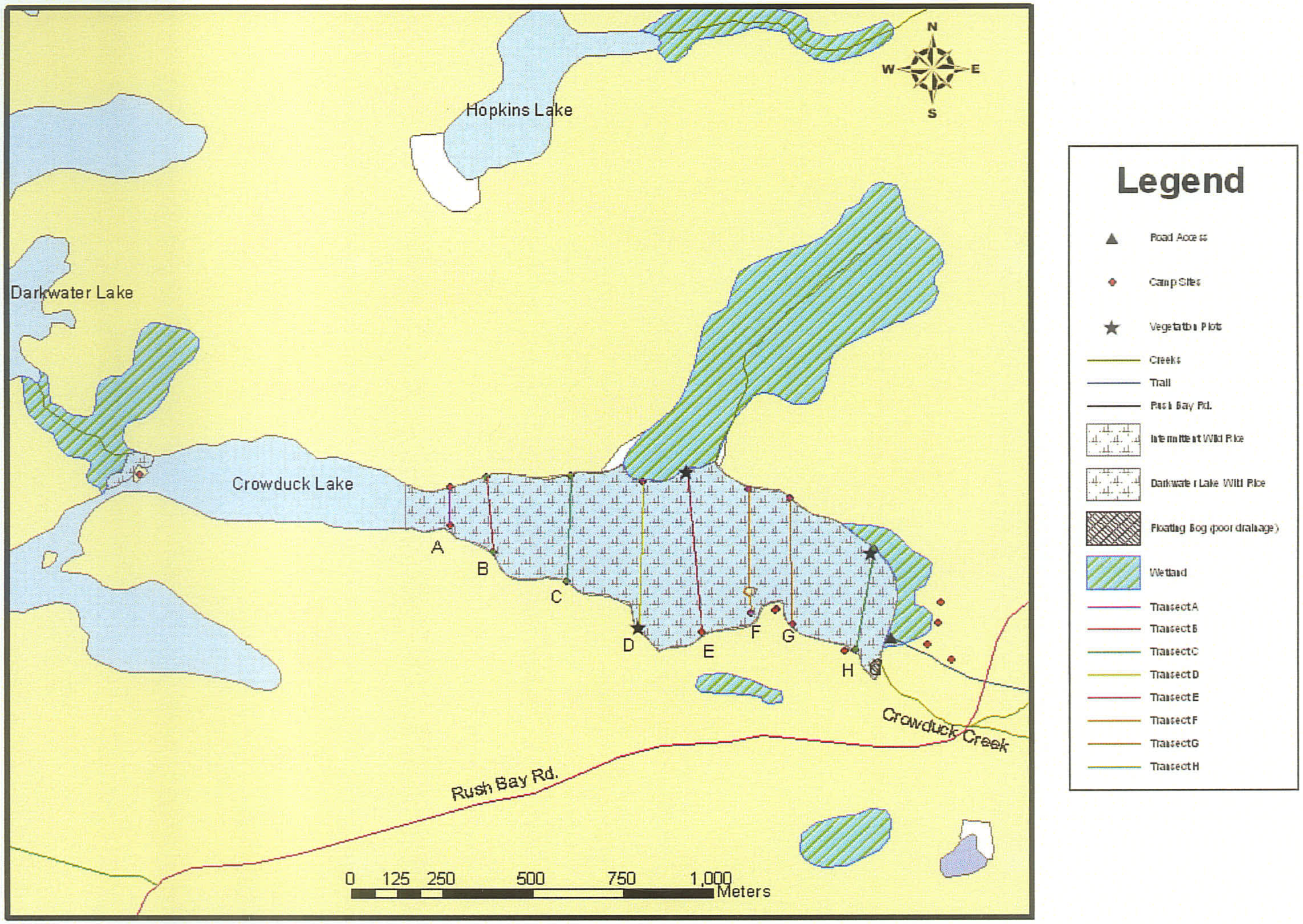

Figure 19. Digital map of 2003 fieldwork at Crowduck Lake: Transects location, polygon mapping, and sites of interest.

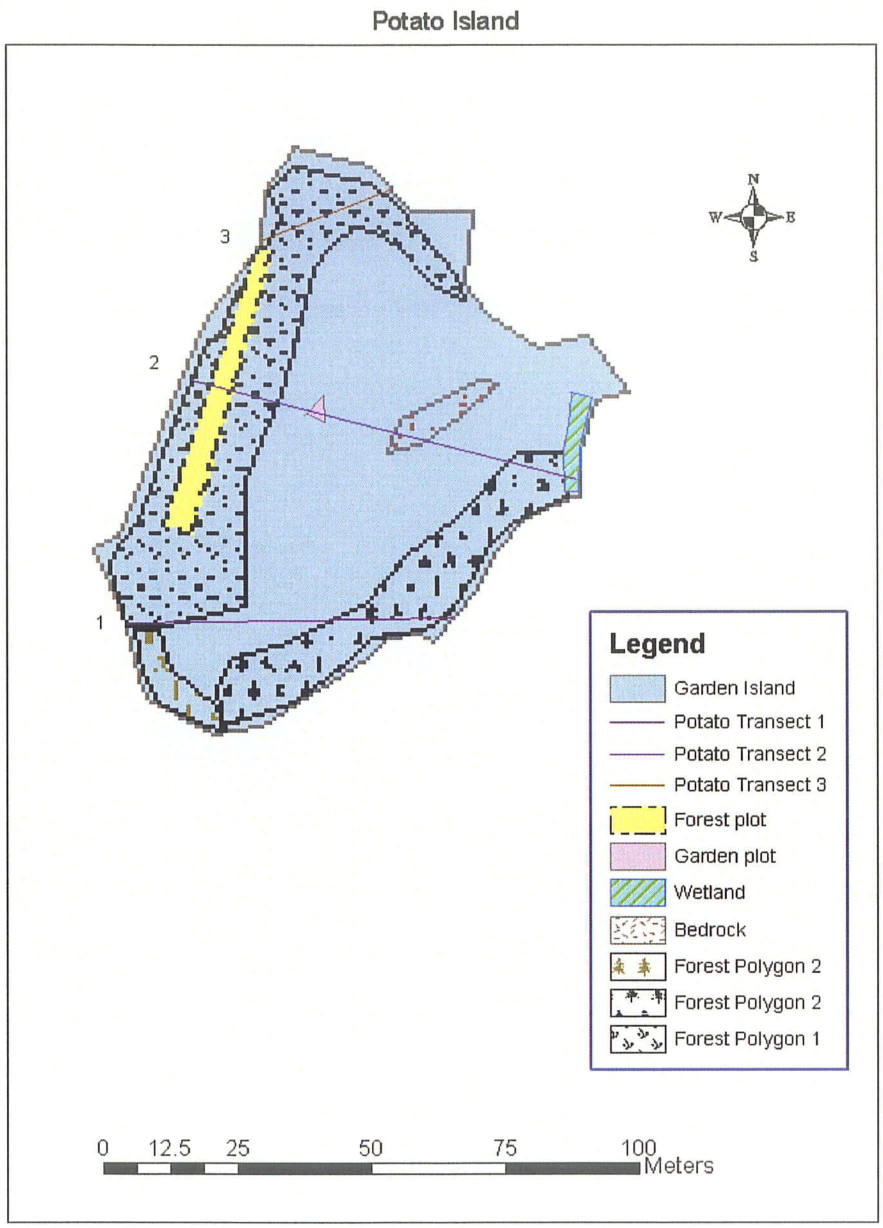

Figure 20. Digital Map of Potato Island.

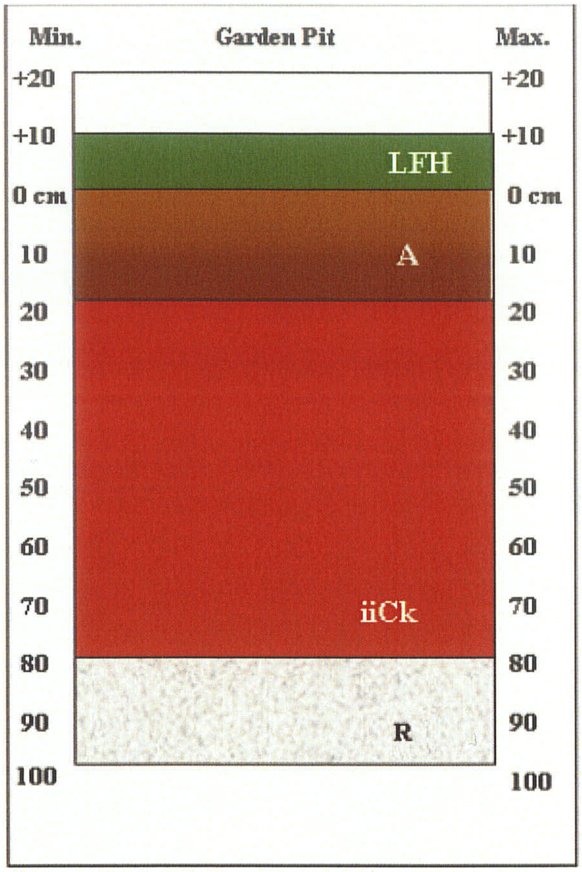

Figure 21. Generalized soil profile for the Garden Pit at Potato Island.

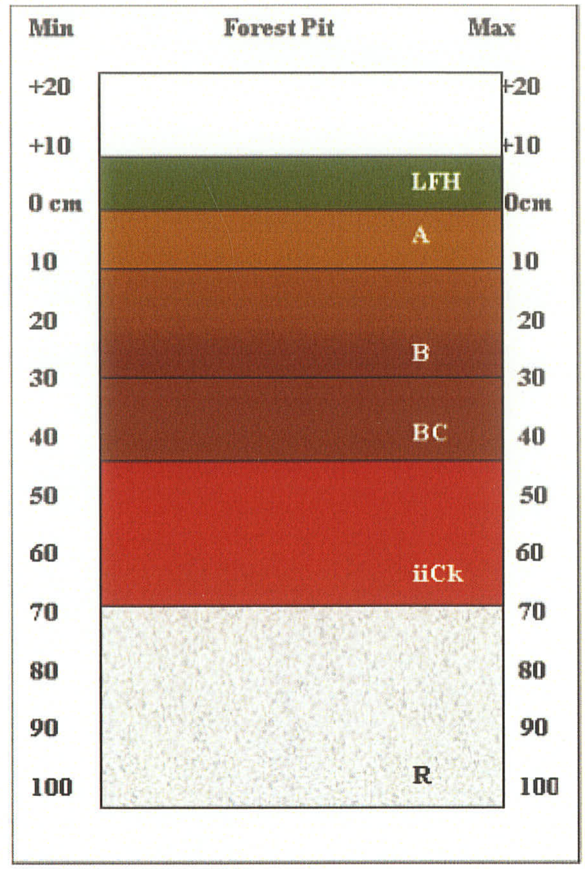

Figure 22. Generalized soil profile for the Forest pit at Potato Island.

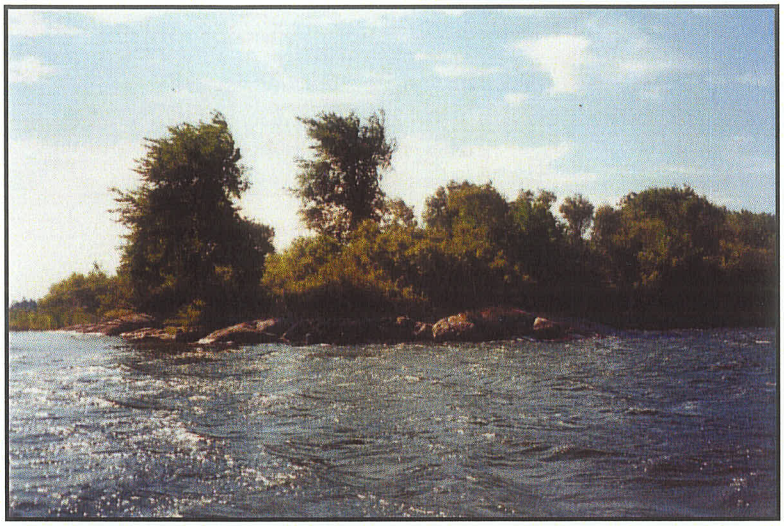

Plate 1. Potato Island – Wind Break

Plate 2. Potato Island - Rich Soil

Plate 3. Crowduck Lake - Wild Rice

Plate 4. Crowduck Lake - Blockage slowing outflow of water

Plate 5. High Lake – Hunting Area

Plate 6. High Lake – Traditional Camp Site

Plate 7. Stull Island – Dense Vegetation

Plate 8. Stull Island – Large Trees

Plate 9. Blueberry patch following clearcut on sandy soils, north of Shoal Lake.

Plate 10. Point on Shoal Lake where blueberries were harvested in the past.

Plate 11. Transect tag marking transect number and UTM coordinate.

Plate 12. Secchi Disc Measurements at Crowduck Lake.

Plate 13. Low Density Wild Rice, Crowduck Lake.

Plate 14. High Density Wild Rice, Crowduck Lake.

Plate 15. Vegetation in Shoreline Plot, Crowduck Lake.

Plate 16. Fragrant White Lily – Competition Species for Wild Rice Growth.

Plate 17. After Clearing 100 sq. m Garden Plot, Potato Island.

Plate 18. Thick vegetation, forest plot, Potato Island.

Chapter 5 – Developing a Restoration Plan

Chapter Overview

An iterative methodology was selected to guide the documentation and development of restoration plans for Iskatewizaagegan's significant cultural landscapes. This chapter will discuss the steps and stages that took place throughout this project to ensure that the community's goals and objectives continually drove the documentation and development of restoration plans for Crowduck Lake and Potato Island. To begin this chapter, the findings and process from the participatory workshops and community involvement in the project will be discussed in relative chronological order. To do so, the *"Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes"* diagram will be used to link the information being discussed with the stage in the iterative process by highlighting the associated box in the diagram. Restoration plans for Crowduck Lake and Potato Island are presented and discussed at the end of this chapter.

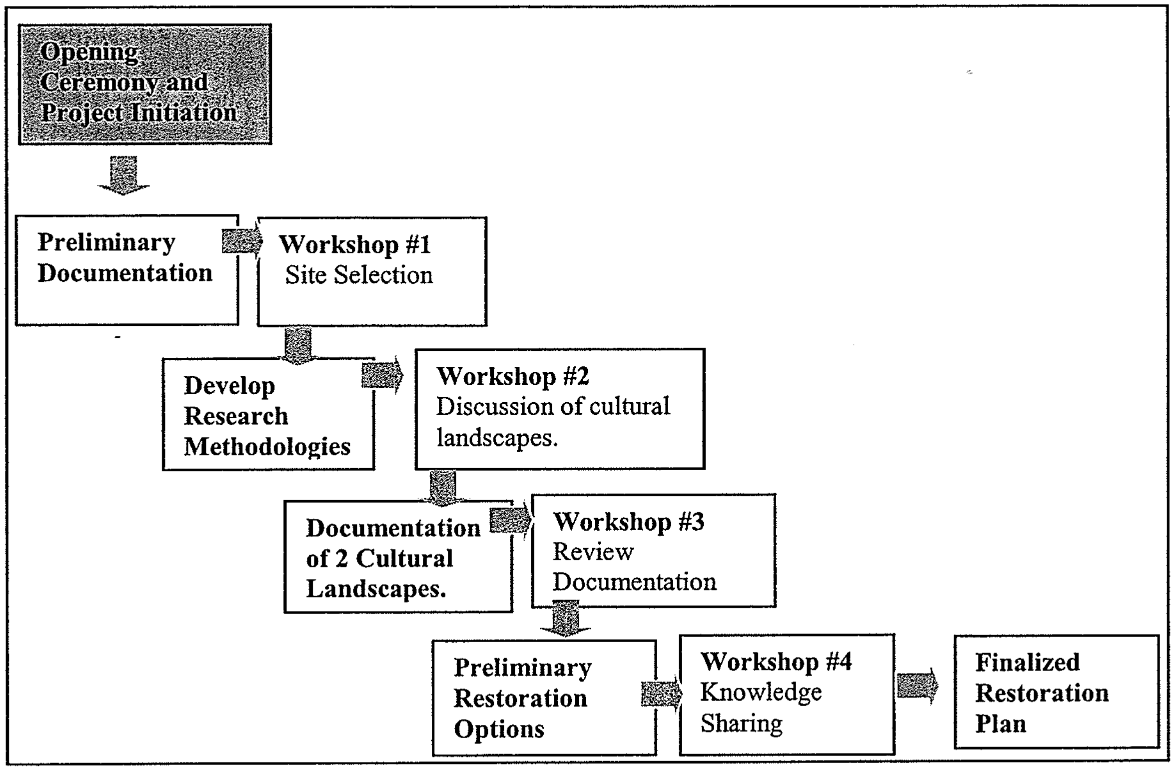

Figure 23. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Line of Inquiry and Project Development Stage.

Line of Inquiry – Project Development

The line of inquiry for this research project emerged during previous projects between the Natural Resources Institute and the Shoal Lake Resources Institute during between 1999 and 2002 (Davidson-Hunt 2003; Ruta 2002). During these projects, IIFN community elders and members voiced concerns about the diminished activity on the land and subsequent loss of language and knowledge. It became evident that the importance of culturally important sites for community health, cultural awareness, and healing needed further investigation. During the previous project three of the five culturally significant places had been identified but not documented. The other two culturally significant places were identified through discussion with elders during the preliminary documentation stage of this project.

During the project development stage, the project team was developed and included NRI and community researchers, elders, and scientists from the OMNR. The research protocol was developed and approved by the elders and band council. On approval of the research protocol, a ceremony and feast was held at Stephen Kejick's roundhouse to celebrate and officially recognize the beginning of the project.

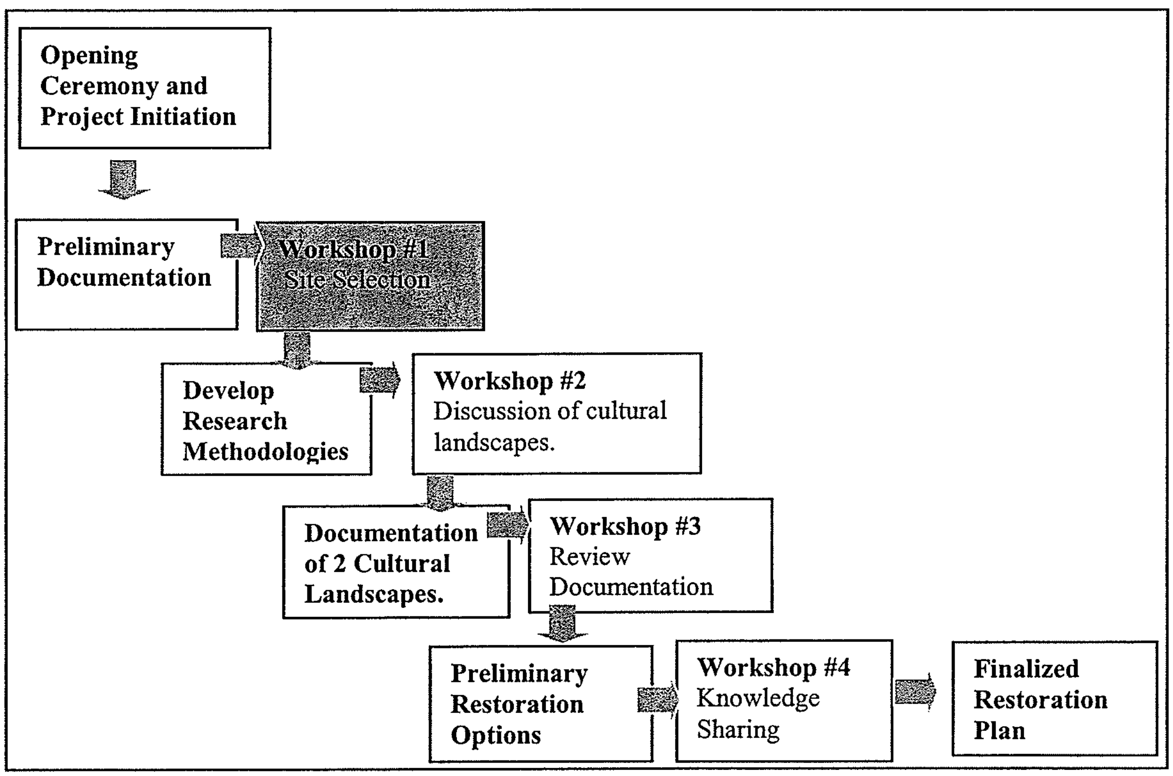

Figure 24. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes –Workshop #1 Site Selection.

Participatory Workshop #1:

September 27 & 28, 2002.

Workshop at the University of Manitoba. *Shoal Lake No.39 participants included:* Robin Greene, Kathleen Greene, Susan Adams, Earl Wapioke, Stephen Mandamin, Leon Mandamin, Phyllis Jack, Basil Greene, and Ella Dawn Greene. *NRI participants included:* Fikret Berkes, Iain Davidson-Hunt, Sherrie Blakney, Shirley Thompson, Michlene Manseau, Will Roberts, Michelle Schlag, Serge LaRochelle, Lairn Bill, Ana The, and Shailesh Shukla.

This workshop focused on the loss of traditional knowledge, culture and health issues within the community of Iskatewizaagegan. Questions were put out at the beginning of the workshop with hopes of drawing some conclusions through the participatory process.

During the workshop the participants from Iskatewizaagegan No.39 identified that the reason children are losing knowledge is due to a lack of activity on the land, lack of traditional teachings, and being sent for schooling in Kenora and not on the reserve. Re-establishment of the wild rice at Crowduck Lake and the re-establishment of the gardens at Potato Island were identified as a priority way of making a connection between the people of the community and the land.

Findings from the preliminary documentation of the five culturally significant landscapes were presented during the workshop to generate discussion and feedback. The preliminary documentation results helped the researchers, elders and community to better understand some of the sites being discussed at the workshop, and also to help develop community goals and objectives for the next stage of the research process.

Goals and Objectives Identified in the Workshop:

a) Increase community knowledge of culturally important sites and histories of the Iskatewizaagegan people, with an emphasis on youth.

b) Children require education through experience. This will help to develop a strong connection with learning on the land.

c) Curriculum needs to include traditional values and traditional teachings. (Youth should be incorporated into the process of restoration, and link long-term learning at these sites into the already existing trapping program).

d) Promote an increased interaction between community youth and community elders. (Develop a mutual respect through traditional teachings and intergenerational interaction).

e) Promote and increase activity on the land, resulting in improved health.

f) Restore harvesting sites for wild rice, and vegetables (emphasizing healthy foods) and promote their production and consumption.

g) Restoration of cultural sites to help gain a larger land base and increase access to traditional areas for the Iskatewizaagegan people.

Prioritizing Cultural Landscapes

Information gathered through the preliminary scoping of the sites, site visits, and at the first participatory workshop, helped to develop and rank the five culturally significant sites according their ability to satisfy community goals and objectives.

Potato Island and Crowduck Lake appeared to be the two cultural landscapes that best fit with the goals and objectives that the community had identified during the initial stages of the research. Throughout the research project, it became apparent that the two most important criterion are 1) importance of the site to elders and community members for cultural and historical value, and 2) proximity to the community (ease of access) to the cultural landscape site (Appendix 2).

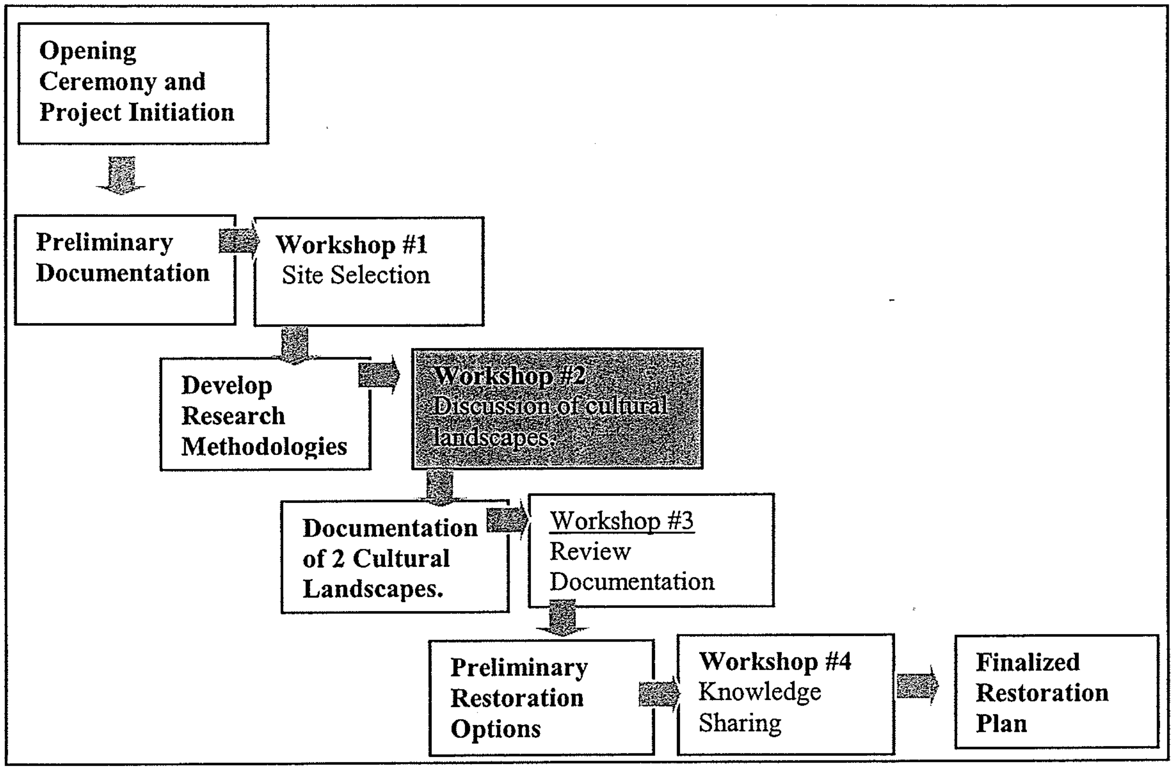

Figure 25. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Participatory Workshop #2 Stage.

Participatory Workshop #2:

February 6, 2003.

Workshop at Shoal Lake #39 Band Office.
Participants included community Elders: Robin Greene, Kathleen Greene. Community members: Kathy Greene (education), Basil Greene (council), Leon Mandamin (Chief in council), Laverna Greene (health). NRI participants included Will Roberts and Iain Davidson-Hunt.

During the second workshop the issues surrounding the restoration of Crowduck Lake and Potato Island were discussed in greater detail. Issues such as funding, working partnerships, and community goals and objectives for the project were discussed. Findings from the workshop indicated that it is important to take time for this project, and that rushing into anything will, in the end, lead nowhere. The community is still interested in documenting and learning more about the sites; however, they are cautious of implementing restoration activities too quickly. Furthermore, the community requested that guidelines and policies for restoring areas be developed for the next workshop for review, and also that a proposal outlining the documentation techniques for restoration be ready for review for the next stage of the project.

<u>Revised Goals and Objectives from the Workshop:</u>

a) Restore community non-timber forest product management institutions.

b) Promote the potential for Anishinaabe eco-tourism opportunities within the Shoal Lake watershed.

c) Establish a link with the newly developed R.V. park and potentially develop an interpretive centre that would house an Anishinaabe museum and act as the eco-tourism headquarters. This interpretive centre could serve as the starting point for eco-tourism tours to different cultural sites.

d) Promote employment through increased funding opportunities.

e) Crowduck Lake should be the number one priority site for consideration by the community.

f) Recognize the need to pre-determine a management strategy and committee to take charge of the sites to be restored. Someone in the community must assume responsibility to take the lead to drive and maintain the project to ensure its success and longevity.

g) Project for restoration must be looked at in great detail. It is important to take time to make sure things will actually work before attempting to implement them. A good plan is crucial.

h) Develop policy and guidelines to regulate the wild rice and other restored areas (deals need to be established between users).

i) Prioritize the sites, Crowduck Lake and Potato Island, as tentative sites to further document and have restoration plans developed.

This workshop identified Crowduck Lake and Potato Island as the two priority sites for further documentation. This community decision enabled the next step of the project which is the development of research methodologies for documenting the identified landscapes

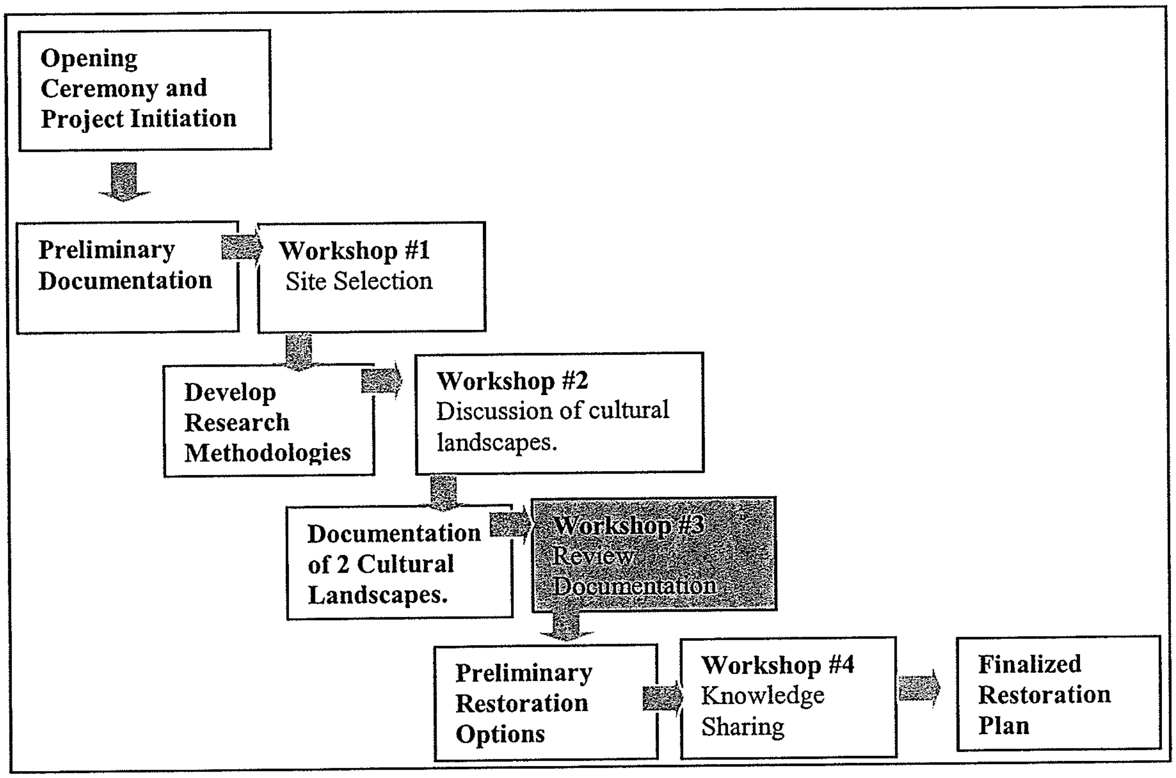

Figure 26. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Participatory Workshop #3 Stage.

Participatory Workshop#3

July 13, 2003	Workshop at Shoal Lake #39 Band Office. Participants included community; Elders: Walter Redsky, Patrick Kejick, and Ed Mandamin Sr., Community members Ed Mandamin, Phyllis Pinesse and Leslie Ainspac; NRI research team: Dr. Iain Davidson-Hunt, Dr. Shirley Thompson, Christa Foley, and Will Roberts.

Guidelines for restoration and documentation techniques for Crowduck Lake and Potato Island were presented to the community for comment for review, comment and feedback through during participatory workshops and presentations. Chapter 3 presents the methods used for documenting both cultural landscapes and Chapter 4 presents findings from the documentation.

The next step in the project was to summarize the documentation of the sites and present it to the community. Furthermore, preliminary restoration plans were developed to present to the community for feedback and direction.

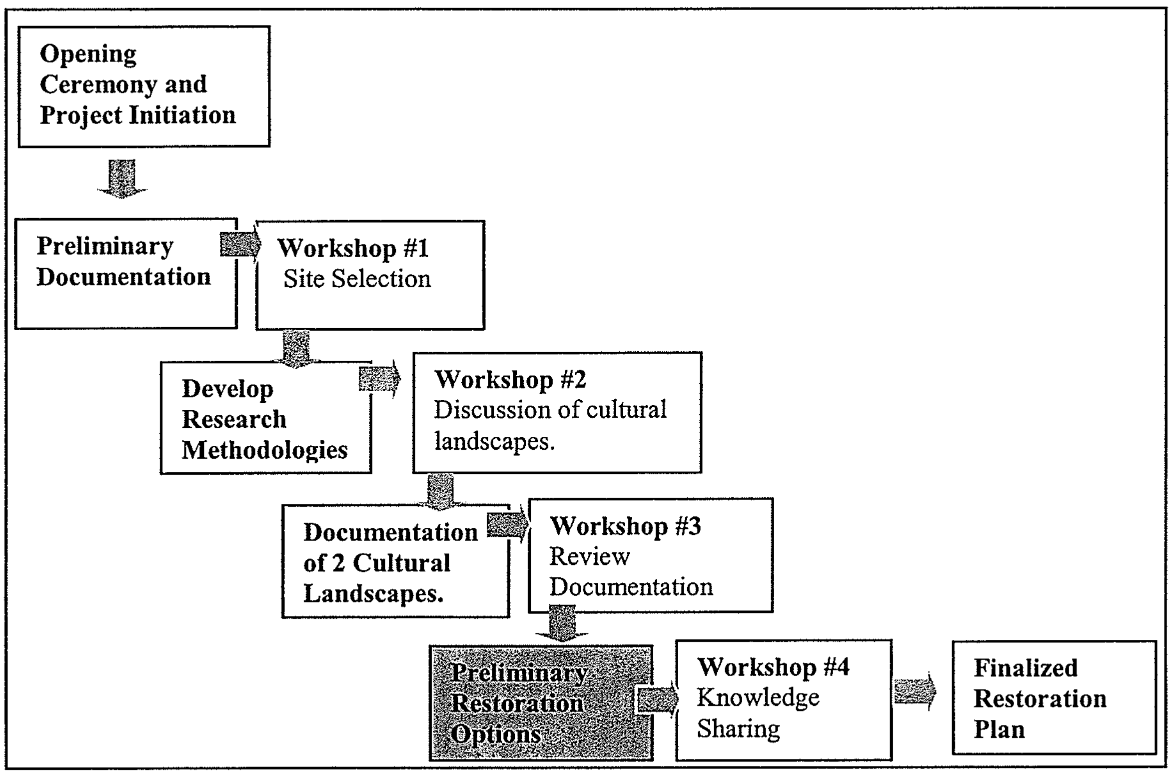

Figure 27. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Preliminary Restoration Options Stage.

Preliminary Restoration Options

Preliminary restoration options were developed for both Crowduck Lake and Potato Island. The options were developed by the researcher to address and provide alternatives for the varied opinions that emerged during the site visits and participatory workshops. Two options were developed for both sites:

1. Do Nothing Option.
2. Vegetation Management (low intensity) Option.

The options laid out the basic objectives, tasks, people, equipment, and dollars required for the implementation of potential restoration management plans.

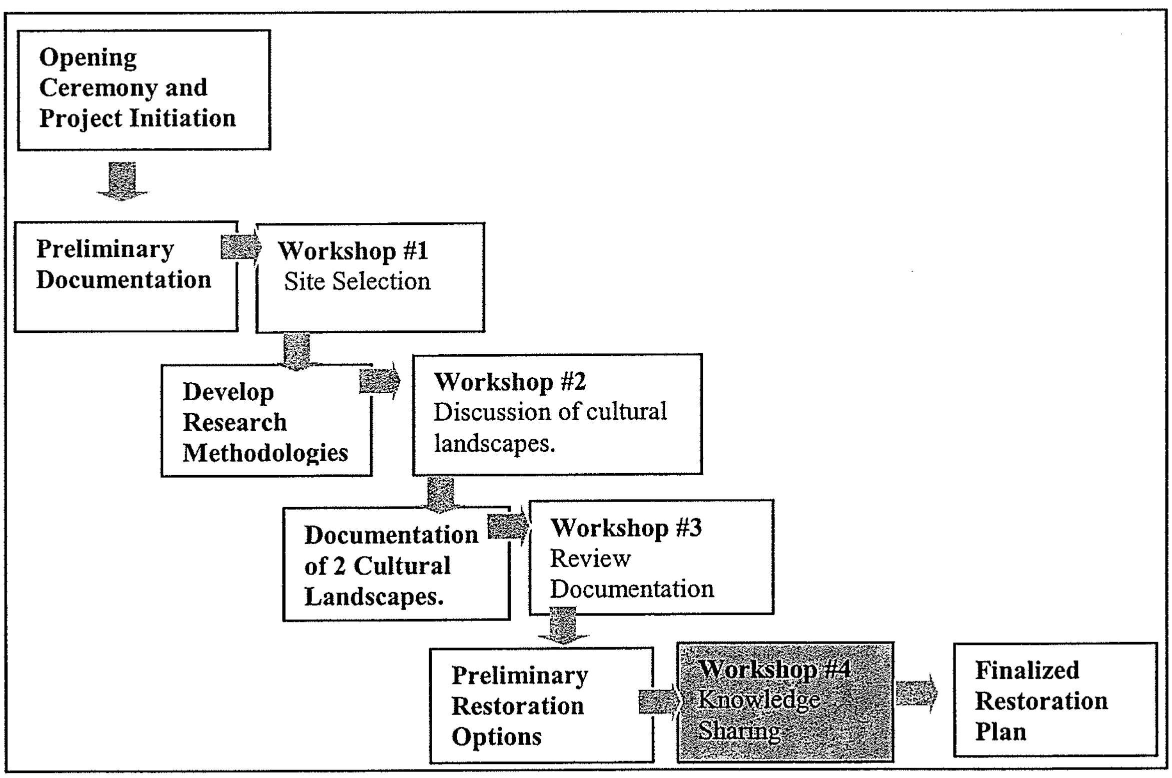

Figure 28. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Participatory Workshop #4 Stage.

Participatory Workshop #4:

April 05 & 06, 2004.

Workshop at Shoal Lake #39 Band Office.
Participants included community;
Elders: Robin Greene, Frank Greene, Ella-dawn Greene, Patrick Kejick, Edward Mandamin Sr., Jimmy Redsky.
Community members; Phyllis Jack, Randy Paiske, Oliver Pineese, John Wapioke, and Tina Holmstrom.
NRI research team: Dr. Iain Davidson-Hunt, and Will Roberts.

The fourth workshop was designed to gather feedback from the biophysical documentation and to determine what type of restoration the elders and community members envisioned to take place at Crowduck Lake and Potato Island. Biophysical documentation of the two sites was displayed and discussed during the workshop. Hypothetical preliminary restoration plans of differing intensity were put forth to the working group to generate discussion.

During this workshop some new concerns about Potato Island were raised. Elders identified that the possibility that Potato Island was in fact a burial ground. No one was certain of this. However, this finding quickly shifted the thinking and discussion towards activity at this site.

The site documentation data and the preliminary restoration plans stimulated a robust group discussion regarding the sites and the issue of restoration. Option #2 (low intensity vegetation management) from the preliminary restoration plans initiated an emotional discussion and emotional response from the group. The group did not like the wording, "vegetation management". Elders felt that the objectives listed in option #2 didn't place enough emphasis on teaching and learning opportunities. They felt that too much emphasis was placed on disturbance and alteration of the site through vegetation management. The community suggested that the preliminary plans did not satisfy their current goals and objectives. Therefore, the community felt that the restoration plans had to be adjusted to meet newly developed goals and objectives for both of the sites.

Re-Revised Goals and Objectives from the Workshop.

a) Potato Island has become a sacred site as a result of being a memorialised site for so many years. The site is too sacred and has deep meaning to the community and therefore vegetation should not be disturbed at this site. It would be okay to take people to the site to tell them the stories of gardening and the residential school but keep people from walk all over the site.

b) Another island should be used for any vegetation management experiments, not Potato Island.

c) Community elders feel that it is important to keep the island and practices related to it sacred. The community is fearful of the outcomes that may develop as a result of revealing the historical information to the OMNR.

d) The community realizes the implications for land practice and management off reserve. Restoration and infrastructure development activities at Crowduck Lake are considered by elders to be high-risk. The potential for management conflicts with the OMNR is very high.

e) Crowduck Lake should be used as a place for education and teachings (achieved through campsite development, and canoe access to wild rice and water).

f) Low-level restoration management and infrastructure development should occur to promote learning, teaching, and harvesting opportunities for community youth.

g) Teaching local youth, visiting youth and other visitors to respect and value Anishinaabe cultural heritage and values should be the focus of both sites. Restoration of cultural landscapes can provide linkages between youth and the land as well as create respect by Anishinaabe people for themselves and others for Anishinaabe people.

h) Neither site should be restored or developed in a way which commercializes cultural practices outside of this teaching context.

i) Any actions at either site should be put on hold for one more year.

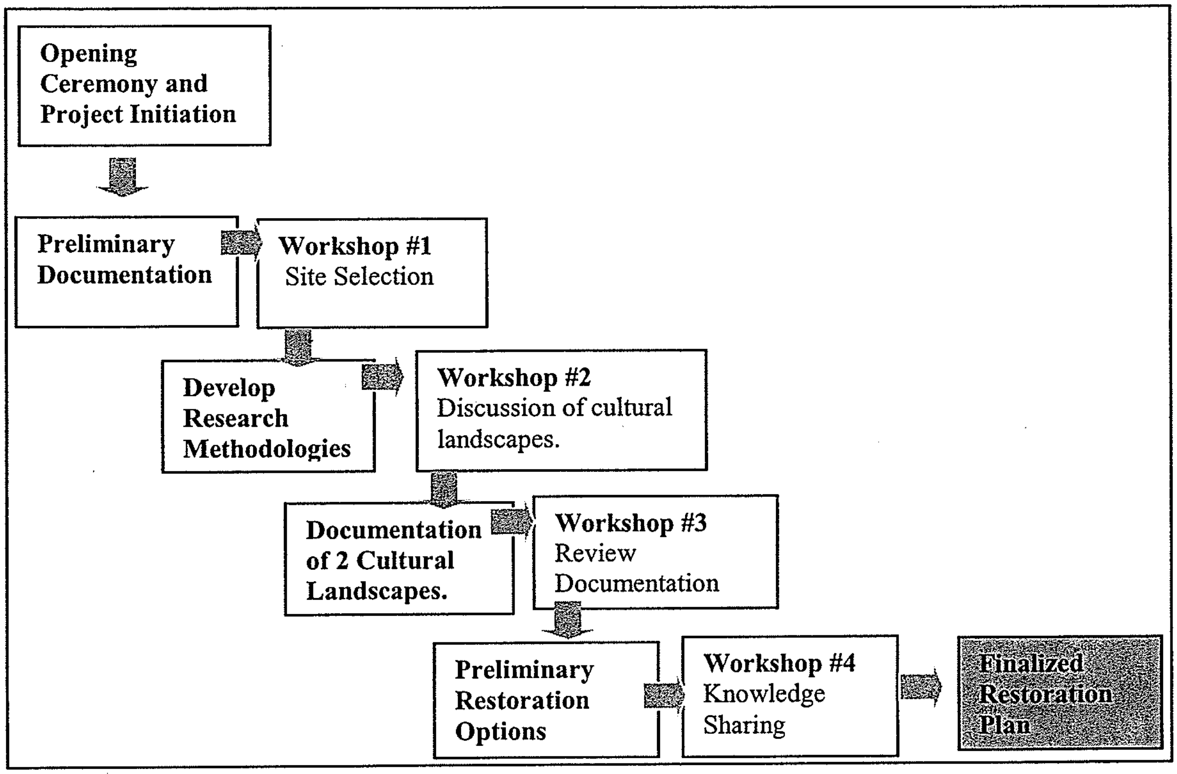

Figure 29. Iterative Methodology for Documenting and Developing Restoration Plans for Aboriginal Cultural Landscapes – Finalized Restoration Plan Stage.

Finalized Restoration Plans

The finalized restoration plans attempt to address the concerns voiced by the community during the fourth participatory workshop. The plans for both Crowduck Lake and Potato Island provide three alternate options for restoration (Tables 4 & 5):

1. Do Nothing Option
2. Sites for Teaching Respect
3. Vegetation Management and Teaching

These three restoration options give the community a choice from which they can select a restoration plan that best fits their goals and objectives. In the previous workshop (workshop #4) the community emphasized the importance of teaching rather than vegetation management for increased harvesting opportunities. Here, two of the three restoration options place an emphasis on providing opportunities for teaching. However, the third option, vegetation management and teaching, attempts to incorporate teaching opportunities through increased harvesting and access opportunities to NTFP's.

Crowduck Lake Restoration Plan

The restoration plans developed for Crowduck Lake provide the community with a variety of options from which they can select. During the final participatory workshop the community indicated that Crowduck Lake should be used as a place for teaching, supported by low intensity infrastructure to improve the learning opportunities.

Currently, Option #3 (Education Management) best suits the goals and objectives the community has for Crowduck Lake (Table 4).

Potato Island Restoration Plan

Three restoration options were developed for the community to consider for Potato Island (Table 5). The "Do Nothing" option best addresses the concerns the community had over the sacredness of Potato Island. The "Do Nothing" option is a valid option for the community to select as it currently best fits their goals and objectives for the site, which is to be left the way that it is. The community does feel that the site can still be used for teaching.

The idea of vegetation management to increase harvesting opportunities and access to NTFP's did appeal to the community. However, at the workshop the group expressed interested in finding another site "less sacred" than Potato Island but with similar physical characteristics for experimental vegetation management practices, such as burning and transplanting of Manitoba maple closer to the community.

Potentially, in the future, the community may feel comfortable with implementing vegetation management practices on other islands similar to Potato Island in the Shoal Lake area. Therefore, the restoration plans developed for Potato Island could be slightly adjusted to be suitable for the application to another garden island in the region.

The above findings indicate that the methodology developed through an iterative process enabled adaptive learning to occur amongst the research team as it undertook subsequent activities. It helped both the researcher to learn from the community and the community to learn from the researcher. Furthermore, the iterative process brought to light numerous important facts regarding the perceptions and associations that the Anishinaabe people of Shoal Lake have of their cultural landscapes. It was clear that the community's goals and objectives for the restoration of the two cultural landscapes shifted over the coarse of the research as a result of greater interaction and thinking about the sites.

Table 4. Restoration Plans for Potato Island (Options 1, 2, 3).

Site	Potato Island - Gitiiganii Minis		
Option	**Do Nothing Option**	**Teaching Sites**	**Vegetation Management and Teaching Site**
Goals	*Protect the sites sacredness.*	*Increase community health, awareness, learning and teaching opportunities.*	*Increase harvesting opportunities and access to Non Timber Forest Products and bush foods.*
Level of Restoration	No restoration.	Low intensity restoration.	Medium intensity restoration.
Objectives	a. Leave the site in its current state.	a. Provide a setting for which elders can teach children and other community members about cultural, heritage and practice at the garden islands.	a. Promote traditional management of the site.
	b. Give community more time to contemplate what is to be done with the site.	b. Make access to the site easy to achieve. Scheduled visits, transportation accessibility.	b. Create berry patch (raspberries, elderberries, etc.)
	c. Ensure the sites sacredness is protected and respected within the community.	c. Promote use of the island throughout the community. Elders and community to organize visits and special outings.	c. Establish community island garden of traditional crops.
	d. Increase awareness and respect of garden islands within community through the promotion of sacredness.	d. Collect stories and interpretive scripts detailing the importance of the island to the community and the culture of it's peoples.	d. Experiment with fire management to see effects on island vegetation.
	e. Protect islands identity from untrusted outside interests through non-action. Currently, knowledge of sites sacredness is relatively unknown outside of the community.	e. Provide community youth with the opportunity to visit and hear the stories of the island. Integrate island visits with elders into the school curriculum or include into the existing Shoal Lake Resource Institute (SLRI).	e. Restore site that community members will be able to use the site. Level of use and harvest must be controlled by the community.

Table 4. Restoration Plans for Potato Island (Options 1, 2, 3).

		f. Work with the MNR to settle land tenure issues surrounding use and management of the island.	f. Work with the MNR to settle land tenure issues surrounding use and management of the island.
Tasks	a. Leave the site as it is, no restoration activities to take place.	a. Minimal trail development to access garden and forest vegetation communities. Development and clearing of a campsite for daytime use and overnight camping trips. Building of a Wigium on site.	a. Apply community traditional knowledge to promote traditional management of the site. Working with the elders to develop a management plan for gardening at the island.
	b. Elders and community members have requested another year to think about the Potato Island.	b. Minimal trail development on the island will increase accessibility. Also, community organized trips to the island will increase individual opportunities to go to the island.	b. Burn the site with controlled fires to clear away debris and promote the development of disturbance dependant vegetation.
	c. Attempt to increase community awareness of the sacredness of the island.	c. Develop a sense of pride and respect within the community through different methods of communication such as; in the classroom, radio, word of mouth, and postings around the reserve.	c. Clear remaining debris, fertilize, till, and plant traditional crop seeds.
	d. Ensure that no community attempt to initiate any restoration/management activities at the site which will draw attention from outside interests.	d. Work with the elders and community members to collect and record stories and scripts about the island. Site visits with elders will enable community members and youth to hear the stories of the garden islands.	d. Prescribed burning within different vegetation types on the island.
		e. Work with the current band council (education counselor) and programmers of the SLRI to include site visits to aboriginal cultural landscapes as part of the curriculum for all community youth.	e. Increasing opportunities and access to non-timber forest products (berry picking site) and provide a site ready for garden establishment.

Table 4. Restoration Plans for Potato Island (Options 1, 2, 3).

		f. Begin dialogue with MNR. Make the MNR aware of your activities that community is planning to do on the island. Displaying to the MNR the importance of the islands to the culture Shoal Lake people and occupancy.	f. Begin dialogue with MNR, work on project as a joint research project with the MNR. Make the MNR aware of the activities that the community intends to undertake on the island.
People	Elders and knowledgeable community members will be involved in telling stories about the island and activities that took place there.	Community elders must first support the plan. Elders and community members must be willing to visit the sites with youth also and other community members.	Community elders must first support the plan.
	Continue to pass on the story of the islands through oral tradition.	Band Council must also support the plan. Council support is necessary to allocate sufficient funding and manpower for this undertaking. Someone within the community either needs to be paid to manage this project.	Band Council must also support the plan. Council support is necessary to allocate sufficient funding and manpower for this undertaking. Someone needs to be allocated to manage this project.
	Community members and council must respect elders requests, that no restoration or management activities are to take place on Potato Island this year.	Volunteers from the community will be required to help with the management of the site annually. Annual site maintenance can be promoted during school visits and cook-outs (feasts).	Volunteers from the community will be required to help with the management of the site annually.
		Site visits with community youth and elders must be incorporated into the current school curriculum. If this is not achievable then possibly the program could exist as an extra curricular activity housed within the SLRI.	A management committee needs to be developed to control use of the site by community members. This management would ensure that activities on the island are controlled, organized and in the best interest of the entire community.
Equipment	No equipment will be required.	Hand tools to clear and maintain campsite (s) and trail network. Mechanical tools such as a brush saw and/or chainsaw maybe used to speed up the operations	Fire suppression equipment (pulaski's, shovels, backpack pumps, wajax mark II)

Table 4. Restoration Plans for Potato Island (Options 1, 2, 3).

		Method of recording and storing stories and information to be taught at the sight (community archive). Digital media could be used to record the stories.	Hand and mechanical tools to clear and maintain campsite (s).
		Materials required for Wigium construction.	Gardening equipment (rota-tiller, hoes, shovels, etc)
		Travel arrangements must be made to ensure safe access to the islands for all community members. A large boat capable of safely transporting many passengers could be obtained by the community for site visits.	Historical seeds that the community decides that it wishes to grow.
			Fertilizers (natural or synthetic).
Timeline	No restoration or management activities will take place for one year. (April 2004 - April 2005).	The setting is already in place. However, some minor infrastructure developments could greatly improve access to all parts of the garden island.	Discussing the site and developing restoration management plans has already began the process of applying tek to management of this cultural landscape.
	Further discussions will take place between elders and community members during that year.	Development and clearing of trails and campsites begin in the early spring of 2005 or fall of 2005.	Burning the site with controlled fires will begin early spring 2005 (or when the elders deem conditions to be suitable).
		Begin community dialogue on the importance of the site. Start to promote the value of cultural teaching and practice immediately.	Clearing debris and planting of crops will depend on the type of harvesting opportunities that wished to be achieved through vegetation management.
		Colllecting stories and interpretive scripts of the island from elders can begin immediately. Site visits with elders to record on digital media.	The community will have to determine if it wishes to begin dialogue with the MNR. Whenever the community feels the time is right.

Table 4. Restoration Plans for Potato Island (Options 1, 2, 3).

		Working with the band council and the SLRI to obtain the necessary manpower and funding can be immediately.	
		The community will have to determine if it wishes to begin dialogue with the MNR. Whenever the community feels the time is right.	

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

Site	Kaagaagiishib Zaagegan - Crowduck Lake		
Option	**Do Nothing Option**	**Teaching Sites**	**Vegetation Management and Teaching Sites**
Goals	*Protect the current conditon of the site.*	*Increase community health, awareness, learning and teaching opportunities.*	*Increase harvesting opportunities and access to Non Timber Forest Products and at the same time community health, awareness, learning and teaching opportunities.*
Level of Restoration	No restoration.	Low intensity restoration.	Medium intensity restoration.
Objectives	a. Leave the site in its current state.	a. Provide a setting for which elders can teach children and other community members about wild rice and the Anishinaabe people at Crowduck Lake.	a. Promote traditional management of the site to increase and improve the wild rice production.
	b. Give community more time to contemplate what is to be done with the site.	b. Make access to the site easy to achieve. Scheduled visits, transportation accessibility.	b. Management and infrastructure development should occur to promote learning, teaching and harvesting opportunities.
	c. No actions should be taken place at Crowduck Lake. Community wishes not to draw attention to the site.	c. Promote the culture and practice surrounding wild rice throughout the community. Encourage youth. Elders and community to organize visits and special outings.	c. Restore site that community members will be able to use the site. Level of use and harvest must be controlled by the community.
		d. Collect stories and interpretive scripts detailing the importance Crowduck Lake and wild rice to the community and the culture of it's peoples.	d. Develop a management unit within the community to ensure that the wild rice will benefit all potential users.

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

		e. Provide community youth with the opportunity to visit and hear the stories of the Crowduck Lake, management practices, ceremonies, and harvesting associated with wild rice. Integrate lake visits with elders into the school curriculum or include into the existing Shoal Lake Resource Institute (SLRI).	e. Work with the MNR to settle land tenure issues surrounding use and management of the lake, surrounding shorelines, access points, and controlling water levels within the lake.
		f. Work with the MNR to settle land tenure issues surrounding use and management of the lake, surrounding shorelines, and access points.	
Tasks	a. Leave the site as it is, no restoration activities to take place.	a. Clearing of existing campsites for daytime use (cook-outs) and overnight camping trips. Fireplace and benches for seating. Building of a Wigium on site.	a. Apply community traditional knowledge to promote traditional management of the site. Working with the elders to develop a management plan for increased production of wild rice at Crowduck.
	b. Elders and community members will be provided with more time (if needed) to think about the site .	b. The community should purchase some canoes to be used to access the campsites and the wild rice. Also, community organized trips to Crowduck Lake will increase interest and opportunities of individuals.	b. Clear out debris and sediment from inlets and outlets of Crowduck Lake that are impeding a successful and abundant annual wild rice production.
		c. Develop a sense of pride and respect within the community through different methods of communication such as; in the classroom, radio, word of mouth, and postings around the reserve.	c. Develop a management system within the community to control water levels to ensure plentiful wild rice each year.

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

		d. Work with the elders and community members to collect and record stories and scripts about the island. Site visits with elders will enable community members and youth to hear the stories of Crowduck Lake and wild rice and have a hands on learning experience.	d. Develop a sense of pride and respect within the community through different methods of communication such as; in the classroom, radio, word of mouth, and postings around the reserve.
		e. Work with the current band council (education counselor) and programmers of the SLRI to include site visits to aboriginal cultural landscapes as part of the curriculum for all community youth.	d. Work with the elders and community members to collect and record stories and scripts about the island. Site visits with elders will enable community members and youth to hear the stories of Crowduck Lake and wild rice and have a hands on learning experience.
		f. Begin dialogue with MNR. Make the MNR aware of your activities that community is planning to do with Crowduck Lake. Show that the people of Shoal Lake are actively using Crowduck Lake and have occupancy.	e. Work with the current band council (education counselor) and programmers of the SLRI to include site visits to aboriginal cultural landscapes as part of the curriculum for all community youth.
			f. Begin dialogue with MNR, work on project as a joint research project with the MNR. Make the MNR aware of the activities that the community intends to undertake on the island.
People	Continue to pass on the story of the Crowduck Lake and wild rice through oral tradition.	Community elders must first support the plan. Elders and community members must be willing to visit the sites with youth also and other community members.	Community elders must first support the plan.

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

	Community members and elders are encouraged to visit the site together.	Band Council must also support the plan. Council support is necessary to allocate sufficient funding and manpower for this undertaking. Someone within the community needs to be paid to manage this project.	Band Council must also support the plan. Council support is necessary to allocate sufficient funding and manpower for this undertaking. Someone needs to be allocated to manage this project.
	Community members and council must respect elders requests, that no restoration or management activities are to take place at Crowduck Lake this year.	Volunteers from the community will be required to help with the management of the site annually. Annual site maintenance can be promoted during school visits and cook-outs (feasts).	All wild rice harvesters in the community must be in agreement with the goals of the Crowduck Lake wild rice field.
		Site visits with community youth and elders must be incorporated into the current school curriculum. If this is not achievable then possibly the program could exist as an extra curricular activity housed within the SLRI.	Volunteers from the community will be required to help with the management of the site annually.
			Project manager will hold bi-annual meetings with elders and interested community members to discuss issues involving Crowduck. Such meetings will enable all community members to take part in the decision making process for the site.
Equipment	No equipment will be required.	Hand and mechanical tools to clear and maintain campsite (s) and access points.	Hand and mechanical tools to clear and maintain campsite (s) and access points.
		Method of recording and storing stories and information to be taught at the sight (community archive). Digital media could be used to record the stories.	Large mechanized equipment will be necessary to remove debris and sediment from inlets and outlets (such as an excavator).
		Materials required for Wigium construction.	Materials required for Wigium construction.

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

		Canoes need to be purchased to access the campsites and the wild rice. It may be beneficial for the SLRI to purchase a larger Prospector style tent for outings.	Canoes need to be purchased to access the campsites and the wild rice. It may be beneficial for the SLRI to purchase a larger Prospector style tent for outings.
		A van or bus can be obtained to get all the participants to one of the two access points.	A van or bus can be obtained to get all the participants to one of the two access points.
			Method of recording and storing stories and information to be taught at the sight (community archive). Digital media could be used to record the stories.
Timeline	No restoration or management activities will take place for one year. (April 2004 - April 2005).	The setting is already in place. However, campsites need to be prepared for visitors and some equipment such as canoes needs to be purchased by the community.	The community must determine to which level of vegetation management/education management it wishes to develop at Crowduck Lake.
	Further discussions will take place between elders and community members during that year.	Development and clearing of campsites begin in the early spring of 2005 or fall of 2005.	Dialogue with the MNR will have to be initiated well before any on the ground activities begin due to the nature of the restoration activities.
		Begin community dialogue on the importance of the site. Start to promote the value of cultural teaching and practice immediately.	Begin community dialogue on the importance of the site. Start to promote the value of cultural teaching and practice immediately.
		Collecting stories and interpretive scripts of the island from elders can begin immediately. Site visits with elders to record on digital media.	Collecting stories and interpretive scripts of the island from elders can begin immediately. Site visits with elders to record on digital media.
		Working with the band council and the SLRI to obtain the necessary manpower and funding can be immediately.	Working with the band council and the SLRI to obtain the necessary manpower and funding can be immediately.

Table 5. Restoration Plans for Crowduck Lake (Option 1, 2, 3).

		The community will have to determine if it wishes to begin dialogue with the MNR. Whenever the community feels the time is right.	

Chapter 6 – Conclusions

Findings

The purpose of this research was to identify and document, with guidance from community members and elders, important aboriginal cultural landscapes in the Shoal Lake area which tell the story of Iskatewizaagegan people. Restoration plans for the two priority cultural landscapes, identified by the community, were developed combining both traditional ecological knowledge and documentation data collected from the sites.

The first objective of the study was to identify, map, and perform preliminary documentation with assistance from the elders and community, five priority sites of aboriginal cultural landscapes which tell the story about land-based cultural history of the Iskatewizaagegan people.

During the first summer of fieldwork, preliminary documentation included the collection and documentation of biophysical characteristics and cultural and historical data for the five sites that included, Crowduck Lake, Potato Island, High Lake and the High Lake Access Trail, Stull Island, and Blueberry harvesting patches. Biophysical information of the sites was collected using a rapid life sciences inventory which included; transect walks, aerial photography interpretation, UTM point collection, photographs, and vegetation identification. Cultural and historical information was collected through site visits with elders, other interested community members, and archives. The preliminary documentation indicated that the five cultural landscapes possess unique physical characteristics such as vegetation, evidence of human interaction, and size. Furthermore, site visits with elders and community members revealed the unique stories, histories and cultural relationships the people of the Iskatewizaagegan have with these landscapes.

During participatory workshops, the preliminary scoping data for the five cultural landscapes was presented to the community for comment and feedback. Using the criterion for prioritising cultural landscapes that had been previously developed with the community, the sites were ranked for their ability to satisfy goals and objectives set by the community. Through this process, the community selected Crowduck Lake and Potato Island as their two priority cultural landscapes for further documentation and restoration within the terms of reference for this study.

The second objective of the study was to conduct a biophysical and cultural documentation of the two priority cultural landscapes identified by the elders using documentation methods developed through the iterative research process. Collecting biophysical data and cultural data of the sites is a crucial step necessary in during the development of a restoration plan. A biophysical and cultural documentation was achieved through the development of site-specific methodologies for Crowduck Lake and Potato Island by combining scientific and traditional knowledge of ecosystems and landscapes. Detailed site-specific cultural/historical and biophysical data was collected and presented to the community for validation, feedback, and reflection.

The main findings of the biophysical and cultural/historical documentation tell us that cultural landscapes have unique physical and cultural characteristics. In order not to generalize these unique characteristics methodologies for documenting cultural landscapes need to be site-specific. However, some methods of documentation such as site visits with elders, oral histories and stories, transects, vegetation identification and collection were found practical at both sites. The collection of biophysical data can be useful for the future monitoring of change to a landscape resulting from restoration or non-action over time. Therefore, selecting the appropriate characteristics for the collection of biophysical data is vitally important.

Documentation of Crowduck Lake indicates that the wild rice growing there is patchy and not as productive as it may once have been, according to cultural and historical accounts. Biophysical data reveals that the Crowduck Lake has the potential to have all of the necessary characteristics for producing wild rice (shallow and clear waters, organic muck bottom, relatively competition free, and drainage inlets/outlets); however, currently, due to a lack of human intervention at the site, the abundance of wild rice is in decline.

The documentation findings of Potato Island clearly indicate that past human practice effected vegetation and soil regimes on the island. There are two vegetation regimes on the island with distinct differences between vegetative communities (garden and forest). The forest community has numerous trees, shrubs, and herbaceous species typical for this region. However, the garden community only has four species of which three are known to be disturbance originated.

Analysis of soils collected from both the garden and forest vegetative communities further strengthened the evidence of human modification on this site. Soil analysis revealed striking differences in the level of nutrient content of the two soils, indicating, that the garden soils have become static due to a lack of nutrient cycling from woody vegetation. Also, it was found that the garden soil pit has one less soil layer than the forest pit, indicating, that likely the garden soils had been tilled, thus, combining two layers of soil into one. Furthermore, it was discovered that both the garden and the forest soils contained very high levels of bray P and Aluminium, potentially resulting from past over fertilization. And finally, fragments of charcoal were found in the forest pit but not the garden pit, indicating that through many years of continual burning any woody debris in the upper layer of tilled soils would have been eliminated. Therefore, these findings indicate that vegetation can be used to identify human occupied sites. Ideally photographic interpreters would be able to identify these sites using aerial photos, which could then be verified on the ground by field workers.

The research indicates that certain vegetation patterns can be an indicator of long term human occupation especially in relation to islands and other where camps were established. Disturbance origin species such as raspberry and nettle found on Potato Island clearly indicate human habitation, the use of fire for vegetation management. The ability to identify such disturbance species and vegetation patterns may assist in the ability to locate and identify human modified sites and cultural landscapes.

The third objective of the study was to develop ecological restoration plans for Crowduck Lake and Potato Island integrating traditional ecological knowledge from elders, other community members and the biophysical inventories through the iterative research process.

Participatory workshops were used to discuss and develop goals and objectives for the restoration plans to be developed for Crowduck Lake and Potato Island. During the workshops, all findings from the biophysical and historical documentation were presented. Preliminary restoration plans were presented to initiate discussion and thinking about the restoration of these two sites. During the discussion, it became clear that the community felt uncomfortable with the notion of restoring the cultural landscapes for vegetation management and commercial tourism. Elders felt that initially, land management and restoration of cultural landscapes needed to focus on using the site for teaching. Furthermore, through these workshops it had become apparent that Potato Island had become a sacred site. Some within, the community preferred not to disturb the site through vegetation management nor by having people walk on the site. One elder was concerned that there may have been people buried on the island. The community did not have the same sense of sacredness about Crowduck Lake, but rather, they felt the site should be used for teaching.

Three restoration plans were developed for each site to suit different goals, levels of restoration intensity, and the objectives of the community. Providing three different options for each site (Do Nothing, Teaching Sites, and Vegetation fits their current goals, objectives, budgetary constraints, and desire to implement restoration. With each option the level of intensity and magnitude of the restoration increases so that the desired objectives can be realized.

The fourth and final objective was to develop teaching and interpretation opportunities through restoration design on the two sites to be restored for the purpose of education and natural-cultural heritage awareness.

Restoration plans were developed which emphasize increasing opportunities for learning and teaching at Crowduck Lake and Potato Island. Teaching and interpretation opportunities have been incorporated into restoration Options #1: (Teaching Sites) and Option #2: (Vegetation Management and Teaching Sites). The objectives listed in Options 1 and 2, for both cultural landscape sites promote a teaching setting, increased access to sites, story collection, and increased opportunities to visit the site. Tasks and equipment outline the infrastructure and tools needed to achieve these objectives. And finally, the restoration plans identify who within the community needs to become involved in the restoration plan if it is to be successful.

Restoration Guidelines

Through the course of this study, guidelines were developed to assist future cultural landscape documentation and restoration plan development. Through this project, it is clear that good ecological restoration plans for cultural landscapes entail negotiating the best possible outcome for a specific site based on the integration of traditional ecological knowledge, biophysical data, and participant goals and objectives. It is the process involved with documenting, designing and implementing successful restoration plans that is the most important part, not necessarily the end product.

Process oriented restoration enables bringing people together to discuss and make decisions about their cultural landscapes. Thus, participation in the process has already begun to achieve community goals and objectives for the project by restoring memories and cultural linkages to the land.

Methodology Reflections

Initially this project was intended to focus on the technical aspects (i.e. western science) of documenting cultural landscapes and developing site-specific restoration plans for cultural landscapes within the Iskatewizaagegan. However, it quickly became clear that gathering only technical information would not effectively tell the story of the Iskatewizaagegan people's interactions and connections to their cultural landscapes.

Furthermore, it became clear that in order for restoration to occur the Iskatewizaagegan people had to become engaged and lead the direction of the project.

The success of this project is in part the iterative process that was used for its development, design, and execution. During the initial stages of the project building relationships with community members was crucial. Establishing a relationship made with community elders and other interested people was made easier as a result of the previous research completed with the community. A network of elders and community researchers was for the most part already established.

During the first summer of research with the community I found that living in a tent at one of the community's more outgoing and popular personalities facilitated in quickly developing solid friendships and working relationships with community members. An eager willingness to learn about the community, the land, and the lake seemed to increase my invitations for day trips to interesting places and sites throughout the Iskatewizaagegan. I found that community members respected an outsider who was interested in working with their community, but at the same time didn't act overly serious and was willing to have a laugh and share a few jokes. Furthermore, community members were generally very interested with general objectives of the research project.

I found that working with community members of all ages really increased community interest and curiosity surrounding the research project. As a result of interest and curiosity some people in the community began to approach the research team to provide information or request participating in a site visit. Their participation increased knowledge sharing and discussion about the cultural landscapes. Furthermore, increased participation by community members and elders helped to direct the next phase of the research project through participatory workshops. I feel that participatory workshops (although sometimes difficult to coordinate) worked extremely well for the dissemination and sharing of information, ideas, and discussion. Participatory workshops also provided a nice way to continue the friendly working relationship between the University research team and the community members involved in the project.

Many different community members and elders attended the participatory workshops at different times throughout the research project which seemed to promote the project at different levels with the community members. For the majority of the research there was a core group of elders and community members of about eight who consistently participated. These participants provided excellent feedback throughout the course of the project because they understood where the project started, the goals and objectives of the project, and changes made to the research methods along the way.

Through the iterative process the community ultimately had almost complete control over the outcome of this research project. All stages of the project were participant driven and goal oriented. The participatory workshops proved to be an excellent mechanism for creating a forum where dialogue could occur regarding data and ideas. Adapting to the unstructured outcomes of the iterative research process, at times, proved difficult. Throughout the project, the community goals and objectives continually shifted and as a result methodologies also had to shift to achieve desired outcomes. The adaptive iterative research methodology proved invaluable for the success of this project.

My research focus throughout the process was focused on working with the community members and elders to document and develop restoration plans for identified cultural landscapes. During my time with the community I was able to gain a much more in depth understanding of these sites through site visits with elders and community members. I began to understand that these sites have a much deeper meaning to the community members than to a non-community member. The level of cultural and spiritual connectivness displayed by the IIFN community members illustrates the importance of identifying, protecting, and providing access to these cultural landscapes. After numerous visits to garden islands my eyes began to pick out other islands with similar vegetation characteristics and questioning their connection to the community, and, in some cases I was able to identify garden islands.

Within Ojibway communities the mode of knowledge transmission is based on working through and with respected and knowledgeable people where relationships have been developed. This, of necessity, creates a limitation and potential biases within the research approach and method. I worked with Edward Mandamin as my mentor within the community who helped me to make contacts with his family, other community elders and members who were willing to work with us on the research project. This group included many younger community members, older community members, and community elders. This methodology was not attempting to gain a representative sample of community members, however, even in this group there was a wide range of opinions being discussed which I attempted to address through the development of the three restoration plan options.

Recommendations

The community needs to develop commitment towards the documentation and restoration of cultural landscapes to suit their goals and objectives (teaching). Elders felt that initially land management and restoration of cultural landscapes needed to focus on using the site for teaching youth and other interested visitors. Elders were less comfortable in thinking about these sites as places for commercial tourism. However, there was some consensus that these sites may serve as a place to help other people better understand their history and cultural practices and thus build respect for Anishinaabe people and way of life.

It is clear that any restoration activities are difficult off the reserve. For the community to become actively engaged in the restoration of their cultural landscape sites, a greater sense of security and trust must be established with land management agencies (OMNR) and other potential resource users (cottage groups, and mining) in the Shoal Lake region. Currently, the community avoids any type of 'known' activities on landscapes outside of the reserve boundaries for fear of giving away cultural knowledge, and creating increased tensions over lands.

If the community wishes to continue the documentation and restoration of cultural landscapes it will be necessary for a group within the community to take responsibility for the process with the support of the Chief and council. This will be necessary in order to sustain the effort and obtain the funding required for restoration efforts. Once the organization capacity has been created, it will also be necessary to create a partnership with the MNR for restoring cultural landscape sites. By working together, the tense relationship that currently exists between the two sides, may become a relationship of learning and understanding; thus benefiting the community and the MNR in the process. Increased documentation and restoration of cultural landscapes will enable the community to developing an excellent setting to teach people about Anishinaabe history and culture on Shoal Lake. In the future, a network of cultural landscape sites on Shoal

Lake will provide the opportunity for the community to lead teaching adventures for their youth and visitors. It is hoped that such learning experiences will build the understanding of Anishinaabe concepts of treaties and other things related to their history on Shoal Lake.

In further review of the literature it was noticed that there remains a gap in the literature related to this research. It was evident that the literature failed to address the practice of integrating TEK into the design and development of site-specific ecological restoration plans. Current literature suggests that restored systems are ones that have experienced some physical change as a result of restoration. However, through this research it becomes clear that the process of restoration does not necessarily mean restoring the landscape to a target ecosystem defined by the community. The research showed that restoration of landscapes is as much a process of restoring the relationships associated with that landscape. Therefore, once these memories of lands are restored more cultural landscapes will begin to be identified. Successful restoration plans must begin by reestablishing memories of a given landscape.

Future Research Directions

To strengthen the findings of this study, more documentation and restoration plans need to be done on other significant cultural landscape sites by applying the guidelines and implementing the iterative process that was developed during this project. Furthermore, to test the findings from this study, monitoring of Crowduck Lake and Potato Island for change after restoration or non-restoration activities should take place. Monitoring change would provide feedback on the quality of the methods used and the choice of characteristics documented for baseline data collection.

The theoretical implication of my research is that more attention be paid both to spatial and temporal issues of scale. Spatially, cultural landscapes exist at different scales. At the smaller scale cultural landscapes can exist as unique sites such as Potato Island. Whereas, at the larger scale a cultural landscape can be considered the area in which a peoples considers its territory within which numerous smaller scale nodes of activity may exist. Temporal relationships within cultural landscapes are in a state of change. Currently, not enough attention focuses on the changes that occur within a cultural landscape over-time. Restoration practice today primarily focuses on what the site should look like and ignores relationships between people and place.

Further research also needs to be done to identify policy opportunities and constraints for First Nation management of cultural landscape sites off the reserve. Protected areas and forest management policies need to be reviewed to identify existing policy that may facilitate or hinder any First Nation plans or actions. Linking this data with the iterative process for documenting and developing restoration could provide a model for how Aboriginal people can become actively engaged in the management of cultural landscapes.

LITERATURE CITED

Able, K and J. Friesen. 1991. *Aboriginal Resource Use in Canada, Historical and Legal Aspects*. University of Manitoba Press, Winnipeg.

Aiken, S.G., P.F. Lee, D. Punter and J.M. Stewart. 1988. *Wild Rice in Canada*. NC Press Limited, Toronto.

Allison, S.K. 2004. What do we mean when we talk about ecological restoration? *Ecological Restoration* **22**(4):281-286

Anderson, K., and Thomas C. Blackburn. 1993. *Before the Wilderness: Environmental Management by California Indians*. Ballena Press, New York

Anderson, K. 1996. Tending the wilderness. *Restoration & Management Notes* **14**(2):154-166.

Anderson, K. and M.G. Barbour. 2003. Simulated Indigenous management: A new model for ecological restoration in national parks. *Ecological Restoration* **21**(4): 269-277.

Bender, B. 1996. "Landscape." In *Encyclopaedia of Social and Cultural Anthropology*. Alan Barnard, Jonathan Spencer eds. Routledge, New York.

Berkes, F. 1999. *Sacred Ecology: Traditional Ecological Knowledge and Resource Management*. Taylor and Francis, Philadelphia.

Berkes, F. and Jolly, D. 2001. Adapting to climate change: social-ecological resilience in a Canadian Western Arctic Community. *Conservation Ecology* **5**(2).

Boyd, R. ed. 1999. *Indian, Fire, and the Land in the Pacific Northwest*. Oregon State University Press, Corvallis, Oregon.

Buggey, S. 1999. *An Approach to Aboriginal Cultural Landscapes*. Historic Sites and Monuments Board of Canada, Ottawa.

Cairns, J., Jr., ed. 1988. *Rehabilitation of Damaged Ecosystems*, Vol. 1 & 2. CRC Press, Florida.

Chambliss, C. E. 1940. The botany and history of *Zizania aquatica* L (wild rice). J. Washington. Academy. *Science*. **30**:185-205.

Cizek, P. 1993. Guardians of manomin: aboriginal self-management of wild rice harvesting. *Alternatives* **19**(3).

Cronon, W. 1983. *Changes in the Land: Indians, Colonists, and the Ecology of New England.* Hill and Wang, New York.

Davidson-Hunt, I.J., L.C. Duchesne, J. Zasada. 2001. Non-timber forest products: Local livelihoods and integrated forest management. In L.C. Duchesne, J.C. Zasada and I.J. Davidson-Hunt. Eds. *Forest Communities in the Third Millennium: Linking Research, Business, and Policy toward a Sustainable Non-timber Forest Product Sector.* Pp.1-12. United States Forest Service: Minneapolis

Davidson-Hunt, I. 2003a. Journeys, Plants and Dreams: Adaptive Learning and Social-Ecological Resilience. Unpublished Ph.D. Thesis, University of Manitoba, Winnipeg.

Davidson-Hunt, I. 2003b. Indigenous lands management, cultural landscapes and Anishinaabe people of Shoal Lake, Northwestern Ontario, Canada. *Environments* **31**(1):21-41

Davidson-Hunt, I. and Berkes. 2003. Learning as you journey: Anishinaabe perception of social ecological environments and adaptive learning. *Conservation Ecology* **8**(1): 5. Available [on-line] http://www.ecologyandsociety.org/vol8/iss1/art5/

Dick, B. 2003. *What can Action Researchers Learn from Grounded Theorists*? Paper Submitted to the AEMLU Conference, Southern Cross University, New Zealand. February 18, 2002.

Gadgil, M., Berkes, F., and Folke, C. 1993. Indigenous knowledge for biodiversity conservation. *Ambio.* **22**:2-3.

Gibbs, A. 2001. Social work and empowerment-based research: possibilities, process and questions. *Australian Social Work* **54**(1):29-39

Higgs, E. 1997. What is good ecological restoration. *Conservation Biology* 11(2):338-348.

Higgs, E. 2003. *Nature by Design: People, Natural Process, and Ecological Restoration.* The MIT Press, Cambridge, Massachusetts.

Holzkamm, T. E. 1986. In Ojibwa horticulture in the upper Mississippi and boundary waters. *Papers of the 17th Algonquin Conference.* Pp143-154. Carelton University Press, Ottawa.

Holzkamm, T. and L. Waisberg, 1993. Agriculture and One 19th Century Ojibwa Band: "They Hardly Ever Loose Sight of Their Field". In *Papers of the 24th Algonquin Conference.* Pp 407-427. Carelton University Press, Ottawa.

Ingold, T. 2000. *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill.* Routledge Press, London.

Kimmerer, R.W. 2000. Native knowledge for Native ecosystems. *Journal of Forestry*, **98**(8): 4-9.

Kinew, K. A. 1995. Manito Gitigaan Governing in the Great Spirit's Garden: Wild Rice in Treaty #3, and example of indigenous government public policy making and intergovernmental relations between the Boundary Water Anishinaabeg and the Crown, 1869-1994. Unpublished Ph.D. Thesis, University of Manitoba, Winnipeg, Manitoba, Canada.

Lee, P. F. 1986. Methodology for the Selection of Sites for the Artificial Dissemination of Wild Rice in Northwestern Ontario. Ontario Ministry of Natural Resources.

Lee, P.F.Stewart, J.M. 1981. Ecological relationships of wild rice, (*Zizania aquatica*). A model for among-site growth. *Canadian Journal of Botany* **59**:2140-2151.

Lewis, H.T., and Ferguson, T.A. 1988. Yard, corridors, and mosaics: How to burn a boreal forest. *Human Ecology* **16**(1):57-76.

National Parks of Canada. 1994. Guiding Principles and Operational Policies. Ottawa: Department of Canadian Heritage. In Buggey, S. 1999. *An Approach to Aboriginal Cultural Landscapes*. Ottawa: Historic Sites and Monuments Board of Canada.

Munt, R. 2002. Building community participation. Stronger Families Learning Exchange Bulletin no.2 Spring - Summer 2002:2-3. Available [on-line] http://www.aifs.gov.au /sf/pubs/bull2/rm.html

Paine, C., and Taylor, J.R. 1995. Cultural Landscape Assessment: A Comparison of Current Methods and their Potential for Application within the Niagara Escarpment. Research Report, University of Guelph, Ontario.

Pyne, Stephen J. 1982. *Fire in America: A Cultural History of Wildland and Rural Fire.* University of Washington Press: Seattle.

Roberts, W., Mandamin, E., Davidson-Hunt, I., and F. Berkes. 2003. *The Cultural Landscape of Iskatewizaagegan No.39 First Nation: The Natural and Cultural History of Five Selected Sites.* Technical Report prepared for the Sustainable Forest Management Network.

Royal Botanical Gardens. 1998. Marsh Vegetation in Cootes Paradise: Vegetation Monitoring and Restoration Techniques at Royal Botanical Gardens, Hamilton, Ontario, Canada. Fact Sheet. Available [on-line] http://www.rbg.ca/pdf/MARSHVEG.pdf

Ruta, T.C. 2002. Forest Patches and Non-Timber Forest Products in the Boreal Forest: A Case Study from the Shoal Lake Watershed, Northwestern Ontario. Masters Thesis, University of Manitoba.

Ruppert, D. 2003. Building partnerships between american indian Tribes and the National Park Service. *Ecological Restoration* **21** (4):261-263.

Ryden, K.C. 1993. *Mapping the Invisible Landscape: Folklore, Writing, and the Sense of Place.* University of Iowa Press, Iowa City.

Sims, R.A., W.D. Towill, K.A. Baldwin, P. Uhlig and G.M. Wickware. 1997. Field Guide to the Forested Ecosystem Classification for Northwestern Ontario. OMNR, Ontario. NWST Field Guide FG-03.

Society for Ecological Restoration. 2000. Guidelines for Developing and Managing Ecological Restoration Projects. Available [on-line] www.ser.org

Society for Ecological Restoration. 2002. The SER Primer on Ecological Restoration, First Edition. Available [on-line] www.ser.org

Society for Ecological Restoration. 2005. Ecological Restoration – a Means of Conserving Biodiversity and Sustaining Livelihoods. Available [on-line] www.ser.org/content/Globalrationale.asp.

Steen-Adams, M. 2002. Applying environmental history to ecological restoration: A case study from Zion National Park. *Ecological Restoration* **20**(4):252-261.

Striplen, C. and DeWeerdt, S. 2002. Old science new science: Incorporating traditional ecological knowledge into contemporary management. *Conservation in Practice*, **3**(3).

Underwood, S., L. Arguello, and N. Siefkin. 2003. Restoring ethnographic landscapes and natural elements in Redwood National Park. *Ecological Restoration* **21**(4):278-283.

Vale, T. R.(ed.) 2002. *Fire, Native Peoples, and the Natural Landscape.* Island Press, Washington DC, USA.

Vennum, T. Jr. 1988. *Wild Rice and the Ojibway People.* Minnesota Historical Society, St. Paul, Minnesota, USA.

Waisberg, L.G. 1984. An ethnographical and historical outline of the rainy river ojibway. In William C. Noble, (ed). *An Historical Synthesis of the Manitou Mounds Site on the Rainy River, Ontario.* Pp. 119-274.

MANUSCRIPT SOURCES

Kenora Public Library

Rat Portage Miner
Kenora Miner and News

PERSONAL COMMUNICATIONS

Ainspac, L. 2003. Iskatewizaagegan Independent First Nation No. 39, August, 2003.

Bowling, C. 2004. Ontario Ministry of Natural Resources Kenora, January, 2004.

Flaten, D. 2004. Faculty of Soil Science, University of Manitoba., February, 2004

Greene, Robin. 2002. Iskatewizaagegan Independent First Nation No. 39, Summer.

Greene, Robin. 2003. Iskatewizaagegan Independent First Nation No. 39, Summer.

Kejick, Patrick. 2003. Iskatewizaagegan Independent First Nation No. 39 , Summer.

Mandamin, Edward, Sr.. 2003. Iskatewizaagegan Independent First Nation No. 39, Summer.

Mandamin, Stephen. 2003. Iskatewizaagegan Independent First Nation No. 39, Summer.

Manseau, M. 2003. Natural Resources Institute, University of Manitoba , July, 2003.

Redsky, J. 2003. Iskatewizaagegan Independent First Nation No. 39, Summer.

Shay, W. 2003. Faculty of Archaeology, University of Manitoba, February, 2003.

APPENDICES

Appendix 1 - Modified Guidelines for Restoration

Conceptual Planning Phase of Restoration

Conceptual planning identifies the reasons why restoration is needed and the general strategy for conducting it. Conceptual planning is conducted when restoration appears to be a feasible option but before a decision has been made to exercise that option. The written conceptual plan captures the essence and character of the potential restoration

	Steps	Description/Methods
1	Identify potential location and boundaries of areas to be restored and document aspects of the landscape surrounding the sites.	Community will identify potential cultural landscapes for restoration. Begin scoping documentation using aerial photos, maps and most importantly local traditional knowledge.
2	Collect a story of the landscapes history and why its current state is worthy of restoration. (Why to restore?)	In cooperation with the community, identified cultural landscapes are preliminarily documented (historical and site descriptions are collected). Cultural, historical, and societal importance to the community. Community will determine if it wishes to undertake restoration at selected sites.
3	Envision the type of ecosystem to be restored and the type of restoration project to occur.	Depends on the goals and objectives of the community. Goals and objectives will determine the type of restoration.
4	Identify the restoration goals pertaining to social and cultural values.	Established through participatory workshops, site visitations with community members and elders. Restoration goals may change throughout the duration of the project. A process of continual feedback is necessary.
5	Development of Prioritization Criteria	Development of a criterion designed to prioritize each cultural landscape. The communities' initial goals and objectives for the project determine the how each site will be prioritized.
6	Identify Site Conditions in Need of Repair.	Workshop (goals and objectives) will determine site conditions to be restored. Site Documentation will identify some of the issues in need of restoration.
7	Identify the stressors needing regulation or re-integration (physical and social).	Stories and histories collected through site visits and workshops with elders and community members.

8	Identify the plant and animal species that may be required for reintroduction or augmentation.	Site documentation will provide necessary biophysical information. Goals and objectives for the project will determine the level of reintroduction or augmentation.
9	Identify the present and future landscape restrictions.	Present and future landscape restrictions will be determined by location, type and level of restoration project initiated by the community.
10	Identify and permit restrictions and legal constraints	Legal restraints and permit restrictions will depend on the location (Crown land or reservation) and type of restoration (low interventions, high interventions, land management issues) project to be undertaken.
11	Identify the anticipated duration of the restoration project	Depends on the goals and objectives of the community. Type and degree of restoration plan selected.
12	Identify long-term protection and management strategies	Depends on the goals and objectives of the community. May be impacted by current land use permits or management strategies already in place.

Preliminary Task Phase of Restoration

Preliminary tasks are those upon which project planning depends. These tasks form the foundation for well-conceived restoration designs and programs. Preliminary tasks are fulfilled after conceptual planning results in the decision to proceed with the restoration project.

	Steps	Description/Methods
1	Document the existing site conditions and collection of a biophysical inventory.	Complete biophysical documentation of the sites that community wishes to implement restoration activities.
2	Interpretive Potential (detailed version)	Detailed cultural, historical, and biophysical information collected through stories, site visitations, and documentation will be used to assess the interpretive value of each cultural landscape.
3	Document the years in which impacts to the site occurred.	Collected through stories and site visitations with community elders, members and historical archives (internal and external).

4	Collect information regarding the recruitment, maintenance and reproduction of key important species	Workshop - goals of restoration will help to determine which species need to be restored and maintained.
5	Determine if the initial project goals and the type of restoration are realistic, or need modification.	Continual feedback through workshops will help to determine if community still holds initial goals and objectives, or if new goals and objectives have developed.
6	Prepare a list of objectives designed to achieve restoration goals. All objectives must be measurable, clear, and have a timeline.	Final objectives will depend on the final goals of the restoration project. These goals and objectives will be determined during feedback workshops. Ultimately the community will determine these goals.
7	Establish a relationship with the local residents and other stakeholders.	Working partnerships, research partnerships with community and governmental agencies.
8	Plan for public participation in project planning and implementation.	Workshops determine goals and objectives of the project. Continual feedback through community member participation with the project and scheduled workshops. The community determines the outcome of the project.

Installation and Evaluation Phase of Restoration

Installation plans describe how the project will be implemented, i.e., project design. Project installation fulfils installation plans. The installation of a project does not guarantee that its objectives will be attained or its goals achieved. Restored ecosystems are dynamic and require evaluation within the context of an indefinite temporal dimension.

	Steps	Description/Methods
1	Identify all actions and treatments needed to obtain the project goals defined in the preliminary task phase.	Actions and treatments will depend on the goals defined in the preliminary task phase.
2	Identify all amount of restoration that can be achieved passively, because many signs of restoration are achieved through passive action ie. The natural propagation of some plant species.	Passive action may achieve project goals such as eco-tourism, historical awareness, education, and the reclassification of the site under provincial standards. Non-passive action may be required in some cases for cultural landscape restoration.
3	Develop empirical performance standards and monitory protocols that measure the attainment of each objective.	Dependent on goals selected. A performance standard (also called a design criterion) provides evidence on whether or not an objective has been attained.

4	Recommend post-implementation tasks such as the weed removal, and continued water level controls.	Tasks that ensure the continual success of the initial cultural restoration.
5	Perform monitoring as required to document the attainment of performance standards.	Monitoring should not be required until monitoring data will be meaningful for decision-making.
6	Recommend necessary adaptive management procedures to respond to the unpredictability of restoration plans.	Depends on the level of implementation selected during the workshops. A restoration plan must contain built-in flexibility. If reconnaissance or monitoring reveals that objectives are not being met, then alternative interventions may have to be attempted.
7	Determine if project goals were met, including those for social and cultural values.	Based on monitoring data and other documentation, evaluate the restoration with respect to its project goals

Appendix 2 -

Criterion for Prioritizing Cultural Landscapes - Potato Island.

Criteria		Cultural Landscape Potato Island
Proximity to the community (safety for group travel and ease of access).	a	Located approximately 7 km's south on Shoal Lake from the landing at IIFN.
	b	Accessible most days by small boat, so long as winds are not high.
	c	Close enough to community to be easily visited and maintained by community members.
Infrastructure required for to achieve goals and objectives	a	No existing infrastructure.
	b	No electrical or septic potential.
	c	Limited space for outhouse development.
	d	Campsite locations available.
	e	Lake water for daytime and overnight consumption.
Importance of the site to elders and community members for cultural and historical value	a	Elders and community members have strong connection to the site.
	b	Envision the re-establishment of island garden.
	c	Interest in using the site for transplant / re-establishment of Stull Islands Manitoba Maples.
	d	Elders and community members believe the island would be a great place for teaching and learning of Anishinaabe culture and traditions.
Willingness to share site with others (education and eco-tourism)	a	Elders and community members are proud of the island gardens, and their local heritage on Shoal Lake.
	b	Most would be willing to share stories with outsiders.

Potential for quality and interesting interpretation.	a	Knowledge of the Potato Island is quite strong amongst elders and community members. There exists a potential for some interesting stories about the site, and cultural activities related to the site.
	b	Site has many interesting physical features that could be of interest such as: old engine, artefacts, vegetation patterns and even birds.
	c	Connection to the residential school.
	d	Strong potential for restoration at the site to be very effective in achieving desired goals and objectives.
Potential to gain managerial control of the site	a	Potato Island is a small and currently crown controlled island located on a portion of Shoal Lake where there is currently little development concerns.
	b	The OMNR has 'unofficially' voiced to the community that the community could pursue some management activities at the island without the ministries direct approval.
	c	Traditional land use is clearly evident and should provide IIFN with the necessary leverage it would need to place the Potato Island under a different land classification providing more security to community actions at the site.

Criterion for Prioritizing Cultural Landscapes - Stull Island.

Criteria		Cultural Landscape Stull Island
Proximity to the community (safety for group travel and ease of access).	a	Stull Island is located approximately 17km south on Shoal Lake from the landing of IIFN.
	b	Accessing Stull Island safely requires very calm winds, which are unpredictable on such a large and open lake.
	c	Travel time to Stull Island is at least 1 hour.
	d	A 16ft deep hulled boat with a thirty horsepower outboard motor is recommended for travel to Stull Island.

	e	Proximity to the community could cause serious issues for management of the site. Maple sap starts to run at the same time as spring ice break up. Therefore, an individual from the community would have to live on the island for a number of weeks.
Infrastructure required for to achieve goals and objectives	a	No existing infrastructure.
	b	No possibility for electrical development.
	c	Potential for septic development.
	d	Large area for campsite and related infrastructure.
	e	Lake water used as source for drinking water.
Importance of the site to elders and community members for cultural and historical value	a	Elders and community members have a strong connection with Stull Island.
	b	In the last decade some community members have been actively harvesting maple sugar from the site.
	c	Elders and community members envision a re-establishment of the maple sugar harvest at Stull Island.
	d	Elders and community members believe the island would be a great place for teaching and learning of Anishinaabe culture and traditions.
	e	Interested in the processes involved with the production of maple syrup.
Willingness to share site with others (education and eco-tourism)	a	Elders and community members are proud of the traditions and stories surrounding the harvesting of maple sugar and the establishment of the Manitoba maples at Stull Island.
	b	Most would be willing to share stories with outsiders
Potential for quality and interesting interpretation.	a	Interesting stories surround the establishment of the Manitoba Maples at Stull Island.
	b	Potential for re-establishment of the tapping of maple trees and production of sugar (NTFP).
	c	Learning about the process and production of maple sugar.
	d	Vegetation at Stull Island is very different than much of the vegetation within the Shoal Lake watershed.

	e	Opportunities for interpretive trails, and campsite development for overnights.
Potential to gain managerial control of the site	a	A small portion of Stull Island is privately owned. This may cause some restrictions for land use permits, and land management activities.
	b	There is clear evidence of long-term aboriginal use at the site.
	c	Managing the site may prove difficult due to the location of the site in relation to IIFN.

Criterion for Prioritizing Cultural Landscapes - High Lake

Criteria		**Cultural Landscape High Lake Access Trail**
Proximity to the community (safety for group travel and ease of access).	a.	The entrance to the High Lake access trail is roughly 4 km to the north on Shoal Lake from the landing at IIFN.
	b.	Weather does not play a great factor in accessing the trail, as much of the water route is protected.
	c.	Travel time is relatively short, approximately 20 minutes.
Infrastructure required for to achieve goals and objectives	a.	No existing infrastructure (except one campsite).
	b.	Little to no possibility for electrical development.
	c.	Potential for septic development.
	d.	Signage required (trail development).
	e.	Canoes required for access High Lake from Shoal Lake.
Importance of the site to elders and community members for cultural and historical value	a.	Elders and community members consider the High Lake access trail culturally significant.
	b.	High Lake access trail has long been used for many generations by the community for accessing fishing, hunting, and transportation routes.
	c.	Elders indicated that the access trail goes through some of the best moose, deer, and waterfowl hunting in the Shoal Lake watershed.
	d.	Camp sites along trail used by community for outings.

Willingness to share site with others (education and eco-tourism)	a.	Elders and community members are somewhat reluctant to share the High Lake access trail with others.
	b.	Willing to share with community for educational purposes.
Potential for quality and interesting interpretation.	a.	Knowledge of the access trail is weak amongst most elders and community members.
	b.	Access trail passes through a large variety of vegetation types.
	c.	Interesting stories about transportation and hunting.
Potential to gain managerial control of the site	a.	The majority of the High Lake access trail is located off of reservation boundaries. Most of the land is crown land, however, there is a small portion of the land that is privately owned.

Criterion for Prioritizing Cultural Landscapes - Blueberry Patches

Criteria		**Cultural Landscape Blueberry Patches**
Proximity to the community (safety for group travel and ease of access).	a.	Blueberry patches are found scattered across the Shoal Lake watershed. Predominantly productive patches are located on rocky knobs in the bush or along the lakeshore. However, many of the sites are no longer productive. One productive site is found north of Shoal Lake along the Shoal Lake road.
Infrastructure required for to achieve goals and objectives	a.	Little to no infrastructure required.
	b.	Outhouse development.
Importance of the site to elders and community members for cultural and historical value	a.	Iskatewizaagegan people have a historical connection to the harvesting of wild blueberries.
	b.	Elders and community members talk of the importance of blueberries and blueberry harvesting sites.
	c.	The Iskatewizaagegan people are aware of the linkage between blueberry patches and forest disturbance.
Willingness to share site with others (education and eco-tourism)	a.	Due to the current decline of abundant blueberry patches and blueberries elders and community members are less willing to share blueberry picking sites with others.
	b.	Blueberry pickers within the Shoal Lake watershed are having a harder time locating productive sites.

	c.	Interested in educational value surrounding blueberry harvesting.
Potential for quality and interesting interpretation.	a.	Elders within the community have many interesting stories about blueberry harvesting in places outside of the Shoal Lake watershed.
	b.	Blueberry site production and management could be discussed.
	c.	Difficulty locating productive sites. These sites are dependant on forest disturbance and therefore are always changing.
	d.	Many people are already very familiar with blueberries and blueberry harvesting.
Potential to gain managerial control of the site	a.	Due to their dependency on disturbance, blueberry patches are constantly moving. Gaining managerial control of blueberry sites would be very difficult.
	b.	Typically the forest disturbance required to generate productive blueberry sites are quite drastic (fire, and / or logging). It would be difficult to gain land permits from the OMNR for such management techniques due to the high level of risks involved.

Criterion for Prioritizing Cultural Landscapes - Crowduck Lake.

Criteria		**Cultural Landscape Crowduck Lake**
Proximity to the community (safety for group travel and ease of access).	a.	Crowduck Lake can be easily accessed on both the west and east ends of the lake. The eastern most corner of the lake (wild rice field) can be accessed by car via Rush Bay road, approximately 33km from the band office.
	b.	Time travel is 35-45 minutes by car.
	c.	The wild rice field is access by canoe is 1-2 minutes from shore.
Infrastructure required for to achieve goals and objectives	a.	Existing infrastructure (camp sites and road access).
	b.	Electrical easily accessible.
	c.	Septic development easily achieved.
Importance of the site to elders and community members for cultural and historical value	a.	Elders and community members have a very strong connection to Crowduck Lake's wild rice and related activities.
	b.	Many stories exist about the rice, management of the rice, and the activities that took place during the wild rice harvest.
	c.	The history of wild rice and the Anishinaabe of this area is great.

	d.	Knowledge of wild rice and importance of teaching this knowledge is great.
Willingness to share site with others (education and eco-tourism)	a.	Elders and community members of IIFN are aware of the potential interest that exists within society.
	b.	Seems to be a desire to display traditional harvesting and preparation methods.
Potential for quality and interesting interpretation.	a.	Crowduck Lake has a high potential for quality and interesting interpretation.
	b.	Numerous traditional campsites exist on the shores of the wild rice field.
	c.	Many elders and community members have had personal experience with the wild rice and wild rice ceremonies at Crowduck Lake.
	d.	Wild rice management systems, growth and production characteristics, traditional and mechanized harvesting and ceremonies surrounding rice are very interesting and tell a cultural story.
Potential to gain managerial control of the site	a.	Crowduck Lake and it's wild rice have a long history with the people of Iskatewizaagegan. The OMNR would likely grant the IIFN permission to manage the lake for wild rice production so long as they were involved in the process.
	b.	Potentially the IIFN could have the lake reclassified to ensure the future of the wild rice crop and its related activities.

Appendix 3

Plant Species Collected along transects

1 - 3, Potato Island.

Transect	Common Name (s)	Scientific Name
1	Green alder	*Alnus crispa* (Ait.) Pursh
	Spreading dogbane	*Apocynum androsaemifolium* L.
	Marsh aster	*Aster borealis* Prov.
	Brome grass	*Bromus sp.* L.
	Blue bead lily	*Clintonia borealis* (Aiton.) Raf.
	Sedge	*Carex* L.
	Red osier dogwood	*Cornus stolonifera* L.
	Fireweed	*Epilobium angustifolium* L.
	Horsetail	*Equisetum sp.* L.
	Service berry	*Amelanchier spp.* Medikus.
	Hemp nettle	*Galeopsis tetrahit* L.
	Cow parsnip	*Heracleum lanatum* Michx.
	Black gooseberry	*Ribes lacustre* (Pers.) Poiret
	Prickly rose	*Rosa acicularis* Michx.
	Wild red raspberry	*Rubus ideaus* L.
	Balsam willow	*Salix pyrifolia* Andersson.
	Common cattail	*Typha latifolia* L.
	Wild red raspberry	*Rubus idaeus* L.
	Slender nettle	*Urtica dioica* L.
2	Fringed bindweed	*Polygonum cilinode* Michx.
	Wild red raspberry	*Rubus idaeus* L.
	Slender nettle	*Urtica dioica* L.
	Red berried elder	*Sambucus pubens* (Michx.) Koehne
	Mountain ash	*Sorbus decora* (Sarg.) C.K. Schneider
	Prickly wild rose	*Rosa acicularis* Lindley.
	Fireweed	*Epilobium angustifolium* L.
	Golden rod	*Solidago sp.* L.
	Chokecherry	*Prunus virginina* L.
	Red osier dogwood	*Cornus Stolonifera* L.
	Manitoba maple	*Acer negundo* L.
	Cut leaved ragwort	*Senecio sp.* L.
	Brome grass	*Bromus sp.* L.
	Horsetail	*Equisetum sp.* L.
	Service berry	*Amelanchier spp.* Medikus.
	Jewel weed	*Impatiens capensis* L.
	Yellow evening primrose	*Calylophus serrulatus* (Nutt.) Raven
	Western willow	*Aster hesperius* A. Gray.
3	Sedge	*Carex sp.* L.
	Green alder	*Alnus crispa* (Ait.) Pursh
	Bur oak	*Quercus macrocarpa* Michx.

	Cow parsnip	*Herocleum lanatum* Michx.
	Black ash	*Fraxinus nigra* Marshall.
	American elm	*Ulmus americana* L.
	Jewel weed	*Impatiens capensis* L.
	Mint Family	*Lamiaceae*
	Red berried elder	*Sambucus pubens* (MIchx.) Koehne.
	Manitoba maple	*Acer negundo* L.
	Prickly wild rose	*Rosa acicularis* Lindley.
	Golden rod	*Solidago sp.* L.
	Red osier dogwood	*Cornus stolonifera* L.
	Balsam willow	*Salix pyrifolia* Andersson.

Appendix 4

Soil test results* for each horizon at Potato Island.

Pit	Horizon	Depth	Texture	pH (Calcium Chloride)	Total Carbon (%)	Total Nitrogen (%)	Bray P (ug/g of soil)
Garden	LFH	8-0		4.49	29.70	2.91	126.00
	A	0-19	Silt Loam	3.60	3.60	0.41	777.84
	II Ck	19-82	Clay	4.02	1.05	0.14	88.93
	R	82+					
Forest	LFH	8-0		4.48	29.80	3.00	181.48
	A	0-11	Silt Loam	3.55	4.99	0.61	658.25
	B	11-28	Loam	3.61	2.40	0.28	813.30
	Bc	28-43	Silt Loam	3.93	1.06	0.15	647.39
	ii Ck	43-67	Clay	4.02	1.05	0.14	88.93
	R	67+					

*values represent the mean of two replicates

Appendix 5

Soil pH at which lime is recommended for Ontario crops.

Crops	Soil pH Below which Lime is Recommended	Target Soil pH1
Coarse and medium-textured mineral soils (sand, sandy loams, loams and silt loams)		
Perennial legumes, oats, barley, wheat, beans, peas, canola, flax, raspberries, strawberries, and all other crops not listed.	**6.1**	**6.5**
Corn, soybeans, grass, rye, hay, pasture, tobacco	**5.6**	**6**
Potatoes	**5.1**	**5.5**
Fine textured mineral soils (clays and clay loams)		
Rutabagas, alfalfa, cole crops.	**6.1**	**6.5**
Other perennial legumes, oats, barley, wheat, soybeans, beans, peas, canola, flax, tomatoes, raspberries, all other crops not listed above.	**5.6**	**6**
Corn, grass, rye, hay, pasture.	**5.1**	**5.5**

Source: Ministry of Agriculture and Food, Ontario.

Appendix 6

1. Summary of Project

Integrating Traditional Ecological Knowledge and Ecological Restoration: Restoring Aboriginal Cultural Landscapes with Iskatewizaagegan No. 39 Independent First Nation.

The overall aim of my thesis is to learn more about how landscapes, ecosystems, cultural health and knowledge management can benefit through the application of traditional ecological knowledge. My objectives are to answer the following four questions: 1) What are aboriginal cultural landscapes? 2) Why and how can traditional ecological knowledge be used in the process of ecological restoration? 3) What are the biophysical features that exist on these cultural landscapes? 4) How can restoration plans integrate traditional ecological knowledge to benefit both the landscape and the people living on the land?

The research will be carried out in collaboration with one Objibway community in Northwestern Ontario; Iskatewizaagegan No. 39 Independent First Nation (Shoal Lake). The elders of this community retain a strong connection, relationship and knowledge to the land and cultural sites centered on traditional activities such as wild rice harvesting and non-timber forest product harvesting, hunting and trapping. Traditional ecological knowledge of these activities and sites shared by the elders will be the main focus of my study with the goal of developing ecological restoration plans.

The principal methods will be drawn from ethnoecology research including documenting the biophysical inventory and life science assessments of identified cultural landscapes and cultural anthropology, ethnographic research including semi-structured interviews.

The Iskatewizaagegan Independent First Nation research on five sites, already identified, will take place under the guidance of elders, band members and interested members in the community. Cultural narratives will be documented through semi-structured interviews and participatory scoping workshops with elders and other knowledgeable community members from Iskatewizaagegan Independent First Nation. These scoping workshops will involve local elders and other interested community members. The intent of the workshops is to encourage participation in the planning and development of the research objectives, direction and continual feedback to the restoration plan. As such, the research as well as the results are recognized as more meaningful and valuable to the community. These interviews may also include identification, mapping and oral histories of socially, culturally and ecologically significant sites. The key issues and themes will be discussed with the interviewees and at the participatory workshops.

2. Research Instruments

Guiding Workshop/Interview Questions

Note: prior to the interview I will read the consent form that includes the background (see appendix 1) and receive their verbal agreement.

1. Which five areas/sites best tell the story about land-based cultural history of the Iskatewizaagegan people? Can you assist in identifying and mapping these sites?
2. Can you provide a brief dialogue regarding the historical background of each of these sites?
3. Why are these sites culturally significant?
4. In what way was the site different in the past?
5. What plants are at the site now? Were there different plants at that site in the past?
6. What wildlife visits this site? Did different wildlife exist at this site in the past?
7. What harvesting activities took place in the past?
8. What plants were culturally important at that site in the past?
9. How do you see these sites being used in the future?
10. What purpose can these sites serve today for the people of Iskatewizaagegan?
11. How could this site be restored to cultural significance?
12. Do you see these sites as places that should be used to educate the youth and people of Iskatewizaagegan about their culture and history? How would these sites be best able to assist in achieving this goal?
13. Will the restoration of these sites contribute to the ecological health of the Iskatewizaagegan people?
14. Would restoration of these sites through incorporating both local traditional knowledge and ecological restoration methods be the best method for creating the desired outcome of these sites?
15. Which two of the five sites do the Iskatewizaagegan people deem as priority sites for restoring?
16. For these selected sites how can we best develop teaching and interpretation opportunities through restoration design?
17. Would you rather have a restoration plan developed in the early stages of the projector implement restoration immediately?
18. What sort of timeline do the Iskatewizaagegan people deem appropriate for this restoration project?

Thank you for your time.

3. Study Subjects

The study subjects are Iskatewizaagegan men and women in the community of Iskatewizaagegan No. 39 Independent First Nation. The people being interviewed will be community elders and other knowledgeable community members. Participants will be selected by the community because of their status within the community, their knowledge about the community and traditional cultural practices, and their interest in the project. Those individuals who are not interested in participating will not be included in the study. The individuals will be informed about the study according to the plain language project summary (below) and read the consent form.

Project Summary
4. Informed Consent

Permission to carry out workshops and interviews in the community of Iskatewizaagegan No. 39 Independent First Nation has been obtained from the communities acting band council, as part of the funding proposal process. More specific terms and conditions related to collection, use and storage of the research results have been dealt with in the research protocol agreement signed by both the community of Iskatewizaagegan No. 39 and the University of Manitoba. The interest and willingness of individuals to participate in the workshops and interviews was scoped in August of 2002. Further verbal consent of these individuals to participate in the research will be achieved at the time of the interview . A verbal overview of the project background and objectives will be given at the beginning of the interview. See attachment 1 for script. Consent will not be obtained in writing, as many of the elders cannot read.

Issues of consent will relate to: willingness of individual to participate in the workshop/interview; terms for use of the interview/workshop results in thesis, publication and presentation; use of individual's name. The workshops will verify results from the interviews and provide opportunities for their name to be deleted from the record.

5. Deception

No methods of deception will be used in this research.

6. Feedback

The results of this study will be presented to the community in three ways. (1) Raw data (results of the workshops and interviews) form each of the workshops and interviews will be presented back to the workshop participants and interviewees who provided the data; (2) All maps, photos, collected field data (site descriptions) will be copied and provided to elders, community members and the Iskatewizaagegan band council; (3) A plain language summary (oral presentation and written report of the research results) will be presented to the community at an interim point (participatory workshop) as well as at the end of the research project.

7. Risks and Benefits

There are no perceived risks to the interviewees or Iskatewizaagegan No. 39 Independent First Nation community. They will benefit through the restoration of some of the communities Aboriginal cultural landscapes using aboriginal traditional ecological knowledge. These sites will help to provide opportunities for teaching, healing, livelihood, and natural-cultural heritage awareness. Capacity-building in the community of Iskatewizaagegan Independent First Nation will also take place through the hiring and training of local community researchers.

8. Anonymity and Confidentiality

For those interviewees who do not wish to be acknowledged in the research process, their confidentiality will be maintained through coding of the research results (e.g. informant A, B, C). Any information that workshop participants and interviewees do not wish to be recorded will be deleted from any transcriptions or other materials in which it appears (e.g. maps or photos).

9. Compensation

The interviewees and workshop participants in Iskatewizaagegan No. 39 will be compensated for participating in the interviews/workshop ($100/day) through the band office and not from myself. The rate and terms of the compensation were determined by the representative organization, Iskatewizaagegan No. 39 Independent First Nation.

Appendix 1a:

CONSENT FORM

INTRODUCTION: You are being asked to take part in a research study. Before you give your consent to be a subject, it is important that you understand what your participation would involve. Please ask questions if there is anything you do not understand.

PURPOSE: The purpose of my research study is to learn more about how Aboriginal cultural landscapes can be restored through the integration of traditional ecological knowledge and ecological restoration. I am specifically interested in knowing whether this can lead to the re-establishment of traditional practice and culture on the land. From this research an ecological restoration plan will be developed with community input.

The study is part of my Masters thesis research. Once, completed, the thesis would be a public document. I have developed an agreement with the Iskatewizaagegan No. 39 Independent First Nation Band Council about how this information will be collected and used. This agreement ensures that any information that the Band Council and community does not want public would remain in the community.

STUDY PROCEDURES: I will undertake in informal and unscheduled interviews that will record your opinions, ideas, and input in the form of hand written field notes. If the information you are providing me with seems to be of a broad public interest I may ask you to record your information on a photo or videotape. These photo and video recordings will be archived by the band council and be made available to the public. You can participate in informal and unscheduled interviews and refuse to have yourself recorded by photo and or videotape.

RISKS: There are no risks associated with this interview.

BENEFITS: For your participation in the study you will be paid a $100/day per diem by the Iskatewizaagegan No. 39 Band Council.

CONFIDENTIALITY: Information gathered by myself through informal, unscheduled interviews and written field notes will be non-invasive and will be kept confidential. You will be asked if you want to be associated with the information you have provided or if you prefer to be masked as the source of information. You should be aware that confidentiality cannot be guaranteed for information recorded through photos or video recordings. You should only provide information that you feel comfortable making public if you accept to have photos and or video recordings taken. Confidentiality cannot be guaranteed for photos and video recordings due to the nature of the community archive.

WHO TO CONTACT: If you have any questions about this study, contact myself at email ( ) or Dr. Fikret Berkes at (204) 474- 6731 or Shirley Thompson, (thesis co-advisor) at (204) 474-7170 during business hours (M-F, 8:00 A.M. - 4:30 P.M.) This research has been approved by the Joint Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact the Human Ethics Secretariat at (204) 474-7122.

VOLUNTARY PARTICIPATION/WITHDRAWAL: Your participation in this research study is strictly voluntary. You may refuse to participate or may choose to leave any question unanswered.

August 08, 2003

To: Karen Duncan, Interim Chair (Joint-Faculty Research Ethics Board)

From: William J. Roberts

Re: Protocol #J2003:108

"Integrating Traditional Ecological Knowledge and Ecological Restoration: Restoring Aboriginal Cultural Landscapes with Iskatewizaagegan No.39"

This letter hopes to address and clarify the concerns noted by the Joint-Faculty Research Ethics Board of my ethics proposal. Please pass on my gratitude to the board for helping me to clarify my research approach. This will allow me to communicate my ideas more clearly with my research partners.

1. Individuals who request to remain anonymous ("masked") during the research process will in no way be identified in the any of the data (video, photo, written), publications, presentations, and workshops resulting from the research project.

2. Concern addressed on the consent form.

3. During this research project no translators outside of the research team will be hired. The research team consists of advisors and researchers from the community and the Natural Resources Institute. Translators, as members of the research team, follow the same conditions of confidentiality as researchers with are outlined in the research protocol signed by partners who are part of the research team. If an individual is not comfortable providing information to members of the research team they can choose not to participate in the research and are free to withdraw at any time without penalty.

4. Due to the nature of the research project (cultural landscapes and ecological restoration), questions being asked of the participants do not require strict confidentiality.
   a) Confidentiality can be guaranteed to people who participate through informal, unscheduled interviews which are kept as field/research notes which will remain solely in the possession of the researcher. To ensure confidentiality people's identities are masked and notes are not archived or made available to the public. Furthermore, people's identities are masked when information/comments they provided are used in a research product which is available to the public.
   b) Confidentiality cannot be guaranteed in the event that participants agree to be photographed or video taped by the researcher because such information is archived by the Shoal Lake Resource Institute (SLRI). However, if the individual approaches the researcher and requests that photos or videos are destroyed before they are given to the SLRI the researcher will do so.
   The Iskatwizaagegan / Shoal Lake Resource Institute archives are public information and can be accessed with the permission of the Iskatewizaagegan Band Council. The band council currently has no archival protocols to keep such materials/information confidential outside of refusing permission to individuals to view such information. Archival material may also be kept by scholars who will not share the information

without permission from the band council and the individual identified in the public materials. Please see changes made to the consent form which clarifies the nature of the information to be collected, confidentiality and archiving of such information.

5. Concern addressed on the consent form.

I hope these additions have helped to clarify some of the Joint-Faculty Research Ethics Boards concerns regarding my research project protocol. If you have any further questions or concerns please contact me at , or Dr. Fikret Berkes at

Sincerely, Will Roberts